Exposing Corrupt Politicians

The Effects of Brazil's Publicly Released Audits on Electoral Outcomes

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Presented by: Sai Zhang

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Outline

Introduction

Theoretical Inspiration

How to hold politicians accountable?

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- Interpreting: Beliefs and biases matter (Rabin, 1998)

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   - **Which** municipalities get audited
   - **When** the municipalities get audited

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   - dissemination of information

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2. Beliefs: The **incumbent**'s revealed corruption level serves as a shock
3. Information:
   - measure of corruption: **objectively** constructed from audit reports
   - dissemination of information: the presence of **local media** (radio, in particular)

Preview of Results

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   - Among municipalities where 2 corrupt violations were reported, the audit policy treatment reduced the incumbent's reelection likelihood by **7 percentage points (17%)**

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   - It also rewards: Among municipalities **with 1 radio station** where **0** corrupt violations were reported, the audit policy treatment **increased** the incumbent's reelection likelihood by **17 percentage points**

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   - Previously, only charges/accusations were used
     Peters and Welch (1980) for US House, Chang and Golden (2004) for Italy
   - Objective measures of corruption became more prevalent
     Golden and Picci (2005) for Italy

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2. Empirical support for the **value of information**
   - on political selection (T. Besley, 2005; T. J. Besley et al., 2005)
   - complementing previous studies on government responsiveness (T. Besley and Burgess, 2002; Di Tella and Schargrodsky, 2003; Reinikka and Svensson, 2005; Yang, 2008)

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4. **Evaluation** of anti-corruption programs

   parallel to the RCT setting of Olken (2007)

Data

Treatment: The Anti-corruption Program in Brazil

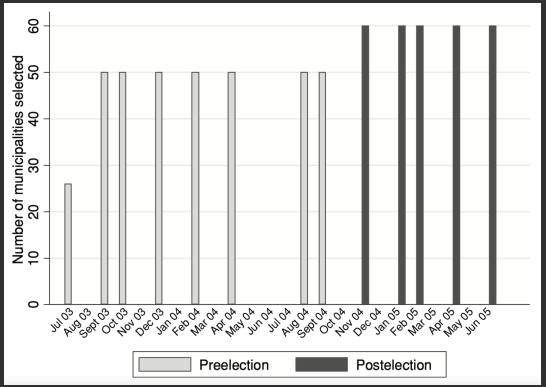

Figure 1: Program Timeline

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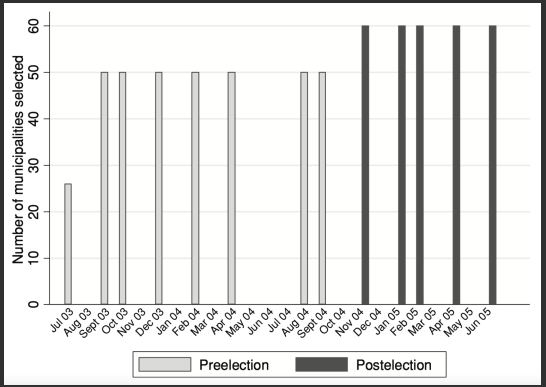

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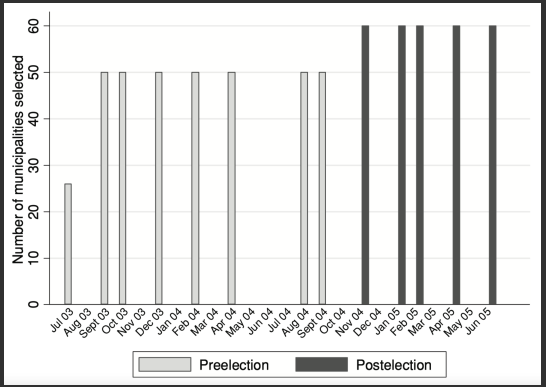

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- 92% of all municipalities
- 73% of total population

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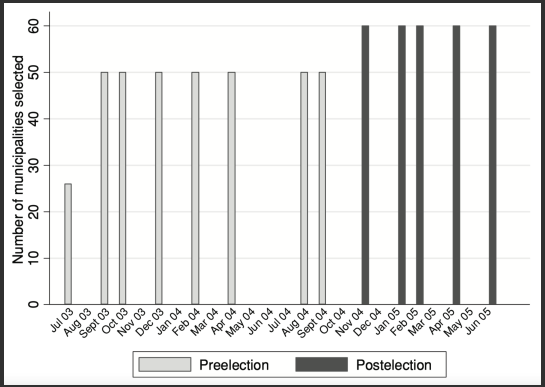

