School Accountability and Administrator Incentives in California
Technical Appendix

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Description

The accompanying report presents evidence that the No Child Left Behind Act of 2001 (NCLB) increased the accountability of school board members and principals for improving student achievement. Specifically, incumbent school board members in districts that make Adequate Yearly Progress are more likely to be re-elected than would have been the case before NCLB, and principals of schools that enter Program Improvement are more likely to be demoted than would have been the case before NCLB. However, I find no evidence of a relationship between changes in principal salaries and a number of different student achievement measures; and I find no evidence of a relationship between student achievement and either superintendent salaries or superintendent retention.

This technical appendix reports summary statistics for the data on which the report is based, details my econometric methodologies, and presents my regression results.

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Appendix A: Summary Statistics

Table A1: District Characteristics

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Enrollment	9359	9473	8005	7923	8194	7987	7921	7639	7728	9085
	(33381)	(33857)	(10650)	(10416)	(10768)	(10433)	(10365)	(10386)	(11571)	(31380)
% Black	4.4%	4.4%	4.5%	4.5%	4.5%	4.3%	4.3%	4.1%	4.0%	4.2%
	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)
% Hispanic	34.0%	34.7%	34.9%	34.9%	35.2%	36.0%	37.5%	38.9%	39.0%	39.6%
	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)	(0.27)	(0.28)	(0.28)	(0.28)
% White	52.0%	50.7%	49.9%	49.7%	49.0%	48.1%	46.1%	44.7%	43.9%	42.5%
	(0.27)	(0.27)	(0.27)	(0.27)	(0.27)	(0.26)	(0.27)	(0.27)	(0.27)	(0.27)
% Subsidized Lunch	41.3%	34.5%	33.6%	32.6%	32.1%	32.4%	33.9%	35.4%	35.3%	36.6%
	(0.25)	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)	(0.24)	(0.23)
Elementary District	43.2%	42.5%	43.0%	43.5%	43.9%	44.7%	45.1%	46.5%	47.0%	46.8%
	(0.50)	(0.49)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
High School District	12.5%	12.5%	13.0%	12.9%	12.4%	12.2%	12.1%	11.5%	11.6%	11.7%
	(0.33)	(0.33)	(0.34)	(0.34)	(0.33)	(0.33)	(0.33)	(0.32)	(0.32)	(0.32)
Unified District	44.3%	45.1%	43.9%	43.7%	43.7%	43.1%	42.7%	42.0%	41.4%	41.6%
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.49)	(0.49)	(0.49)
Teachers' Salary Increase	3.6%	3.2%	8.8%	3.6%	1.4%	0.6%	1.8%	3.1%	5.0%	3.0%
	(1.6)	(1.6)	(2.6)	(2.4)	(1.5)	(1.1)	(1.6)	(1.7)	(1.8)	(1.9)
Districts	449	457	460	451	451	427	412	469	517	575

Standard deviations in parentheses

Table A2: District Achievement

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
% Proficient in ELA						43.0%	43.0%	46.9%	49.7%	49.7%
						(17.5)	(17.4)	(16.8)	(16.5)	(16.1)
% Proficient in Math						43.6%	44.4%	48.8%	51.9%	51.8%
						(16.1)	(16.0)	(14.9)	(14.4)	(14.1)
Normalized Reading	-0.003	-0.028	-0.014	0.018	0.049	0.063	0.034			
Score	(1.00)	(1.00)	(1.00)	(1.01)	(0.99)	(0.99)	(1.01)			
Normalized Math	-0.021	-0.040	-0.028	-0.008	0.016	0.036	0.005			
Score	(0.97)	(0.98)	(1.00)	(1.01)	(0.99)	(0.99)	(1.00)			
Met All AYP						34.7%	52.9%	56.1%	61.9%	45.7%
Requirements						(0.48)	(0.50)	(0.50)	(0.49)	(0.50)
In PI (Title I Districts								21.4%	21.5%	23.9%
Only)								(0.41)	(0.41)	(0.43)
Districts	449	457	460	451	451	427	412	469	517	575

Standard deviations in parentheses

Table A3: School Board Election Results

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Incumbents Running	1.9	1.8	1.6	1.9	2.1	1.8	1.8	2.0	2.0
	(1.0)	(0.9)	(0.9)	(1.0)	(0.9)	(0.9)	(0.8)	(0.9)	(0.9)
Other Candidates Running	1.2	1.0	1.1	1.3	1.1	1.0	0.9	1.3	1.2
	(0.9)	(0.9)	(0.9)	(1.0)	(0.9)	(0.8)	(0.9)	(0.9)	(0.9)
Incumbents Winning	1.6	1.4	1.3	1.5	1.7	1.4	1.4	1.5	1.6
	(0.9)	(1.0)	(0.9)	(1.0)	(0.9)	(0.9)	(0.8)	(0.9)	(0.9)
Open Seats	2.8	2.4	2.4	2.8	2.8	2.4	2.4	2.8	2.8
	(0.5)	(0.6)	(0.6)	(0.5)	(0.5)	(0.6)	(0.6)	(0.5)	(0.6)
November Election	98.9%	99.2%	98.2%	99.3%	97.6%	100.0%	99.3%	98.4%	100.0%
	(0.11)	(0.09)	(0.13)	(0.09)	(0.15)	(0.00)	(0.08)	(0.13)	(0.00)
School Board Races	180	127	164	137	168	117	144	123	188

