

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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- Findings:
 1. Political turnover reduces test scores by .05-.08 s.d. units.
 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 control over the bureaucracy has potential benefits and costs.

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- Benefits: (Evans, 1995; Gulzar and Pasquale, 2016; Raffler, 2016; Ferraz and Finan, 2011)
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 - ▶ Providing accountability (indirectly through politicians)
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- Costs: (Weber, 1922; Folke, Hirano, and Snyder, 2011; Colonnelli, Prem, and Teso, 2016; Rauch, 1995; Rasul and Roger, 2016)
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 - ▶ Short-horizoned incentive structures
 - ▶ Loss of autonomy

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→ First contribution:

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

Relevance (2/2)

Elections and the cost of political control over the bureaucracy.

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→Second contribution:

- In this setting, the net effect of political control over the bureaucracy is negative in terms of one welfare relevant measure: students' test scores.
 1. Setting where bureaucrats are not shielded from political process.
 2. Welfare relevant measure of public good which is tightly linked to the performance of the bureaucrat.

Outline

- Context
- Data and Empirical Strategy
- Results
- Mechanism
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Municipalities and Education in Brazil

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- ▶ Municipal school personnel:
 - ★ 1/3 of teachers are temporary, contract teachers. The remainder are tenured *but* can be transferred across schools.
 - ★ 60% of headmasters are politically appointed.

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 - ★ These are politically desirable positions. [▶ education bureaucracy](#)

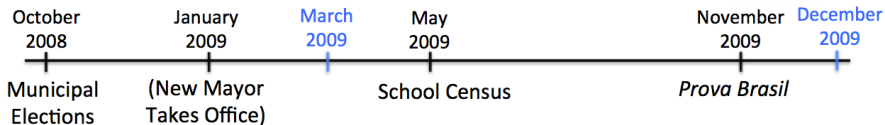
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Timeline

Timeline of Events and Relevant Data Sources

Academic Year



- Party Turnover

- Teachers
- Dropout Rates

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

▶ Data

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
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- 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 2,500 municipality-election cycle (33% of total # of municipalities)

Outline

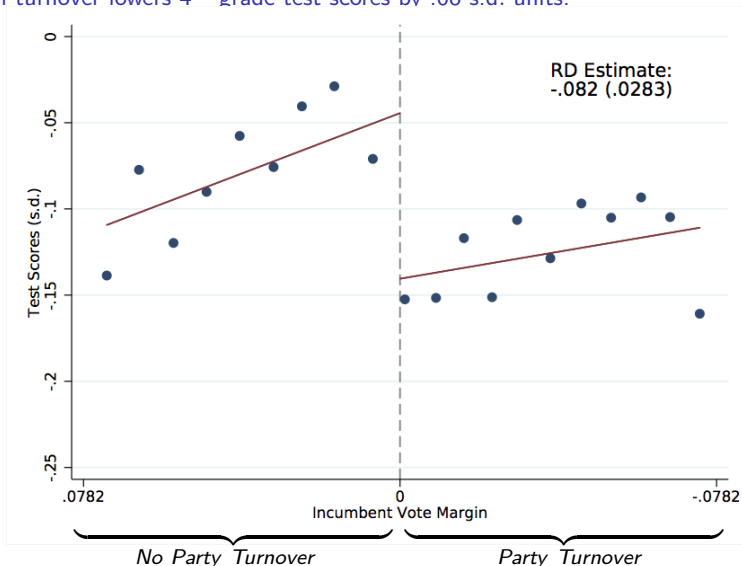
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- **Results**
 1. **Political turnover** → **Student achievement**
 2. Political turnover → School personnel
 3. Political discretion over assignment of school personnel → Student achievement
- Mechanism
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4th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

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



▶ External Validity

▶ Baseline Scores

4th Grade Test Scores

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	Outcome: Individual 4th Grade Test Scores (standardized)					
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbf{1}\{IncumbVoteMargin < 0\}$	-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.

Political Turnover → Student Achievement

Robustness

Party turnover reduces students' test scores by .05 – .08 s.d. units.

▶ 8th grade

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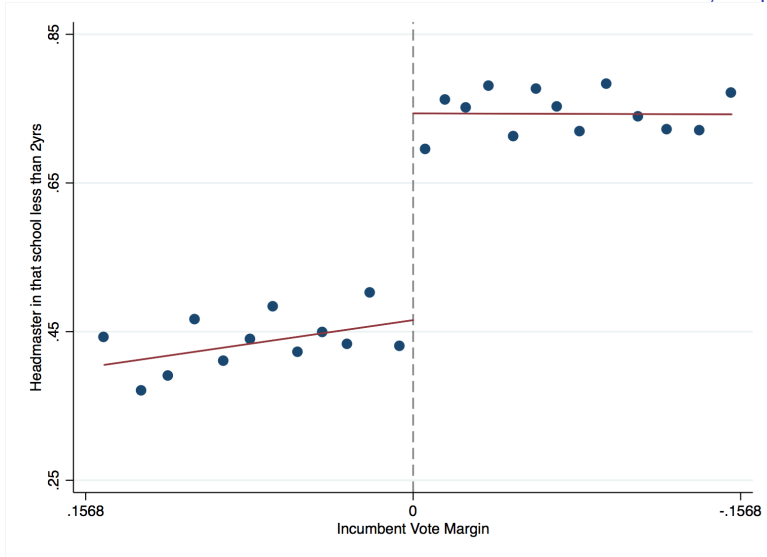
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3. “Political turnover has a cost in the short-term but not in the long-term:” The negative effect of party turnover on scores persists for at least 3-5 years in terms of the point estimate. [▶ Results](#)

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- Context
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- **Results**
 1. Political turnover \rightarrow Student achievement \downarrow
 2. **Political turnover** \rightarrow **School personnel**
 3. Political discretion over assignment of school personnel \rightarrow Student achievement
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Headmaster Replacements

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



▶ Event Study

▶ Table

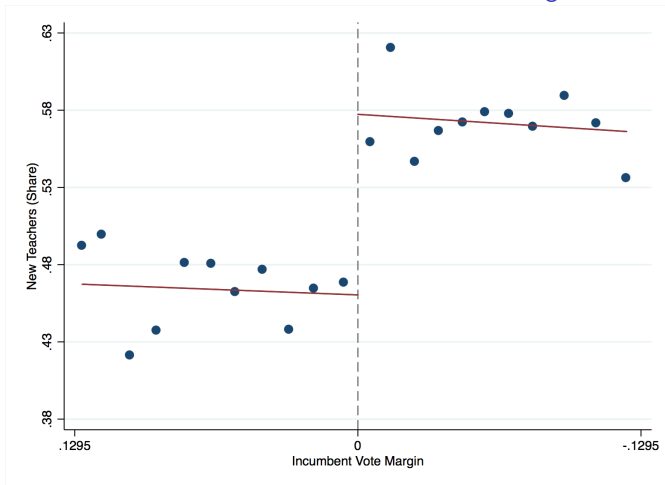
▶ Propagation

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Teacher Replacements: New Teachers

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



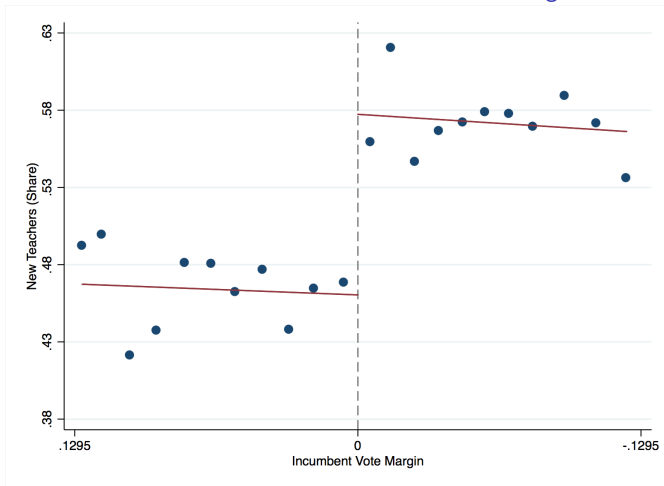
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- Evidence of political discretion over personnel assignments.