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- excluding most state capitals/coastal cities

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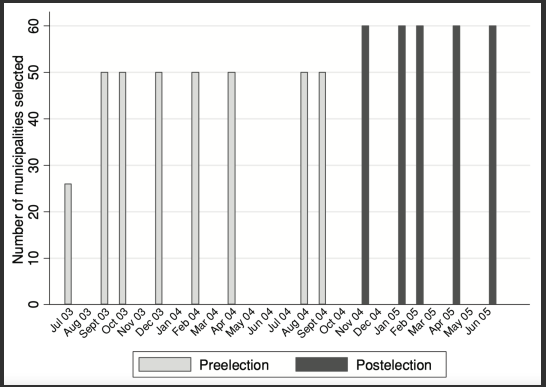

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$26 + 7 \times 50 + 5 \times 60 = 676$ selections were made
7 duplicated selections
669 municipalities were randomly selected

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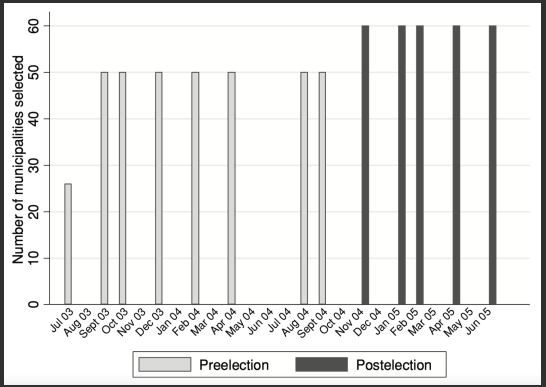

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- 10 days of auditing

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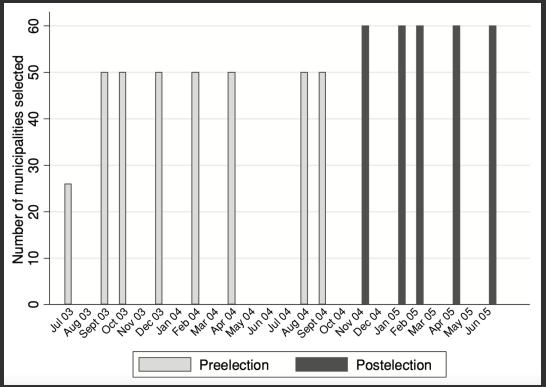

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- **validity**: hired competitively; well trained and paid; supervised

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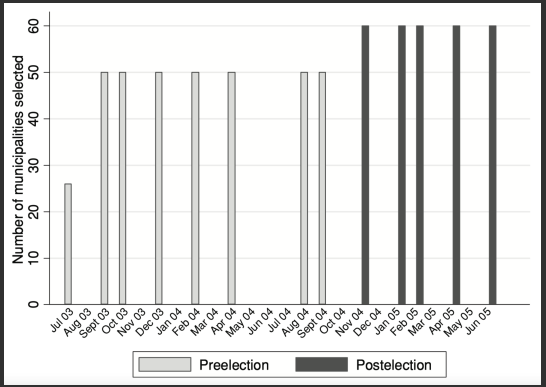

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- **summary**: media and the Internet

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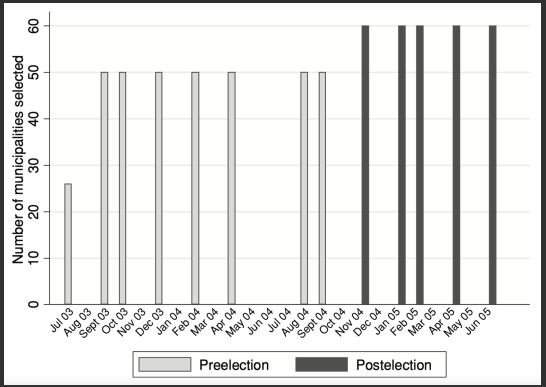

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- What form of media? **radio**