Standard deviations in parentheses

Table A4: Superintendent Characteristics

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Share Retained	69.3%	77.0%	79.3%	75.4%	73.8%	67.4%	77.9%	71.2%	61.9%	57.4%
	(0.46)	(0.42)	(0.41)	(0.43)	(0.44)	(0.47)	(0.42)	(0.45)	(0.49)	(0.49)
Years in Education	28.0	28.1	28.4	28.6	28.9	29.0	28.3	27.8	27.8	27.5
	(7.43)	(7.51)	(6.95)	(7.31)	(7.69)	(7.92)	(8.55)	(9.16)	(9.38)	(9.73)
Female	25.4%	27.4%	25.0%	25.9%	24.2%	23.0%	23.5%	25.8%	28.2%	31.1%
	(0.44)	(0.45)	(0.43)	(0.44)	(0.43)	(0.42)	(0.42)	(0.44)	(0.45)	(0.46)
Black	1.6%	1.8%	2.0%	2.0%	1.8%	1.6%	0.7%	1.5%	1.9%	1.7%
	(0.12)	(0.13)	(0.14)	(0.14)	(0.13)	(0.13)	(0.09)	(0.12)	(0.14)	(0.13)
Latino	8.5%	9.4%	9.6%	8.0%	7.5%	8.4%	9.7%	10.9%	11.4%	10.8%
	(0.28)	(0.29)	(0.29)	(0.27)	(0.26)	(0.28)	(0.30)	(0.31)	(0.32)	(0.31)
White	87.1%	86.0%	85.4%	86.5%	88.0%	87.8%	86.7%	84.4%	83.9%	84.2%
	(0.34)	(0.35)	(0.35)	(0.34)	(0.33)	(0.33)	(0.34)	(0.36)	(0.37)	(0.37)
Salary	$97,775	$102,264	$107,205	$117,112	$125,274	$128,765	$131,349	$134,718	$141,364	$150,408
	(17472.9)	(18947.2)	(20453.9)	(23840.6)	(26954.2)	(27463.7)	(28559.2)	(31290.2)	(34116.2)	(39797.4)
Contract Days	228.4	227.0	225.0	226.1	226.2	225.9	226.3	225.4	224.1	224.9
	(10.30)	(8.69)	(7.23)	(8.57)	(8.57)	(8.87)	(9.11)	(8.72)	(8.04)	(8.72)
Superintendents	449	457	460	451	451	427	412	469	517	575

Standard deviations in parentheses

Table A5: School Characteristics

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Enrollment	838	836	839	832	836	838	838	828	813	790
	(551)	(553)	(558)	(556)	(569)	(588)	(597)	(605)	(609)	(596)
% Black	8.7%	8.6%	8.4%	8.3%	7.9%	7.7%	7.6%	7.6%	7.6%	7.6%
	(0.13)	(0.13)	(0.12)	(0.12)	(0.12)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)
% Latino	37.5%	38.2%	39.0%	40.0%	41.2%	42.5%	43.7%	44.8%	45.7%	46.5%
	(0.28)	(0.28)	(0.28)	(0.28)	(0.29)	(0.29)	(0.29)	(0.29)	(0.30)	(0.30)
% White	41.4%	40.6%	39.6%	38.5%	37.3%	36.1%	34.3%	32.9%	31.6%	30.4%
	(0.29)	(0.29)	(0.28)	(0.28)	(0.28)	(0.28)	(0.27)	(0.27)	(0.27)	(0.26)
% Subsidized Lunch	48.6%	40.5%	40.2%	39.5%	39.6%	39.8%	40.8%	40.9%	40.0%	42.0%
	(0.30)	(0.27)	(0.28)	(0.28)	(0.28)	(0.28)	(0.28)	(0.28)	(0.29)	(0.27)
Elementary School	71.3%	71.7%	72.1%	72.2%	72.1%	72.5%	72.6%	72.0%	70.9%	70.3%
	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.45)	(0.46)
High School	11.8%	11.5%	11.0%	11.0%	10.8%	10.8%	10.8%	11.4%	12.2%	12.9%
	(0.32)	(0.32)	(0.31)	(0.31)	(0.31)	(0.31)	(0.31)	(0.32)	(0.33)	(0.34)
Middle School	16.8%	16.7%	16.7%	16.6%	16.9%	16.6%	16.3%	16.2%	16.3%	16.1%
	(0.37)	(0.37)	(0.37)	(0.37)	(0.37)	(0.37)	(0.37)	(0.37)	(0.37)	(0.37)
K-12 School	0.11%	0.15%	0.15%	0.13%	0.17%	0.17%	0.24%	0.42%	0.58%	0.65%
	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.06)	(0.08)	(0.08)
Teachers' Salary	3.7%	3.0%	9.5%	3.1%	1.6%	0.3%	1.6%	2.9%	5.5%	2.7%
Increase	(1.5)	(2.0)	(2.2)	(2.4)	(1.6)	(0.9)	(1.4)	(1.6)	(2.0)	(1.8)
Schools	5241	5334	5205	5346	5357	5348	5398	5696	6086	6597

Standard deviations in parentheses

Table A6: School Achievement

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
% Proficient in ELA						40.4%	40.6%	45.1%	47.6%	47.9%
						(20.0)	(19.9)	(19.5)	(19.2)	(18.7)
% Proficient in Math						44.4%	45.5%	50.6%	53.0%	53.1%
						(19.1)	(19.2)	(18.6)	(18.3)	(18.1)
Normalized Reading	-0.026	-0.020	-0.018	-0.024	-0.020	-0.016	-0.024			
Score	(0.99)	(0.99)	(1.00)	(1.01)	(1.01)	(1.01)	(1.02)			
Normalized Math	-0.038	-0.028	-0.019	-0.028	-0.025	-0.021	-0.030			
Score	(0.99)	(0.99)	(0.99)	(1.00)	(1.01)	(1.01)	(1.01)			
Met School-Wide			83.9%	71.8%	68.9%	90.8%	64.6%	82.5%	73.5%	66.3%
API Growth Target			(0.37)	(0.45)	(0.46)	(0.29)	(0.48)	(0.38)	(0.44)	(0.47)
Met All AYP						61.3%	70.0%	62.8%	68.6%	69.5%
Requirements						(0.49)	(0.46)	(0.48)	(0.46)	(0.46)
Identified for PI	2.8%	5.3%	7.2%	9.1%	12.1%	13.6%	22.2%	29.1%	29.9%	37.5%
(Title I Schools Only)	(0.16)	(0.22)	(0.26)	(0.29)	(0.33)	(0.34)	(0.42)	(0.45)	(0.46)	(0.48)
Schools	3587	3619	3551	3657	3693	3724	3798	3998	4256	4590