▶ Political assignments

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 1. Political turnover → Student achievement ↓
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 3. **Political discretion over assignment of school personnel** → **Student achievement**
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Political Turnover, School Personnel, and Student Achievement

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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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- State schools (20%);
- Federal schools (1%);
- Private schools (15%) – not in *Prova Brasil* data

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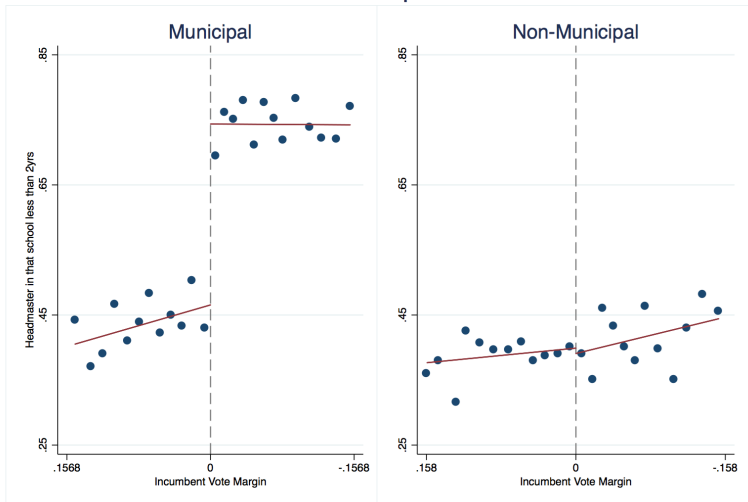
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When the new political party comes to power, what does it do to non-municipal schools?

Headmaster Replacements in Non-municipal Schools

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

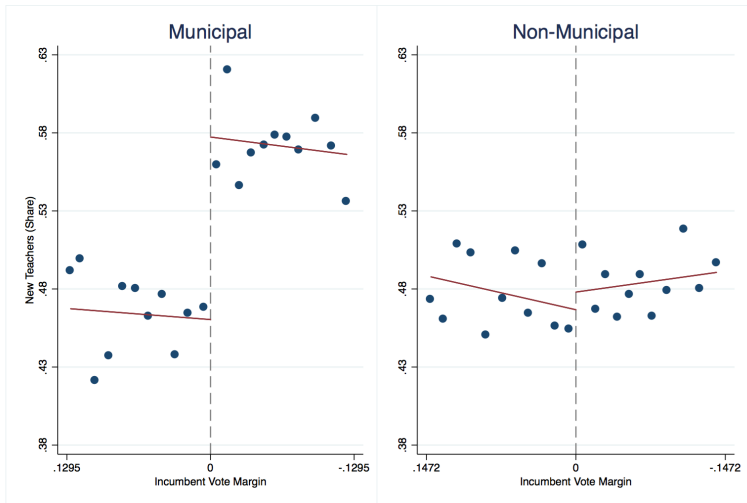
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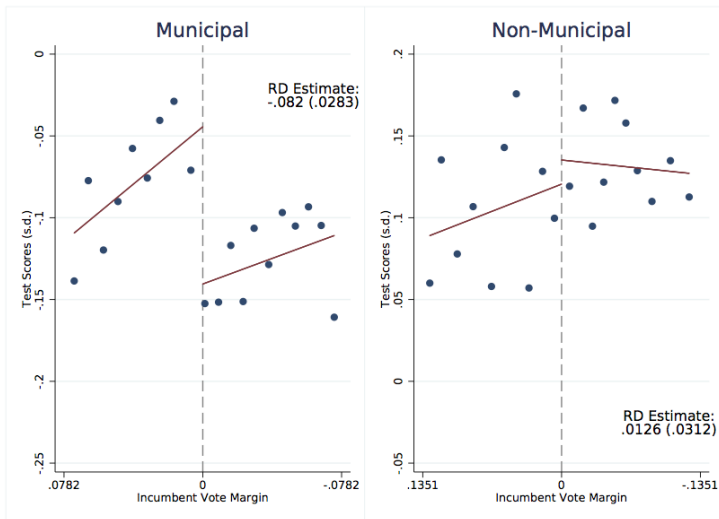
Municipal party turnover does not significantly affect share of new teachers in non-municipal schools.

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.

▶ Figure

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- Context
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- **Mechanism:**
 - ▶ Personnel replacements $\uparrow \rightarrow$ Student achievement \downarrow **How so?**
- Conclusion

Personnel Replacement & Student Achievement

How does greater personnel replacement translate to worse education outcomes for students?

1. School personnel attributes are reduced.

- ▶ Headmasters are less experienced and less educated. ▶ heasmaster's attributes
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2. But, what does it do to school operation and management?

School Operation and Management

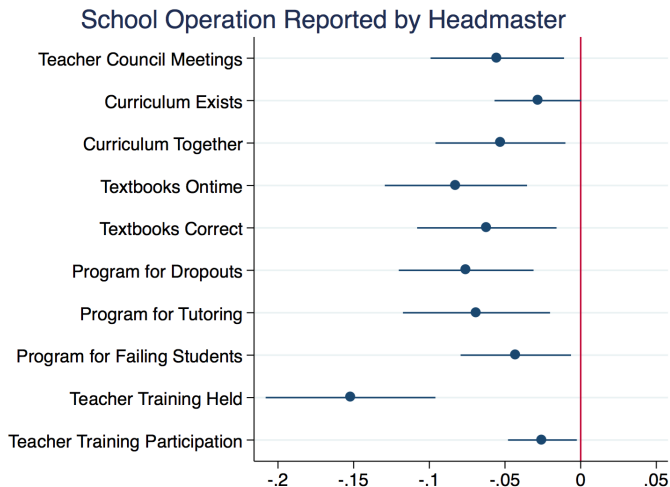
- Ronfeldt, Loeb, and Wyckoff (2013) associate high teacher turnover with lower test scores, possibly through changes in teacher quality but also:
 - ▶ Reduced school-specific human capital
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- When students take the *PB* exam, the headmaster (and the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

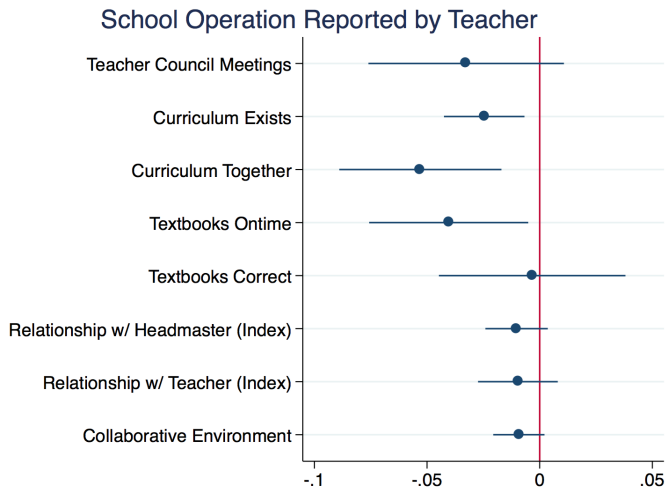
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Party turnover increases negative reports by headmasters about the operation of their school.



School Operation and Management

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



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Conclusion

- When the party of the mayor changes in Brazil:
 - ▶ Student achievement is reduced,
 - ▶ School personnel are replaced,
 - ▶ Evidence suggests that student achievement is reduced due to political discretion over the education bureaucracy and the resulting disruptions in the staff and operation of the school.

Thank you!

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 - ▶ Political turnover in a setting with greater political discretion over the bureaucracy.

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 - ▶ There is political discretion in education and students' test scores are a direct measure of service quality.
- Administration-level replacement of personnel might underestimate the extent of the problem. Reshuffling across service units within the administration can be as costly to society and more frequent. (Akhtari, Moreira and Trucco, 2017)
 - ▶ Personnel replacement at the school level (at service unit level)

Implications

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1. Consider *disruption* costs of political discretion over the bureaucracy when thinking about whether to have a responsive bureaucracy vs. an insulated bureaucracy
2. The design of political and democratic institutions
 - ▶ Democratic elections, even when competitive, disrupt the continuity in service delivery.

Future work (1/2)

How do policymakers exert political discretion in hiring?

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- What is the source and destination employment of all those who enter and leave the municipal government?
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We propose to address these questions by extending the analysis to use administrative, employer-employee matched data for all public-sector workers.

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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.

Thank you!

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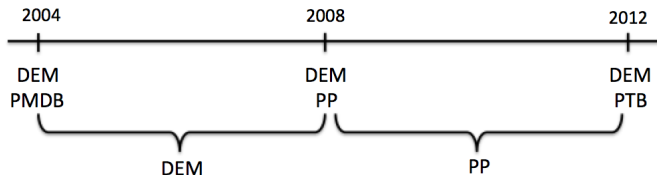
October 2013: “Mayors of 86 cities in Paraíba hire 20,000 without public contest”

[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?