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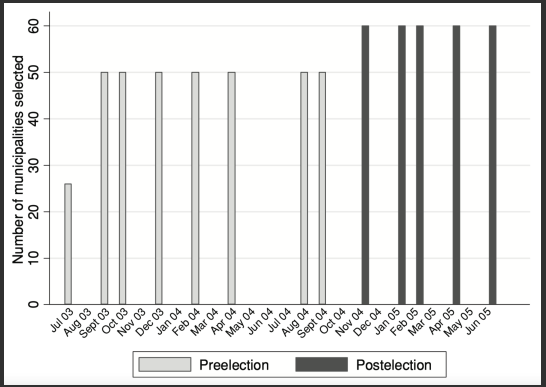

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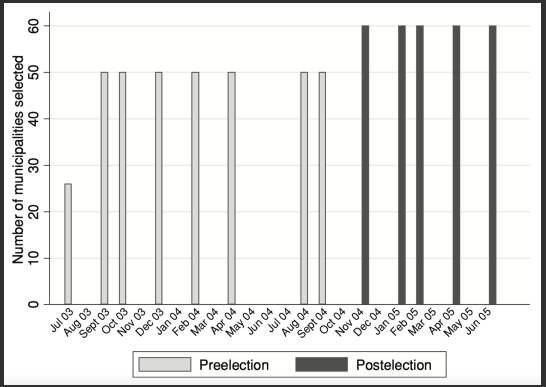

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Is the information really used by voters?

Yes, allegedly.

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- **Justification 1**: most common
- **Justification 2**: often complementary

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- **Justification 1**: most common
- **Justification 2**: often complementary
- My interpretation: Layer 1 measure of corruption magnitude, could be more detailed, quantitatively

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Outcome: Reelection results

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Empirical Strategy

Randomization Test

168 audited after election $v.s.$ 205 audited before election

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Randomization Test: Political Characteristics

$\underbrace{168}_{C}$ audited after election $v.s.$ $\underbrace{205}_{T}$ audited before election

	Control	Treatment	Difference	Std.Error
Reelection rates: 2004 elections	0.413	0.395	0.018	0.045
Reelection rates: 2000 elections	0.423	0.443	-0.020	0.040
2004 reelection rates, conditional on running	0.585	0.559	0.026	0.044
Ran for reelection in 2004	0.707	0.707	-0.001	0.060
Mayor's vote share in 2000	0.529	0.525	0.004	0.013

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In 2000, every mayor was eligible to run for a second term, since only after 1997 it was allowed to run as an incumbent.

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Balanced rate of re-running and incumbent advantage

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Initial popularity of reelection seeking mayors is balanced too

Randomization Test: Mayor and Municipal Characteristics

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	Control	Treatment	Difference	Std.Error
Panel A: Mayor characteristics				
Member of PMDB	0.254	0.172	0.082	0.047
Panel B: Municipal characteristics				
Number of newspapers	3.58	2.21	1.37	0.79
Share of HHs that own a radio	0.423	0.443	-0.020	0.040
Municipalities with a radio station	0.585	0.559	0.026	0.044
Number of radio stations (condtional on having one)	0.707	0.707	-0.001	0.060

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Radio presence is well-balanced.

Randomization Test: Constructed Corruption Measure

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	Control	Treatment	Difference	Std.Error
Number of corrupt violations	1.952	1.584	0.369	0.357
Total resources audited (R$)	5,770,189	5,270,001	500,188	1,361,431

Randomization Test: Constructed Corruption Measure

$\underbrace{168}_{C}$ audited after election $v.s.$ $\underbrace{205}_{T}$ audited before election

	Control	Treatment	Difference	Std.Error
Number of corrupt violations	1.952	1.584	0.369	0.357
Total resources audited (R$)	5,770,189	5,270,001	500,188	1,361,431

The constructed measure is balanced, so is the *intensity* of auditing.

Randomization Test: Constructed Corruption Measure

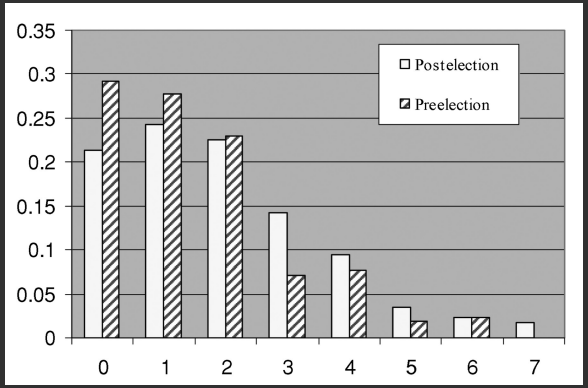

Figure 2: Distribution of Corrupt Violations

Estimation I: Exogenous Treatment

$$E_{ms} = \alpha + \beta A_{ms} + X_{ms}\gamma + \nu_s + \epsilon_{ms}$$

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$$E_{ms} = \alpha + \beta A_{ms} + X_{ms}\gamma + \nu_s + \epsilon_{ms}$$

where:

