

Political Turnover, Bureaucratic Turnover, and the Quality of Public Services

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- If political turnover leads to upheaval of the bureaucracy, what are the impacts on provision of public goods and services?
 - ▶ Entrenchment (+) vs. (–) General and organization-specific human capital.

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 2. Political turnover increases headmaster and teacher replacements.
 3. The negative effect of political turnover on student achievement occurs only where politicians have discretion over the assignment of school personnel.

Relevance (1/2)

Political cycle and the cost of political control over the bureaucracy.

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- In this setting, the net effect of political control over the bureaucracy is negative in terms of one welfare relevant measure: students' test scores.
 - ▶ Key advantage: Welfare relevant measure of public good which is tightly linked to the performance of the bureaucrat (under the control of the politician).

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- Costs: (Weber, 1922; Folke, Hirano, and Snyder, 2011; Colonnelli, Prem, and Teso, 2016; Xu, 2018; Rauch, 1995; Rasul and Roger, 2016)
 - ▶ Patronage (incentive and selection)
 - ▶ Short-horizoned incentive structures
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→ Our contribution:

- Highlighting another cost of political discretion due to the *disruption in the provision process*.

Outline

- Context
- Data and Empirical Strategy
- Results
- Mechanism
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 - ▶ Highly decentralized and autonomous, responsible for key public services such as education, health, and sanitation
- Municipal elections:
 - ▶ Mayor's term in office is 4 years (can serve 2 consecutive terms)
 - ▶ Appointment of bureaucrats:
 1. Civil service exam, have tenure (68%)
 2. Hired on contract, more flexible positions, at the discretion of the municipal government (32%)

▶ In the News

Brazilian Education

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 - ▶ Enforcing the conditionality of the *Bolsa Familia* conditional cash transfer program: headmasters can justify school absences as to not count towards noncompliance (Brollo et al., 2015)
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December 2014: “The Rio Secretary of Education resigns”

It is not normal for students to go hungry because there are no school lunches when the school received money for it. It is not normal for the school to have no toilet covers and no toilet paper when the school received money for it. But then the school buys 3,000 kilos of tangerines... in cash?

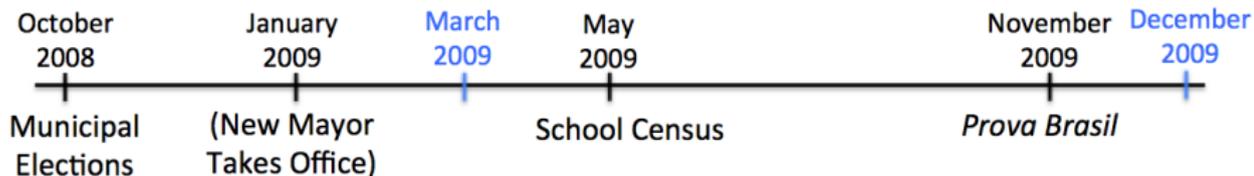
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Timeline

Timeline of Events and Relevant Data Sources

Academic Year



- Party Turnover

- Teachers
- Dropout Rates

- Student test Scores
- Student, teacher, & headmaster surveys

▶ Data

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- Electoral information
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 1. School-level controls, tracking the movement of teachers, dropout measures [Annual School Census - Censo Escolar]
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- Municipality:
 - ▶ Municipal government personnel movement [Ministry of Labor - RAIS data]
 - ▶ GDP per capita and Population [Brazilian Bureau of Statistics - Instituto Brasileiro de Geografia e Estatística]
 - ▶ Party ideology [Non-partisan think-tank - Atlas Político/Mapa do Congresso]

Sample Definition

▶ sample selection

	All Municipalities	Sample Municipalities	Sample Municipalities & School Takes PB
Municipal Characteristics			
Population	33,290	20,201	21,180
Ruling party from left	0.26	0.26	0.26
Winning party from left	0.30	0.28	0.28
School Characteristics			
Num. of schools per municipality	17.85	14.88	4.96
Share urban	0.34	0.31	0.73
Share connected to grid	0.85	0.86	0.99
Share with Internet	0.29	0.27	0.64
Num. of teachers per school	9.67	8.79	18.83
Share teachers with BA	0.50	0.51	0.70
Share teachers took Concurso	0.64	0.63	0.76
Num. of students per school	190.37	163.43	378.56
Num. of classrooms per school	8.42	7.66	15.69
Students/class per school	18.51	17.72	23.41
N (municipality-election cycle)	11,106	5,966	5,608

Two restrictions (29%): incumbent party runs for reelection; also no run-off election. The table presents the mean value of each variable in: all municipalities, municipalities in the sample, as well as schools in sample municipalities that participate in Prova Brasil exam.

Empirical Strategy

Regression Discontinuity Design Using Close Elections in 2008 and 2012

$$Y_{jmt+1} = \alpha + \gamma \text{IncumbVoteMargin}_{mt} + \beta \mathbf{1}\{\text{IncumbVoteMargin}_{mt} < 0\} + \delta \text{IncumbVoteMargin}_{mt} \times \mathbf{1}\{\text{IncumbVoteMargin}_{mt} < 0\} + \lambda X_{jmt} + \varepsilon_{jmt};$$

where $|\text{IncumbVoteMargin}_{mt}| \leq h$ ("Close elections").

- Y_{jmt+1} : Test scores, headmaster/teacher replacements
- $\text{IncumbVoteMargin}_{mt}$: Difference between vote share of incumbent party and vote share of strongest opponent

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- $\text{IncumbVoteMargin}_{mt}$: Difference between vote share of incumbent party and vote share of strongest opponent
- X_{jmt} : Controls at the individual-level (gender, race, and parental education) or school-level (located in urban area, infrastructure quality, baseline scores), election-cycle dummy
- ε_{jmt} : Clustered at municipality level
- “Close election” (h) defined according to Calonico, Cattaneo, and Titiunik (2016):
 - ▶ RD sample ($h \in [0.07, 0.11]$):
400,000 students in 2,300 municipality-election cycle (33% of total # of municipalities)

Identification Assumption

Potential outcomes are continuous around the cutoff, thus any discontinuities in outcomes at the cutoff are the results of party turnover.

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2. No evidence of discontinuity in covariates at the cutoff. [▶ Table](#)

No Discontinuity in Covariates

Table: Mean characteristic at baseline in control and treatment municipalities, pooling 2008 & 2012 elections (Bandwidth: ± 0.09)

	No Party Turnover	Party Turnover	P-value
Num. Municipalities	1,233	1,195	.
Population	18,299.92	20,095.88	0.72
Ruling party from left	0.25	0.23	0.78
Winning party from left	0.25	0.30	0.04
School in urban area	0.26	0.28	0.50
Num. Students	152.24	160.96	0.74
Num. Teachers	7.58	8.05	0.95
Teacher took <i>Concurso</i>	0.66	0.68	0.20
Teacher has BA	0.43	0.44	0.48
4th Grade Scores	-0.16	-0.12	0.10
8th Grade Scores	-0.18	-0.16	0.22
Dropout rate	0.04	0.04	0.85
New headmaster	0.36	0.33	0.80
New teacher	0.51	0.52	0.68

The p-value corresponds to the coefficient on $\mathbf{1}\{IncumbVoteMargin < 0\}$ in the main regression with the corresponding variable at baseline used as the left hand side variable in the regression.

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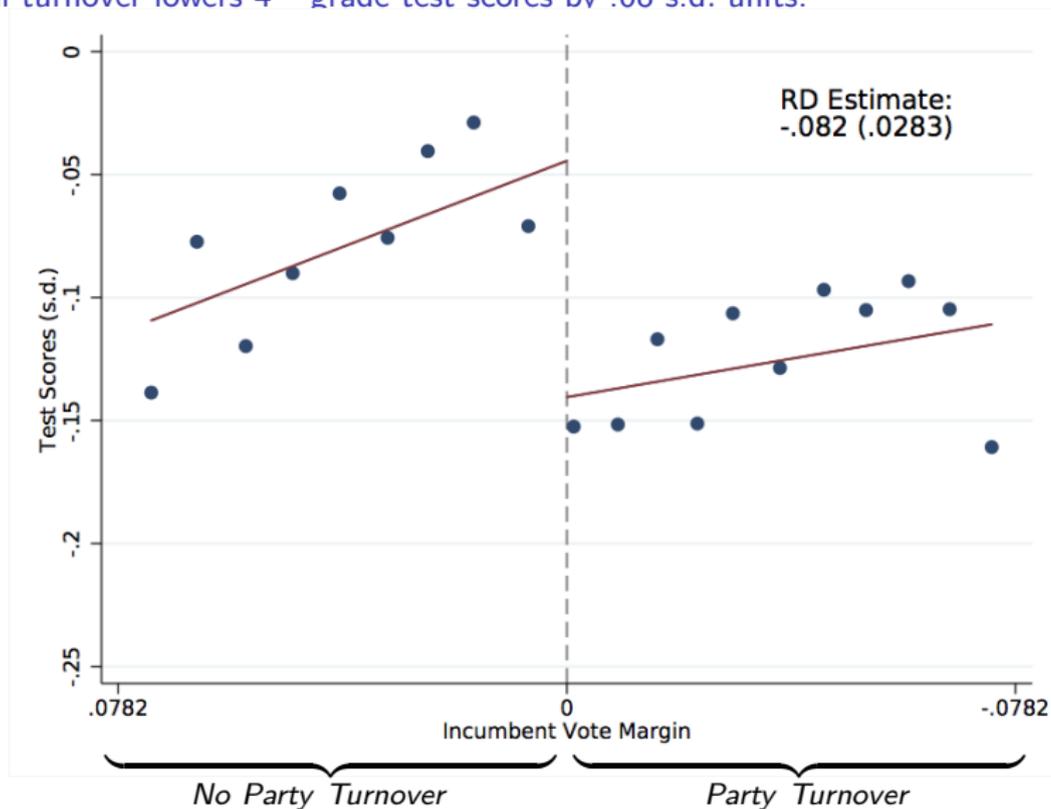
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 2. Political turnover → School personnel
 3. Political discretion over assignment of school personnel → Student achievement
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4th Grade Test Scores

Political turnover lowers 4th grade test scores by .08 s.d. units.



▶ External Validity

▶ Baseline Scores

4th Grade Test Scores

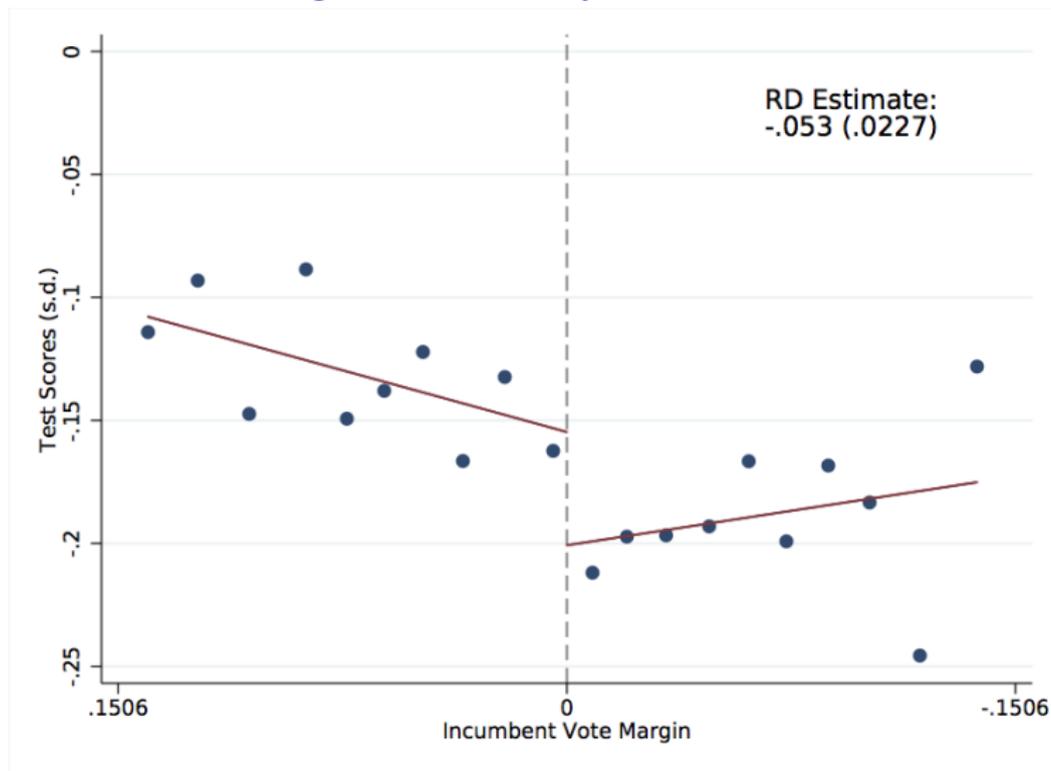
Political turnover lowers 4th grade test scores by .08 s.d. units.

	Outcome: Individual 4th Grade Test Scores (standardized)					
	(1)	(2)	(3)	(4)	(5)	(6)
$1\{IncumbVoteMargin < 0\}$	-0.082*** (0.028)	-0.064** (0.026)	-0.091*** (0.029)	-0.075*** (0.027)	-0.067*** (0.024)	-0.055** (0.022)
N	325,554	325,554	295,170	295,170	429,979	429,979
R-squared	0.218	0.252	0.213	0.248	0.218	0.252
Controls	No	Yes	No	Yes	No	Yes
Clusters	1669	1669	1538	1538	2101	2101
Using Bandwidth	0.0782	0.0782	0.0700	0.0700	0.110	0.110
Optimal Bandwidth	0.0782	0.0782	0.0782	0.0782	0.0782	0.0782

Baseline scores, i.e. school-level, average scores from 2007 or 2011, are included as controls in all specifications. Controls include school-level controls, individual-level controls, and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet. Individual controls include an indicator variable for gender, whether the student is white, and whether the student sees their parent reading.

8th Grade Test Scores

Political turnover lowers 8th grade test scores by .05 s.d. units.



▶ External Validity

▶ Back

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	Outcome: Individual 8th Grade Test Scores (standardized)					
	(1)	(2)	(3)	(4)	(5)	(6)
$1\{IncumbVoteMargin < 0\}$	-0.054** (0.023)	-0.042* (0.023)	-0.050* (0.030)	-0.046 (0.029)	-0.059** (0.025)	-0.049** (0.025)
N	245,302	245,302	126,855	126,855	191,169	191,169
R-squared	0.162	0.174	0.158	0.170	0.157	0.169
Controls	No	Yes	No	Yes	No	Yes
Clusters	1602	1602	965	965	1335	1335
Using Bandwidth	0.151	0.151	0.0700	0.0700	0.110	0.110
Optimal Bandwidth	0.151	0.151	0.151	0.151	0.151	0.151

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- Potential offsetting policies: hire one extra contract teacher per classroom (in Kenya, Kremer et al 2011) or USD 195 per pupil school voucher (in Colombia, Angrist et al 2002), each increases primary school test scores by 0.2 s.d.

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- Political turnover “consumes” 27% of 4-year (2009-2012) improvement experienced by the average (control) municipality.

▶ Overtime

Political Turnover → Student Achievement

Robustness

Three objections:

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2. “Turnover per se vs. ideology:” The effect of party turnover on test scores is independent of party ideology. [▶ Results](#)
3. “Political turnover has a cost in the short-term but not in the long-term:” The negative effect of party turnover on scores persists for at least 3-5 years in terms of the point estimate. [▶ Results](#)

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 1. Political turnover → Student achievement ↓
 2. **Political turnover** → **Municipal government personnel**
 3. Political discretion over assignment of school personnel → Student achievement
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Municipal Personnel: Incoming and Outgoing

Political turnover increase net personnel in municipal governments by 10 p.p.

VARIABLES	(1) y after SHhired_Mun_09	(2) y after SHhired_Mun_09	(3) y after SHhired_Mun_09	(4) y after SHfired_Mun_09	(5) y after SHfired_Mun_09	(6) y after SHfired_Mun_09
pX_dummy	0.1005*** (0.0354)	0.0972** (0.0415)	0.0782** (0.0333)	-0.0167 (0.0407)	-0.0158 (0.0441)	-0.0393 (0.0351)
Observations	1,208	932	1,322	1,069	932	1,322
R-squared	0.0126	0.0150	0.0153	0.0005	0.0017	0.0022
Mean Dep Variable	0.416	0.421	0.410	0.306	0.309	0.298
Using Bandwidth	0.0986	0.0700	0.110	0.0827	0.0700	0.110
Optimal Bandwidth	0.0986	0.0986	0.0986	0.0827	0.0827	0.0827

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Municipal personnel & Education personnel

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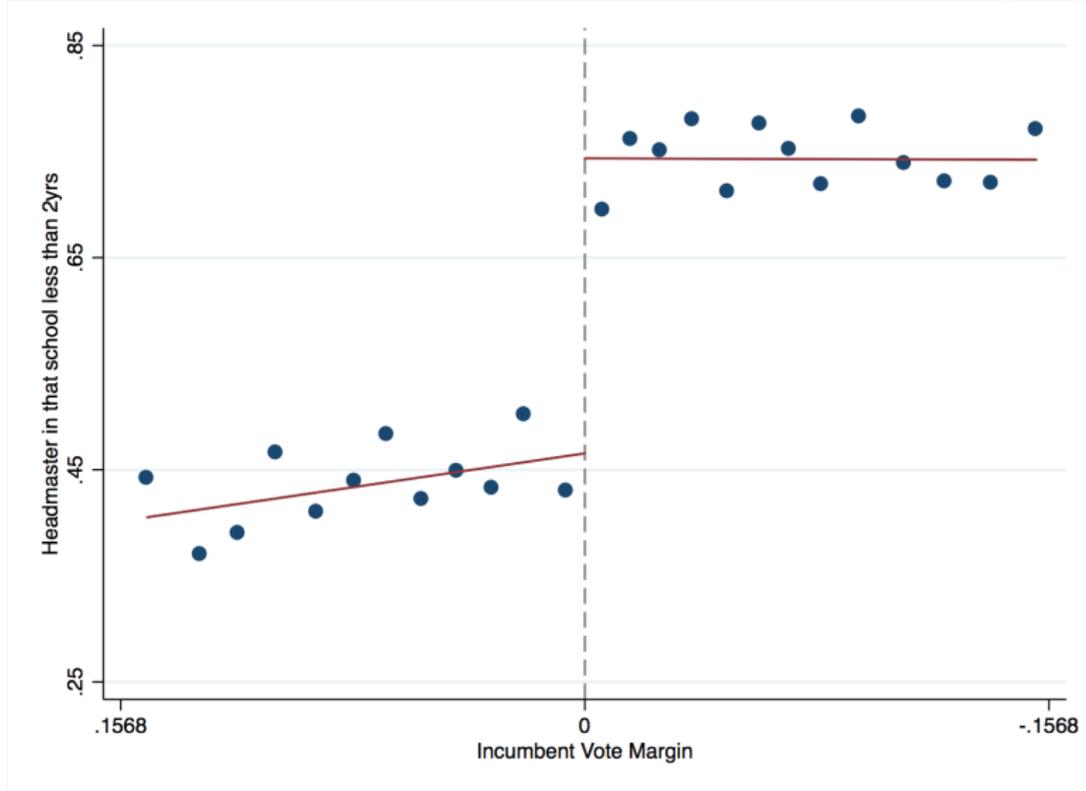
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Municipal personnel & Education personnel

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- Yet, unclear the extent of replacements in the frontline organizations where services are actually provided.
- We study the consequence for school personnel

Headmaster Replacements

Party turnover increases share of headmasters that are new to their school by 28 pp.



▶ Event Study

▶ Table

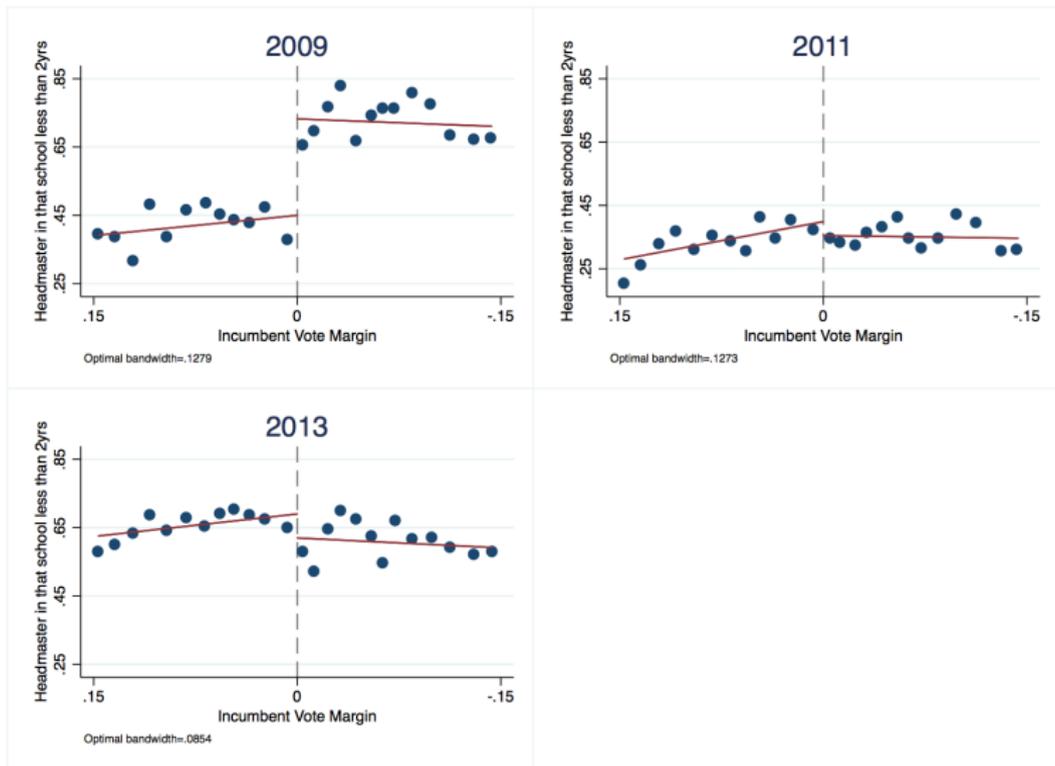
▶ Propagation

▶ Het. wrt Income

▶ External Validity

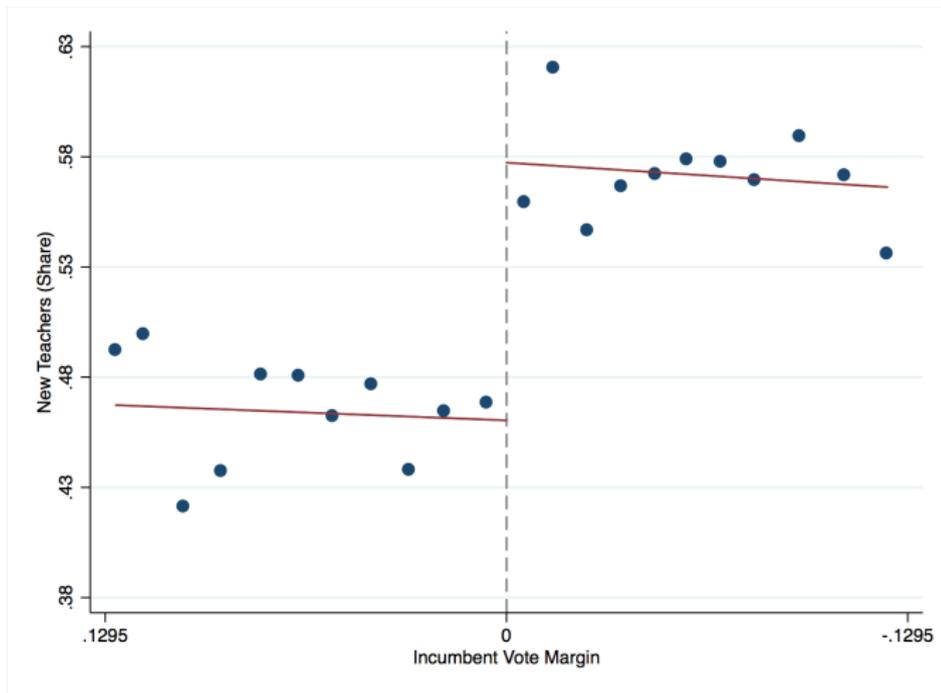
Headmaster Changes Occur Immediately After the Election

Tracing out the effect of party turnover in 2008 on headmaster changes in 2009, 2011, and 2013



Teacher Replacements: New Teachers

Party turnover increases share of teachers who are new to a given school by 11 pp.