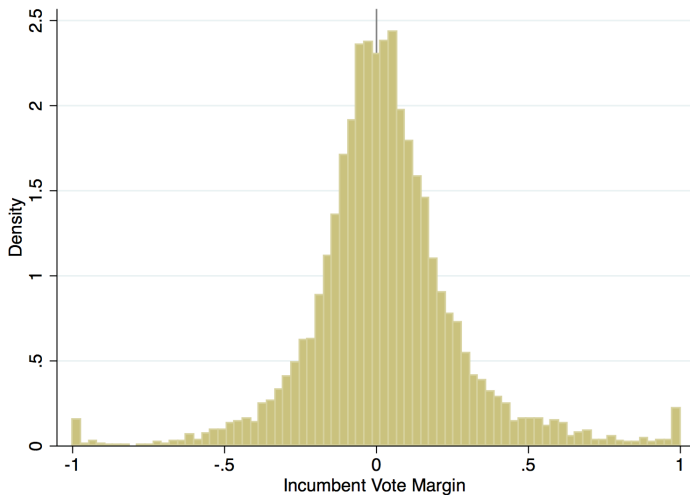
Coalition-identity is weak in Brazil. Coalitions change over time and, therefore, it is not clear how to define “coalition turnover.”

Coalition vs. Party Turnover



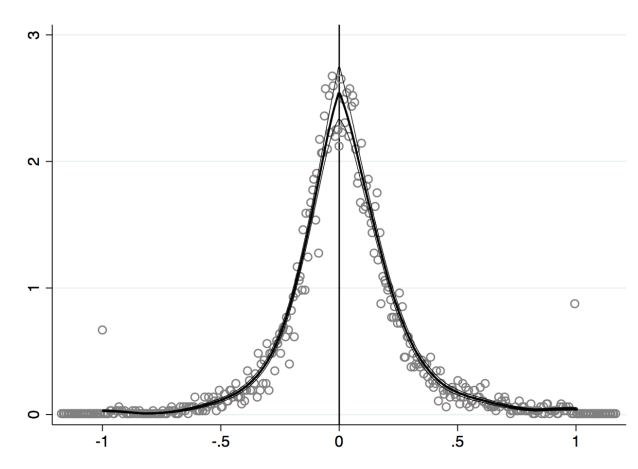
Sorting near the Threshold

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](#)

No Discontinuity in Covariates

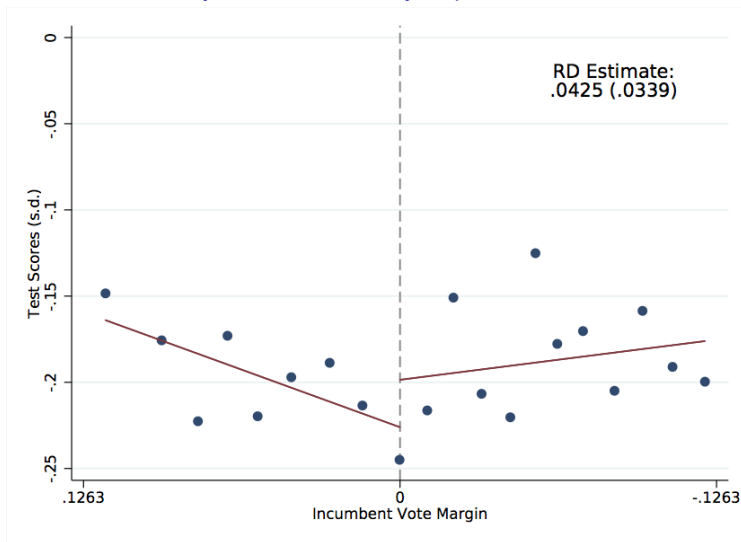
Table: Mean characteristic at baseline in control and treatment municipalities, pooling 2008 & 2012 elections (Bandwidth: ± 0.09)

	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.

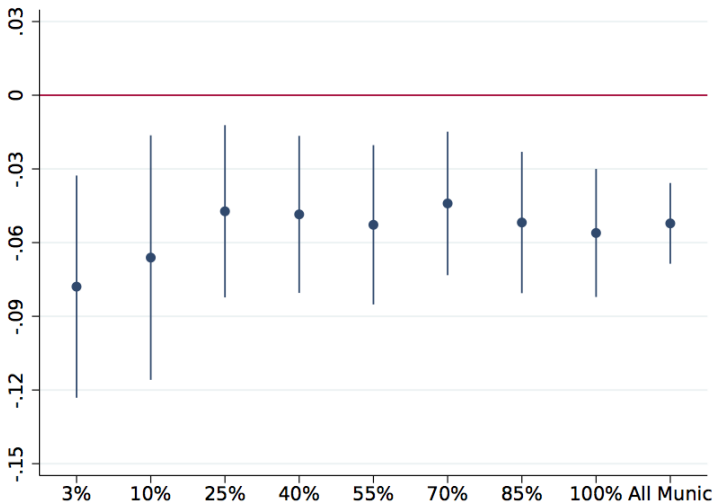
Balance of Covariates – Test Scores

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



All Elections – 4th Grade Test Scores

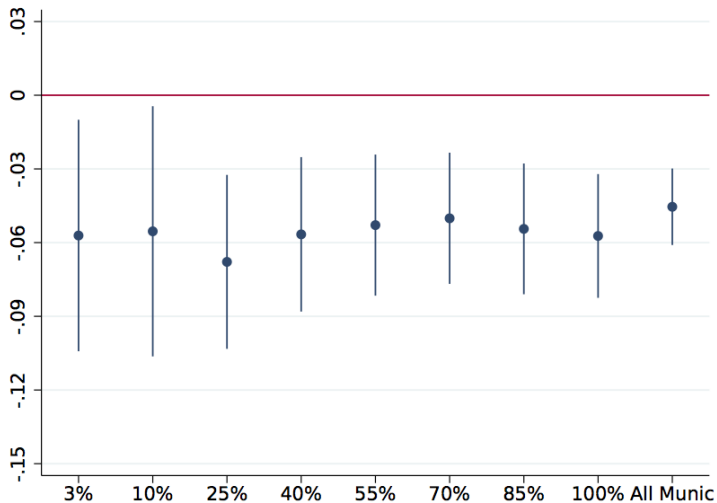
Including municipalities with supplementary elections & those that may potentially go to second round (population \geq 200,000)

	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.

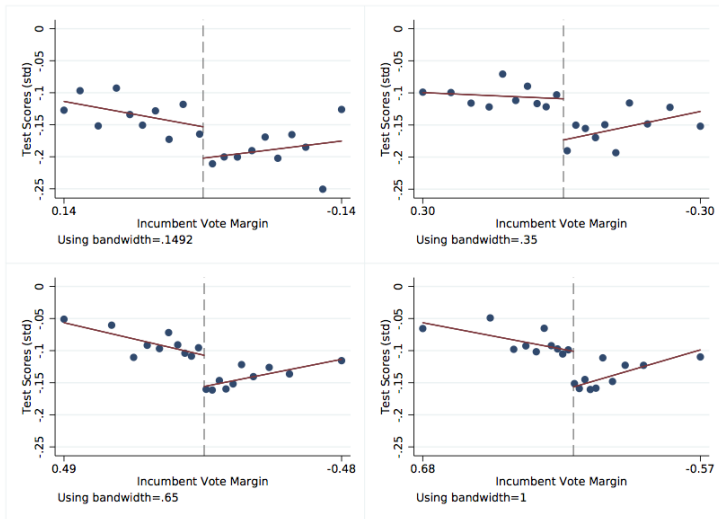
External Validity – 8th Grade Test Scores

Effect of party turnover across various incumbent vote margin bandwidths



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
$\mathbf{1}\{IncumbVoteMargin < 0\}$	-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)

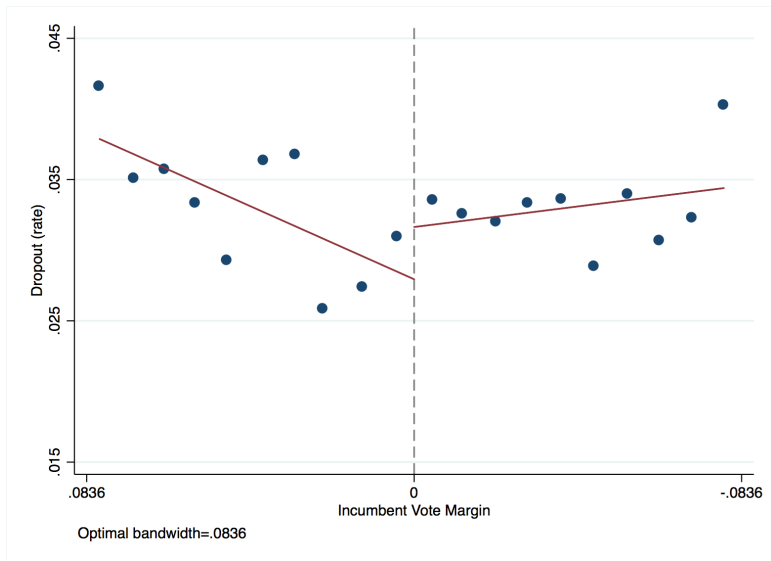
There is no statistically significant effect of political turnover on dropout rates.