- E_{ms}: reelection performance of an eligible incumbent mayor in **municipality** m, **state** s

Estimation I: Exogenous Treatment

$$E_{ms} = \alpha + \beta A_{ms} + X_{ms}\gamma + \nu_s + \epsilon_{ms}$$

where:

- E_{ms}: reelection performance of an eligible incumbent mayor in **municipality** m, **state** s
  - Discrete: whether winning the reelection or not
  - Continuous: vote share; win margin
  - Changes from 2000 results: $\Delta E_{ms} = E_{ms,2004} - E_{ms,2000}$

Estimation I: Exogenous Treatment

$$E_{ms} = \alpha + \beta A_{ms} + X_{ms}\gamma + \nu_s + \epsilon_{ms}$$

where:

- E_{ms}: reelection performance of an eligible incumbent mayor in **municipality** m, **state** s
- A_{ms}: $= 1$ if audited prior to the 2004 elections

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where:

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- X_{ms}: municipality and mayor controls

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- X_{ms}: municipality and mayor controls
- ν_s: state fixed effect

β: the treatment effect of being audited and the public release of auditing results

Estimation II: Adding Voters' Prior Beliefs

$$E_{ms} = \alpha + \beta_1 A_{ms} + X_{ms}\gamma + \nu_s + \epsilon_{ms}$$

Estimation II: Adding Voters' Prior Beliefs

$$E_{ms} = \alpha + \beta_0 C_{ms} + \beta_1 A_{ms} + \beta_2 (A_{ms} \times C_{ms}) + X_{ms}\gamma + \nu_s + \epsilon_{ms}$$

Estimation II: Adding Voters' Prior Beliefs

$$E_{ms} = \alpha + \beta_0 C_{ms} + \beta_1 A_{ms} + \beta_2 (A_{ms} \times C_{ms}) + X_{ms}\gamma + \nu_s + \epsilon_{ms}$$

where:

- C_{ms}: **number of** corrupt irregularities in the municipality
- $A_{ms} \times C_{ms}$: interaction term

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- **Prediction**: Negative treatment effect at higher levels of reported corruption, presumably positive at lower levels.

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where:

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- $A_{ms} \times C_{ms}$: interaction term

β_2: the treatment effect conditional on corruption levels

- **Prediction**: Negative treatment effect at higher levels of reported corruption, presumably positive at lower levels.
- **Underlying assumption**: Voters do **not** systematically over- or underestimate the incumbent's corruption level.

Estimation III: Adding the Presence of Local Media

$$E_{ms} = \alpha + \beta_0 C_{ms} + \beta_1 A_{ms} + \beta_2 \left(A_{ms} \times C_{ms}\right) + X_{ms}\gamma + \nu_s + \epsilon_{ms}$$

Estimation III: Adding the Presence of Local Media

$$E_{ms} = \alpha + \beta_0 C_{ms} + \beta_1 A_{ms} + \beta_2 M_{ms} + \beta_3 (A_{ms} \times M_{ms}) + \beta_4 (A_{ms} \times C_{ms}) + \beta_5 (M_{ms} \times C_{ms}) + \beta_6 (A_{ms} \times C_{ms} \times M_{ms}) + X_{ms}\gamma + \nu_s + \epsilon_{ms}$$

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where:

- M_{ms}: measure of media presence

Estimation III: Adding the Presence of Local Media

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where:

- M_{ms}: measure of media presence
  - main specification: the number of local **AM radio stations**
  - robustness check: share of HHs with radios, number of newspapers, share of HHs with a TV

Estimation III: Adding the Presence of Local Media

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- $A_{ms} \times M_{ms}, M_{ms} \times C_{ms}$: double interaction terms

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- M_{ms}: measure of media presence
- $A_{ms} \times M_{ms}, M_{ms} \times C_{ms}$: double interaction terms
- $A_{ms} \times C_{ms} \times M_{ms}$: triple interaction terms

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β_6: the treatment effect conditional on corruption levels and local media presence