▶ Table

▶ Propagation

▶ Teachers who left

Personnel Replacements & Political Discretion

- Party turnover induces headmaster replacement mostly amongst politically appointed headmasters (as opposed to headmasters who are selected through a competitive process and/or community elections). [▶ Table](#)

Personnel Replacements & Political Discretion

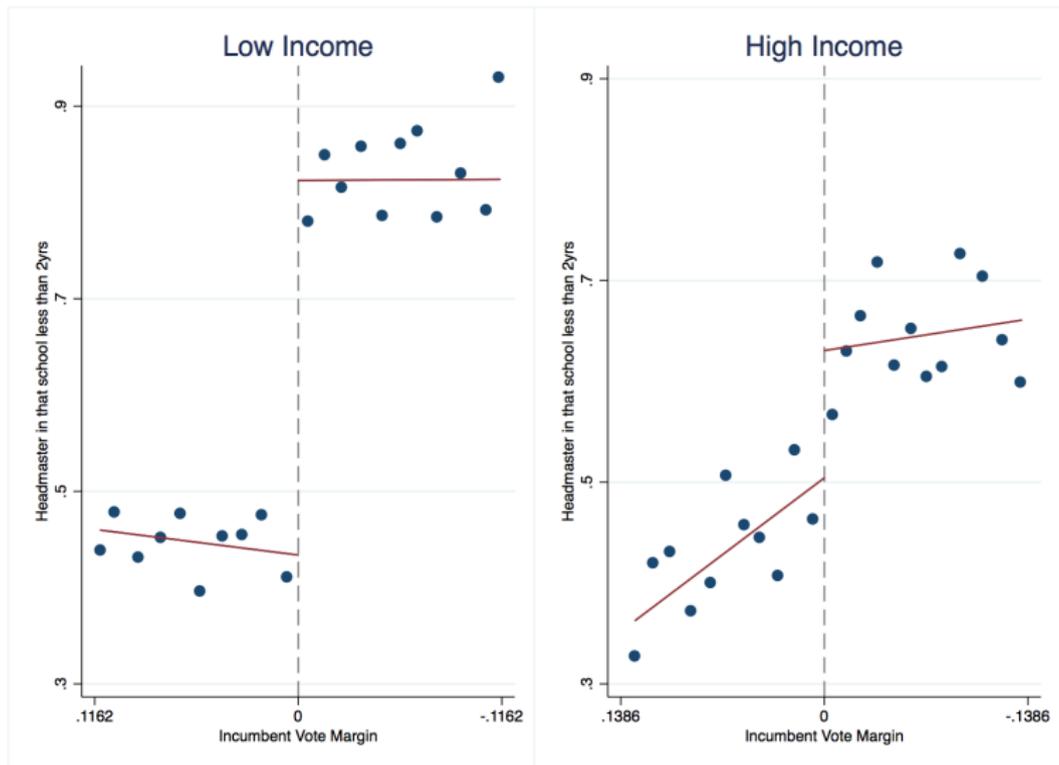
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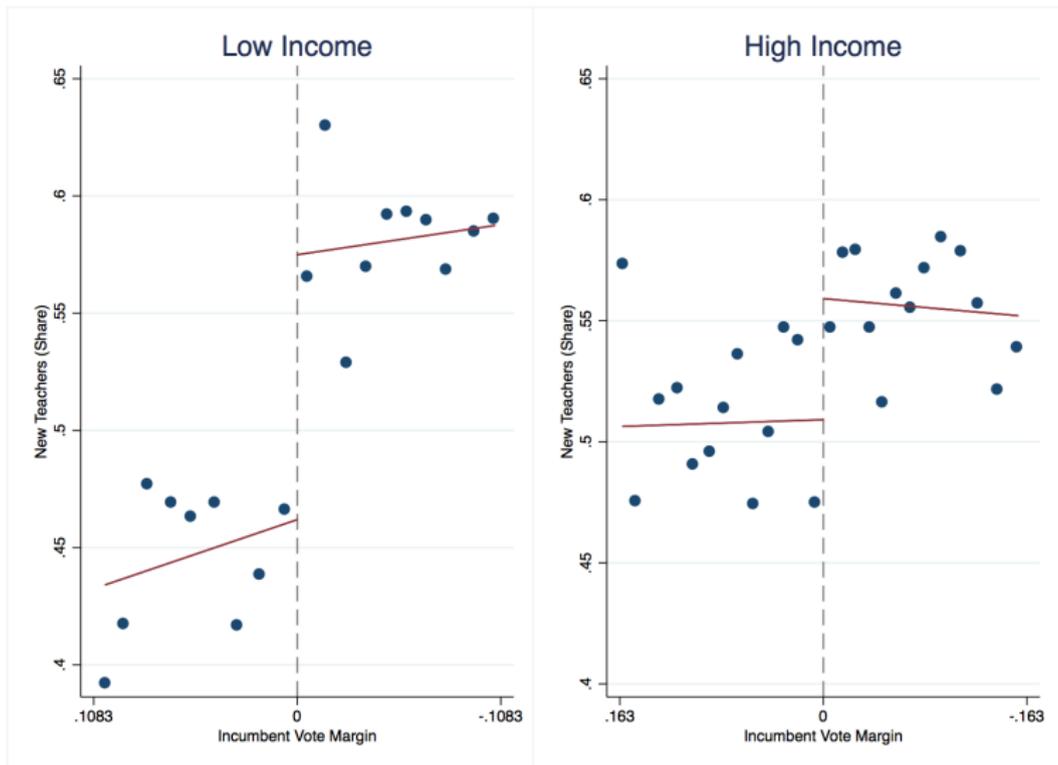
Headmaster Replacements: by Income

Effect of party turnover on headmaster replacements is three times larger in low-income municipalities.



Teacher replacement: by Income

Effect of party turnover on teacher replacements is three times larger in low-income municipalities.



Outline

- Context
- Data and Empirical Strategy
- **Results**
 1. Political turnover → Student achievement ↓
 2. Political turnover → Municipal personnel replacements ↑
 3. **Political discretion over assignment of personnel** → **Student achievement**
- Mechanism
- Conclusion

Political Turnover, School Personnel, and Student Achievement

Does political turnover affect student achievement through its disruption of the school personnel?

Is there a set of schools in the municipality where the municipal government does not control the assignment of school personnel?

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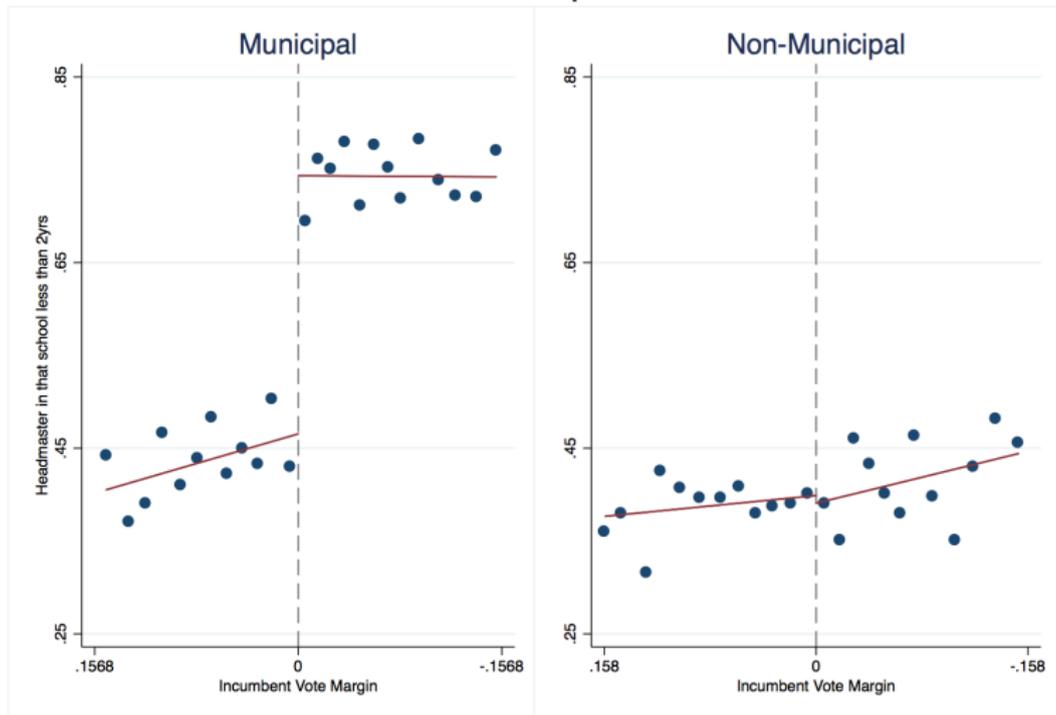
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When the new political party comes to power, what does it do to non-municipal schools?

Headmaster Replacements in Non-municipal Schools

Municipal party turnover does not affect headmaster replacements in non-municipal schools.

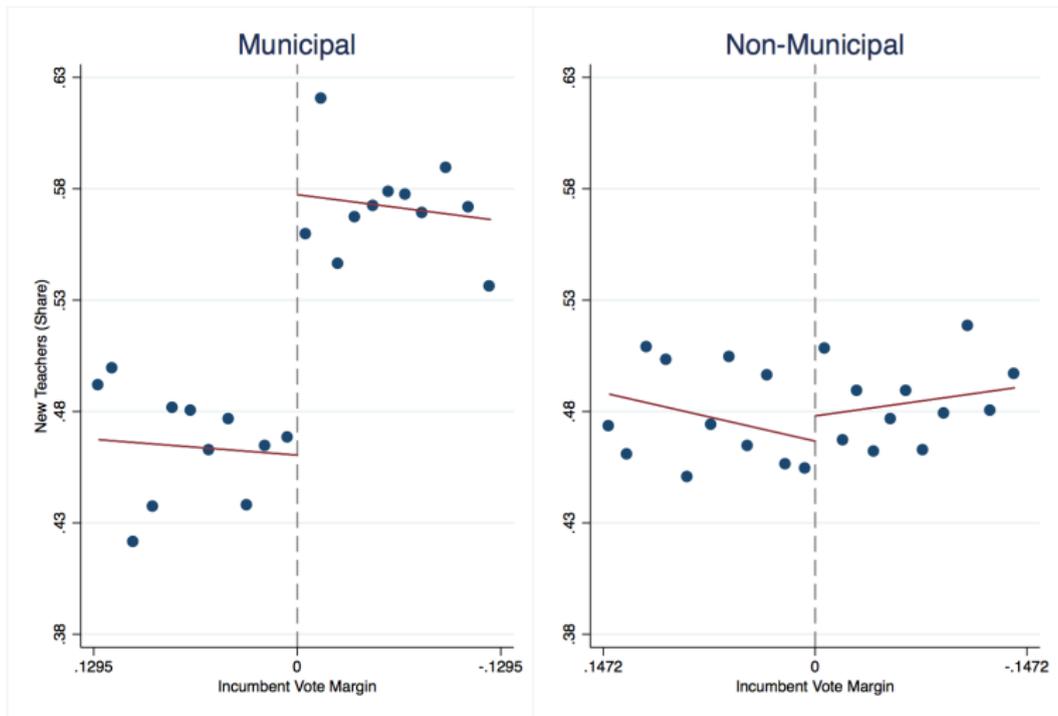
Headmaster Replacements



Teacher Replacements in Non-municipal Schools

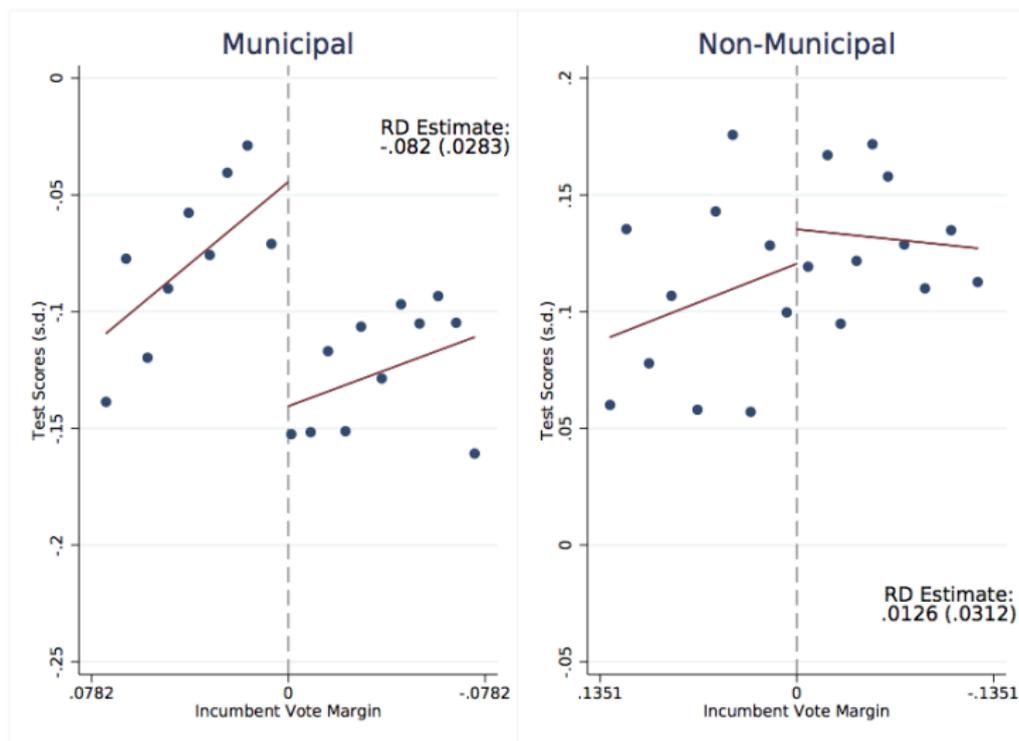
Municipal party turnover does not significantly affect share of new teachers in non-municipal schools.

Share of Teachers New to the School



4th Grade Test Scores in Non-municipal Schools

Municipal party turnover does not affect students' test scores in non-municipal schools.



Political Turnover, School Personnel, and Student Achievement

- It provides suggestive evidence that political turnover affects student achievement through the (politically caused) disruption in the assignment of school personnel:
 - ▶ When the municipal government does not control the assignment of school personnel, there is no adverse effect on student achievement.

Political Turnover, School Personnel, and Student Achievement

- It provides suggestive evidence that political turnover affects student achievement through the (politically caused) disruption in the assignment of school personnel:
 - ▶ When the municipal government does not control the assignment of school personnel, there is no adverse effect on student achievement.
- But there may be other differences between municipal and non-municipal schools, for instance, education resources.
 - ▶ Party turnover does not decrease municipal resources to education.
 - ▶ Educ Spending
 - ▶ School Level Resources

Outline

- Context
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- **Mechanism:**
 - ▶ Personnel replacements $\uparrow \rightarrow$ Student achievement \downarrow

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Personnel Replacement & Student Achievement

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2. But, what does it do to school operation and management?

School Operation and Management

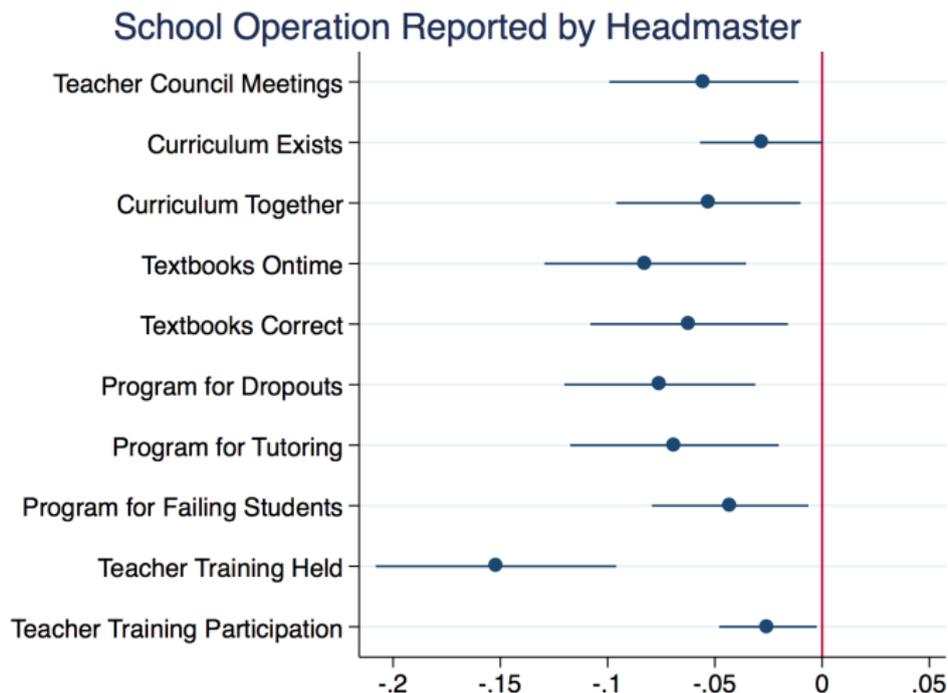
- Ronfeldt, Loeb, and Wyckoff (2013) associate high teacher turnover with lower test scores, possibly through changes in teacher quality but also:
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 - ▶ Disrupted school programs
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- When students take the *PB* exam, the headmaster (and the proctoring teachers) complete questionnaires. This survey asks some questions about how the school operates.

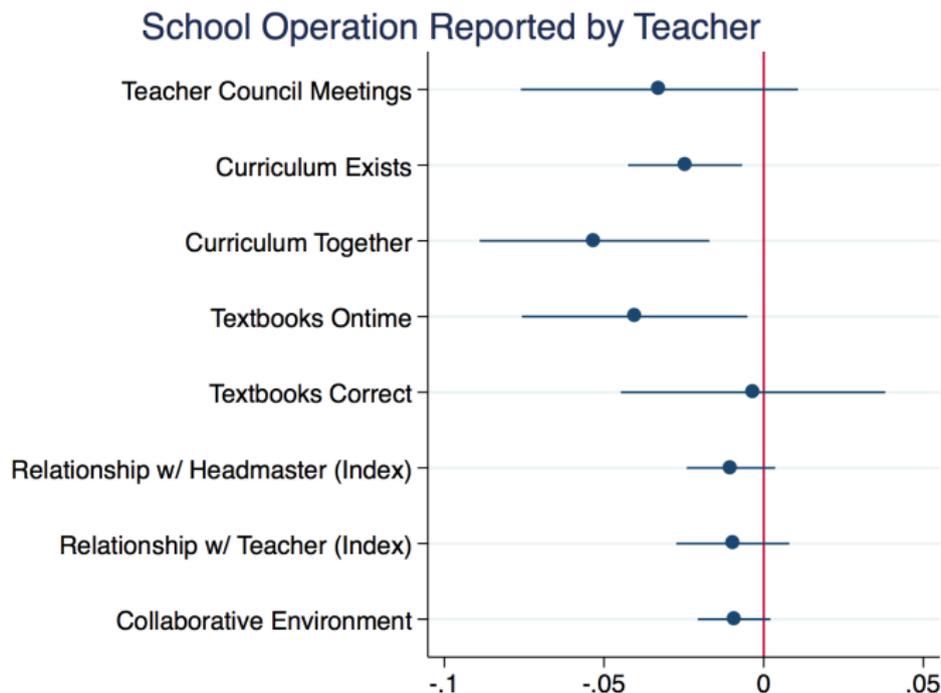
School Operation and Management

Party turnover increases negative reports by headmasters about the operation of their school.



School Operation and Management

Party turnover increases negative reports by teachers about the operation and relationships within their school.



School Operation and Management

Summary

1. Headmasters and teachers in municipalities with party turnover are more likely to report negatively on how the school operates.
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1. Headmasters and teachers in municipalities with party turnover are more likely to report negatively on how the school operates.
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 - Politically caused personnel replacements in the school disrupting school programs and lessening collaboration between personnel.
 - This is consistent with recent evidence that management and principal leadership matter for student achievement (Bloom, Lemos, Sadun and Van Reenen, 2015).