	Outcome: School-level Dropout Rates					
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbf{1}\{IncumbVoteMargin < 0\}$	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

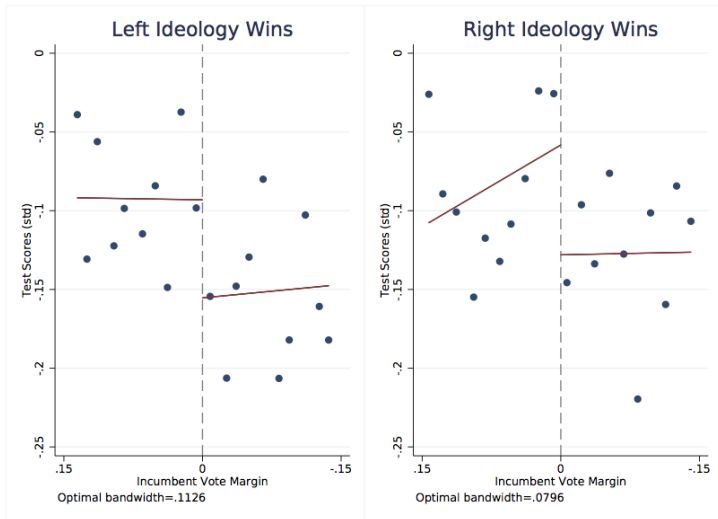
Heterogeneity wrt ideology of winning party

	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

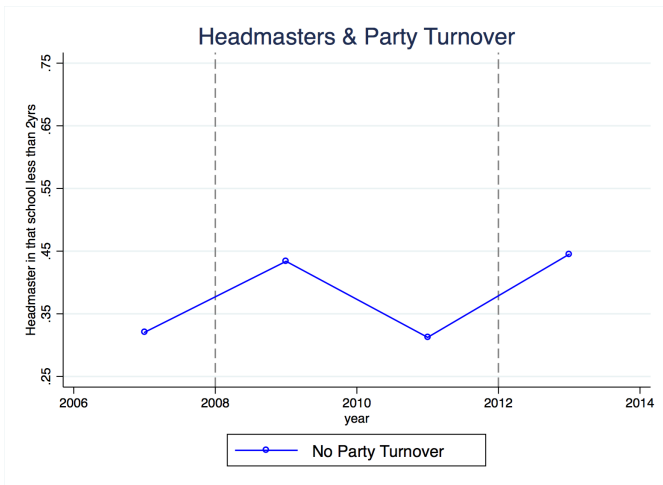
Event-study using all municipalities

- 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

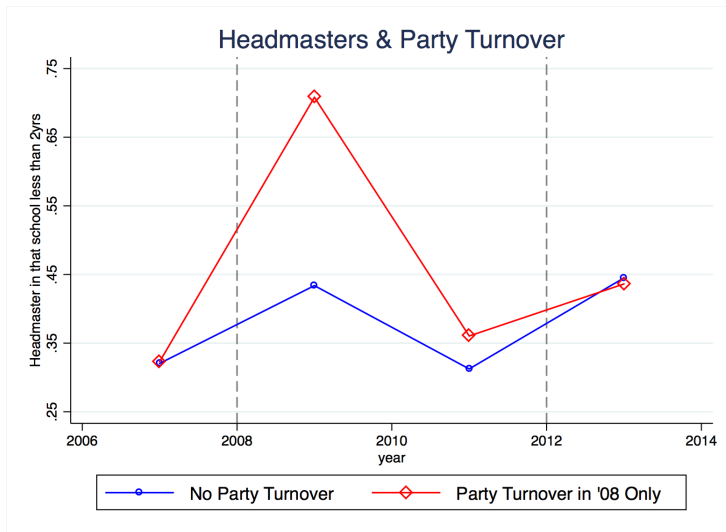
Event-study using all municipalities

- 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.