Estimations: Summary

$$E_{ms} = \alpha + \beta A_{ms} + X_{ms}\gamma + \nu_s + \epsilon_{ms} \tag{1}$$

$$E_{ms} = \alpha + \beta_0 C_{ms} + \beta_1 A_{ms} + \beta_2 (A_{ms} \times C_{ms}) + X_{ms}\gamma + \nu_s + \epsilon_{ms} \tag{2}$$

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Estimations: Summary

$$E_{ms} = \alpha + \beta A_{ms} + X_{ms}\gamma + \nu_s + \epsilon_{ms} \quad (1)$$

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- β: Average treatment effect of pre-election auditing

Estimations: Summary

$$E_{ms} = \alpha + \beta A_{ms} + X_{ms}\gamma + \nu_s + \epsilon_{ms} \quad (1)$$

$$E_{ms} = \alpha + \beta_0 C_{ms} + \beta_1 A_{ms} + \beta_2 (A_{ms} \times C_{ms}) + X_{ms}\gamma + \nu_s + \epsilon_{ms} \quad (2)$$

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- β: Average treatment effect of pre-election auditing
- β_2: Treatment effect, conditional on corruption level

Estimations: Summary

$$E_{ms} = \alpha + \beta A_{ms} + X_{ms}\gamma + \nu_s + \epsilon_{ms} \quad (1)$$

$$E_{ms} = \alpha + \beta_0 C_{ms} + \beta_1 A_{ms} + \beta_2 (A_{ms} \times C_{ms}) + X_{ms}\gamma + \nu_s + \epsilon_{ms} \quad (2)$$

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- β: Average treatment effect of pre-election auditing
- β_2: Treatment effect, conditional on corruption level
- β_6: Treatment effect, conditional on corruption level and media presence

Estimations: Summary

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- β: Average treatment effect of pre-election auditing
- β_2: Treatment effect, conditional on corruption level
- β_6: Treatment effect, conditional on corruption level and media presence
- X_{ms}: Controls should **not** have an effect

Results

Estimation I: Exogenous Treatment

$$E_{ms} = \alpha + \beta A_{ms} + X_{ms}\gamma + \nu_s + \epsilon_{ms}$$

	All incumbent mayors		Those ran
	(1)	(2)	(3)
Preelection audit (1/0)	-0.036	0.036	-0.059
	(0.053)	(0.052)	(0.065)
Observations	373	373	263
R^2	0.05	0.17	0.22
State FEs	Yes	Yes	Yes
Municipal controls	No	Yes	Yes
Mayoral controls	No	Yes	Yes

Note: Hereafter, robust standard errors are displayed in parenthesis, significant levels: 99%(**), 95%(*), 90%(+).

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Estimation I: Exogenous Treatment

$$E_{ms} = \alpha + \beta A_{ms} + X_{ms}\gamma + \nu_s + \epsilon_{ms}$$

Only mayors ran for reelection

	Pr(reelection)	Vote share	Win margin	Δvote share	Δwin margin
	(3)	(4)	(5)	(6)	(7)
Preelection audit (1/0)	-0.059	-0.055	-0.020	-0.032^{+}	-0.028
	(0.065)	(0.072)	(0.027)	(0.018)	(0.027)
Observations	263	263	263	263	263
R^2	0.22	0.16	0.22	0.39	0.31
State FEs			Yes		
Municipal controls			Yes		
Mayoral controls			Yes		

Estimation I: Exogenous Treatment

$$E_{ms} = \alpha + \beta A_{ms} + X_{ms}\gamma + \nu_s + \epsilon_{ms}$$

Results: $\beta = 0$

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Results: $\beta = 0$

1. **Beliefs** matter: The effects of surprisingly low and high levels of corruption cancel each other out.

Estimation I: Exogenous Treatment

$$E_{ms} = \alpha + \beta A_{ms} + X_{ms}\gamma + \nu_s + \epsilon_{ms}$$

Results: $\beta = 0$

1. **Beliefs** matter: The effects of surprisingly low and high levels of corruption cancel each other out.
2. **Media presence** matters: Information might not be so effectively disseminated.