Mechanisms

Summary

- How does politically caused disruption in the school personnel assignment translate to worse outcomes for students?
 1. Headmasters are less experienced and teachers are less educated in municipalities with a change in the party.
 2. There is disruption in school programs and lessened collaboration between school personnel.

Outline

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External Validity

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 - ▶ Causality aside: political turnover and test scores is correlated outside of RD window. [▶ 4th grade External Validity](#) [▶ 8th grade External Validity](#)

RD Sample vs All Municipalities

RD Sample municipalities are smaller and have fewer “left wing” representatives (however, are not poorer nor have schools of lower quality)

	Non-RD Sample	RD Sample	p-value
Ruling party from left	0.26	0.24	0.07
Winning party from left	0.30	0.28	0.02
Ruling party from right	0.56	0.57	0.29
Winning party from right	0.52	0.54	0.17
Population	35,317.25	25,047.90	0.03
Number of schools	18.44	15.46	0.00
Share urban	0.34	0.32	0.00
4th Grade Test Scores	-0.15	-0.15	0.56
8th Grade Test Scores	-0.16	-0.17	0.15
GDP per capita	5.29	5.44	0.27
N (municipality-election cycle)	11,106.00	2,191.00	.

Test Scores by municipality size

Adverse consequences of political turnover is not attenuated or amplified by municipality size.

	(1)	(2)	(3)	(4)
	Outcome: Individual 4 th Grade Test Scores			
$\mathbf{1}\{IncumbVoteMargin < 0\}$	-0.066 (0.050)	-0.073* (0.040)	-0.060 (0.041)	-0.069* (0.037)
$\mathbf{1}\{Population > Median\}$	-0.023 (0.043)	-0.041 (0.035)		
$\mathbf{1}\{IncumbVoteMargin < 0\} \times \mathbf{1}\{Population > Median\}$	-0.020 (0.059)	0.003 (0.049)		
$\mathbf{1}\{\text{Number of Schools} > Median\}$			-0.078* (0.041)	-0.091*** (0.035)
$\mathbf{1}\{IncumbVoteMargin < 0\} \times \mathbf{1}\{\text{Number of Schools} > Median\}$			-0.025 (0.055)	0.001 (0.049)
Observations	325,554	429,979	325,554	429,979
R-squared	0.223	0.222	0.225	0.224
Controls	Yes	Yes	Yes	Yes
Clusters	1669	2101	1669	2101
Using Bandwidth	0.0782	0.110	0.0782	0.110
Optimal Bandwidth	0.0782	0.0782	0.0782	0.0782

Ratio between municipalities above and below population median: 1.06; Ratio between municipalities above and below number of schools median: 1.10

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[▶ Results](#)

Overall suggests that if political turnover were to happen in municipalities further from winning threshold, adverse consequence would be of similar or larger magnitude.

[▶ Caveats](#)

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In an environment where the bureaucracy is not shielded from the political process, political turnover can adversely affect the quality of public services by *disrupting* the service delivery process.

Thank you!

Open Questions (1/2)

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- Under the existent set of incentives we have shown that political discretion over the appointment of bureaucrats adversely affect the provision of public service.
- It is likely not always bad (In fact my prior was that we needed more flexibility in the brazilian public sector)
- How does political discretion affect service delivery in environments with greater incentives to perform (e.g. property based revenue vs intergovernment transfers)?
 - ▶ Moreira and Ferraz (2018)

Open Questions (2/2)

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3. The design of political and democratic institutions:
 - ▶ Democratic elections, even when competitive, disrupt the continuity in service delivery.

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We propose to address these questions by conducting a RCT informing mayors about AMT (2017) findings: the extent of personnel replacement and the cost for students' achievement.

Appendix

Relevance (2/3)

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The Brazilian Bureaucracy

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The first complete survey of the bureaucratic structure of states reveals that, in 2012, the 27 governors employed a total of 105,000 employees who did not contest to enter the public administration. If all these people gather, none of the 2014 World Cup stadiums, not even the Maracanã, would be able to accommodate them.

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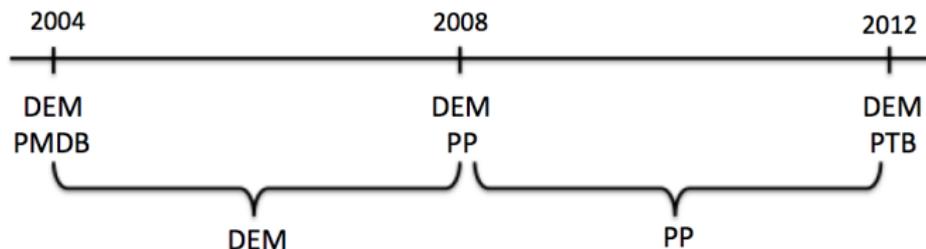
October 2013: “Mayors of 86 cities in Paraíba hire 20,000 without public contest”

[This is worrisome] because it denies citizens equal opportunity to access public careers, favoring electoral patronage... Also because procurement without contest implies admission of public servants who are not qualified, causing inefficient provision of public services and losses to the entire society.” - Head of Commission to Combat Administrative Misconduct

Why not Coalition Turnover?

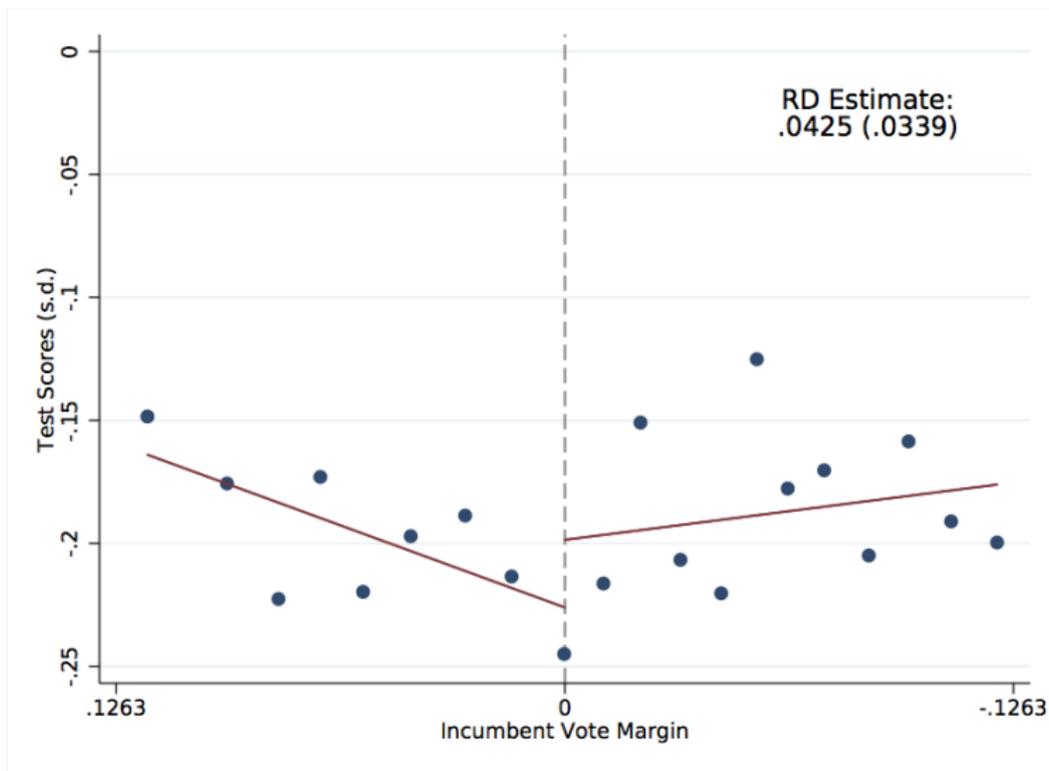
Coalition-identity is weak in Brazil. Coalitions change over time and, therefore, it is not clear how to define “coalition turnover.”

Coalition vs. Party Turnover



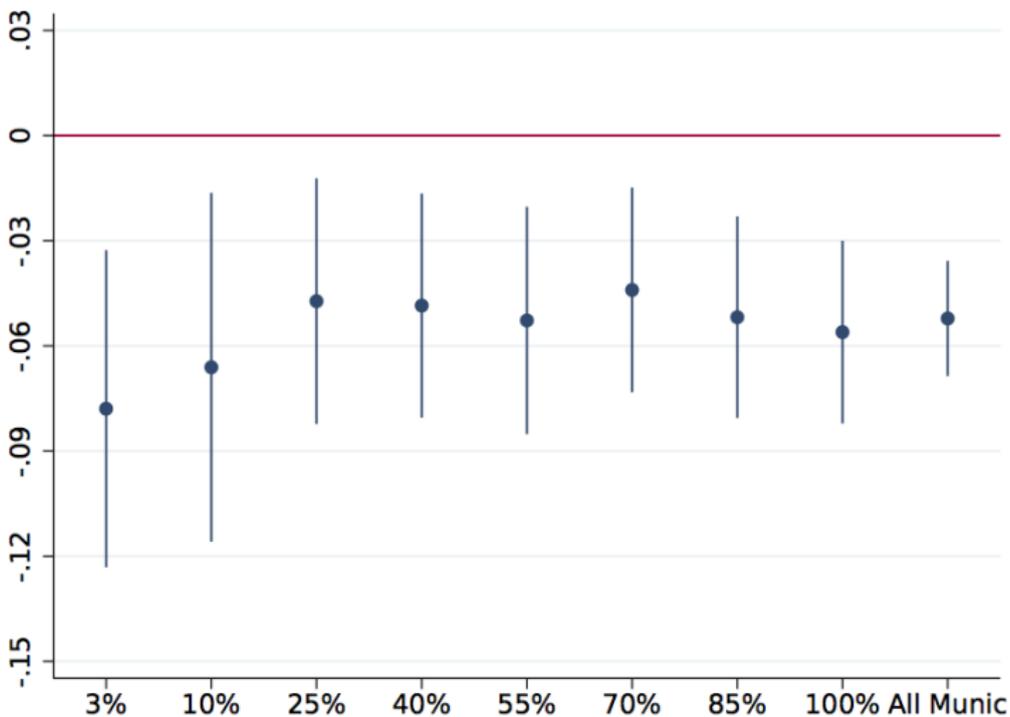
Balance of Covariates – Test Scores

No evidence of discontinuity in test scores the year prior to the election.



External Validity – 4th Grade Test Scores

Effect of party turnover across various incumbent vote margin bandwidths



▶ Back

▶ Back (to External Validity)

All Elections – 4th Grade Test Scores

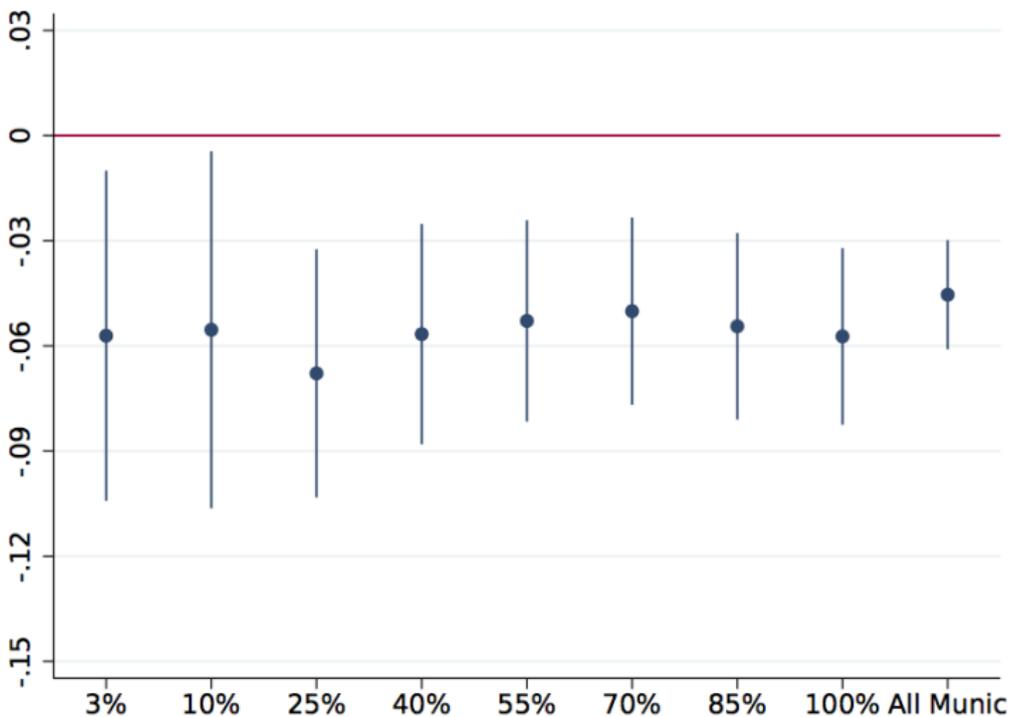
Including municipalities with supplementary elections & those that may potentially go to second round (population $\geq 200,000$)

	Outcome: Individual 4th Grade Test Scores (standardized)					
	(1)	(2)	(3)	(4)	(5)	(6)
Party Turnover	-0.065** (0.031)	-0.066** (0.029)	-0.070** (0.036)	-0.066** (0.033)	-0.070** (0.031)	-0.070** (0.028)
N	582,788	582,788	405,856	405,856	601,125	601,125
R-squared	0.199	0.235	0.189	0.225	0.197	0.233
Controls	No	Yes	No	Yes	No	Yes
Clusters	2153	2153	1606	1606	2193	2193
Using Bandwidth	0.107	0.107	0.0700	0.0700	0.110	0.110
Optimal Bandwidth	0.107	0.107	0.107	0.107	0.107	0.107

The endogenous variable, Party Turnover, is instrumented for using the incumbent political party's vote margin from the first round of regular elections. The first-stage coefficients for the instrument range from .80-.81 across bandwidths (not reported). Baseline scores, i.e. school-level, average scores from 2007 or 2011, are included as controls in all specifications. Controls include school-level controls, individual-level controls, and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet. Individual controls include an indicator variable for gender, whether the student is white, and whether the student sees their parent reading.

External Validity – 8th Grade Test Scores

Effect of party turnover across various incumbent vote margin bandwidths

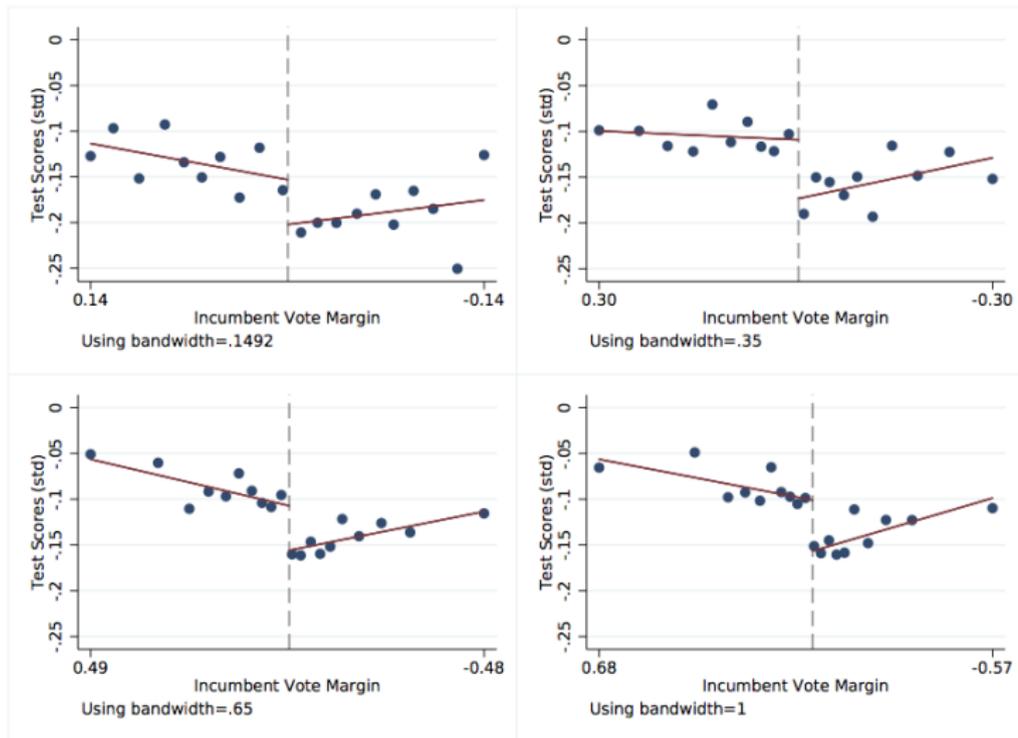


▶ Back

▶ Back (to External Validity)

External Validity – 8th Grade Test Scores

The negative effect of party turnover on student achievement is not limited to competitive elections.



All Elections – 8th Grade Test Scores

Including municipalities with supplementary elections & those that may potentially go to second round (population $\geq 200,000$)

	Outcome: Individual 8th Grade Test Scores (standardized)					
	(1)	(2)	(3)	(4)	(5)	(6)
Party Turnover	-0.080*** (0.029)	-0.068** (0.030)	-0.086** (0.038)	-0.087** (0.038)	-0.086** (0.034)	-0.084** (0.034)
N	335,824	335,824	169,556	169,556	255,509	255,509
R-squared	0.137	0.151	0.140	0.153	0.148	0.161
Controls	No	Yes	No	Yes	No	Yes
Clusters	1536	1536	1010	1010	1401	1401
Using Bandwidth	0.124	0.124	0.0700	0.0700	0.110	0.110
Optimal Bandwidth	0.124	0.124	0.124	0.124	0.124	0.124

The endogenous variable, Party Turnover, is instrumented for using the incumbent political party's vote margin from the first round of regular elections. The first-stage coefficients for the instrument range from .87-.90 across bandwidths (not reported). Baseline scores, i.e. school-level, average scores from 2007 or 2011, are included as controls in all specifications. Controls include school-level controls, individual-level controls, and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet. Individual controls include an indicator variable for gender, whether the student is white, and whether the student sees their parent reading.

Political Turnover and Student Composition

Party turnover does not affect the composition of students.

	(1) Female	(2) White	(3) Family Assets (Index)	(4) Mother's Education	(5) Mother Reads	(6) Parent Involvement (Index)	(7) Works	(8) Prev Failed	(9) Prev Dropout
$1\{IncumbVoteMargin < 0\}$	-0.007 (0.006)	-0.011 (0.013)	0.059 (0.215)	0.085 (0.097)	-0.0002 (0.011)	-0.002 (0.038)	-0.006 (0.004)	-0.005 (0.012)	-0.002 (0.004)
N	933,305	933,305	933,143	933,305	933,305	933,143	933,305	691,559	700,956
R-squared	0.001	0.015	0.055	0.010	0.008	0.003	0.002	0.016	0.005
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	2294	2294	2294	2294	2294	2294	2294	2287	2287
Mean Dep Var	0.381	0.231	-1.358	4.091	0.628	-0.0834	0.134	0.369	0.0818
Using Bandwidth	0.110	0.110	0.110	0.110	0.110	0.110	0.110	0.110	0.110
Optimal Bandwidth	0.133	0.103	0.117	0.137	0.133	0.112	0.134	0.0972	0.114

Controls include school-level controls and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet.

School-level Dropout Rate (all grades)

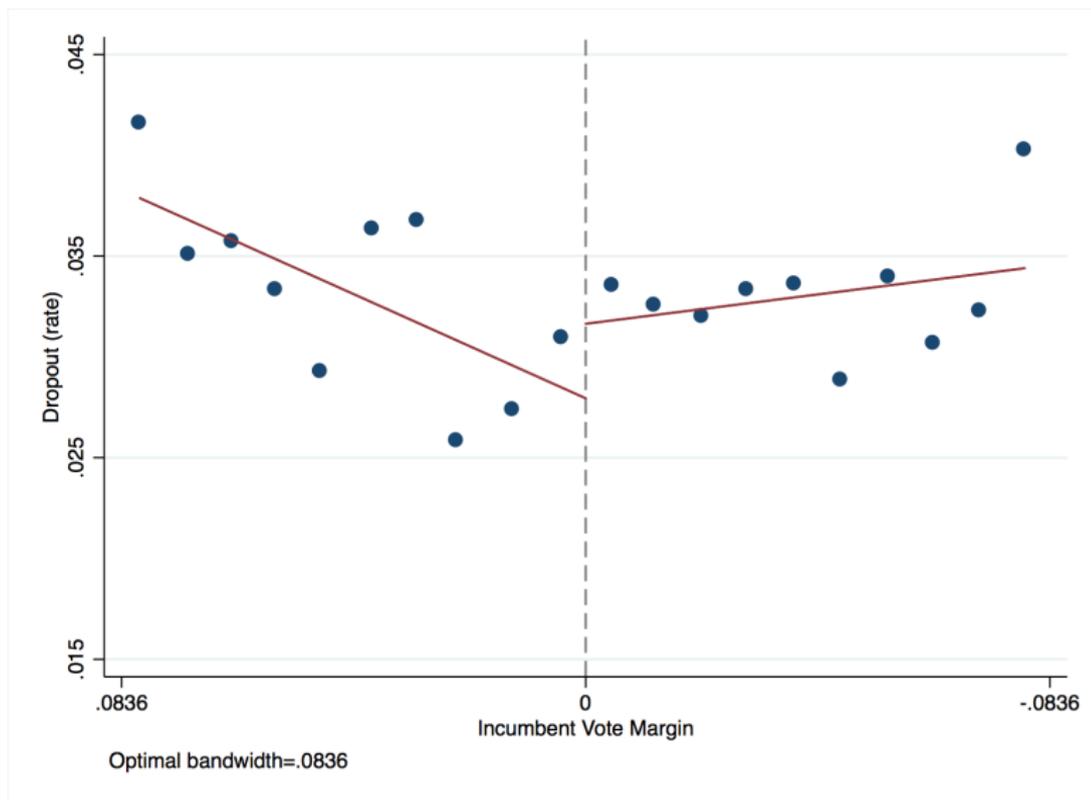
There is no statistically significant effect of political turnover on dropout rates.