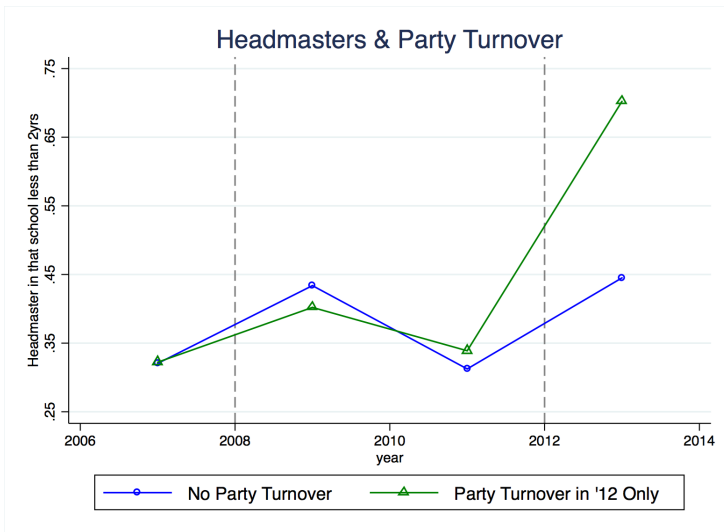
Headmaster Replacements

Event-study using all municipalities



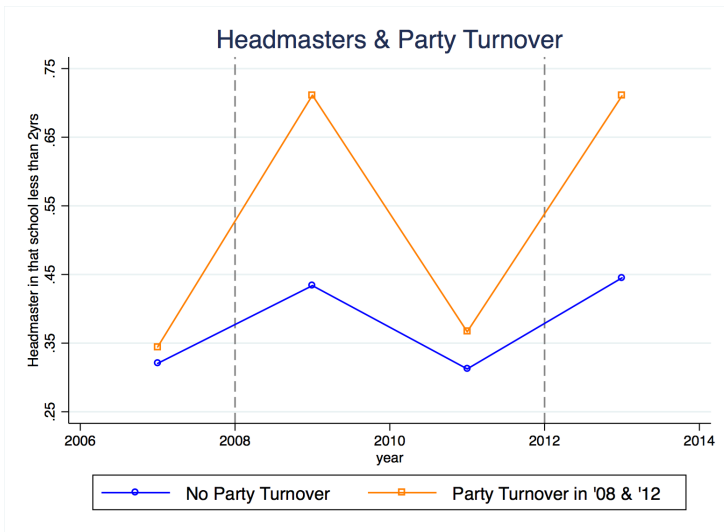
Headmaster Replacements

Event-study using all municipalities



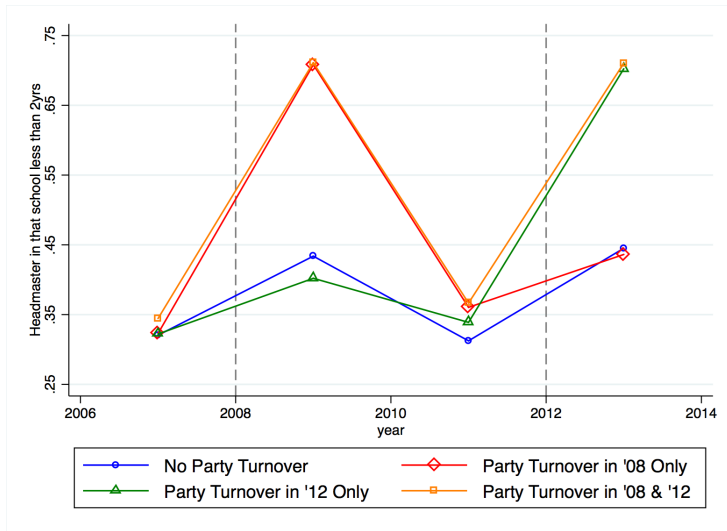
Headmaster Replacements

Event-study using all municipalities



Headmaster Replacements

Event-study using all municipalities



Headmaster Replacements

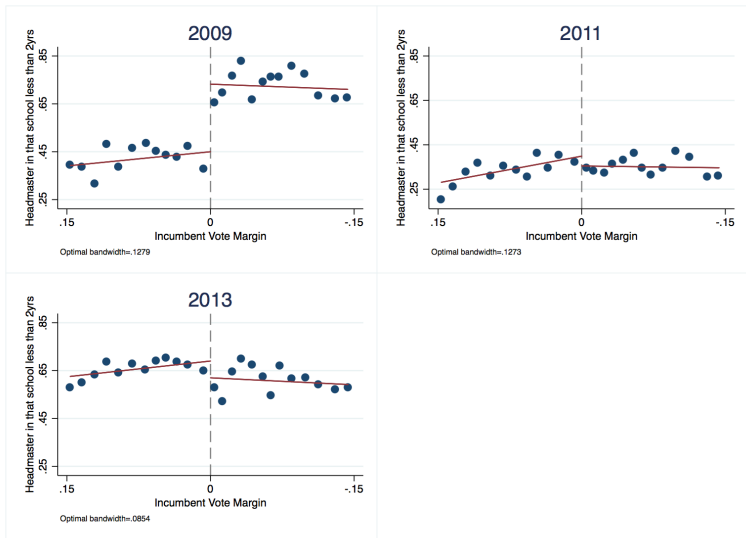
Party turnover increases share of headmasters that are new to their school by 28 pp.

	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

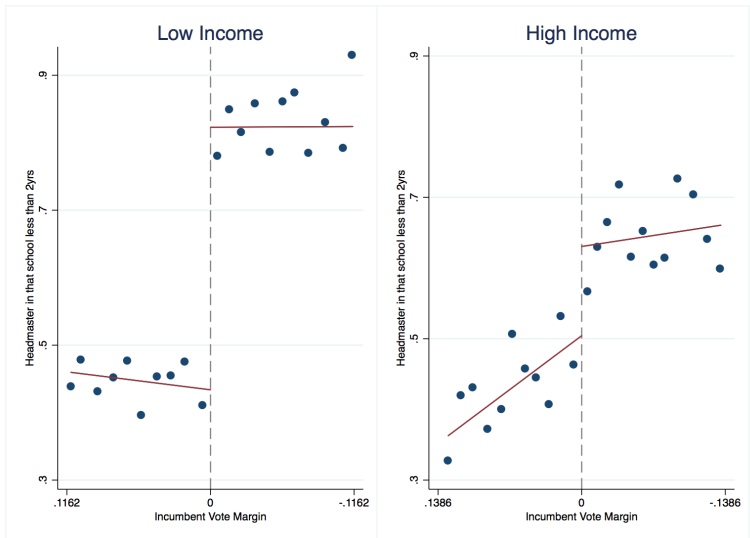
Does personnel replacement have less adverse consequences when the bureaucracy is entrenched?

- 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” or greater bureaucratic entrenchment)

	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

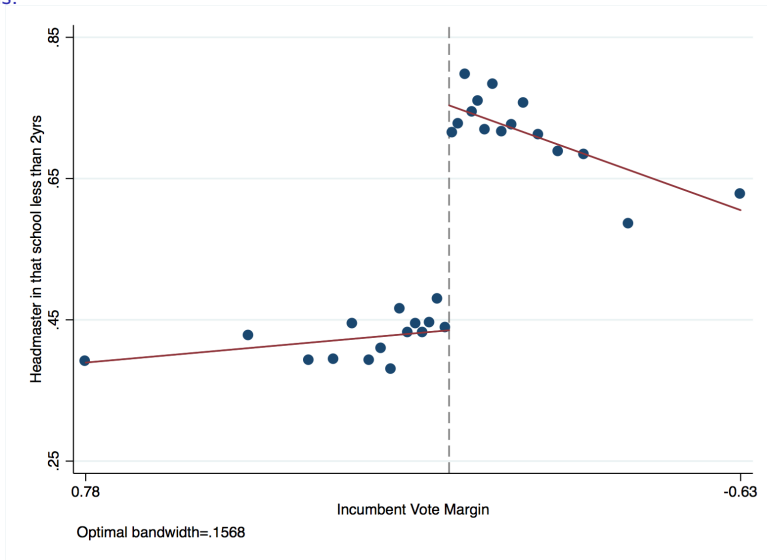
Baseline scores, i.e. school-level, average scores from 2007 or 2011, are included as controls in all specifications. Controls include school-level controls, individual-level controls, and an indicator variable for the 2012 election cycle. School controls are whether: the school is located in an urban 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.

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:

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

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.

Issues with Evidence for Politically Appointed Headmasters

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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.

Issues with Evidence for Politically Appointed Headmasters

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

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.

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

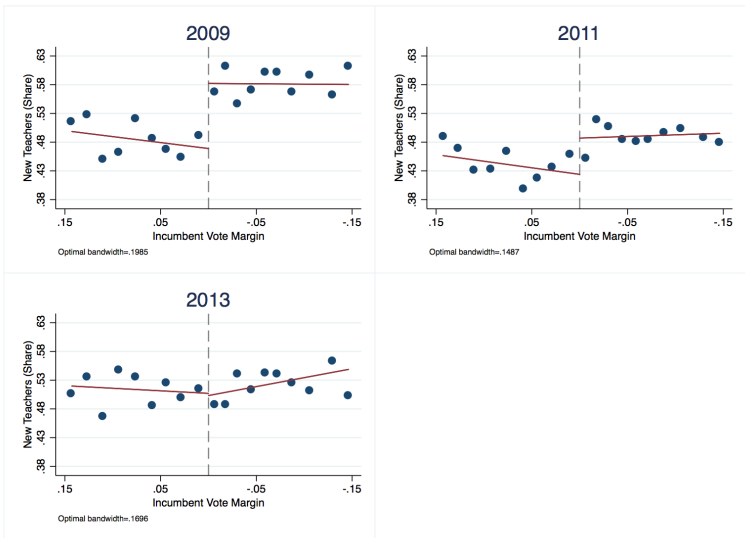
Party turnover increases share of teachers who are in a given school at time t but were not in that school at time $(t-2)$ by 11 pp.

	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.

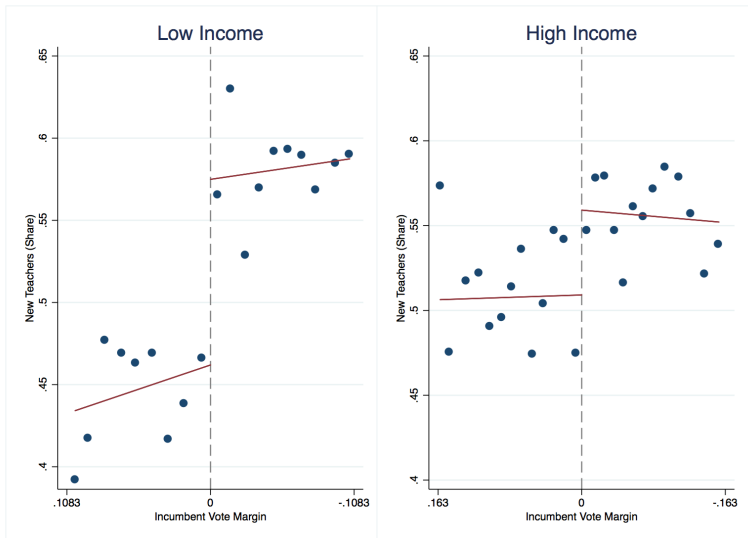
Teacher Changes Mostly Occur After the Election

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

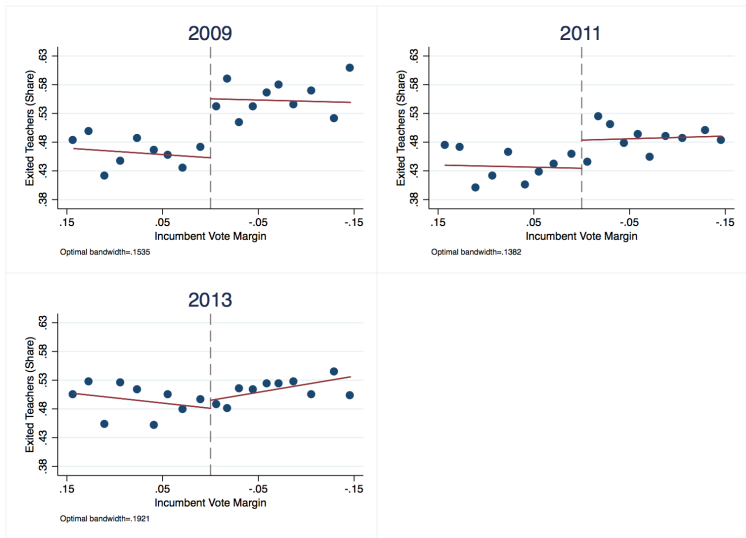
Party turnover increases share of teachers who were in a given school at time ($t-2$) but are no longer in that school at time t by 11 pp.