Estimation II: Adding Voters' Prior Beliefs

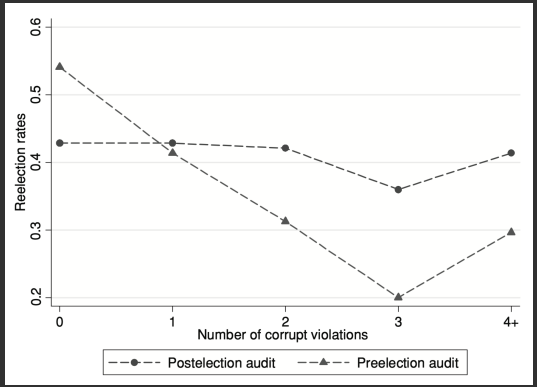

Figure 3: Descriptive evidence: Reelection Rates and Corruption Levels

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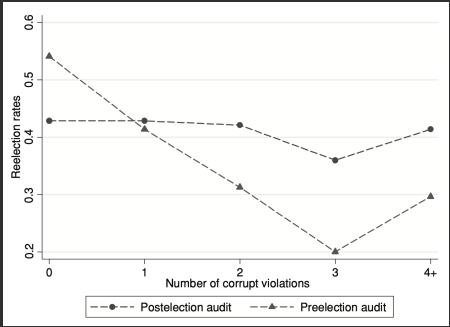

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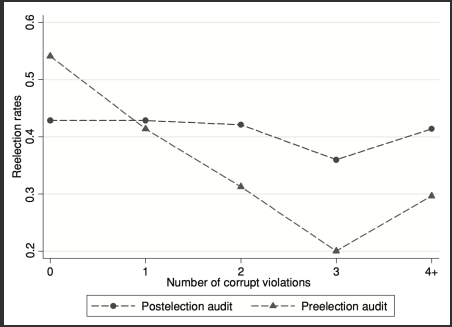
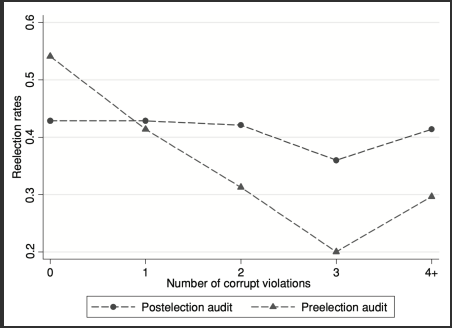


Linear

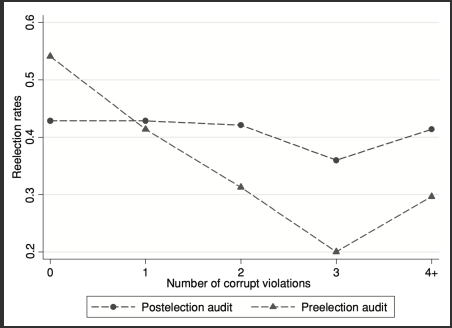
	(1)	(2)
Preelection audit ×	-0.038	-0.038
No. corruption violations	(0.035)	(0.035)
Observations	373	373
R^2	0.05	0.18
State FEs	Yes	Yes
Municipal controls	No	Yes
Mayoral controls	No	Yes

Estimation II: Adding Voters' Prior Beliefs



	Different models		
	Linear	Quadratic	Semiparametric
	(2)	(3)	(4)
Preelection audit ×	-0.038	-0.200*	
No. corruption violations	(0.035)	(0.090)	
Preelection audit ×		0.034*	
No. corruption violations^2		(0.017)	
Preelection audit ×			0.010
corruption = 0			(0.156)
Preelection audit ×			-0.253+
corruption = 2			(0.148)
Preelection audit ×			-0.321+
corruption = 3			(0.192)
Preelection audit ×			-0.159
corruption = 4			(0.168)
R^2	0.18	0.19	0.22
$F-$test (p-value)		0.089	0.192

Estimation II: Adding Voters' Prior Beliefs



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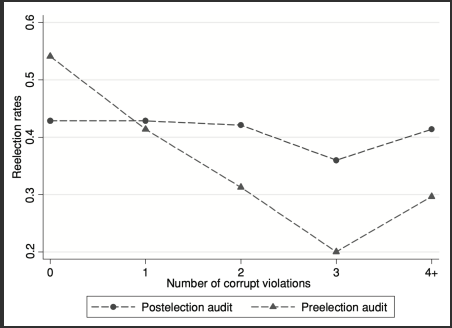