Standard deviations in parentheses

Table A7: Principal Characteristics

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Share Retained	67.0%	71.4%	70.9%	69.7%	70.8%	63.6%	69.4%	67.0%	64.4%	63.3%
	(0.47)	(0.45)	(0.45)	(0.46)	(0.45)	(0.48)	(0.46)	(0.47)	(0.48)	(0.48)
Years in Education	23.8	23.8	23.5	23.5	23.0	22.9	22.3	22.0	21.6	21.2
	(8.06)	(8.33)	(8.65)	(8.78)	(9.09)	(9.19)	(9.43)	(9.58)	(9.80)	(9.82)
Female	56.6%	57.3%	58.1%	59.4%	60.4%	60.6%	61.1%	61.2%	61.1%	60.8%
	(0.50)	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)
Black	7.9%	7.9%	8.2%	7.8%	7.9%	7.2%	7.4%	7.6%	7.7%	7.6%
	(0.27)	(0.27)	(0.27)	(0.27)	(0.27)	(0.26)	(0.26)	(0.27)	(0.27)	(0.27)
Latino	12.2%	12.4%	12.5%	12.8%	12.9%	14.1%	14.7%	14.9%	15.6%	16.2%
	(0.33)	(0.33)	(0.33)	(0.33)	(0.33)	(0.35)	(0.35)	(0.36)	(0.36)	(0.37)
White	75.9%	74.8%	74.6%	74.7%	74.7%	74.4%	72.7%	71.5%	71.4%	70.4%
	(0.43)	(0.43)	(0.44)	(0.43)	(0.43)	(0.44)	(0.45)	(0.45)	(0.45)	(0.46)
Salary	$74,711	$77,483	$80,642	$87,750	$90,946	$93,461	$94,100	$95,922	$99,089	$104,106
	(6710.4)	(6921.7)	(7036.7)	(9437.8)	(9716.0)	(9416.6)	(9426.0)	(9533.6)	(10340.8)	(11453.8)
Contract Days	213.6	213.2	213.5	212.2	212.1	211.8	212.0	212.2	211.9	211.6
	(8.4)	(6.9)	(6.8)	(9.6)	(8.7)	(8.6)	(9.3)	(8.7)	(8.9)	(8.3)
Principals	5241	5334	5205	5346	5357	5348	5398	5696	6086	6597

Standard deviations in parentheses

Appendix B: Empirical Strategy

School board members serve four-year terms. School board elections occur every two years, so that roughly half of the members of a school board are elected every two years. Achievement results are released in August, and most school board elections occur in November. School board election results are modeled as follows:[1]

$$w_{dt} = \beta_0 + \beta_1 c_{dt} + X3'_{dt}\beta_2 + \beta_3 A_{dt} + \beta_4 A_{dt} * ACCT_t + \beta_5 A_{dt} + \beta_6 A_{dt-1} * ACCT_t + \tau_t + \eta_d + \varepsilon_{dt} \quad (1)$$

The number of incumbents winning re-election to the school board in district *d* during year *t* is assumed to be a function of the number of open seats, district characteristics,[2] and student achievement over the past two years. The relationship between the number of incumbents winning re-election and student achievement is allowed to be different in years that NCLB is in effect. Year fixed effects are included to control for year-specific factors affecting the share of votes received by incumbents in all school districts in a given year. District fixed effects are included to control for constant differences across districts in the number of incumbents re-elected. The number of incumbents standing for re-election and the number of challengers may also be related to student achievement and are therefore not controlled for in the model.

To allow for the possibility that shocks to school board elections are correlated within districts, the error term ε_{dt} is clustered at the district level.

Superintendent retention is modeled using the following linear probability model:[3]

$$\Pr(y_{dt,t+1} = 1) = \beta_0 + X1'_{dt}\gamma_1 + \gamma_2 A_{dt-1} + \gamma_3 A_{dt-1} * ACCT_t + \mu_t + \delta_d + u_{dt} \quad (2)$$

Superintendent retention in district *d* during year *t* is assumed to be a function of superintendent and district characteristics,[4] the achievement of students in the district two years previously, and other unobservable factors affecting retention of all superintendents within a given year. The relationship between superintendent retention and student achievement is allowed to differ in years in which PSAA or NCLB are in effect. A district fixed effect is included to control for constant differences in retention rates across districts. To allow for the possibility that shocks to superintendent retention are correlated within districts, the error term u_{dt} is clustered at the district level.

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[1] For simplicity, many of the symbols used in this section are used repeatedly. Each equation is estimated separately, and with the exception of the symbols repeated in equations (5) and (5.1), each symbol represents a different value in each equation.

[2] Shares of students who are African American, Latino, and white; share of students who qualify for subsidized meals; log of enrollment; and number of schools in the district.

[3] Because district fixed effects are often perfect predictors of superintendent retention, a linear probability model is used instead of a probit or a logit.

[4] Years in education and its square; gender; race; education level; shares of students who are African-American, Latino, and white; share of students who qualify for subsidized meals; log of district enrollment; and number of schools in the district.

If a school board chooses to terminate a superintendent's contract, the superintendent must be informed by the middle of May. However, student achievement data is not released until late August. Therefore, I assume that achievement data from year *t-1* is related to superintendent retention between years *t* and *t+1,* but student achievement data from year *t* is not. Equation (2) is estimated using only the subsample of superintendents who are retained between years *t-1* and *t.*

The salaries of superintendents retained between years *t* and *t+1* are modeled as follows:

$$\Delta y_{dt,t+1} = \beta_0 + X2'_{dt}\beta_1 + \beta_2 A_{dt-1} + \beta_3 A_{dt-1} * ACCT_t + \tau_t + \eta_d + \varepsilon_{dt} \quad (3)$$

The change in log salary of a superintendent in district *d* between years *t* and *t-1* is assumed to be a function of observable district characteristics[5] and unobservable year-specific factors affecting the salaries of all superintendents. It is assumed that among other factors, student achievement during the previous year also plays a role in determining superintendent salaries. The relationship between superintendent salaries and student achievement is allowed to be different in years that PSAA or NCLB is in effect. A district fixed effect is included to control for constant differences in salary increases across districts. To allow for the possibility that shocks to superintendent salaries are correlated within districts, the error term ε_{dt} is clustered at the district level.

Principal retention is modeled using the following linear probability model:

$$P(y_{1st,t+1} = 1) = \beta_0 + X1'_{st}\gamma_1 + \gamma_2 A_{st-1} + \gamma_3 A_{st-1} * ACCT_t + \mu_t + \delta_s + u_{st} \quad (4)$$

Principal retention in school *s* during year *t* is assumed to be a function of principal and school characteristics,[6] the achievement of students in the school during the previous year, and other unobservable factors affecting the retention of all principals in a given year. The relationship between principal retention and student achievement is allowed to be different in years in which PSAA or NCLB are in effect. A school fixed effect is included to control for constant differences in retention rates across schools. To allow for the possibility that shocks to principal retention are correlated within schools, the error term u_{st} is clustered at the school level.