	Outcome: School-level Dropout Rates					
	(1)	(2)	(3)	(4)	(5)	(6)
$1\{IncumbVoteMargin < 0\}$	0.0039 (0.0036)	0.0033 (0.0033)	0.0049 (0.0034)	0.0050 (0.0032)	0.0031 (0.0033)	0.0031 (0.0030)
N	31,742	31,742	26,492	26,492	39,661	39,661
R-squared	0.1446	0.1651	0.1502	0.1681	0.1391	0.1614
Controls	No	Yes	No	Yes	No	Yes
Clusters	2029	2029	1783	1783	2412	2412
Mean Dep Var	0.0337	0.0337	0.0323	0.0323	0.0335	0.0335
Using Bandwidth	0.0836	0.0836	0.0700	0.0700	0.110	0.110
Optimal Bandwidth	0.0836	0.0836	0.0836	0.0836	0.0836	0.0836

Baseline dropout, i.e. school-level dropout rates from 2007 or 2011, are included as controls in all specifications. Controls include school-level controls and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet.

School-level Dropout Rate (all grades)

There is no statistically significant effect of political turnover on dropout rates.



4th Grade Test Scores

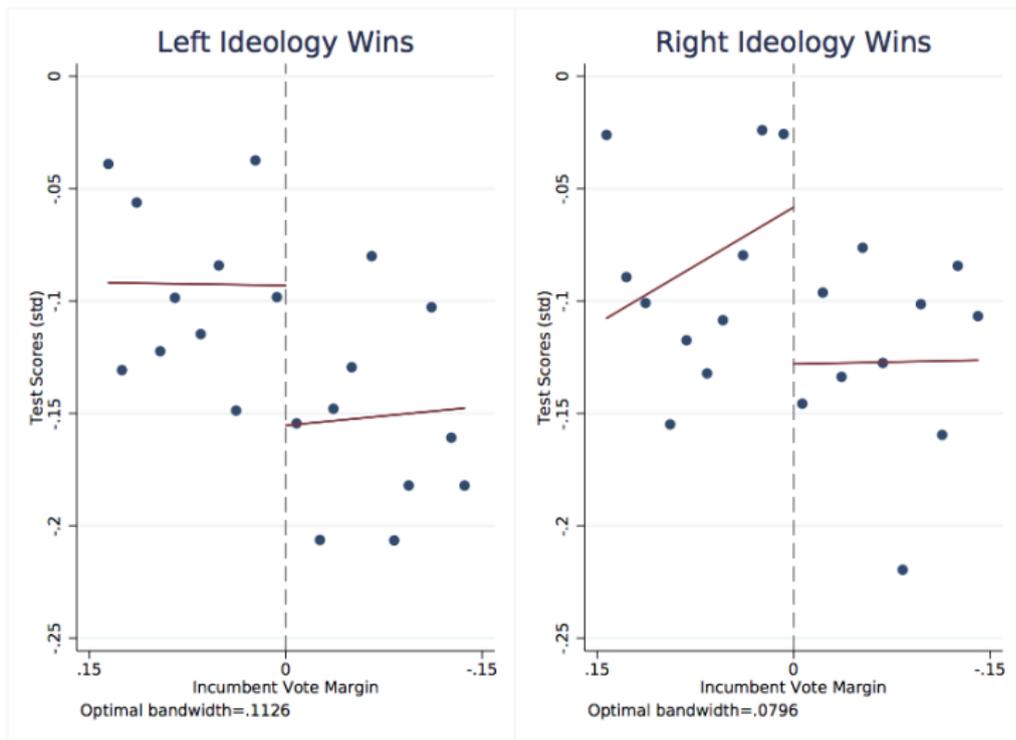
Heterogeneity wrt ideology of winning party

	Outcome: Individual 4th Grade Test Scores			
	(1)	(2)	(3)	(4)
$1\{IncumbVoteMargin < 0\}$	-0.122** (0.047)	-0.117*** (0.041)	-0.089** (0.038)	-0.085*** (0.033)
Left Party Wins	-0.052 (0.056)	-0.053 (0.053)	-0.035 (0.045)	-0.030 (0.043)
$1\{IncumbVoteMargin < 0\} \times$ Left Party Wins	0.029 (0.071)	0.039 (0.063)	0.038 (0.057)	0.035 (0.051)
N	223,557	223,557	327,168	327,168
R-squared	0.205	0.240	0.208	0.243
Controls	No	Yes	No	Yes
Clusters	1243	1243	1703	1703
Using Bandwidth	0.0700	0.0700	0.110	0.110
Optimal Bandwidth	0.0910	0.0910	0.0910	0.0910

Baseline scores, i.e. school-level, average scores from 2007 or 2011, are included as controls in all specifications. Controls include school-level controls, individual-level controls, and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet. Individual controls include an indicator variable for gender, whether the student is white, and whether the student sees their parent reading.

4th Grade Test Scores

Heterogeneity wrt ideology of winning party



Does the Effect of Political Turnover on Scores Persist?

In municipalities with a new party in 2008, there is no significant improvement in test scores 3-5 years after the election.

	Outcome: Individual 4th Grade Test Scores			
	(1)	(2)	(3)	(4)
$\mathbf{1}\{IncumbVoteMargin_{2008} < 0\}$	-0.113** (0.046)	-0.106** (0.041)	-0.063 (0.039)	-0.060* (0.035)
$\mathbf{1}\{IncumbVoteMargin_{2008} < 0\} \times 2011$	0.019 (0.049)	0.013 (0.046)	0.016 (0.042)	0.011 (0.040)
$\mathbf{1}\{IncumbVoteMargin_{2008} < 0\} \times 2013$	0.033 (0.056)	0.038 (0.051)	-0.013 (0.046)	-0.013 (0.042)
N	384,233	384,233	535,315	535,315
R-squared	0.165	0.203	0.163	0.200
Controls	No	Yes	No	Yes
Clusters	728	728	1013	1013
Using Bandwidth	0.0700	0.0700	0.110	0.110

Average, school-level test scores from 2007 are included as controls in all specifications. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet. Individual controls include an indicator variable for gender, whether the student is white, and whether the student sees their parent reading.

Does the Effect of Political Turnover on Scores Persist?

Tracing out the effect of party turnover in 2008 on scores in 2009, 2011, and 2013

	Outcome: Individual 4th Grade Test Scores (standardized)					
	2009		2011		2013	
	(1)	(2)	(3)	(4)	(5)	(6)
$1\{IncumbVoteMargin < 0\}$	-0.113** (0.046)	-0.115*** (0.041)	-0.093 (0.063)	-0.092 (0.056)	-0.080 (0.064)	-0.061 (0.055)
School-level Score in 2007	0.827*** (0.027)	0.696*** (0.028)	0.796*** (0.028)	0.675*** (0.032)	0.765*** (0.029)	0.616*** (0.028)
N	138,089	138,089	124,158	124,158	121,986	121,986
R-squared	0.179	0.209	0.164	0.199	0.149	0.203
Controls	No	Yes	No	Yes	No	Yes
Clusters	728	728	728	728	728	728
Using Bandwidth	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700
Optimal Bandwidth	0.0772	0.0772	0.104	0.104	0.102	0.102

Score in 2007 is the school-level, average test score from 2007. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet. Individual controls include an indicator variable for gender, whether the student is white, and whether the student sees their parent reading.

Headmaster Replacements

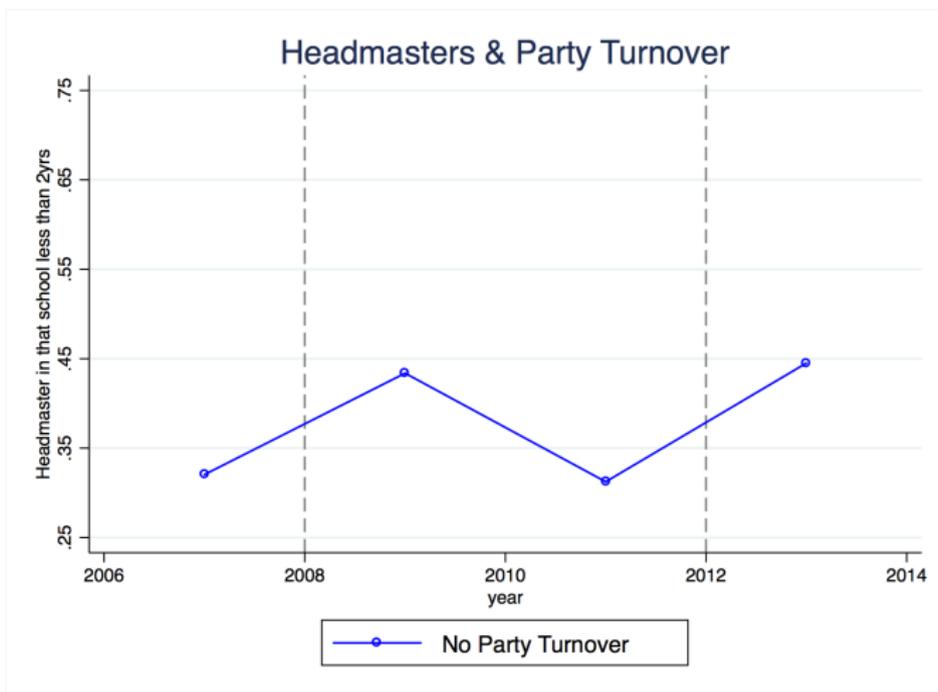
Event-study using all municipalities

- Divide municipalities into 4 groups: did not experience party turnover in either election cycle, experienced party turnover only in 2008, experienced party turnover only in 2012, experienced party turnover in both election cycles.

Headmaster Replacements

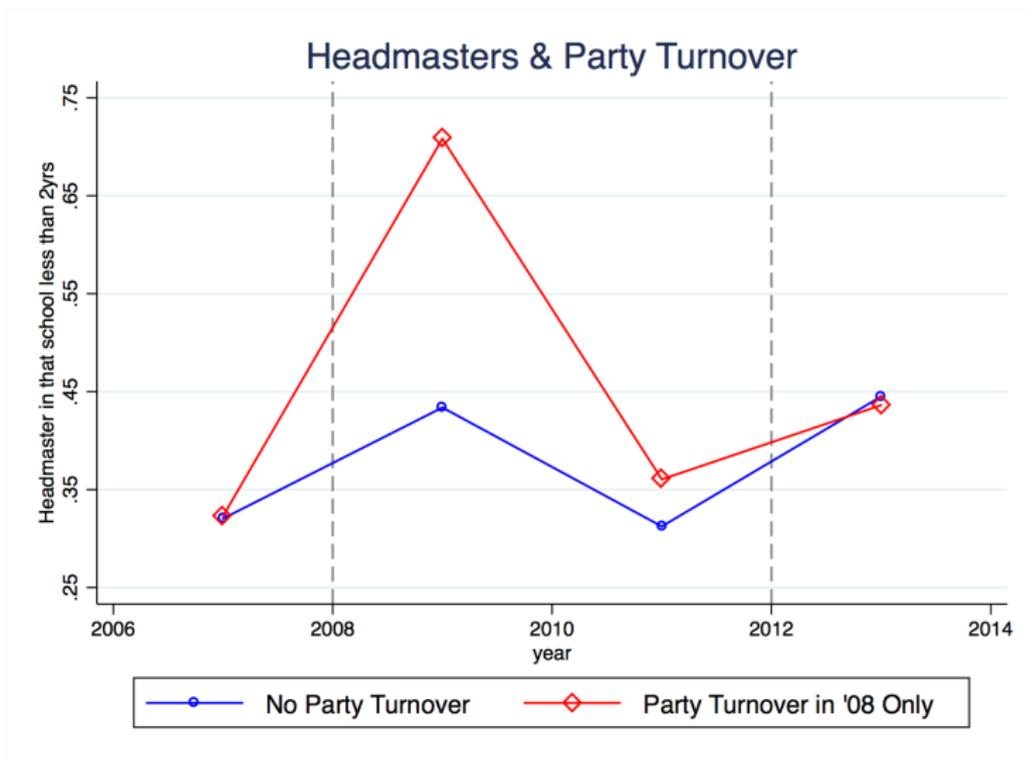
Event-study using all municipalities

- Divide municipalities into 4 groups: did not experience party turnover in either election cycle, experienced party turnover only in 2008, experienced party turnover only in 2012, experienced party turnover in both election cycles.



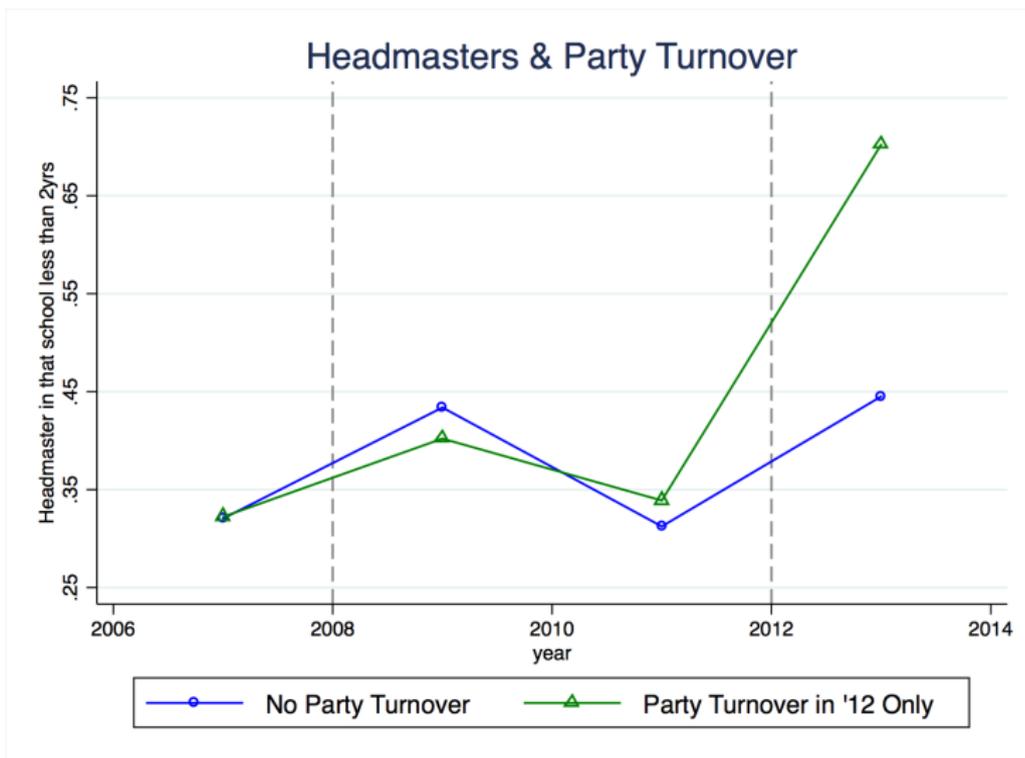
Headmaster Replacements

Event-study using all municipalities



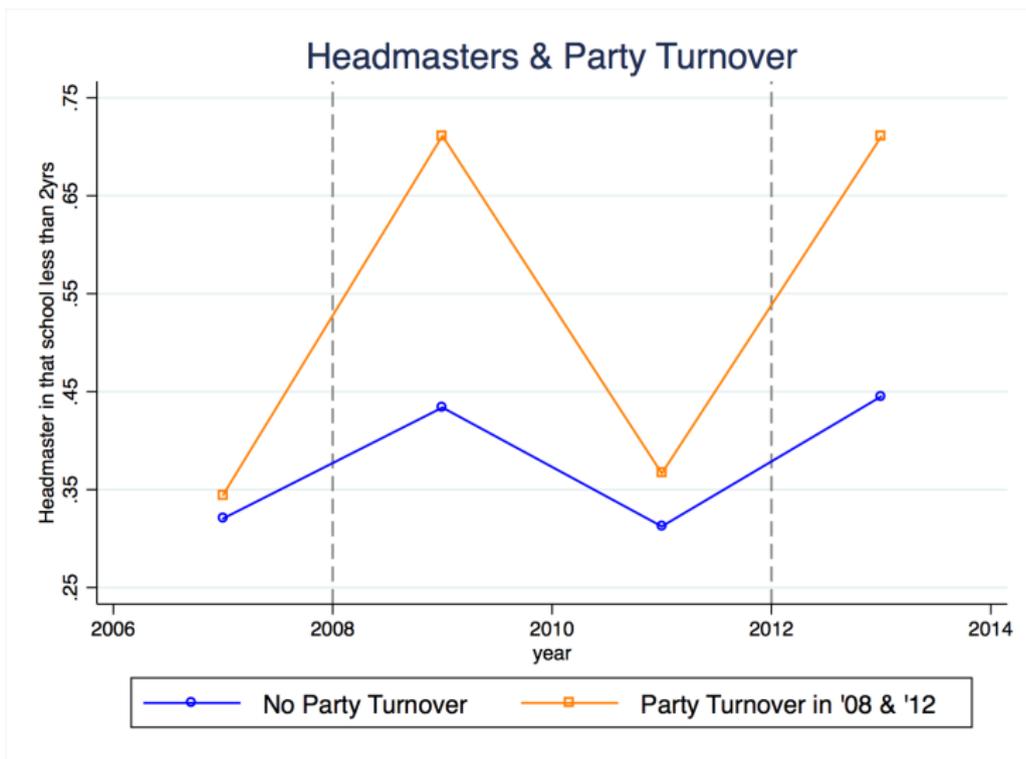
Headmaster Replacements

Event-study using all municipalities



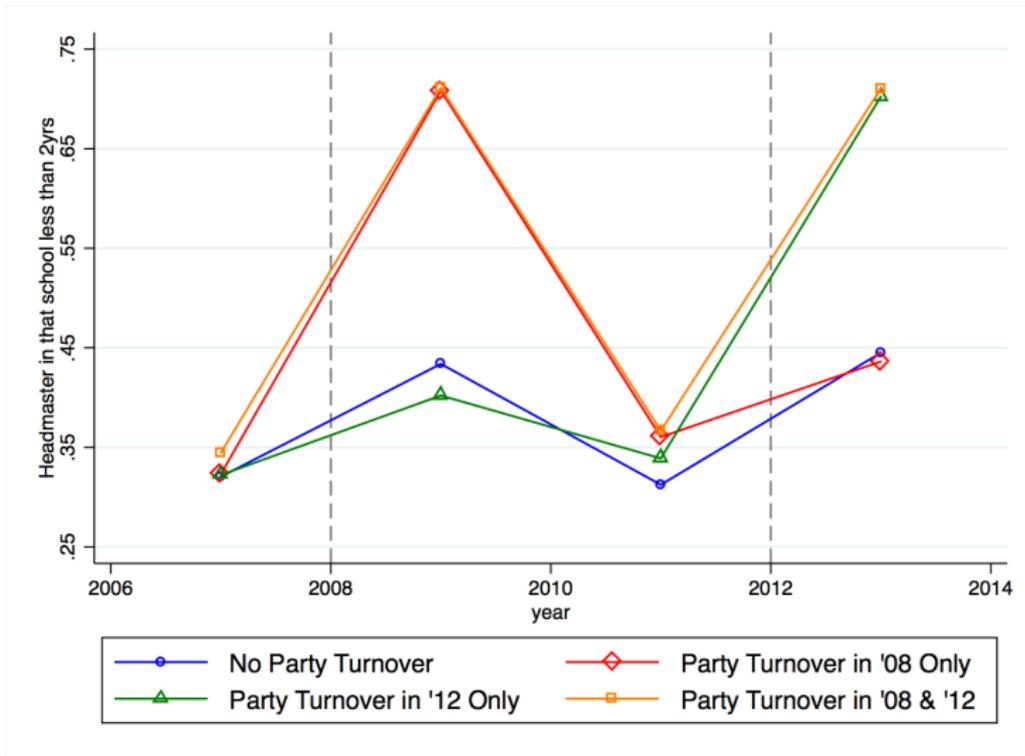
Headmaster Replacements

Event-study using all municipalities



Headmaster Replacements

Event-study using all municipalities



▶ Back

Headmaster Replacements

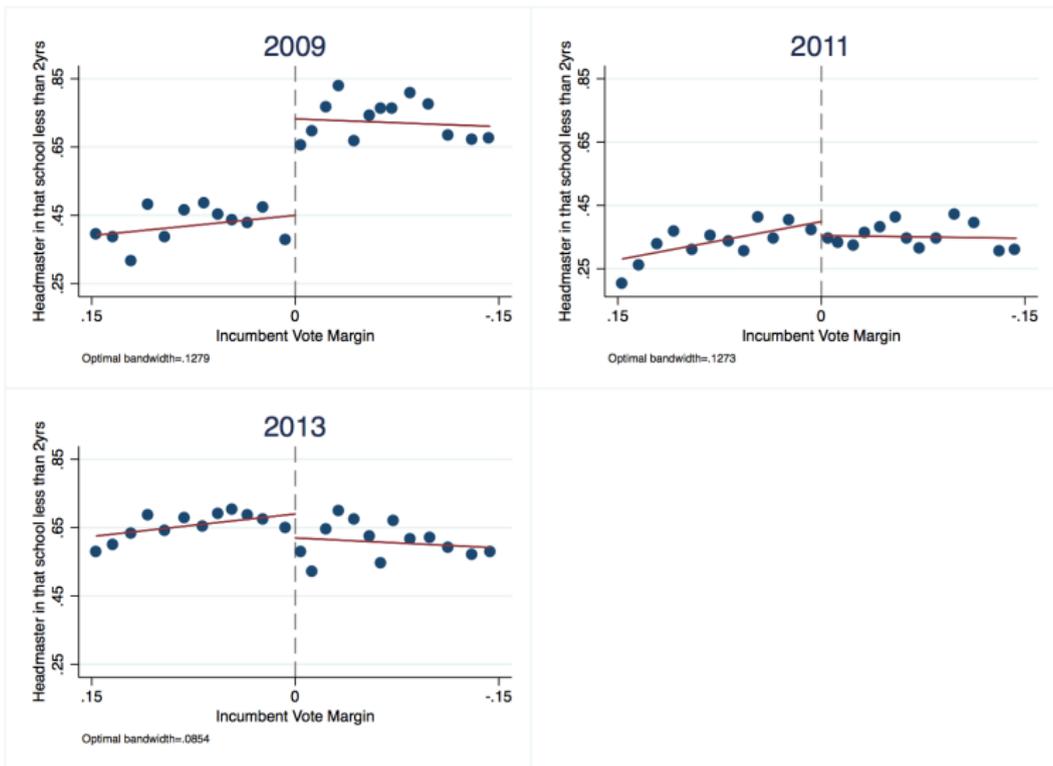
Party turnover increases share of headmasters that are new to their school by 28 pp.