	Outcome: Share of Teachers that have Left the School					
	(1)	(2)	(3)	(4)	(5)	(6)
$1\{\text{IncumbVoteMargin} < 0\}$	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.

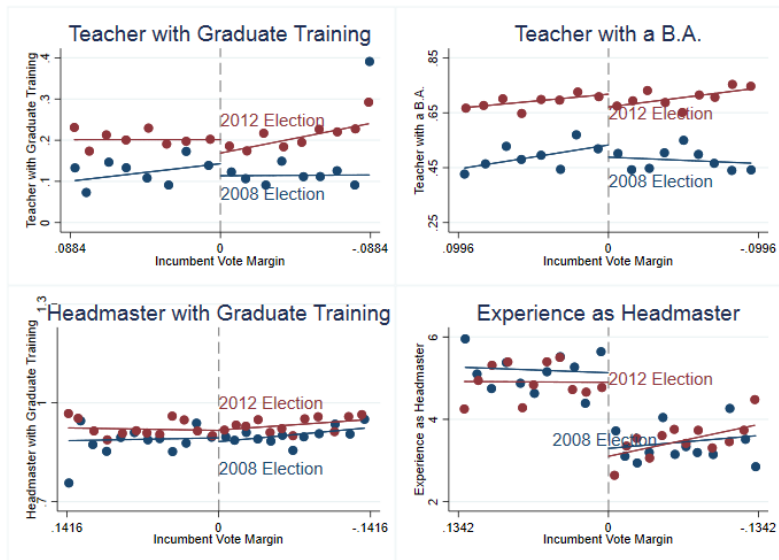
Teacher Changes Mostly Occur After the Election

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.

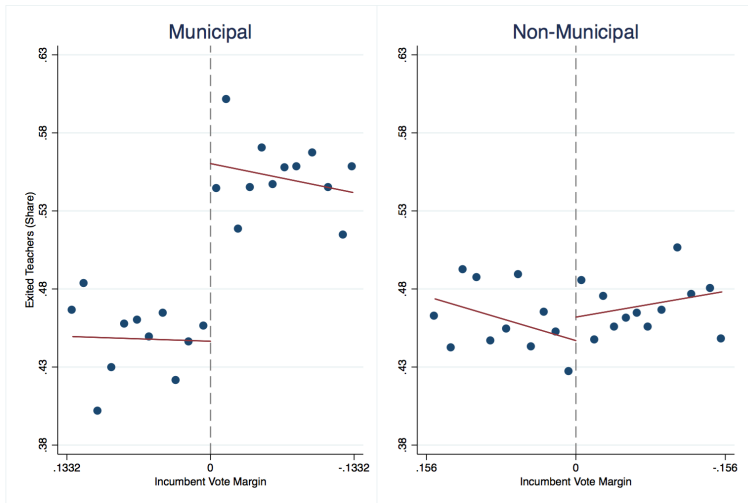
	Outcome:		Outcome:	
	Share of Teachers that are New	Share of Teachers that are New	Share of Teachers that have Left	Share of Teachers that have Left
	(1)	(2)	(3)	(4)
Party Turnover	0.011 (0.013)	0.015 (0.013)	0.015 (0.012)	0.015 (0.012)
N	13,819	13,819	14,427	14,427
R-squared	0.001	0.018	0.001	0.023
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

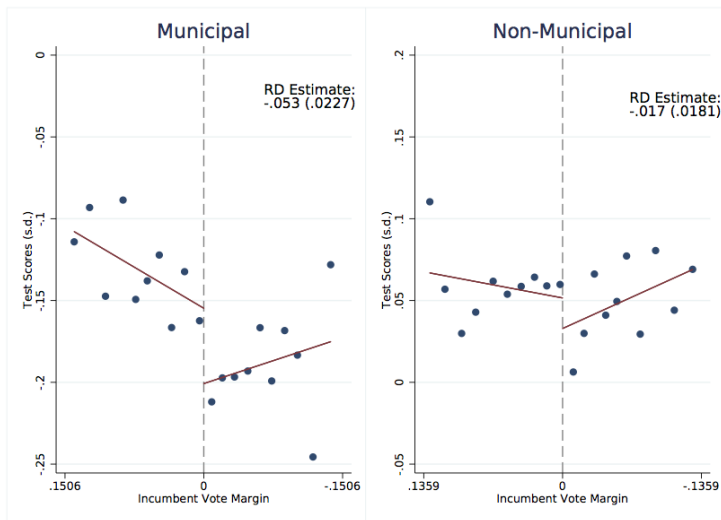
Municipal party turnover does not affect test scores in non-municipal schools.

	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)
$1\{IncumbVoteMargin < 0\}$	-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

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

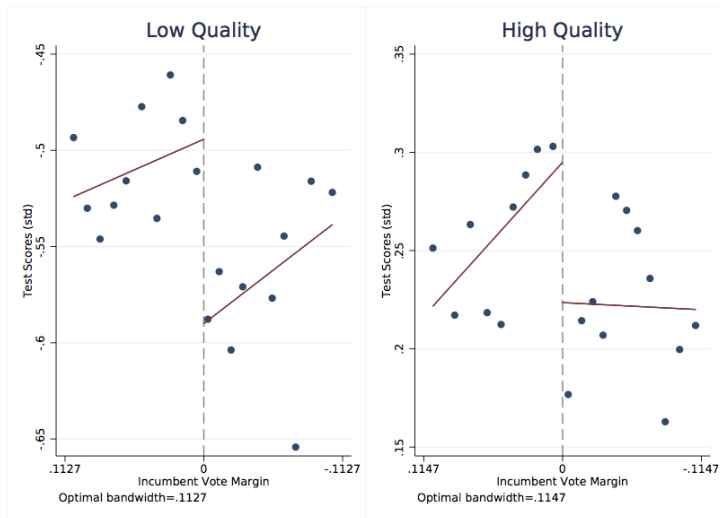
Divide schools into low quality and high quality schools (based on baseline test scores)

	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.

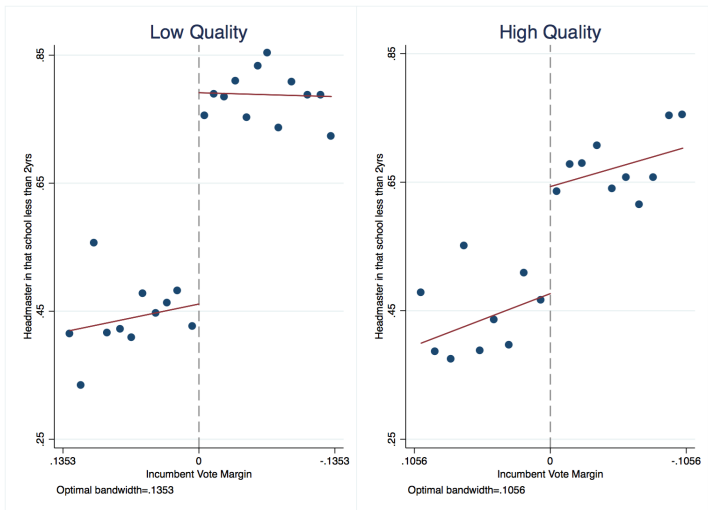
Heterogeneity by School Quality

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.