If a school board chooses to terminate a principal's contract, the principal must be informed by the middle of May. However, student achievement data is not released until late August. Therefore, I assume that achievement data from year *t-1* is related to principal retention between years *t* and *t+1,* but student achievement data from year *t* is not. Equation (4) is estimated using only the subsample of principals who are retained between years *t-1* and *t.*

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[5] Percentage change in teacher salaries in the district; change in the number of superintendent contract days; years in education and its square; gender; race; education level; shares of students who are African American, Latino, and white; share of students who qualify for subsidized meals; log of district enrollment; and number of schools in the district.

[6] Years in education and its square; gender; race; education level; shares of students who are African American, Latino, and white; share of students who qualify for subsidized meals; and log of school enrollment.

The salaries of principals who are retained between years *t-1* and *t* are modeled as follows:

$$\Delta y_{dst,t+1} = \beta_0 + X2'_{dst}\beta_1 + \beta_2 A_{dst-1} + \beta_3 A_{dst-1} * ACCT_t + \tau_t + \eta_s + \varepsilon_{dst} \quad (5)$$

The change in log salary of a principal in school *s* of district *d* between years *t* and *t+1* is assumed to be a function of observable school characteristics[7] and unobservable year-specific factors affecting the salaries of all principals. It is assumed that among other factors, student achievement during the previous year also plays a role in determining principal salaries. The relationship between principal salaries and student achievement is allowed to be different in years that PSAA or NCLB is in effect. A school fixed effect is included to control for constant differences in salary increases across districts. To allow for the possibility that shocks to principal salaries are correlated within schools, the error term ε_{sdt} is clustered at the school level.

Data on individual principal salaries are not available. Therefore, I use average principal salaries within the district in place of individual principal salaries and re-write equation (5) as follows:

$$\Delta\bar{y}_{dt,t+1} = \beta_0 + X2'_{dst}\beta_1 + \beta_2 A_{dst-1} + \beta_3 A_{dst-1} * ACCT_t + \tau_t + \eta_s + \Delta e_{dst,t+1} + \varepsilon_{dst}$$

(5.1)

where

$$\Delta e_{dst,t+1} = \Delta\bar{y}_{dt,t+1} - \Delta y_{dst,t+1}$$

If A_{dst-1} and $\Delta e_{dst,t+1}$ are positively correlated, estimates of β_2 and β_3 will be biased downward. For example, if an individual principal is awarded with a larger-than-average salary increase following an unusually successful school year as measured by A_{dst-1}, Δe_{dst} will increase. Therefore, estimates of β_2 and β_3 identify the relationship between student achievement and changes in principal salaries between districts, but not the relationship between achievement and salaries within districts. Because all principals within a district are often compensated according to a single salary schedule, equation (5.1) may be a more appropriate specification than equation (5).

Existing data make it difficult to determine if principals who are not retained in the same position are promoted, demoted, move to another district, or leave the profession altogether. Because this determination is not possible, I look for individuals who have characteristics identical to that of a principal who is not retained and who appear in the district the subsequent year. Positions within a district are ranked in the following order: assistant elementary school principal, assistant middle school principal, assistant high school principal,

[7] Percentage change in teacher salaries in the district; change in the number of principal contract days; years in education and its square; gender; race; education level; shares of students who are African American, Latino, and white; share of students who qualify for subsidized meals; and log of school enrollment.

elementary school principal, middle school principal, high school principal, assistant superintendent, superintendent.[8]

Principals who move up one step, such as being promoted from an elementary school principal to a middle school principal, are given a promotion score of 1; principals who move up two positions are a given a promotion score of 2, etc. Principals who are demoted are given a score of -1, -2, etc., based on the number of steps they are demoted, and principals who remain within the same position are given a promotion score of 0. Principals assigned to positions other than those listed above are removed from the sample, as are principals for whom no matches are found.

I then model changes in principal status as follows:

$$\Delta y_{1st,t+1} = \beta_0 + X1'_{st}\gamma_1 + \gamma_2 A_{st-1} + \gamma_3 A_{st-1} * ACCT_t + \mu_t + \delta_s + u_{st} \qquad (7)$$

The change in the status of a principal at school *s* between years *t* and *t+1* is assumed to be a function of principal and school characteristics,[9] the achievement of students in the school during the previous year, and other unobservable factors affecting changes in the status of all principals in a given year. The relationship between changes in principal status and student achievement is allowed to be different in years in which PSAA or NCLB are in effect. A school fixed effect is included to control for constant differences in changes in principal status across schools. To allow for the possibility that shocks to principal promotion or demotion are correlated within schools, the error term u_{st} is clustered at the school level.

Often there is more than one match for a principal who is not retained (i.e., I find more than one individual with identical characteristics in the district the following year). Thus it is not possible to accurately determine the true promotion or demotion of each principal. To address this problem, I randomly assign one of each principal's possible matches to that principal and record the demotion or promotion represented by that match. Some of these principals will be matched correctly; if a relationship between student achievement and changes in principal status truly exists, these correct matches will help me to estimate that relationship. Among the incorrect matches, some will report a change in principal status that is greater than the principal's true change in status, and others will report a change in status that is smaller than the principal's true change in status. These incorrect matches introduce "noise" to the data and decrease the likelihood that I will be able to infer that a relationship between student achievement and principal status exists.[10]

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[8] These rankings correspond to the salary rankings of administrators in the Los Angeles Unified School District, Long Beach Unified School District, Sacramento City Unified School District, San Diego Unified School District, and San Francisco Unified School District.

[9] Years in education and its square; gender; race; education level; shares of students who are African American, Latino, and white; share of students who qualify for subsidized meals; and log of school enrollment.

[10] It is also possible to use this method to match principals who are not retained to individuals in the following year who are new to their administrative positions anywhere in California. However, the very low signal-to-noise ratio that would result would undoubtedly render such an exercise useless.