	Outcome: Headmaster is new to the school (as headmaster)					
	(1)	(2)	(3)	(4)	(5)	(6)
$1\{IncumbVoteMargin < 0\}$	0.278*** (0.027)	0.277*** (0.026)	0.273*** (0.040)	0.272*** (0.039)	0.271*** (0.032)	0.270*** (0.032)
N	15,011	15,011	7,517	7,517	11,196	11,196
R-squared	0.099	0.103	0.090	0.096	0.096	0.100
Controls	No	Yes	No	Yes	No	Yes
Clusters	2648	2648	1562	1562	2139	2139
Mean Dep Var	0.435	0.435	0.454	0.454	0.446	0.446
Using Bandwidth	0.157	0.157	0.0700	0.0700	0.110	0.110
Optimal Bandwidth	0.157	0.157	0.157	0.157	0.157	0.157

Controls include school-level controls and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet.

Headmaster Changes Occur Immediately After the Election

Tracing out the effect of party turnover in 2008 on headmaster changes in 2009, 2011, and 2013



Personnel Replacement and Bureaucratic Entrenchment

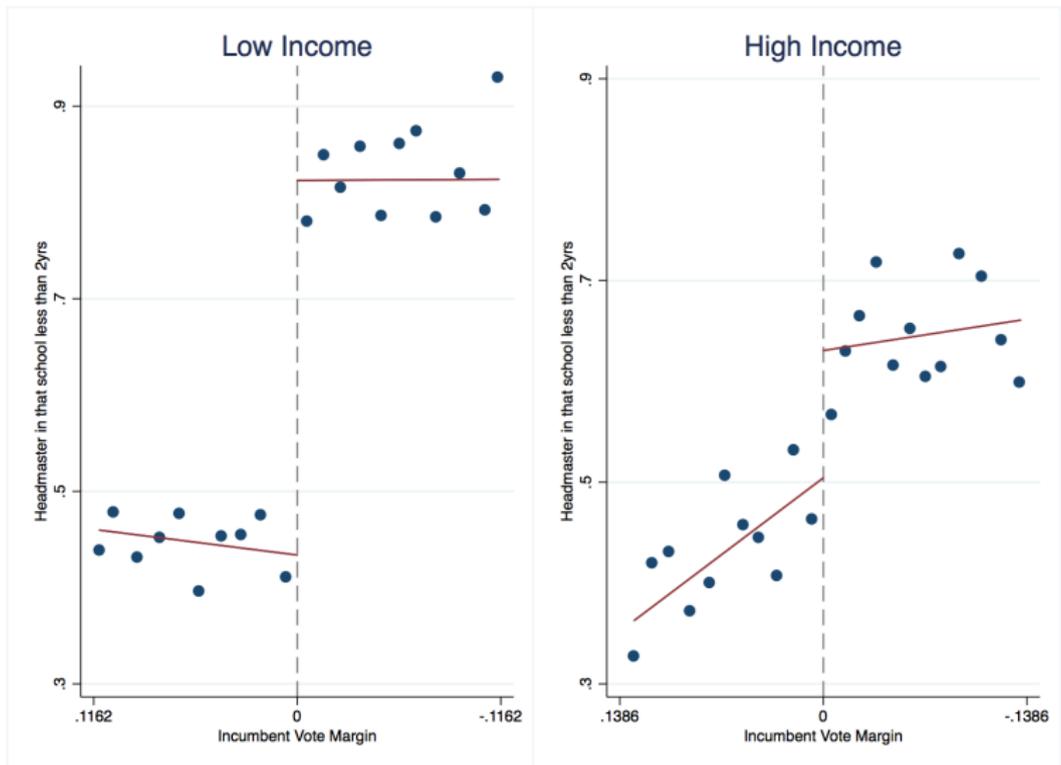
Does personnel replacement have less adverse consequences when the bureaucracy is entrenched?

- Low vs. High-income municipalities [▶ het wrt Income](#)
 - ▶ Replacement of headmasters is $3\times$ larger in low-income municipalities, which is likely more entrenched.
 - ▶ Consistent with greater entrenchment, greater replacement rate does not translate to even worse outcomes for students.
- 1st vs. 2nd consecutive political turnover
 - ▶ [To do]

[▶ Back](#)

Heterogeneity by Income

Effect of party turnover on headmaster replacements is three times larger in low-income municipalities.



Heterogeneity by Income for Effect on Test Scores

The effect of party turnover on *test scores* is not larger in low-income municipalities (possibly due to a “ceiling effect”)

	Outcome: Individual 4th Grade Test Scores (standardized)					
	(1)	(2)	(3)	(4)	(5)	(6)
$1\{IncumbVoteMargin < 0\}$	-0.073*	-0.088	-0.101**	-0.104	-0.068*	-0.083
	(0.039)	(0.059)	(0.043)	(0.065)	(0.035)	(0.054)
$1\{IncumbVoteMargin < 0\} \times Low\ Income$	0.003	0.078	0.034	0.124	0.006	0.069
	(0.051)	(0.075)	(0.058)	(0.083)	(0.048)	(0.070)
N	379,922	447,524	289,991	341,313	422,161	499,017
R-squared	0.227	0.204	0.222	0.202	0.225	0.203
Controls	No	Yes	No	Yes	No	Yes
Clusters	1854	1973	1494	1584	2041	2169
Using Bandwidth	0.0956	0.0956	0.0700	0.0700	0.110	0.110
Optimal Bandwidth	0.0956	0.0956	0.0956	0.0956	0.0956	0.0956

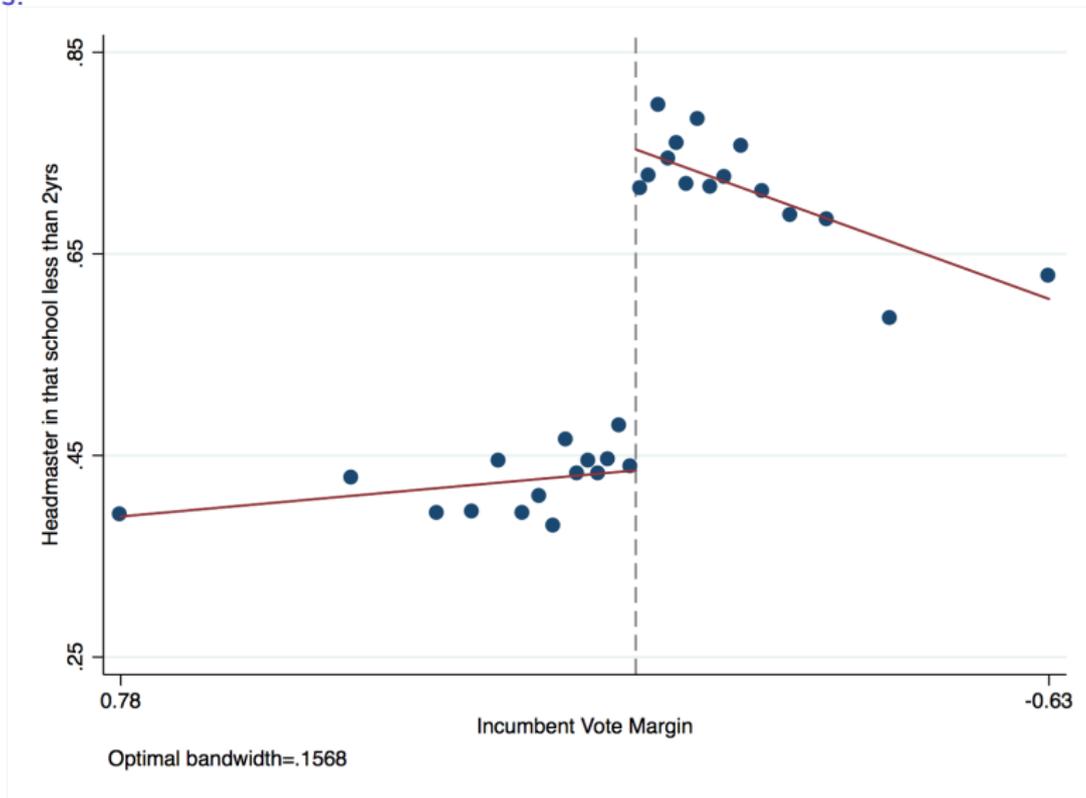
Baseline scores, i.e. school-level, average scores from 2007 or 2011, are included as controls in all specifications. Controls include school-level controls, individual-level controls, and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet. Individual controls include an indicator variable for gender, whether the student is white, and whether the student sees their parent reading.

▶ Back

▶ Back (entrenchment)

External Validity – Headmaster Replacements

The effect of party turnover on headmaster replacements is not limited to competitive elections.



Political Turnover & Headmaster Characteristics

Headmasters in municipalities with party turnover are less experienced as headmasters.

	(1) Female	(2) Age	(3) BA	(4) Graduate Training	(5) Salary	(6) Hours	(7) Experience in Education	(8) Experience as Headmaster
$1\{IncumbVoteMargin < 0\}$	-0.019 (0.018)	-0.230 (0.406)	-0.004 (0.014)	-0.044** (0.022)	9.107 (76.810)	-0.097 (0.274)	-0.133 (0.222)	-1.756*** (0.257)
N	11,112	10,989	10,853	10,773	11,019	11,170	11,161	11,176
R-squared	0.033	0.055	0.052	0.254	0.275	0.323	0.149	0.046
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	2142	2141	2132	2130	2141	2144	2136	2142
Mean Dep Var	0.820	41.62	0.901	0.767	2056	38.69	14.14	5.047
Using Bandwidth	0.110	0.110	0.110	0.110	0.110	0.110	0.110	0.110
Optimal Bandwidth	0.137	0.139	0.142	0.113	0.117	0.145	0.166	0.134

Controls include school-level controls and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet.

▶ Main

▶ Back

Politically Appointed Headmasters

- Headmasters in Brazil can be: politically appointed, selected through a competitive process (*concurso público*), or elected by the school community (or a combination of these).
- In the *PB* survey, headmasters are asked “How were you chosen for the headmaster position in this school?”
 - ▶ Categorical outcome variable to indicate whether the headmaster is new **and** politically appointed:

$$\text{▶ } y_{smt} = \left\{ \begin{array}{l} \text{No Change in Headmaster (base)} \\ \text{Headmaster is new, not Political} \\ \text{Headmaster is new, and Political} \end{array} \right\} .$$

Politically Appointed Headmasters

With political turnover, the school is more likely to experience a politically appointed headmaster change.

Political turnover significantly increases the relative risk of experiencing politically appointed headmaster replacement by a factor of 3.67, or $e^{1.30}$. Although political turnover increases the relative risk of experiencing replacement for non-politically appointed headmasters, the magnitude is smaller (a factor of 1.52, or $e^{.42}$) and only marginally statistically significant.

	(1)		(2)	
	Headmaster New & not Political	Headmaster New & Political	Headmaster New & not Political	Headmaster New & Political
$1\{IncumbVoteMargin < 0\}$	0.418* (0.232)	1.301*** (0.170)	0.413* (0.231)	1.303*** (0.168)
N	10,662	10,662	10,662	10,662
Controls	No	No	Yes	Yes
Clusters	2119	2119	2119	2119
Using Bandwidth	0.110	0.110	0.110	0.110

Table reports the estimated multinomial logistic regression coefficients for the following outcome variable defined at the school level: the outcome is equal to 0 if there is no change in the headmaster, equal to 1 if the headmaster is new and not a political appointee, and equal to 2 if the headmaster is new and a political appointee. The referent (base) category is the set of schools where there is no change in the headmaster. Controls include school-level controls and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet.

Issues with Evidence for Politically Appointed Headmasters

When the headmaster is asked "How were you chosen as headmaster?"

Answer options: selection, election only, selection and election, technical appointment, political appointment, other appointment, other.

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February 2011: "Plan to improve education in the state promises to end political appointments"

The new education plan for the state of Rio aims to end the political appointment of school headmasters and bring a new way of choosing them: meritocracy.

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December 2014: "The Rio Secretary of Education resigns"

*[Regarding the practice of politically appointed headmasters]
When we tried to open the process to selection, we had a lot of resistance from some lawmakers and teacher unions. Then, the speech was that there were "elections." But what happened in practice was just many interests/external forces taking the "vote" as hostage. - Former Secretary of Education, Rio de Janeiro*

Teacher Replacements: New Teachers

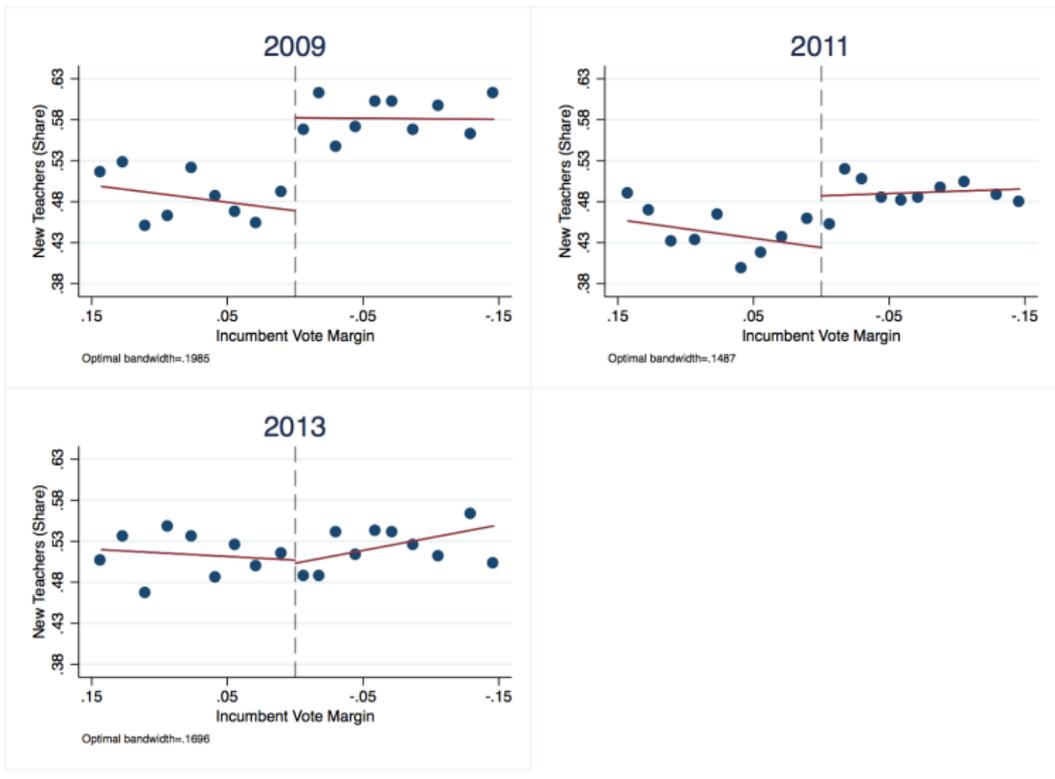
Party turnover increases share of teachers who are in a given school at time t but were not in that school at time $(t-2)$ by 11 pp.

	Outcome: Share of Teachers that are New					
	(1)	(2)	(3)	(4)	(5)	(6)
$1\{IncumbVoteMargin < 0\}$	0.117*** (0.018)	0.119*** (0.018)	0.112*** (0.022)	0.113*** (0.022)	0.101*** (0.019)	0.102*** (0.019)
N	38,065	38,065	21,885	21,885	32,883	32,883
R-squared	0.026	0.032	0.027	0.031	0.030	0.035
Controls	No	Yes	No	Yes	No	Yes
Clusters	2297	2297	1509	1509	2056	2056
Mean Dep Var	0.464	0.464	0.464	0.464	0.459	0.459
Using Bandwidth	0.130	0.130	0.0700	0.0700	0.110	0.110
Optimal Bandwidth	0.130	0.130	0.130	0.130	0.130	0.130

Controls include school-level controls and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet.

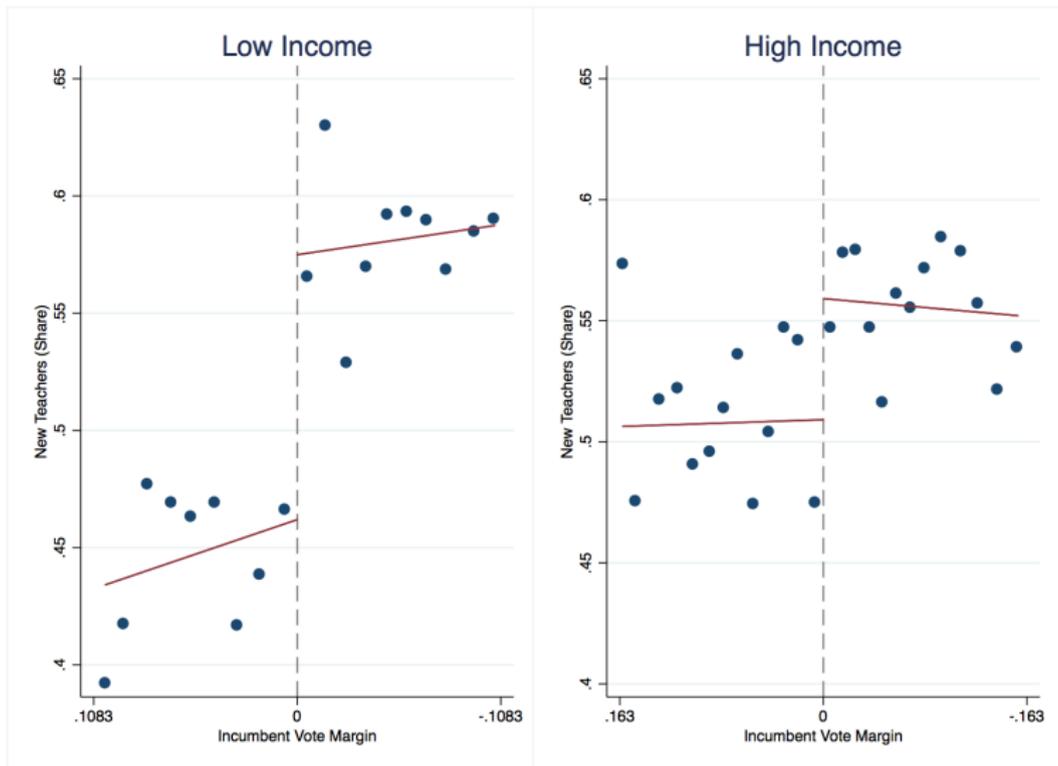
Teacher Changes Mostly Occur After the Election

Tracing out the effect of party turnover in 2008 on teacher changes in 2009, 2011, and 2013



Heterogeneity by Income

Effect of party turnover on teacher replacements is three times larger in low-income municipalities.



Teacher Replacements: Teachers who Left

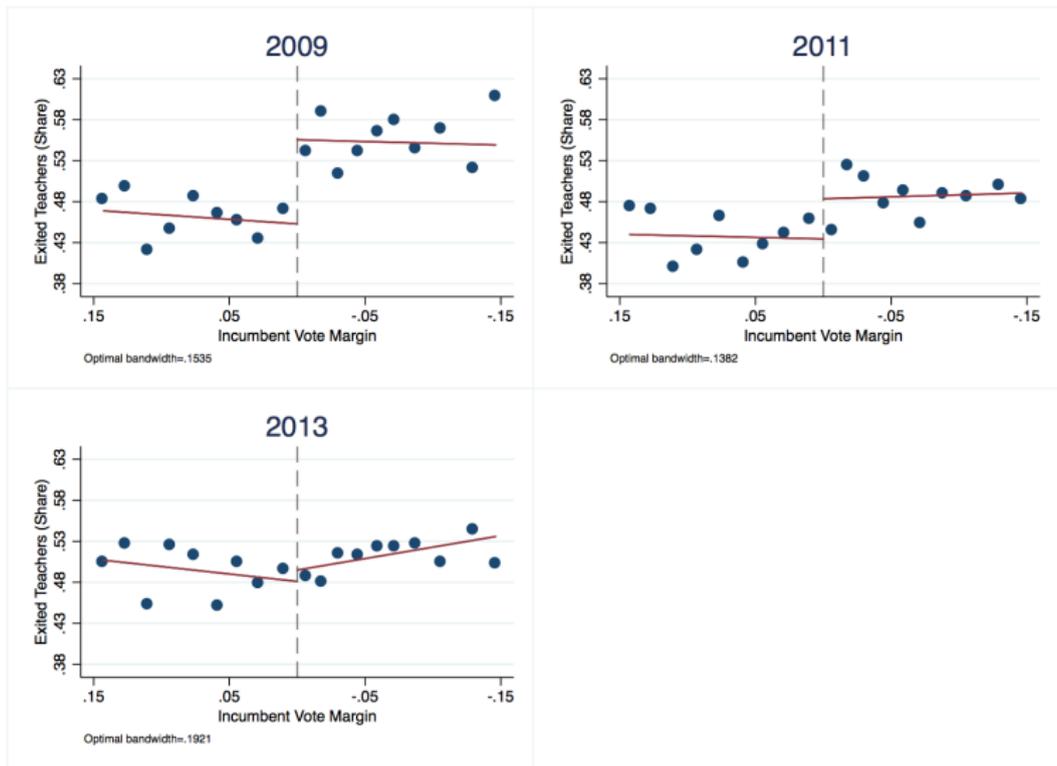
Party turnover increases share of teachers who were in a given school at time ($t-2$) but are no longer in that school at time t by 11 pp.

	Outcome: Share of Teachers that have Left the School					
	(1)	(2)	(3)	(4)	(5)	(6)
$1\{IncumbVoteMargin < 0\}$	0.114*** (0.018)	0.115*** (0.018)	0.106*** (0.022)	0.107*** (0.022)	0.098*** (0.019)	0.099*** (0.019)
N	38,808	38,808	21,885	21,885	32,883	32,883
R-squared	0.024	0.028	0.025	0.028	0.027	0.031
Controls	No	Yes	No	Yes	No	Yes
Clusters	2327	2327	1509	1509	2056	2056
Mean Dep Var	0.448	0.448	0.449	0.449	0.444	0.444
Using Bandwidth	0.133	0.133	0.0700	0.0700	0.110	0.110
Optimal Bandwidth	0.133	0.133	0.133	0.133	0.133	0.133

Controls include school-level controls and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet.