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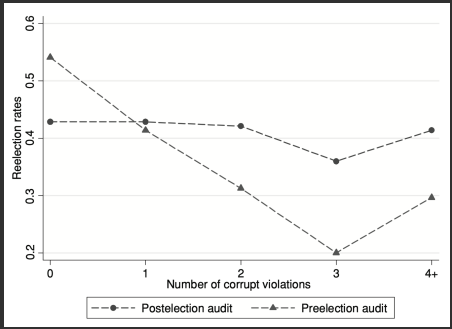
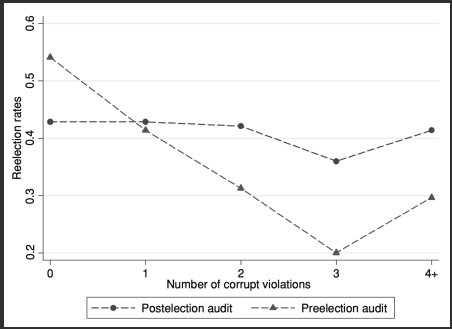


	Different samples		
	Full	Corruption$\leq$5	Corruption$\leq$4
	(2)	(5)	(6)
Preelection audit $\times$	-0.038	-0.070^{+}	-0.088*
No. corruption violations	(0.035)	(0.041)	(0.043)
Observations	373	362	351
R^2	0.18	0.19	0.20

Estimation II: Adding Voters' Prior Beliefs



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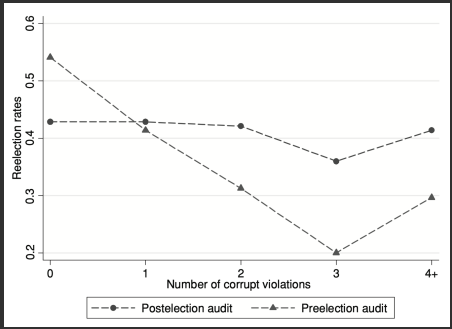

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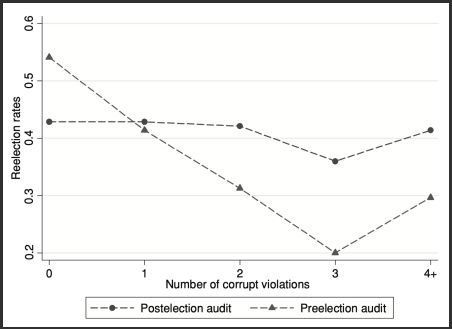

Summary

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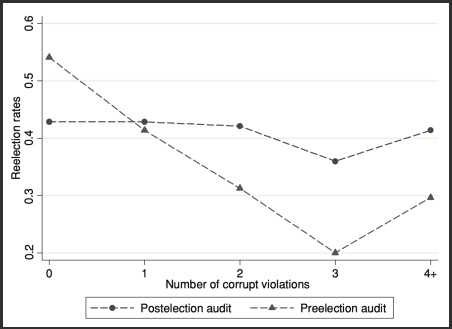

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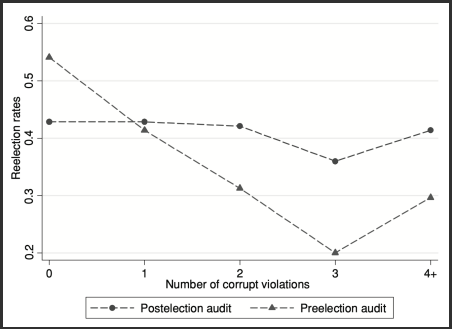

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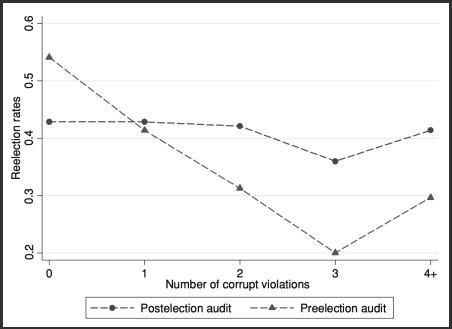

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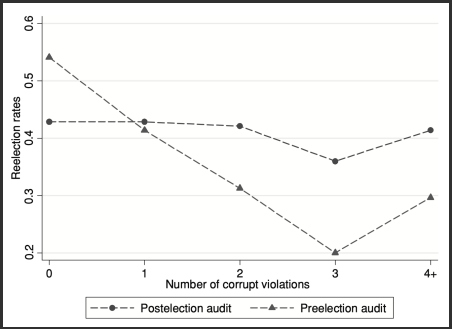

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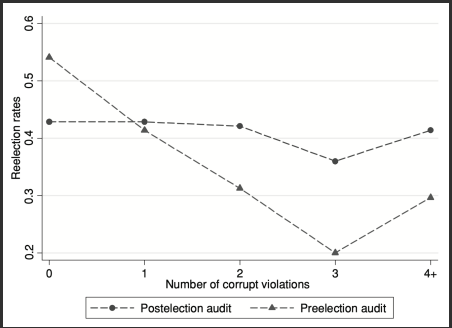

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Question: what about those extremely corrupted mayors?