Appendix C: Estimates of Administrator Accountability

Table C1: Board Members Elected and High-Stakes Exams

	(1)	(2)	(3)	(4)
% Proficient - ELA	-0.016			
	(0.046)			
% Proficient - ELA (lag)	0.084			
	(0.047)			
% Proficient - math		0.019		
		(0.034)		
% Proficient - math (lag)		0.015		
		(0.024)		
Made AYP			-0.014	
			(0.176)	
Made AYP (lag)			0.510	
			(0.175)**	
Program Improvement				-0.400
				(0.254)
Program Improvement (lag)				0.230
				(0.203)
# of Open Seats	0.565	0.542	0.550	0.578
	(0.115)**	(0.119)**	(0.125)**	(0.059)**
Enrollment (log)	-4.614	-5.024	-5.272	-1.090
	(2.059)*	(1.980)*	(1.807)**	(0.514)*
% African American	2.852	0.392	3.365	1.865
	(8.914)	(9.283)	(9.246)	(4.170)
% Latino	0.026	-0.081	0.602	-2.698
	(6.578)	(6.916)	(6.796)	(2.220)
% White	-2.030	-1.481	-0.010	-1.448
	(5.536)	(5.499)	(5.517)	(2.171)
% Poverty	2.772	2.676	2.907	0.001
	(1.397)*	(1.440)	(1.106)**	(0.783)
# of Schools	0.084	0.124	0.116	0.036
	(0.103)	(0.101)	(0.110)	(0.038)
Observations	422	422	422	1020
R-squared	0.38	0.36	0.40	0.18

* significant at 5% level; ** significant at 1% level
Robust standard errors, clustered by district, in parentheses
All specifications include a constant term and year and district fixed effects.

Table C2: Board Members Elected and Low-Stakes Exams

	(1)	(2)	(3)	(4)
Reading Score (Normalized)	0.875	0.180		
	(0.871)	(0.435)		
Reading Score (Normalized) (lag)	-1.379	-0.649		
	(0.846)	(0.438)		
Reading Score (Normalized) * PSAA	0.883			
	(0.912)			
Reading Score (Normalized) (lag) * PSAA	-0.739			
	(0.907)			
Reading Score (Normalized) * NCLB		-0.008		
		(0.595)		
Reading Score (Normalized) (lag) *NCLB		0.051		
		(0.599)		
Math Score (Normalized)			0.266	0.266
			(0.783)	(0.362)
Math Score (Normalized) (lag)			-0.742	-0.663
			(0.786)	(0.343)
Math Score (Normalized) * PSAA			0.113	
			(0.835)	
Math Score (Normalized) (lag) *PSAA			0.054	
			(0.852)	
Math Score (Normalized) * NCLB				0.156
				(0.640)
Math Score (Normalized) (lag) * NCLB				-0.125
				(0.654)
# of Incumbents Running	0.513	0.509	0.507	0.505
	(0.068)**	(0.070)**	(0.068)**	(0.069)**
Enrollment (log)	0.364	0.203	0.194	0.081
	(0.816)	(0.782)	(0.790)	(0.779)
% African American	-2.138	-1.909	-0.948	-0.952
	(7.528)	(7.553)	(7.328)	(7.560)
% Latino	-3.319	-3.954	-3.162	-4.188
	(3.218)	(3.403)	(3.208)	(3.492)
% White	-3.409	-3.611	-3.197	-3.753
	(3.234)	(3.340)	(3.249)	(3.357)
% Poverty	1.041	1.037	1.207	1.222
	(1.033)	(1.026)	(0.976)	(0.986)
# of Schools	-0.103	-0.109	-0.097	-0.103
	(0.057)	(0.057)	(0.057)	(0.057)
Observations	800	800	800	800
R-squared	0.20	0.19	0.20	0.20

* significant at 5% level; ** significant at 1% level
Robust standard errors, clustered by district, in parentheses
All specifications include a constant term and year and district fixed effects.

Table C3: Superintendent Retention and High-Stakes Exams

	(1)	(2)	(3)	(4)
% Proficient - ELA (lag)	-0.008			
	(0.008)			
% Proficient - math (lag)		-0.007		
		(0.005)		
Made AYP (lag)			0.016	
			(0.038)	
Program Improvement (lag)				0.005
				(0.051)
Experience	0.066	0.067	0.069	0.057
	(0.028)*	(0.028)*	(0.028)*	(0.009)**
Experience ^ 2	-0.002	-0.002	-0.002	-0.001
	(0.001)**	(0.001)**	(0.001)**	(0.000)**
Female	0.129	0.131	0.130	-0.032
	(0.174)	(0.174)	(0.175)	(0.044)
Black	0.327	0.352	0.320	0.045
	(0.661)	(0.670)	(0.665)	(0.215)
Latino	0.043	0.059	0.021	-0.096
	(0.466)	(0.467)	(0.466)	(0.193)
White	-0.142	-0.139	-0.160	0.053
	(0.400)	(0.396)	(0.397)	(0.184)
Enrollment (log)	-0.181	-0.131	-0.136	-0.068
	(0.389)	(0.389)	(0.392)	(0.158)
% African American	0.469	0.434	0.580	1.370
	(2.556)	(2.559)	(2.548)	(1.218)
% Latino	-0.589	-0.460	-0.543	0.077
	(1.310)	(1.302)	(1.300)	(0.544)
% White	1.446	1.489	1.399	-0.346
	(0.992)	(0.988)	(0.986)	(0.513)
% Poverty	-0.405	-0.395	-0.365	0.041
	(0.309)	(0.309)	(0.312)	(0.192)
# of Schools	0.006	0.004	0.005	-0.006
	(0.024)	(0.024)	(0.024)	(0.009)
Observations	1229	1229	1229	2771
R-squared	0.17	0.17	0.17	0.08

* significant at 5% level; ** significant at 1% level
Robust standard errors, clustered by district, in parentheses
All specifications include a constant term and year, district, and level-of-education fixed effects.