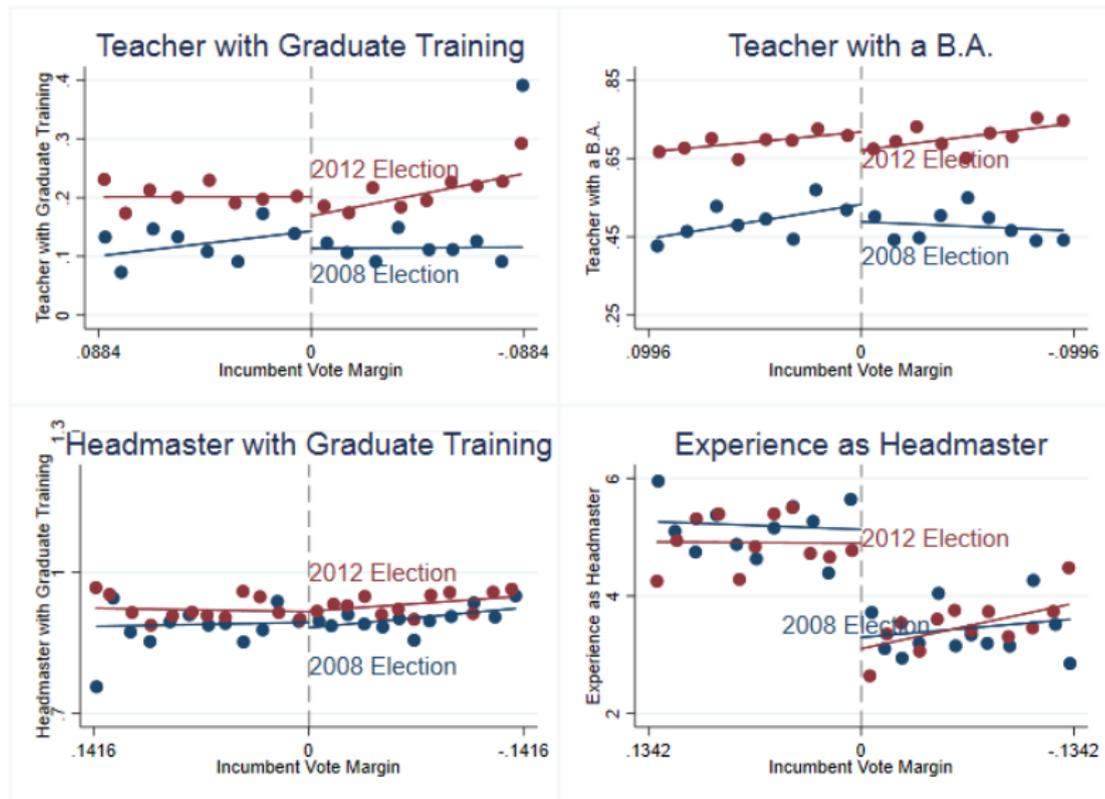
Teacher Changes Mostly Occur After the Election

Tracing out the effect of party turnover in 2008 on teacher changes in 2009, 2011, and 2013



Personnel Characteristics: 2008 vs. 2012 Elections

Levels of personnel's attributes are higher in election-cycle 2012 compared to 2008.



The Brazilian Bureaucracy - The Case of Education

Teachers

July 2009: "How to deal with turnover of teachers?"

By joining the network [of teachers], the teacher takes the position that first becomes available, which in general is a school that is far for the teacher. Over time, thanks to internal selection processes (concurso de remoção), he can choose one closer to where lives. It is a right he has. - School Management Coordinator of Paraná

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As Secretary of Education of São Paulo, Maria Helena Guimarães de Castro stated a turnover of 40% in the state system: "High rates [of teacher] turnover transform the school into a space without a soul, where people circulate without any attachments to the school and community."

Headmaster Replacements in Non-municipal Schools

Municipal party turnover does not affect headmaster replacements in non-municipal schools.

	Outcome: Headmaster is new to the school (as headmaster)					
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbf{1}\{IncumbVoteMargin < 0\}$	-0.008 (0.027)	-0.016 (0.025)	0.002 (0.039)	-0.019 (0.036)	0.027 (0.032)	0.008 (0.030)
N	7,762	7,762	4,050	4,050	5,780	5,780
R-squared	0.001	0.023	0.001	0.029	0.000	0.025
Controls	No	Yes	No	Yes	No	Yes
Clusters	2321	2321	1374	1374	1858	1858
Mean Dep Var	0.389	0.389	0.387	0.387	0.395	0.395
Using Bandwidth	0.158	0.158	0.0700	0.0700	0.110	0.110
Optimal Bandwidth	0.158	0.158	0.158	0.158	0.158	0.158

Controls include school-level controls and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet.

Teacher Replacements in Non-municipal Schools

- The market for teachers is not perfectly partitioned: within a year, 20% of teachers in state schools teach in other kinds of schools as well.

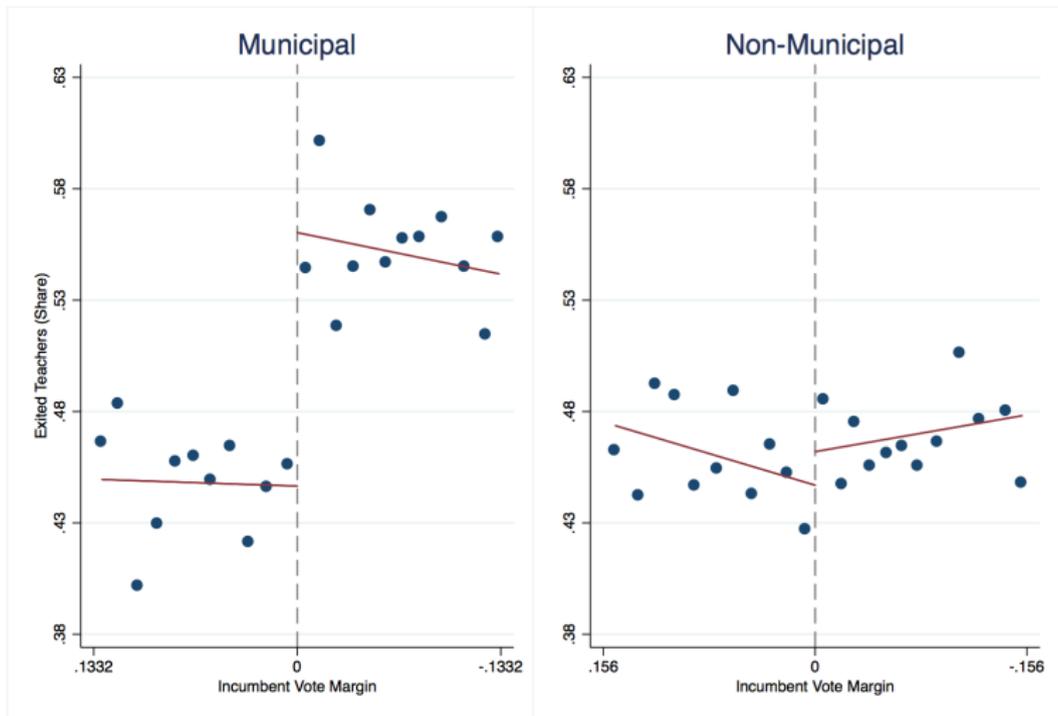
	Outcome:		Outcome:	
	Share of Teachers that are New	Share of Teachers that are New	Share of Teachers that have Left	Share of Teachers that have Left
	(1)	(2)	(3)	(4)
Party Turnover	0.011 (0.013)	0.015 (0.013)	0.015 (0.012)	0.015 (0.012)
N	13,819	13,819	14,427	14,427
R-squared	0.001	0.018	0.001	0.023
Controls	No	Yes	No	Yes
Clusters	2466	2466	2551	2551
Mean Dep Var	0.477	0.477	0.460	0.460
Using Bandwidth	0.147	0.147	0.156	0.156
Optimal Bandwidth	0.147	0.147	0.156	0.156

Controls include school-level controls and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet.

Teacher Replacements in Non-municipal Schools

Municipal party turnover does not significantly affect share of teachers that leave non-municipal schools.

Share of Teachers that Left the School



4th Grade Test Scores in Non-municipal Schools

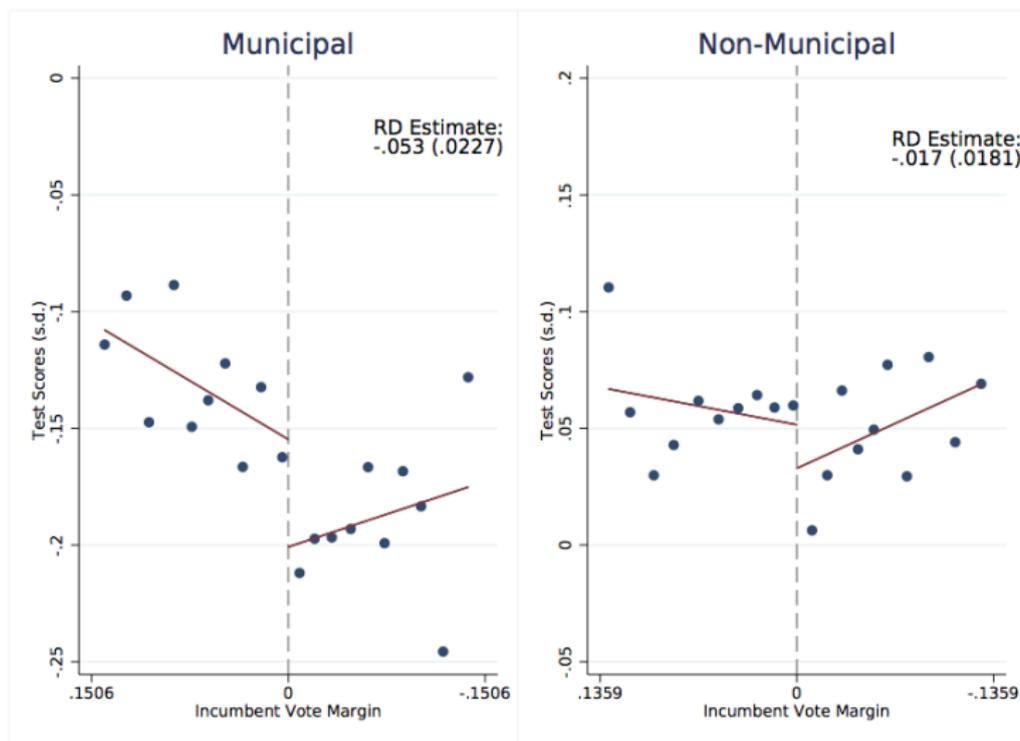
Municipal party turnover does not affect test scores in non-municipal schools.

	Outcome: Individual 4th Grade Test Scores (standardized)					
	(1)	(2)	(3)	(4)	(5)	(6)
$1\{IncumbVoteMargin < 0\}$	0.013 (0.031)	0.024 (0.029)	-0.005 (0.044)	0.024 (0.040)	0.007 (0.035)	0.025 (0.033)
N	152,086	152,086	89,753	89,753	126,439	126,439
R-squared	0.157	0.191	0.154	0.188	0.158	0.192
Controls	No	Yes	No	Yes	No	Yes
Clusters	1161	1161	755	755	1015	1015
Using Bandwidth	0.135	0.135	0.0700	0.0700	0.110	0.110
Optimal Bandwidth	0.135	0.135	0.135	0.135	0.135	0.135

Baseline scores, i.e. school-level, average scores from 2007 or 2011, are included as controls in all specifications. Controls include school-level controls, individual-level controls, and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet. Individual controls include an indicator variable for gender, whether the student is white, and whether the student sees their parent reading.

8th Grade Test Scores in Non-municipal Schools

Municipal party turnover does not significantly affect test scores in non-municipal schools.



8th Grade Test Scores in Non-municipal Schools

Municipal party turnover does not significantly affect test scores in non-municipal schools.

	Outcome: Individual 8th Grade Test Scores (standardized)					
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbf{1}\{IncumbVoteMargin < 0\}$	-0.017 (0.018)	-0.011 (0.018)	-0.030 (0.026)	-0.013 (0.025)	-0.031 (0.021)	-0.023 (0.020)
N	381,972	381,972	222,724	222,724	316,167	316,167
R-squared	0.106	0.125	0.106	0.125	0.107	0.126
Controls	No	Yes	No	Yes	No	Yes
Clusters	2155	2155	1409	1409	1888	1888
Using Bandwidth	0.136	0.136	0.0700	0.0700	0.110	0.110
Optimal Bandwidth	0.136	0.136	0.136	0.136	0.136	0.136

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Heterogeneity by School Quality

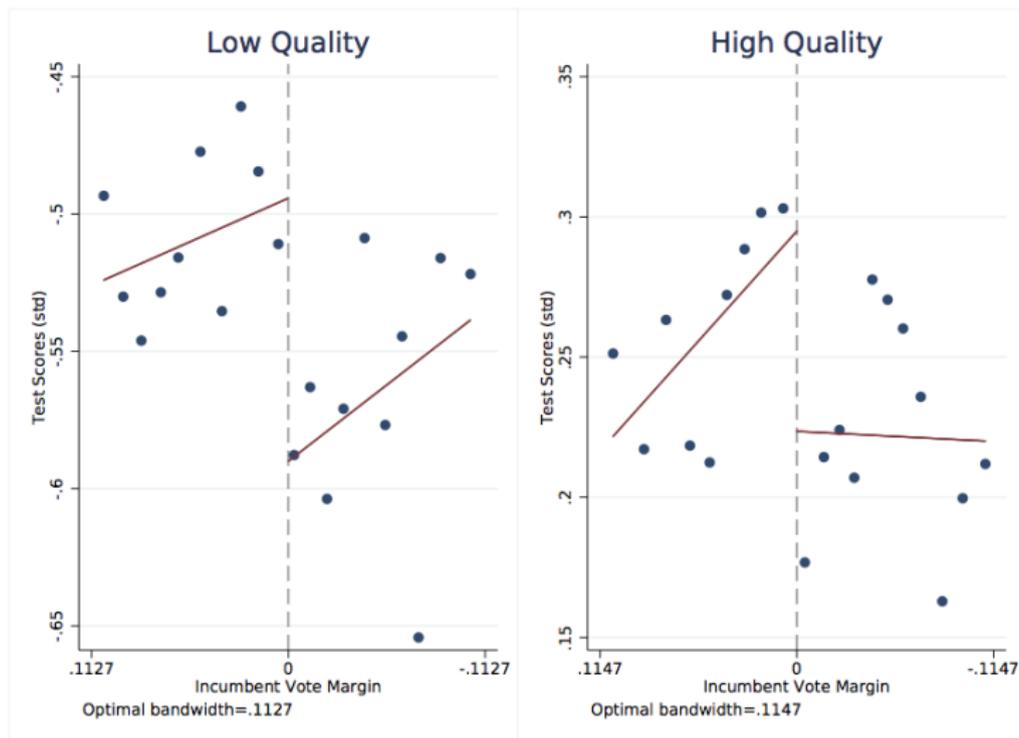
Divide schools into low quality and high quality schools (based on baseline test scores)

	Outcome: Individual 4th Grade Test Scores			
	(1)	(2)	(3)	(4)
$\mathbf{1}\{IncumbVoteMargin < 0\}$	-0.103*** (0.039)	-0.100*** (0.035)	-0.060* (0.032)	-0.063** (0.029)
$\mathbf{1}\{IncumbVoteMargin < 0\} \times \text{Low Quality}$	0.021 (0.052)	0.053 (0.048)	-0.021 (0.042)	0.012 (0.040)
N	295,170	295,170	429,979	429,979
R-squared	0.214	0.248	0.218	0.252
Controls	No	Yes	No	Yes
Clusters	1538	1538	2101	2101
Using Bandwidth	0.0700	0.0700	0.110	0.110

Baseline scores, i.e. school-level, average scores from 2007 or 2011, are included as controls in all specifications. Controls include school-level controls, individual-level controls, and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet. Individual controls include an indicator variable for gender, whether the student is white, and whether the student sees their parent reading.

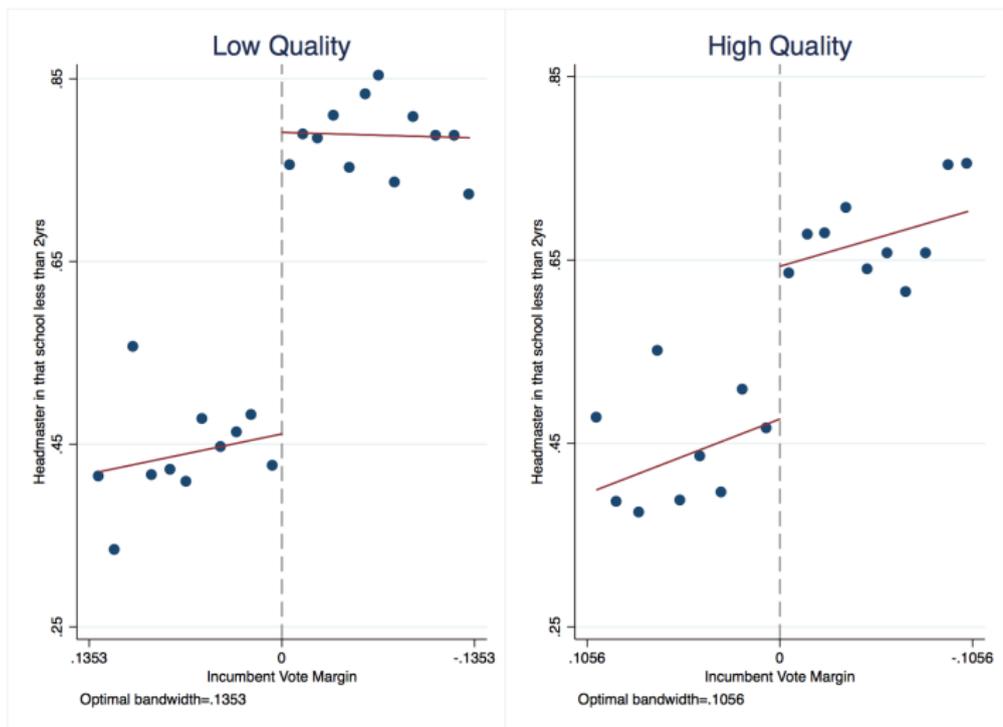
Heterogeneity by School Quality

There is a negative effect of mayoral party turnover on test scores in low- and high-quality municipal schools.



Heterogeneity by School Quality

The effect of party turnover on school personnel is twice as large in low-quality municipal schools.



School Operation and Management

Party turnover increases negative reports by headmasters about the operation of their school.

	(1) Teacher Council Meetings	(2) Curriculum Exists	(3) Curriculum Together	(4) Textbooks Overtime	(5) Textbooks Correct
$1\{IncumbVoteMargin < 0\}$	-0.130** (0.066)	-0.027** (0.011)	-0.047** (0.021)	-0.090*** (0.026)	-0.059** (0.025)
N	7,058	7,058	7,058	7,058	7,058
Controls	Yes	Yes	Yes	Yes	Yes
Clusters	1819	1819	1819	1819	1819
Mean Dep Var	2.557	0.963	0.776	0.776	0.794
Using Bandwidth	0.110	0.110	0.110	0.110	0.110
Optimal Bandwidth	0.160	0.119	0.142	0.115	0.138
	(6) Program for Dropouts	(7) Program for Tutoring	(8) Program for Failing Students	(9) Teacher Training Held	(10) Teacher Training Participation
$1\{IncumbVoteMargin < 0\}$	-0.052* (0.027)	-0.076*** (0.025)	-0.035* (0.019)	-0.150*** (0.031)	-0.026** (0.013)
N	7,058	7,058	7,058	7,058	4,228
Controls	Yes	Yes	Yes	Yes	Yes
Clusters	1819	1819	1819	1819	1521
Mean Dep Var	0.621	0.835	0.845	0.607	0.639
Using Bandwidth	0.110	0.110	0.110	0.110	0.110
Optimal Bandwidth	0.113	0.132	0.139	0.120	0.117

Controls include school-level controls and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet.

School Operation and Management

Party turnover increases negative reports by (the proctoring) teachers about the operation of their school.

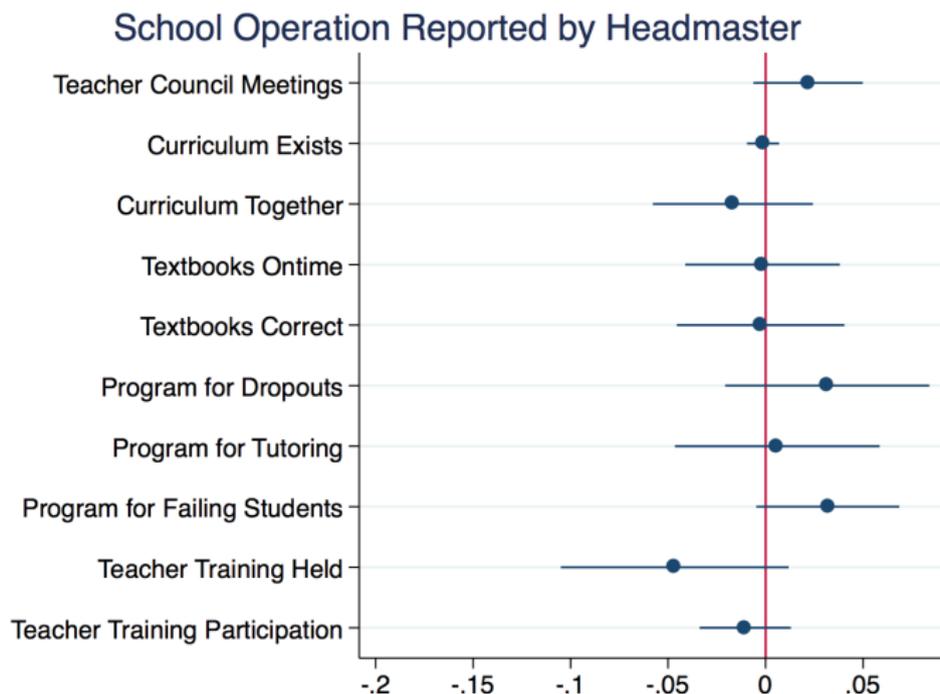
	(1) Teacher Council meetings	(2) Curriculum Exists	(3) Curriculum Together
$1\{IncumbVoteMargin < 0\}$	-0.042 (0.064)	-0.014** (0.007)	-0.037** (0.017)
N	23,409	23,409	23,409
Controls	Yes	Yes	Yes
Clusters	2087	2087	2087
Mean Dep Var	2.337	0.969	0.800
Using Bandwidth	0.110	0.110	0.110
Optimal Bandwidth	0.146	0.135	0.144

	(4) Relations w/ Headmaster (Index)	(5) Relations w/ Teachers (Index)	(6) Collaborative Environment
$1\{IncumbVoteMargin < 0\}$	-0.235 (0.311)	-0.059 (0.157)	-0.028 (0.031)
N	23,409	23,409	23,409
Controls	Yes	Yes	Yes
Clusters	2087	2087	2087
Mean Dep Var	0.705	0.387	3.677
Using Bandwidth	0.110	0.110	0.110
Optimal Bandwidth	0.190	0.130	0.121

Controls include school-level controls and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet.