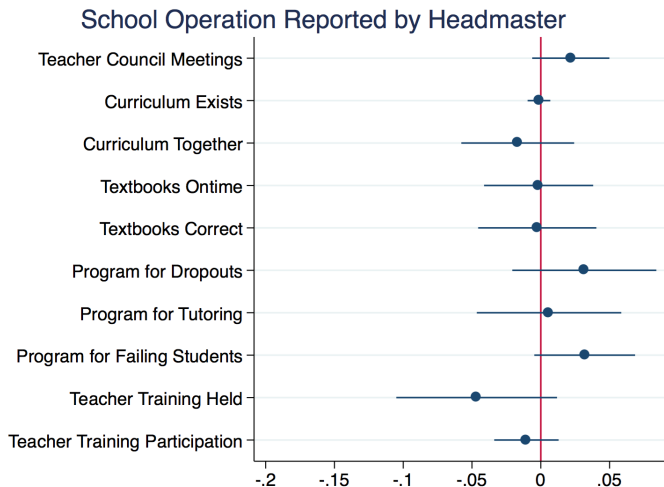
	(1) Teacher Council meetings	(2) Curriculum Exists	(3) Curriculum Together
$1\{IncumbVoteMargin < 0\}$	-0.042 (0.064)	-0.014** (0.007)	-0.037** (0.017)
N	23,409	23,409	23,409
Controls	Yes	Yes	Yes
Clusters	2087	2087	2087
Mean Dep Var	2.337	0.969	0.800
Using Bandwidth	0.110	0.110	0.110
Optimal Bandwidth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

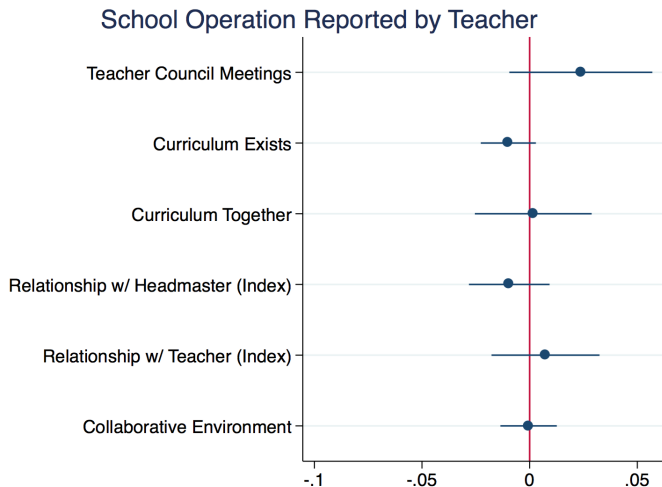
School Operation in Non-municipal Schools

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.

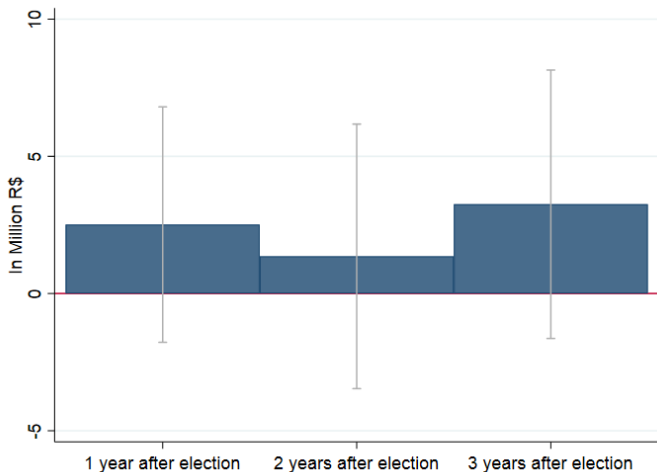


Teacher Turnover

- 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.



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

Brazilian Municipalities

- Approx. 5,500 municipalities
 - ▶ 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

- Schools in Brazil: private (15%), federal (<1%), state (20%), or **municipal** (65%) – The municipal government serves as the “school district.”
- Municipal school bureaucracy:
 - ▶ 33% of teachers are temporary, contract teachers; completely at the discretion of the municipal government. The remainder are tenured *but* can be transferred across schools.
 - ▶ 60% of headmasters are politically appointed.

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
munic. with incumb. party running	2,852	3,114
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.

Data

- Electoral information every 4 years starting in 2004: *Tribunal Superior Eleitoral*
 - ▶ Municipal elections
- All schools every 2 years starting in 2007: *Censo Escolar*
 - ▶ School-level controls, tracking the movement of teachers, dropout measures
- Schools with test score data every 2 years starting in 2007: *Prova Brasil*
 - ▶ National exam for students in grades 4 & 8 (Portuguese & Math), student-level characteristics, measure of headmaster changes
 - ▶ School must have at least 20 students enrolled in that particular grade to participate.
- Municipal characteristics: *Instituto Brasileiro de Geografia e Estatística*; Party ideology: *Atlas Político – Mapa do Congresso*

Contributions

1. Political discretion over the bureaucracy has potential benefits and costs.

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 - ▶ Highlighting a cost of political discretion due to *disruption*

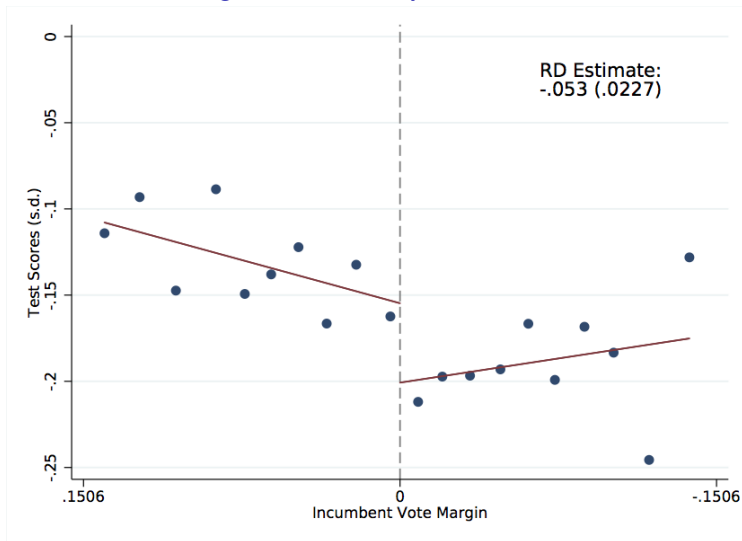
Contributions

1. Political discretion over the bureaucracy has potential benefits and costs.
 - ▶ In this setting, the net effect of political control over the bureaucracy is negative in terms of one welfare relevant measure: students' test scores.
 - ▶ Highlighting a cost of political discretion due to *disruption*
2. Production function of education
 - ▶ Headmaster and teacher turnover harm student achievement.

▶ Back

8th Grade Test Scores

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



▶ External Validity

▶ Back

8th Grade Test Scores

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

	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

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 & 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](#)

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](#)
- 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-cycle

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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-cycle

- 8 p.p. decrease in share of teachers with a B.A. is correlated with .017 s.d. unit reduction in 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
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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

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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

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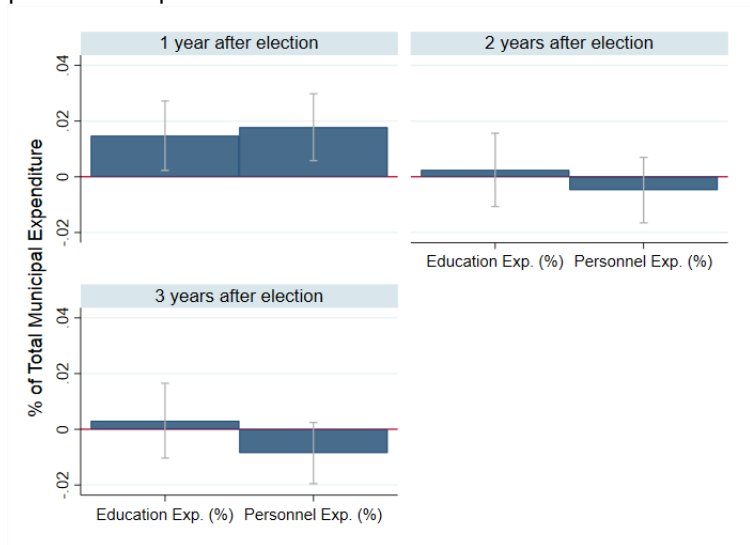
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- Does political turnover affect student achievement through its disruption of the school personnel?

Education and Personnel Expenditure (% of Total)

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



Data

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 - ▶ Two municipal electoral cycles: 2008 and 2012 [Supreme Electoral Court - Tribunal Superior Eleitoral]

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- Municipal characteristics:
 - ▶ 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

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.

For municipalities with close elections, party turnover is essentially as good as randomly assigned.