Table C4: Superintendent Retention and Low-Stakes Exams

	(1)	(2)	(3)	(4)
Reading Score (Normalized) (lag)	0.065	0.045		
	(0.071)	(0.069)		
Reading Score (Normalized) (lag) * PSAA	-0.035			
	(0.024)			
Reading Score (Normalized) (lag) * NCLB		-0.020		
		(0.021)		
Math Score (Normalized) (lag)			0.043	0.027
			(0.065)	(0.064)
Math Score (Normalized) (lag) *PSAA			-0.036	
			(0.024)	
Math Score (Normalized) (lag) * NCLB				-0.034
				(0.021)
Experience	0.065	0.065	0.065	0.065
	(0.010)**	(0.010)**	(0.010)**	(0.010)**
Experience ^ 2	-0.002	-0.002	-0.002	-0.002
	(0.000)**	(0.000)**	(0.000)**	(0.000)**
Female	0.003	0.008	0.003	0.010
	(0.063)	(0.063)	(0.063)	(0.063)
Black	0.327	0.326	0.328	0.320
	(0.272)	(0.273)	(0.274)	(0.274)
Latino	0.014	0.016	0.014	0.008
	(0.273)	(0.273)	(0.274)	(0.273)
White	0.214	0.213	0.213	0.210
	(0.259)	(0.259)	(0.260)	(0.260)
Enrollment (log)	0.052	0.048	0.062	0.046
	(0.200)	(0.200)	(0.199)	(0.200)
% African American	0.373	0.366	0.267	0.170
	(1.414)	(1.420)	(1.405)	(1.410)
% Latino	-0.763	-0.792	-0.794	-1.004
	(0.678)	(0.710)	(0.675)	(0.704)
% White	-1.820	-1.857	-1.815	-1.982
	(0.618)**	(0.627)**	(0.618)**	(0.630)**
% Poverty	0.403	0.398	0.400	0.392
	(0.242)	(0.240)	(0.242)	(0.239)
# of Schools	-0.021	-0.021	-0.021	-0.022
	(0.013)	(0.013)	(0.013)	(0.013)
Observations	2169	2169	2169	2169
R-squared	0.08	0.08	0.08	0.08

* significant at 5% level; ** significant at 1% level
Robust standard errors, clustered by district, in parentheses
All specifications include a constant term and year, district, and level-of-education fixed effects.

Table C5: Percent Change in Superintendent Salaries and High-Stakes Exams

	(1)	(2)	(3)	(4)
% Proficient - ELA (lag)	0.000			
	(0.001)			
% Proficient - math (lag)		0.000		
		(0.001)		
Made AYP (lag)			-0.002	
			(0.007)	
Program Improvement (lag)				-0.002
				(0.009)
Change in Contract Work Days	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
% Change in Teacher Salaries	0.006	0.006	0.006	0.006
	(0.002)**	(0.002)**	(0.002)**	(0.001)**
Experience	-0.001	-0.001	-0.001	0.001
	(0.005)	(0.005)	(0.005)	(0.002)
Experience ^ 2	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Female	0.079	0.080	0.079	0.000
	(0.053)	(0.053)	(0.052)	(0.007)
Black	0.000	0.000	0.000	0.023
	(0.000)	(0.000)	(0.000)	(0.033)
Latino	-0.032	-0.035	-0.030	0.020
	(0.050)	(0.051)	(0.050)	(0.030)
White	-0.100	-0.102	-0.098	0.012
	(0.038)**	(0.038)**	(0.038)**	(0.031)
Enrollment (log)	-0.011	-0.014	-0.014	0.058
	(0.061)	(0.063)	(0.062)	(0.022)**
% African American	-0.562	-0.554	-0.568	-0.298
	(0.385)	(0.387)	(0.386)	(0.180)
% Latino	-0.139	-0.144	-0.142	-0.048
	(0.217)	(0.217)	(0.216)	(0.073)
% White	-0.131	-0.134	-0.132	-0.054
	(0.167)	(0.168)	(0.167)	(0.070)
% Poverty	0.037	0.037	0.033	0.034
	(0.052)	(0.051)	(0.052)	(0.027)
# of Schools	0.002	0.002	0.002	-0.000
	(0.003)	(0.003)	(0.003)	(0.001)
Observations	931	931	931	2134
R-squared	0.09	0.09	0.09	0.16

* significant at 5% level; ** significant at 1% level
Robust standard errors, clustered by district, in parentheses
All specifications include a constant term and year, district, and level-of-education fixed effects.

Table C6: Percent Change in Superintendent Salaries and Low-Stakes Exams

	(1)	(2)	(3)	(4)
Reading Score (Normalized) (lag)	0.037	0.032		
	(0.012)**	(0.012)**		
Reading Score (Normalized) (lag) *PSAA	-0.008			
	(0.004)*			
Reading Score (Normalized) (lag) *NCLB		-0.002		
		(0.003)		
Math Score (Normalized) (lag)			0.014	0.009
			(0.010)	(0.009)
Math Score (Normalized) (lag) *PSAA			-0.007	
			(0.004)	
Math Score (Normalized) (lag) * NCLB				-0.000
				(0.003)
Change in Contract Work Days	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
% Change in Teacher Salaries	0.006	0.006	0.006	0.006
	(0.001)**	(0.001)**	(0.001)**	(0.001)**
Experience	0.004	0.004	0.004	0.003
	(0.002)*	(0.002)*	(0.002)*	(0.002)
Experience ^ 2	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Female	0.015	0.015	0.014	0.014
	(0.008)	(0.008)	(0.008)	(0.008)
Black	0.119	0.119	0.117	0.117
	(0.026)**	(0.027)**	(0.026)**	(0.027)**
Latino	0.129	0.130	0.126	0.127
	(0.018)**	(0.020)**	(0.017)**	(0.018)**
White	0.104	0.104	0.100	0.099
	(0.018)**	(0.020)**	(0.017)**	(0.018)**
Enrollment (log)	0.097	0.100	0.102	0.105
	(0.027)**	(0.027)**	(0.027)**	(0.027)**
% African American	-0.106	-0.095	-0.174	-0.150
	(0.207)	(0.207)	(0.214)	(0.215)
% Latino	-0.072	-0.044	-0.092	-0.049
	(0.094)	(0.095)	(0.093)	(0.094)
% White	-0.114	-0.095	-0.105	-0.076
	(0.080)	(0.080)	(0.082)	(0.082)
% Poverty	0.091	0.091	0.086	0.086
	(0.041)*	(0.041)*	(0.040)*	(0.040)*
# of Schools	-0.002	-0.002	-0.002	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)
Observations	1711	1711	1711	1711
R-squared	0.21	0.21	0.21	0.20

* significant at 5% level; ** significant at 1% level
Robust standard errors, clustered by school, in parentheses
All specifications include a constant term and year, school, and level-of-education fixed effects.