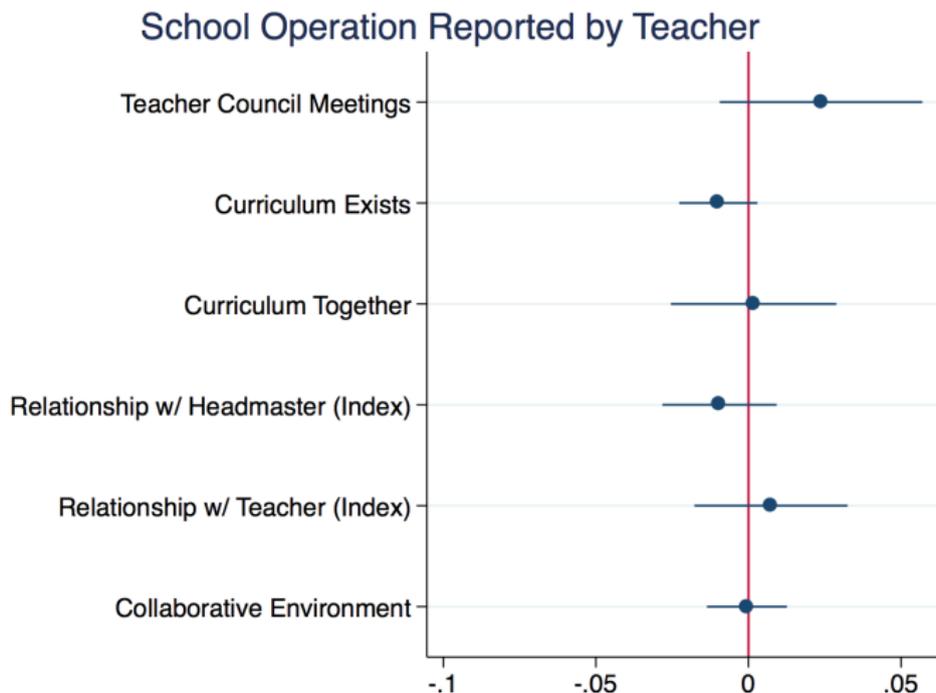
School Operation in Non-municipal Schools

Party turnover does not impact headmaster reports of school operations in non-municipal schools.



School Operation in Non-municipal Schools

Party turnover does not impact teacher reports of school operations in non-municipal schools.



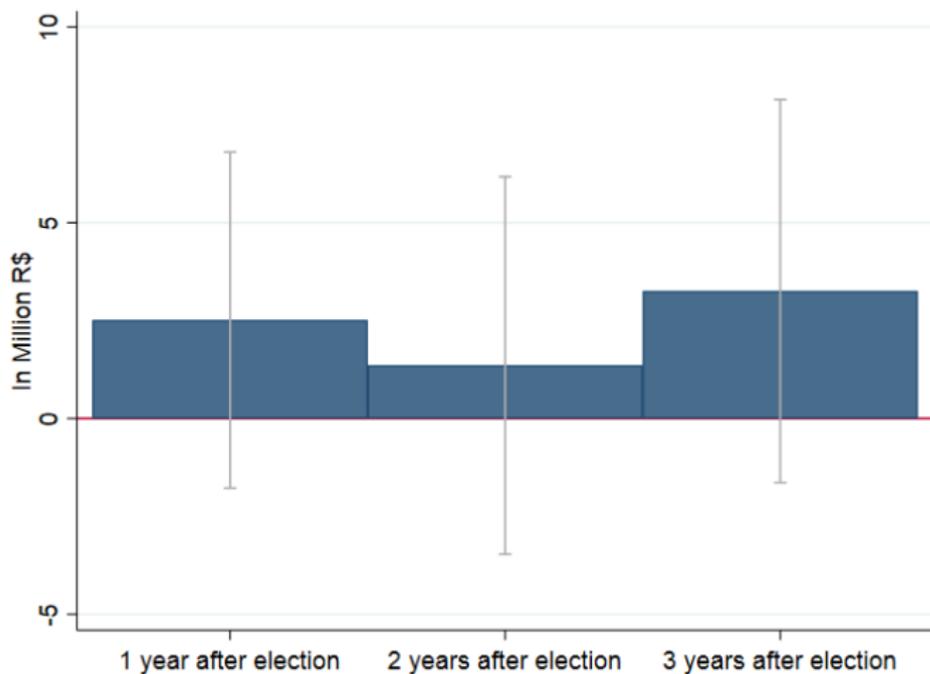
Teacher Turnover

Ongoing debate about the impact of teacher turnover on student achievement (mostly in the US)

- A disruptive effect of teacher turnover beyond changing the composition in teacher quality (Ronfeldt, et al., 2013)
 - ▶ loss of organizational-specific knowledge
 - ★ wasted resources
 - ★ cohesion and trust between teachers
- Hanushek et al. (2016): taking into account loss in teacher experience *and* endogenous grade-switching behavior of incumbent teachers fully accounts for negative effects of teacher turnover on students.

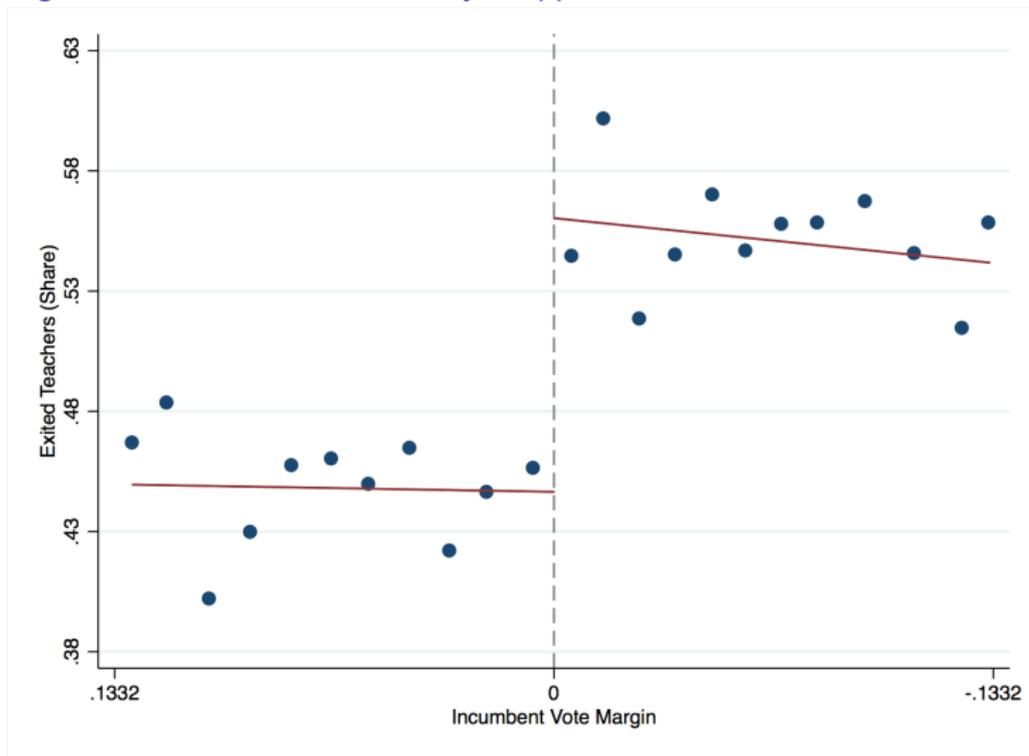
Total Expenditure (in Million R\$)

Party turnover does not affect the access to resources to the municipality.



Teacher Replacements: Teachers who Left

Party turnover increases share of teachers who were in a given school at time ($t-2$) but are no longer in that school at time t by 11 pp.



School Level Financial Resources

"Does your school experience financial problems?"

	(1)	(2)	(3)
$\mathbf{1}\{IncumbVoteMargin < 0\}$	0.023 (0.024)	0.038 (0.028)	0.027 (0.023)
N	10,813	7,389	11,011
R-squared	0.013	0.014	0.013
Controls	Yes	Yes	Yes
Clusters	2105	1563	2139
Mean LHS	0.601	0.608	0.601
Using Bandwidth	0.108	0.0700	0.110
Optimal Bandwidth	0.108	0.108	0.108

Sample Definition

Mayoral elections in 2008 and 2012 (5,553 municipalities)

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	2008 Election cycle	2012 Election cycle
munic. with regular elections	5,285	5,313
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munic. with incumb. party running & party turnover	1,138	1,588

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3. Schools must have at least 20 students enrolled in that particular grade to participate in the *Prova Brasil* (PB) exam for 4th or 8th graders.

Contributions

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 - ▶ Highlighting a cost of political discretion due to *disruption*
2. Production function of education
 - ▶ Headmaster and teacher turnover harm student achievement.

▶ Back

Political Turnover & Headmaster Characteristics

- Party turnover induces headmaster replacement mostly amongst politically appointed headmasters (as opposed to headmasters who are selected through a competitive process and/or community elections). [▶ Table](#)

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- Headmasters in municipalities with party turnover are less experienced as headmasters (1.8 years). [▶ Table](#)
 - ▶ +1 year of headmaster experience is correlated with .0013 s.d. unit improvement in test scores.

Political Turnover & Teacher Characteristics

Teachers in municipalities with party turnover are less educated.

	(1) Number of Teachers	(2) Age	(3) Female	(4) B.A.	(5) Graduate Training	(6) Temporary Contract	(7) Contract Type Missing
$1\{\text{IncumbVoteMargin} < 0\}$	0.196 (0.279)	-0.400 (0.364)	-0.015 (0.014)	-0.073*** (0.023)	-0.023* (0.014)	0.042 (0.034)	0.010* (0.006)
N	39,642	39,642	39,642	39,642	39,642	20,945	20,945
R-squared	0.507	0.060	0.068	0.295	0.200	0.121	0.024
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	2304	2304	2304	2304	2304	1523	1523
Mean Dep Var	7.859	37.31	0.815	0.485	0.155	0.344	0.0184
Using Bandwidth	0.110	0.110	0.110	0.110	0.110	0.110	0.110
Optimal Bandwidth	0.0922	0.144	0.0995	0.0917	0.0884	0.0915	0.169

Controls include school-level controls and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban or rural area, the school is connected to a water network, the school is connected to a sewage system, the school's trash is regularly collected, and the school has Internet.

[▶ Het wrt election-cicle](#) [▶ Back to Mechanism](#)

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- 8 p.p. decrease in share of teachers with a B.A. is correlated with .017 s.d. unit reduction in scores.
- Aside on teacher turnover in Brazil: [▶ Baseline Teacher Turnover](#)

Political Turnover → School Personnel

Summary

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But, are there other mechanisms through which personnel replacement impacts student achievement?

School's Personnel and Operation

Summary

- How does political turnover translate to worse outcomes for students?

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Through the politically caused disruption to the school's personnel and operation in municipalities with party turnover.

- ▶ There is an increase in replacements of teachers and headmasters.
- ▶ Headmasters are less experienced and teachers are less educated in municipalities with a change in the party.
- ▶ Headmaster and teachers report negatively on how school operates and relationships within the school.

▶ Entrenched Bureaucracy

School's Personnel and Operation

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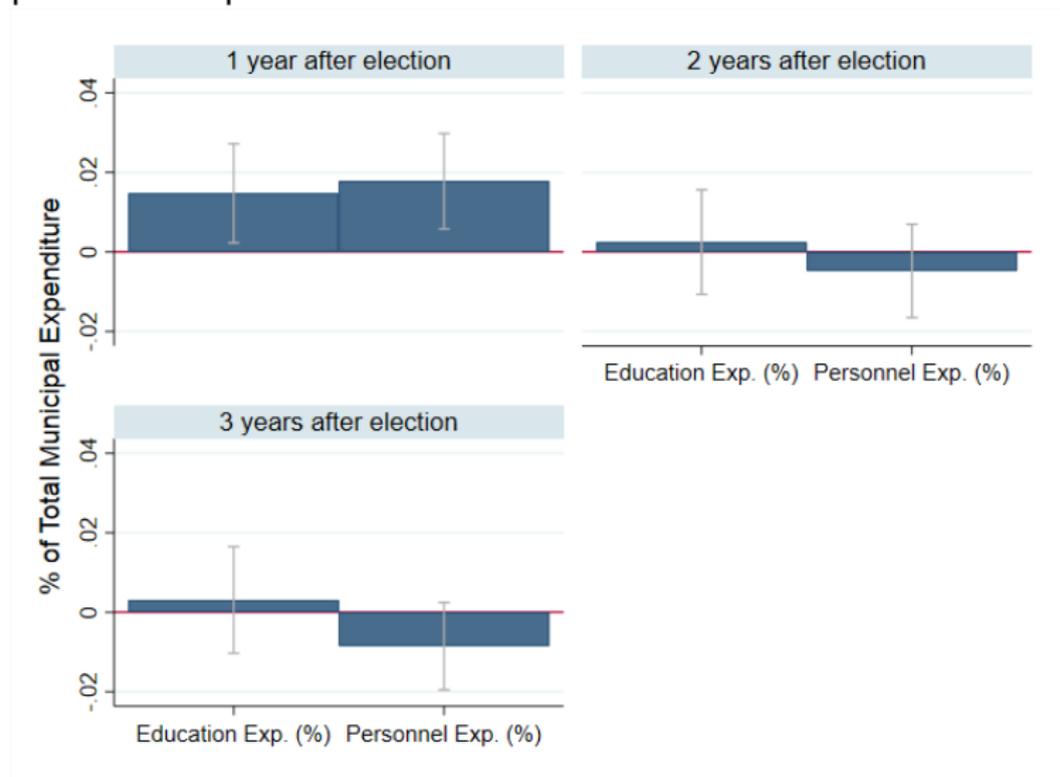
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▶ Entrenched Bureaucracy

- Does political turnover affect student achievement through its disruption of the school personnel?

Education and Personnel Expenditure (% of Total)

First year increase in education expenditure is similar to increase in overall personnel expenditure.



School Operation and Management

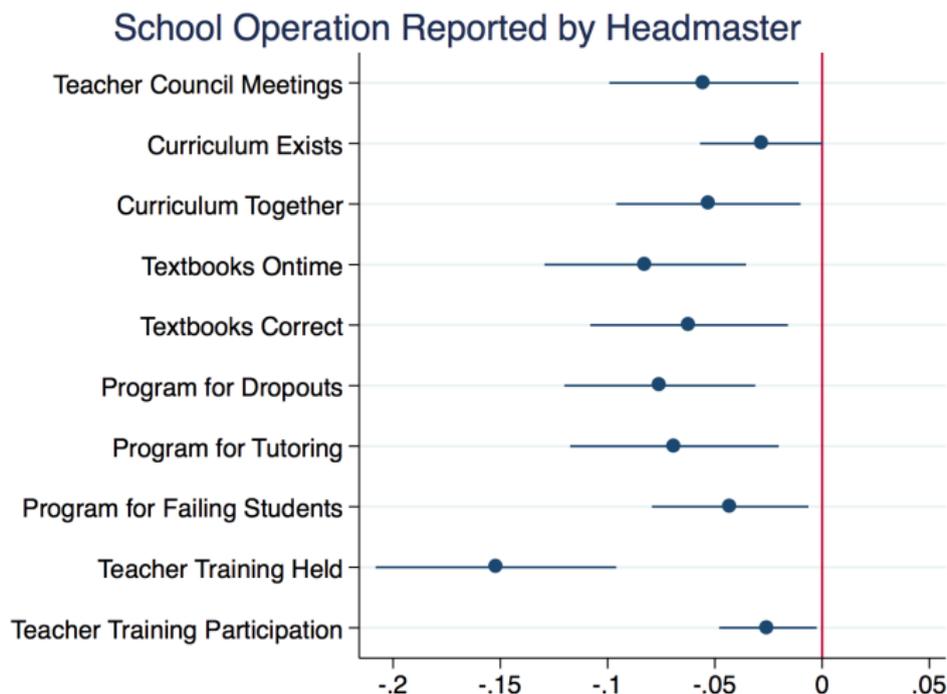
- Ronfeldt, Loeb, and Wyckoff (2013) associate high teacher turnover with lower test scores, possibly through changes in teacher quality but also:
 - ▶ Reduced school-specific human capital
 - ▶ Disrupted school programs
 - ▶ Lessened teacher collaboration

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 - ▶ Reduced school-specific human capital
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- When students take the *PB* exam, the headmaster (and the proctoring teachers) complete questionnaires. This survey asks some questions about how the school operates.

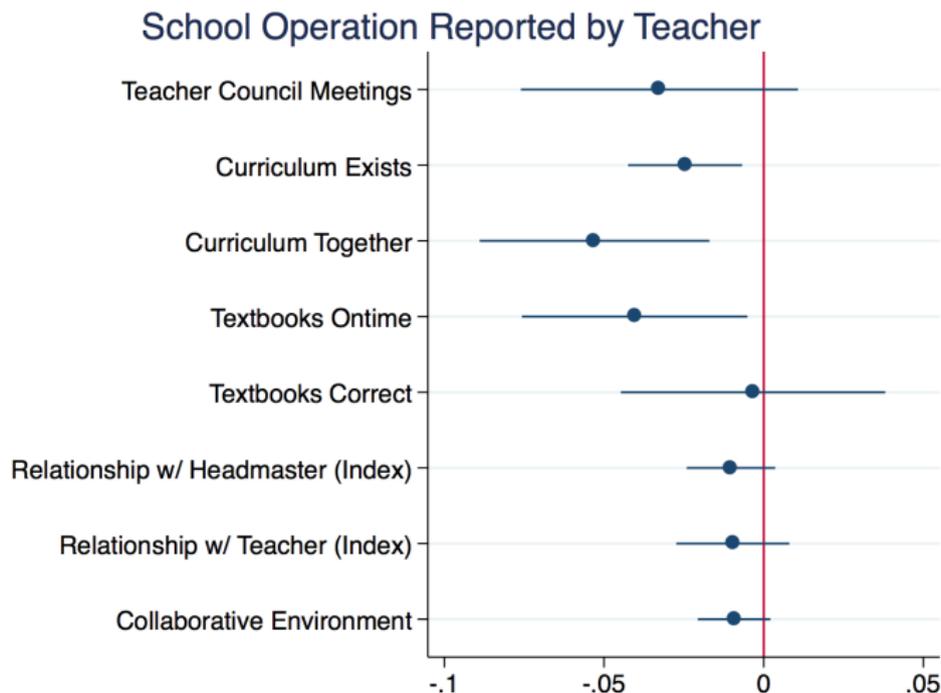
School Operation and Management

Party turnover increases negative reports by headmasters about the operation of their school.



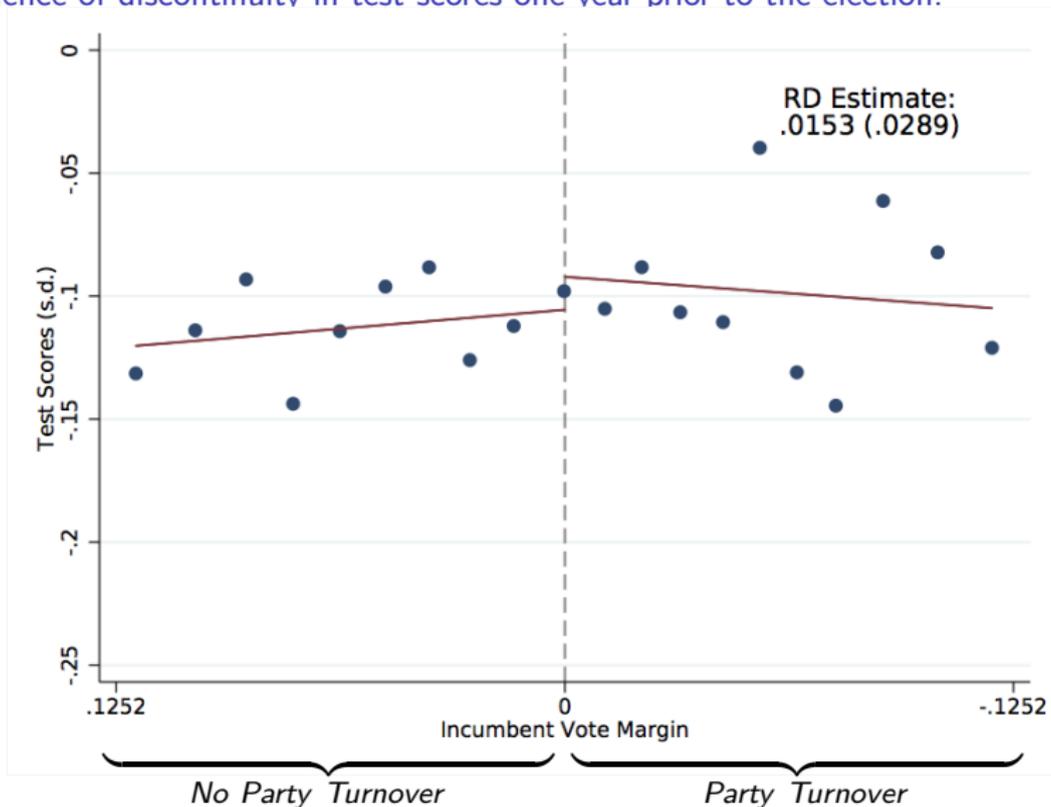
School Operation and Management

Party turnover increases negative reports by teachers about the operation and relationships within their school.