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	Full (1)	Corruption$\leq$5 (2)	Demographics (3)	Demographics & institutional (4)
Preelection audit	-0.059	-0.033	0.296	0.208
No. corrupt violations	-0.034	-0.013	-0.13	-0.069
No. radio stations	-0.131*	-0.150*	-0.216**	-0.253**
Preelection audit $\times$ No. radio stations	0.229*	0.271**	0.356**	0.449**
Preelection audit $\times$ No. corrupt violations	0.007	-0.018	-0.236	-0.412
No. radio stations $\times$ No. corrupt violations	0.050$^+$	0.058*	0.082**	0.09**
Triple interaction	-0.118**	-0.157*	-0.185**	-0.238**
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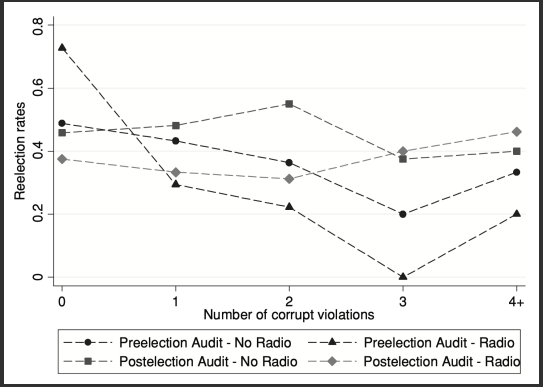

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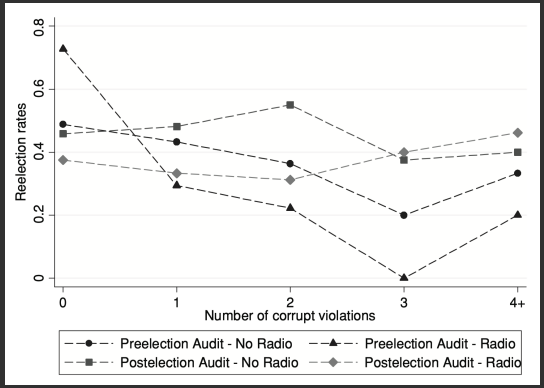

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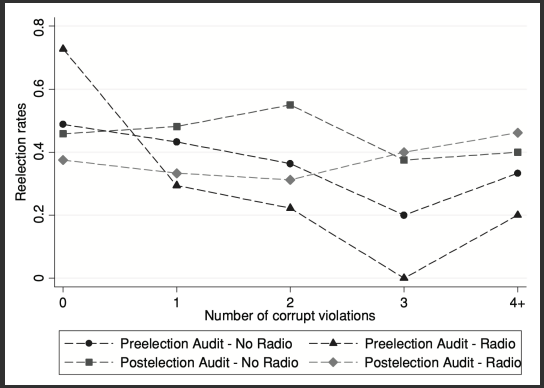

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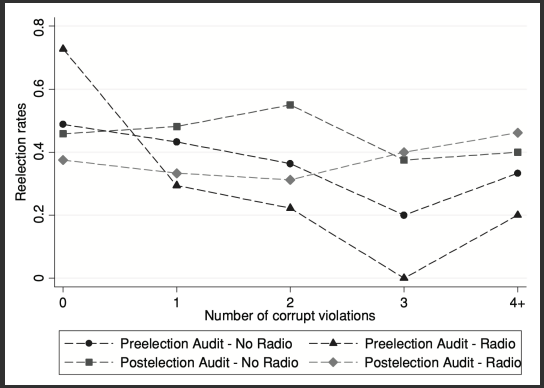

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2. Different measures of electoral outcomes and media presence

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5. Next-step consequences (reduction of corruption, studied in Avis et al. (2018))

Final Comments

What I like...

- empirical completeness

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- TYPOS, in tables :(

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Thank you!