Table C7: Principal Retention and High-Stakes Exams

	(1)	(2)	(3)	(4)	(5)
% Proficient - ELA (lag)	-0.003				
	(0.001)*				
% Proficient - math (lag)		-0.002			
		(0.001)*			
Made API (lag)			0.025		
			(0.008)**		
Made AYP (lag)				0.005	
				(0.015)	
Program Improvement (lag)					-0.030
					(0.013)*
Experience	0.017	0.017	0.018	0.017	0.013
	(0.006)**	(0.006)**	(0.003)**	(0.007)**	(0.003)**
Experience ^ 2	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**
Female	0.089	0.088	0.029	0.090	0.010
	(0.035)*	(0.035)*	(0.015)*	(0.035)**	(0.013)
Black	0.125	0.125	0.058	0.126	0.001
	(0.100)	(0.100)	(0.042)	(0.100)	(0.036)
Latino	0.113	0.113	0.030	0.114	-0.010
	(0.089)	(0.089)	(0.036)	(0.089)	(0.033)
White	0.102	0.104	0.062	0.104	0.020
	(0.080)	(0.080)	(0.032)	(0.080)	(0.030)
Enrollment (log)	0.025	0.025	-0.068	0.024	-0.035
	(0.067)	(0.067)	(0.039)	(0.067)	(0.037)
% African American	-0.446	-0.434	-0.552	-0.391	-0.302
	(0.432)	(0.433)	(0.239)*	(0.433)	(0.217)
% Latino	-0.332	-0.313	-0.054	-0.312	-0.136
	(0.276)	(0.276)	(0.143)	(0.276)	(0.135)
% White	0.325	0.336	0.122	0.302	-0.005
	(0.269)	(0.269)	(0.136)	(0.269)	(0.132)
% Poverty	-0.122	-0.117	-0.042	-0.114	0.012
	(0.068)	(0.068)	(0.050)	(0.068)	(0.045)
Observations	14643	14643	25342	14643	22477
R-squared	0.07	0.07	0.04	0.07	0.04

* significant at 5% level; ** significant at 1% level
Robust standard errors, clustered by school, in parentheses
All specifications include a constant term and year, school, and level-of-education fixed effects.

Table C8: Principal Retention and Low-Stakes Exams

	(1)	(2)	(3)	(4)
Reading Score (Normalized) (lag)	-0.047	-0.040		
	(0.019)*	(0.018)*		
Reading Score (Normalized) (lag) * PSAA	0.013			
	(0.009)			
Reading Score (Normalized) (lag) *NCLB		0.010		
		(0.007)		
Math Score (Normalized) (lag)			-0.028	-0.026
			(0.016)	(0.014)
Math Score (Normalized) (lag) *PSAA			0.005	
			(0.009)	
Math Score (Normalized) (lag) * NCLB				0.005
				(0.007)
Experience	0.013	0.013	0.013	0.013
	(0.003)**	(0.003)**	(0.003)**	(0.003)**
Experience ^ 2	-0.001	-0.001	-0.001	-0.001
	(0.000)**	(0.000)**	(0.000)**	(0.000)**
Female	0.029	0.029	0.029	0.029
	(0.015)	(0.015)	(0.015)	(0.015)
Black	0.018	0.017	0.017	0.017
	(0.042)	(0.043)	(0.043)	(0.043)
Latino	0.011	0.011	0.011	0.010
	(0.038)	(0.039)	(0.038)	(0.038)
White	0.024	0.024	0.024	0.024
	(0.034)	(0.034)	(0.034)	(0.034)
Enrollment (log)	-0.035	-0.037	-0.039	-0.039
	(0.041)	(0.041)	(0.041)	(0.041)
% African American	-0.477	-0.475	-0.462	-0.462
	(0.246)	(0.246)	(0.246)	(0.246)
% Latino	-0.311	-0.287	-0.323	-0.305
	(0.152)*	(0.155)	(0.152)*	(0.155)*
% White	-0.172	-0.148	-0.209	-0.193
	(0.143)	(0.145)	(0.143)	(0.145)
% Poverty	0.004	0.002	0.006	0.005
	(0.055)	(0.055)	(0.055)	(0.055)
Observations	24572	24572	24572	24572
R-squared	0.04	0.04	0.04	0.04

* significant at 5% level; ** significant at 1% level
Robust standard errors, clustered by school, in parentheses
All specifications include a constant term and year, school, and level-of-education fixed effects.

Table C9: Principal Promotion and High-Stakes Exams

	(1)	(2)	(3)	(4)	(5)
% Proficient - ELA (lag)	0.001				
	(0.002)				
% Proficient - math (lag)		-0.000			
		(0.001)			
Made API (lag)			-0.003		
			(0.010)		
Made AYP (lag)				0.017	
				(0.021)	
Program Improvement (lag)					-0.035
					(0.017)*
Experience	0.003	0.003	0.020	0.003	0.010
	(0.024)	(0.024)	(0.008)*	(0.024)	(0.007)
Experience ^ 2	0.000	0.000	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)*	(0.000)	(0.000)
Female	-0.076	-0.077	-0.004	-0.076	-0.014
	(0.105)	(0.105)	(0.029)	(0.105)	(0.026)
Black	-0.027	-0.027	0.037	-0.025	0.077
	(0.249)	(0.249)	(0.074)	(0.249)	(0.077)
Latino	-0.227	-0.226	0.031	-0.225	0.051
	(0.253)	(0.253)	(0.074)	(0.253)	(0.071)
White	-0.288	-0.289	-0.003	-0.288	0.053
	(0.211)	(0.211)	(0.066)	(0.212)	(0.068)
Enrollment (log)	0.059	0.059	-0.037	0.057	-0.046
	(0.104)	(0.104)	(0.055)	(0.104)	(0.054)
% African American	0.720	0.704	-0.347	0.711	0.132
	(0.553)	(0.550)	(0.411)	(0.553)	(0.374)
% Latino	0.237	0.234	-0.104	0.226	-0.069
	(0.333)	(0.331)	(0.183)	(0.333)	(0.165)
% White	-0.359	-0.354	-0.369	-0.360	-0.051
	(0.338)	(0.337)	(0.183)*	(0.340)	(0.174)
% Poverty	0.068	0.066	0.007	0.071	0.079
	(0.071)	(0.071)	(0.064)	(0.072)	(0.050)
Observations	7180	7180	12566	7180	11385
R-squared	0.03	0.03	0.01	0.03	0.01

* significant at 5% level; ** significant at 1% level
Robust standard errors, clustered by school, in parentheses
All specifications include a constant term and year, school, and level-of-education fixed effects.