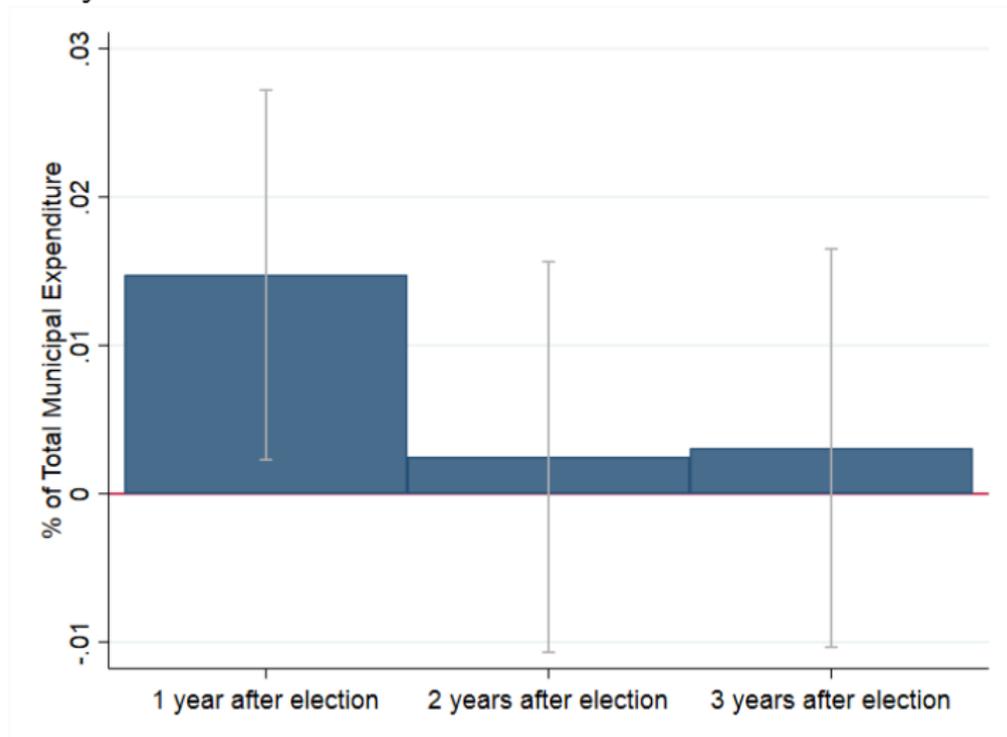
Balance of Covariates – Test Scores

No evidence of discontinuity in test scores one year prior to the election.



Education Expenditure (% of Total)

Party turnover does not decrease resources allocated to education.



▶ Total Expenditure

▶ Personnel Expenditure

▶ Back

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Political Turnover → School Personnel

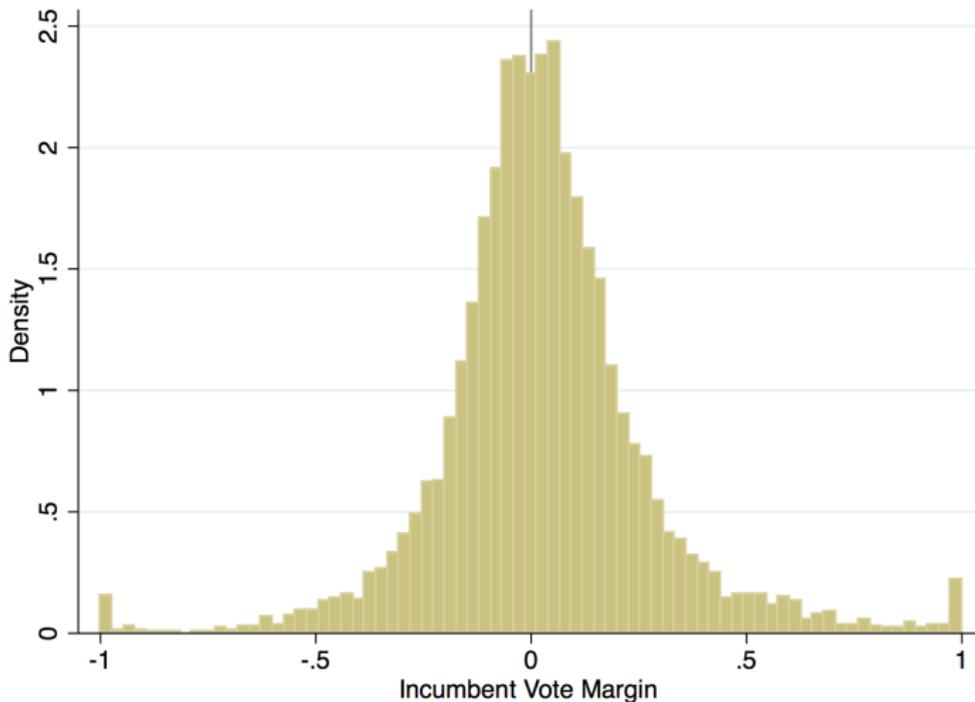
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But, does political turnover affect student achievement (**only**) through its disruption of the school personnel?

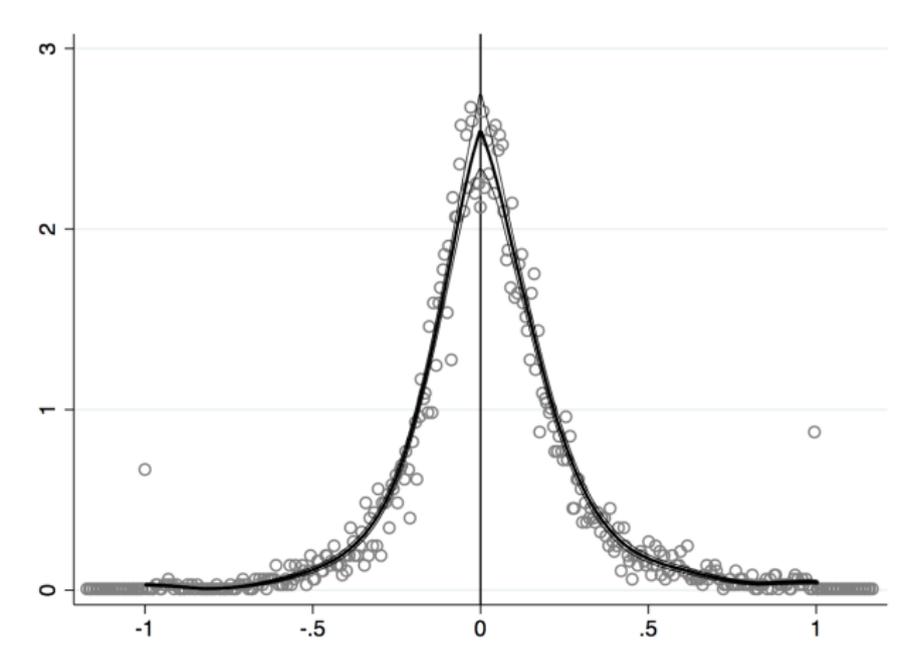
Sorting near the Threshold

The distribution of incumbent's vote margin seems smooth around the threshold.



Sorting near the Threshold

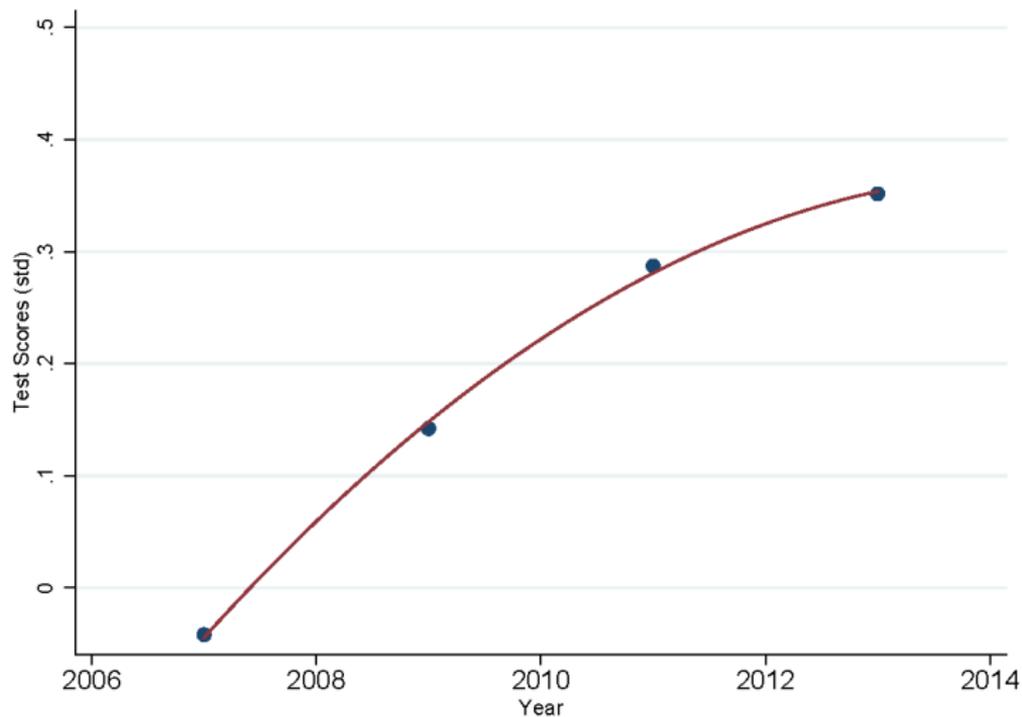
The McCrary Test fails to reject the null hypothesis of continuity at the threshold.



Discontinuity estimate (log difference in height) = -0.0019 , s.e. = $.0608$ [▶ Back](#)

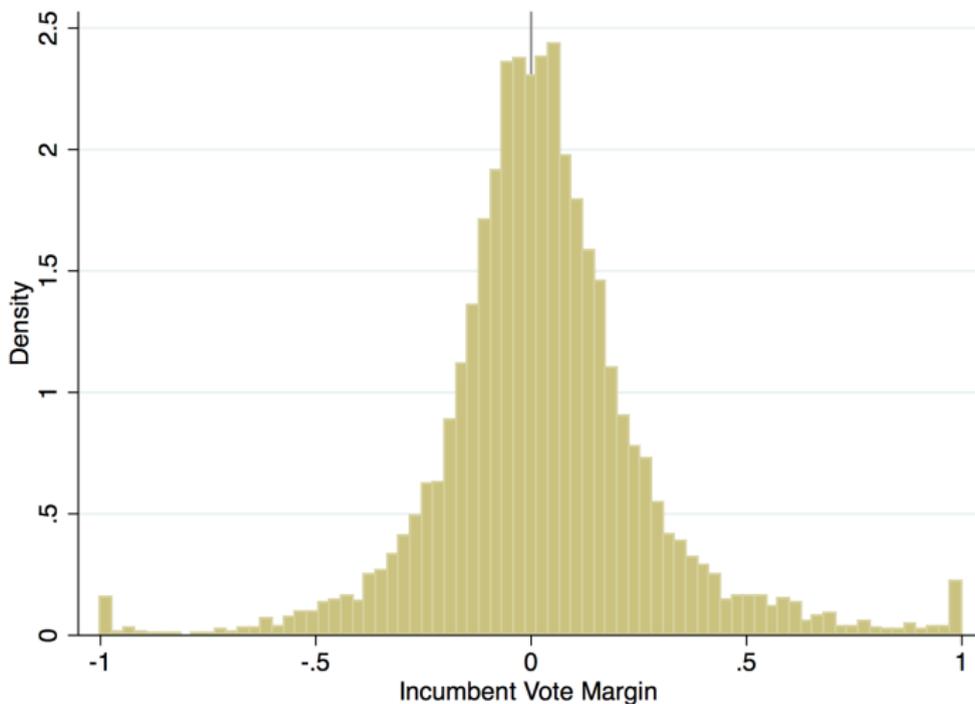
4th grade Test Scores Overtime ("control group" sample)

▶ Back



Sorting near the Threshold

The distribution of incumbent's vote margin seems smooth around the threshold.



Headmaster Replacement 2013 by Turnover in 2008

▶ Back

	(1)	(2)	(3)	(4)
	Outcome: Headmaster Turnover in 2012			
$\mathbf{1}\{IncumbVoteMargin < 0\}$	0.254***	0.246***	0.227***	0.215***
	(0.078)	(0.075)	(0.082)	(0.079)
Turnover in 2008	-0.001	-0.021	-0.025	-0.045
	(0.064)	(0.066)	(0.067)	(0.069)
$\mathbf{1}\{IncumbVoteMargin < 0\} \times$ Turnover in 2008	-0.055	-0.031	-0.043	-0.013
	(0.107)	(0.105)	(0.112)	(0.111)
N	3,768	3,768	3,419	3,419
R-squared	0.074	0.082	0.081	0.089
Controls	No	Yes	No	Yes
Clusters	842	842	766	766
Using Bandwidth	0.124	0.124	0.110	0.110
Optimal Bandwidth	0.124	0.124	0.124	0.124

New teachers 2013 by Turnover in 2008

▶ Back

	(1)	(2)	(3)	(4)
	Outcome: Number of New Teachers in 2012			
$\mathbf{1}\{IncumbVoteMargin < 0\}$	0.137***	0.136***	0.168***	0.167***
	(0.036)	(0.035)	(0.042)	(0.042)
Turnover in 2008	0.060	0.056	0.087	0.082
	(0.049)	(0.050)	(0.061)	(0.062)
$\mathbf{1}\{IncumbVoteMargin < 0\} \times$ Turnover in 2008	-0.032	-0.027	-0.085	-0.078
	(0.065)	(0.065)	(0.076)	(0.076)
Observations	11,875	11,875	8,538	8,538
R-squared	0.036	0.038	0.042	0.044
Controls	No	Yes	No	Yes
Clusters	924	924	695	695
Using Bandwidth	0.157	0.157	0.110	0.110
Optimal Bandwidth	0.157	0.157	0.157	0.157

New Teachers by municipality size

	(1)	(2)	(3)	(4)
	Outcome: Number of New Teachers			
$\mathbf{1}\{IncumbVoteMargin < 0\}$	0.121*** (0.025)	0.095*** (0.028)	0.080*** (0.018)	0.083*** (0.020)
$\mathbf{1}\{Population > Median\}$	0.032 (0.025)	0.020 (0.027)		
$\mathbf{1}\{IncumbVoteMargin < 0\} \times \mathbf{1}\{Population > Median\}$	-0.005 (0.034)	0.010 (0.037)		
$\mathbf{1}\{\text{Number of Schools} > Median\}$			-0.010 (0.020)	0.005 (0.023)
$\mathbf{1}\{IncumbVoteMargin < 0\} \times \mathbf{1}\{\text{Number of Schools} > Median\}$			0.045 (0.027)	0.025 (0.030)
Observations	46,626	39,611	46,626	39,611
R-squared	0.025	0.028	0.024	0.027
Controls	Yes	Yes	Yes	Yes
Clusters	2598	2303	2598	2303
Using Bandwidth	0.133	0.110	0.133	0.110
Optimal Bandwidth	0.133	0.133	0.133	0.133

Headmaster by municipality size

	(1)	(2)	(3)	(4)
	Outcome: Headmaster Turnover			
$\mathbf{1}\{IncumbVoteMargin < 0\}$	0.341*** (0.036)	0.321*** (0.042)	0.291*** (0.037)	0.254*** (0.043)
$\mathbf{1}\{Population > Median\}$	-0.061* (0.033)	-0.066* (0.040)		
$\mathbf{1}\{IncumbVoteMargin < 0\} \times \mathbf{1}\{Population > Median\}$	-0.073 (0.047)	-0.059 (0.056)		
$\mathbf{1}\{\text{Number of Schools} > Median\}$			-0.073** (0.034)	-0.098** (0.041)
$\mathbf{1}\{IncumbVoteMargin < 0\} \times \mathbf{1}\{\text{Number of Schools} > Median\}$			-0.013 (0.049)	0.026 (0.058)
Observations	15,011	11,196	15,011	11,196
R-squared	0.106	0.104	0.105	0.102
Controls	Yes	Yes	Yes	Yes
Clusters	2648	2139	2648	2139
Using Bandwidth	0.157	0.110	0.157	0.110
Optimal Bandwidth	0.157	0.157	0.157	0.157

Headmaster by School rank within municipality

	(1)	(2)	(3)	(4)
	Outcome: Headmaster Turnover			
$1\{IncumbVoteMargin < 0\}$	0.235***	0.238***	0.217***	0.220***
	(0.042)	(0.042)	(0.052)	(0.050)
$1\{School's\ Municipal\ Rank > Median\}$	0.020	0.026	0.006	0.014
	(0.028)	(0.028)	(0.032)	(0.032)
$1\{IncumbVoteMargin < 0\} \times$	0.029	0.029	0.045	0.044
$1\{School's\ Municipal\ Rank > Median\}$	(0.038)	(0.038)	(0.047)	(0.046)
Observations	10,291	10,291	7,623	7,623
R-squared	0.096	0.100	0.089	0.094
Controls	No	Yes	No	Yes
Clusters	2440	2440	1966	1966
Using Bandwidth	0.157	0.157	0.110	0.110
Optimal Bandwidth	0.157	0.157	0.157	0.157

New Teacher by School rank within municipality

	(1)	(2)	(3)	(4)
	Outcome: Number of New Teachers			
$\mathbf{1}\{IncumbVoteMargin < 0\}$	0.095*** (0.020)	0.096*** (0.020)	0.072*** (0.022)	0.073*** (0.022)
$\mathbf{1}\{\text{School's Municipal Rank} > Median\}$	-0.028** (0.011)	-0.028** (0.011)	-0.034*** (0.013)	-0.033** (0.013)
$\mathbf{1}\{IncumbVoteMargin < 0\} \times$ $\mathbf{1}\{\text{School's Municipal Rank} > Median\}$	0.002 (0.015)	0.003 (0.015)	0.012 (0.017)	0.013 (0.017)
Observations	10,825	10,825	9,135	9,135
R-squared	0.054	0.061	0.063	0.069
Controls	No	Yes	No	Yes
Clusters	2330	2330	2067	2067
Using Bandwidth	0.133	0.133	0.110	0.110
Optimal Bandwidth	0.133	0.133	0.133	0.133

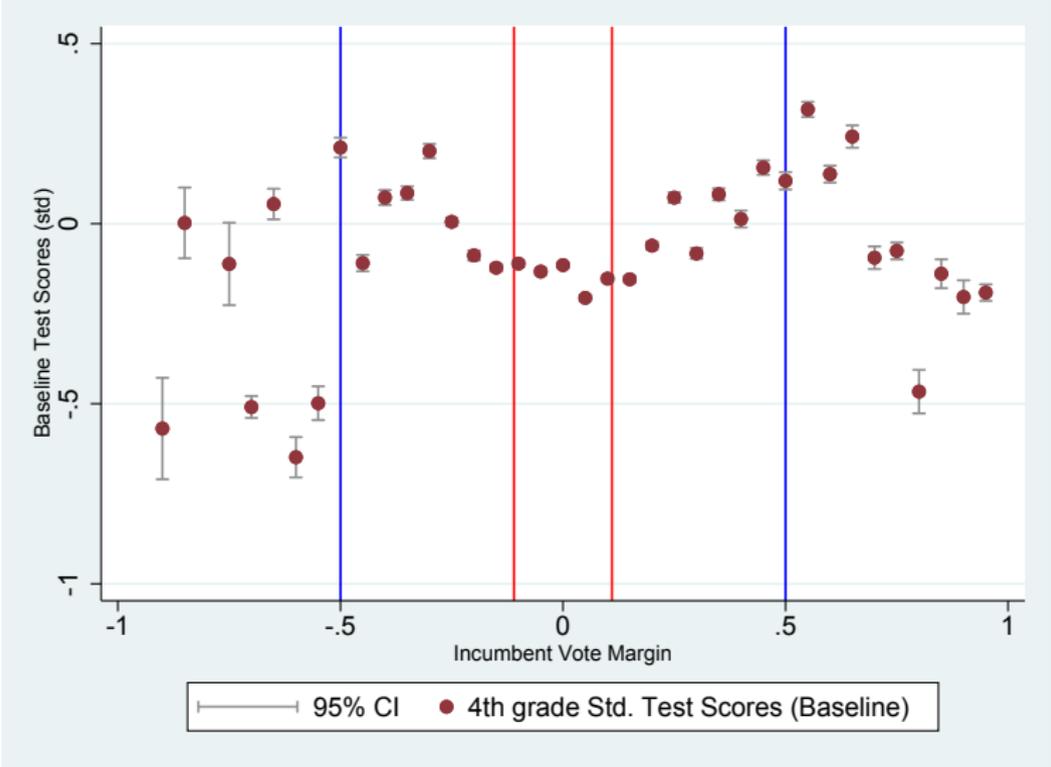
Test Score in 2013 by Political turnover in 2008

Adverse consequences of political turnover in 2012 is not attenuated by whether there was turnover in 2008 when, just like in close elections, the bureaucracy is likely less entrenched.

	(1)	(2)	(3)	(4)
	Outcome: Individual 4 th Grade Test Scores in 2013			
$\mathbf{1}\{IncumbVoteMargin < 0\}$	-0.047 (0.055)	-0.046 (0.054)	-0.043 (0.052)	-0.041 (0.051)
Turnover in 2008	-0.052 (0.049)	-0.033 (0.049)	-0.049 (0.048)	-0.029 (0.049)
$\mathbf{1}\{IncumbVoteMargin < 0\} \times$ Turnover in 2008	0.010 (0.077)	-0.008 (0.077)	0.003 (0.074)	-0.017 (0.074)
Observations	124,935	124,935	129,254	129,254
R-squared	0.243	0.245	0.241	0.243
Controls	No	Yes	No	Yes
Clusters	696	696	714	714
Using Bandwidth	0.106	0.106	0.110	0.110
Optimal Bandwidth	0.106	0.106	0.106	0.106

Baseline Test Scores

Close elections vs All elections with a incumbent running



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- However, we have little to say about:
 - ▶ Political discretion over the assignment in settings with alternative institutional arrangements (for example, with greater incentives to perform)
 - ▶ Political discretion over the assignment in the absence or irrespective of political turnover.