1. No evidence that incumbent parties can manipulate the vote margin.

▶ Dist of X

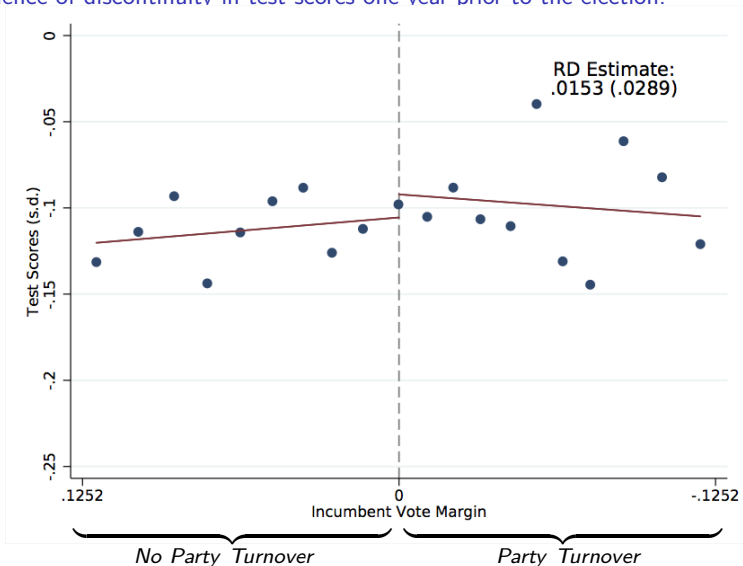
▶ McCrary

1.1 No evidence of discontinuity in covariates at the cutoff.

▶ Table

Balance of Covariates – Test Scores

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



School Operation and Management

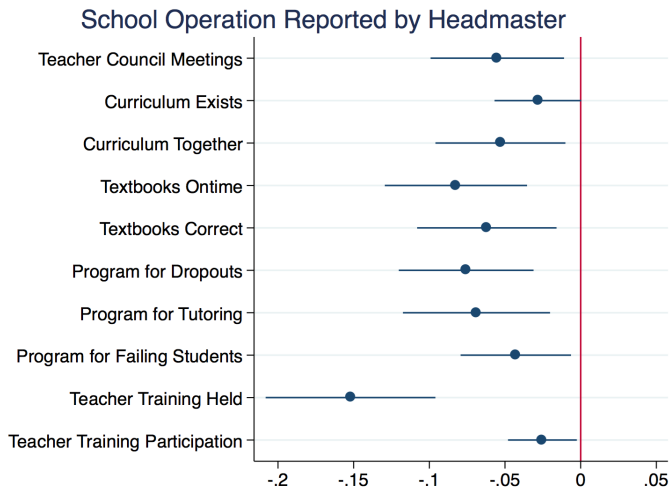
- Ronfeldt, Loeb, and Wyckoff (2013) associate high teacher turnover with lower test scores, possibly through changes in teacher quality but also:
 - ▶ Reduced school-specific human capital
 - ▶ Disrupted school programs
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 - ▶ Reduced school-specific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

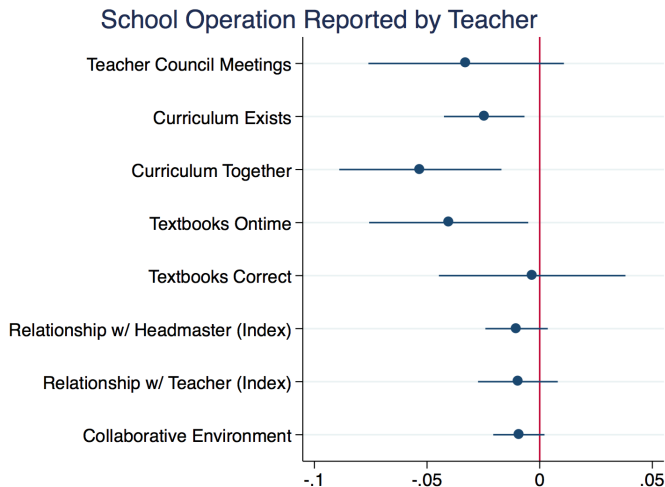
School Operation and Management

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.



The Brazilian Education Bureaucracy

Why do politician care about the identity of the headmaster and teachers?

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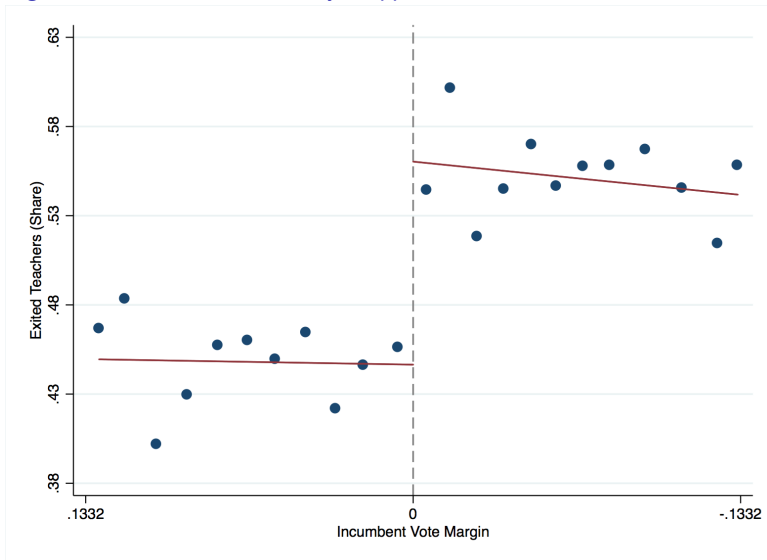
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December 2014: “The Rio Secretary of Education resigns”

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?

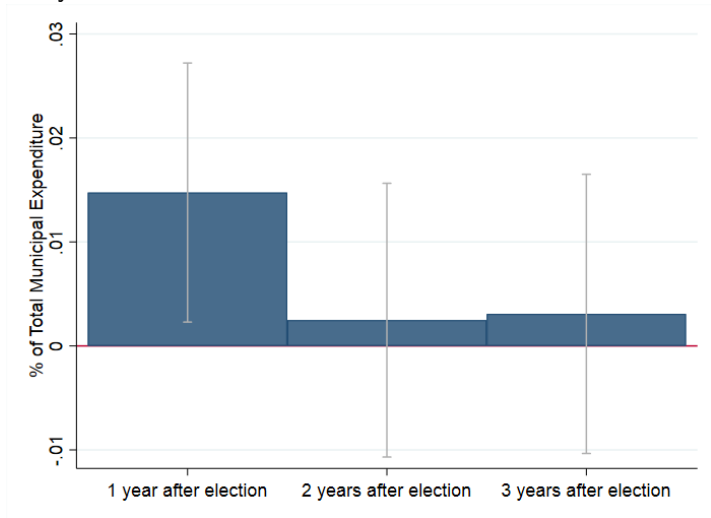
Teacher Replacements: Teachers who Left

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.



Education Expenditure (% of Total)

Party turnover does not decrease resources allocated to education.



▶ Total Expenditure

▶ Personnel Expenditure

▶ School Level Resources

▶ Back

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

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

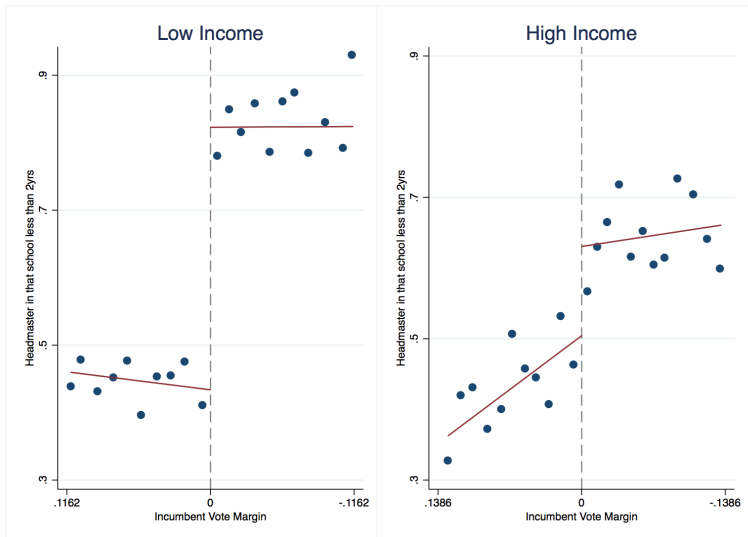
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 - ▶ When disrupting education is less (electorally) costly, do politicians replace school personnel even more?

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.