Table C10: Principal Promotion and Low-Stakes Exams

	(1)	(2)	(3)	(4)
Reading Score (Normalized) (lag)	0.013	0.021		
	(0.021)	(0.021)		
Reading Score (Normalized) (lag) * PSAA	0.011			
	(0.008)			
Reading Score (Normalized) (lag) *NCLB		0.004		
		(0.008)		
Math Score (Normalized) (lag)			0.022	0.030
			(0.016)	(0.017)
Math Score (Normalized) (lag) *PSAA			0.011	
			(0.008)	
Math Score (Normalized) (lag) * NCLB				0.002
				(0.008)
Experience	0.009	0.009	0.009	0.009
	(0.006)	(0.006)	(0.006)	(0.006)
Experience ^ 2	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Female	0.012	0.012	0.012	0.013
	(0.027)	(0.027)	(0.027)	(0.027)
Black	0.059	0.059	0.059	0.059
	(0.078)	(0.078)	(0.078)	(0.078)
Latino	0.049	0.050	0.048	0.048
	(0.068)	(0.068)	(0.069)	(0.069)
White	0.059	0.059	0.059	0.058
	(0.065)	(0.065)	(0.065)	(0.065)
Enrollment (log)	-0.051	-0.053	-0.050	-0.051
	(0.048)	(0.048)	(0.049)	(0.049)
% African American	0.381	0.382	0.386	0.382
	(0.330)	(0.331)	(0.331)	(0.333)
% Latino	0.062	0.053	0.071	0.049
	(0.178)	(0.185)	(0.179)	(0.191)
% White	0.100	0.093	0.111	0.097
	(0.142)	(0.148)	(0.141)	(0.145)
% Poverty	0.041	0.039	0.044	0.042
	(0.057)	(0.057)	(0.057)	(0.057)
Observations	12951	12951	12951	12951
R-squared	0.01	0.01	0.01	0.01

* significant at 5% level; ** significant at 1% level
Robust standard errors, clustered by school, in parentheses
All specifications include a constant term and year, school, and level-of-education fixed effects.

Table C11: Percent Change in Principal Salaries and High-Stakes Exams

	(1)	(2)	(3)	(3)	(4)
% Proficient - ELA (lag)	-0.000				
	(0.000)				
% Proficient - math (lag)		0.000			
		(0.000)			
Made API (lag)			0.000		
			(0.000)		
Made AYP (lag)				0.000	
				(0.000)	
Program Improvement (lag)					-0.000
					(0.000)
Change in Contract Work Days	0.002	0.002	0.003	0.002	0.001
	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**
% Change in Teacher Salaries	0.006	0.006	0.008	0.006	0.007
	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**
Experience	0.000	0.000	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Experience ^ 2	-0.000	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Female	0.000	0.000	0.001	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Black	0.001	0.001	0.000	0.001	0.000
	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)
Latino	0.001	0.001	0.001	0.001	-0.000
	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)
White	0.001	0.001	0.000	0.001	-0.000
	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)
Enrollment (log)	0.003	0.003	0.001	0.003	0.000
	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)
% African American	-0.034	-0.034	0.027	-0.034	0.011
	(0.030)	(0.030)	(0.015)	(0.030)	(0.012)
% Latino	-0.021	-0.022	0.023	-0.021	0.016
	(0.022)	(0.022)	(0.011)*	(0.022)	(0.010)
% White	-0.021	-0.024	0.047	-0.022	0.024
	(0.023)	(0.023)	(0.011)**	(0.023)	(0.010)*
% Poverty	0.011	0.011	0.007	0.011	0.003
	(0.003)**	(0.003)**	(0.003)**	(0.003)**	(0.002)
Observations	10193	10193	17779	10193	16063
R-squared	0.66	0.66	0.50	0.66	0.74

* significant at 5% level; ** significant at 1% level
Robust standard errors, clustered by school, in parentheses
All specifications include a constant term and year, school, and level-of-education fixed effects.

Table C12: Percent Change in Principal Salaries and Low-Stakes Exams

	(1)	(2)	(3)	(4)
Reading Score (Normalized) (lag)	0.001	0.002		
	(0.001)	(0.001)**		
Reading Score (Normalized) (lag) * PSAA	0.001			
	(0.000)*			
Reading Score (Normalized) (lag) *NCLB		-0.001		
		(0.000)**		
Math Score (Normalized) (lag)			0.001	0.003
			(0.001)	(0.001)**
Math Score (Normalized) (lag) *PSAA			0.001	
			(0.000)**	
Math Score (Normalized) (lag) * NCLB				-0.001
				(0.000)**
Change in Contract Work Days	0.001	0.001	0.001	0.001
	(0.000)**	(0.000)**	(0.000)**	(0.000)**
% Change in Teacher Salaries	0.008	0.008	0.008	0.008
	(0.000)**	(0.000)**	(0.000)**	(0.000)**
Experience	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Experience ^ 2	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Female	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Black	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Latino	-0.000	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)
White	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Enrollment (log)	0.003	0.003	0.003	0.003
	(0.002)	(0.002)	(0.002)	(0.002)
% African American	-0.001	-0.001	-0.001	0.001
	(0.013)	(0.013)	(0.013)	(0.013)
% Latino	0.015	0.008	0.015	0.010
	(0.010)	(0.010)	(0.010)	(0.010)
% White	0.022	0.012	0.023	0.014
	(0.010)*	(0.010)	(0.011)*	(0.011)
% Poverty	0.003	0.004	0.004	0.004
	(0.002)	(0.002)	(0.002)	(0.002)
Observations	17684	17684	17684	17684
R-squared	0.71	0.71	0.71	0.71

* significant at 5% level; ** significant at 1% level
Robust standard errors, clustered by school, in parentheses
All specifications include a constant term and year, school, and level-of-education fixed effects.

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