

# Fiscal Rules, Austerity in Public Administration, and Political Accountability: Evidence from a Natural Experiment in Colombia

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## Can fiscal rules help to reduce waste in public administration?

- Organizations in the public sector are prone to waste and overspending
  - Soft budget constraints, political turnover, weak bureaucratic incentives, corruption
  - Waste in public administration in Latin America  $\approx 4.4\%$  of GDP (Izquierdo et al., 2018)
- Fiscal rules are a promising tool to reduce wasteful spending
  - Widely used in developed and developing countries (Lledó et al., 2017)
- But do they work?
  - Ineffective due to weak enforcement or creative accounting
  - Reduced public good provision may reduce welfare
  - Electoral backlash could make fiscal rules politically unpalatable

## We study a subnational fiscal rule targeting administrative spending in Colombia

- Reform in 2000 introduced a cap on the operating expenditures (i.e., administrative spending) of municipal governments as a percentage of current revenue
- Difference-in-difference design leveraging the timing of the reform and cross-sectional variation in *de facto* exposure to the fiscal rule across 900+ municipalities
- Three families of outcomes: (i) fiscal, (ii) public goods, (iii), political (elections, protests) + qualitative interviews with former mayors

⇒ ↓ Operating expenses + No impact on public goods + ↑ support for incumbent's party

## We provide causal evidence on the fiscal, economic, and political impact of a fiscal rule

- Large correlational literature on effectiveness in developed world (Heinemann et al., '18)
  - Italy RDD (Grembi et al., '16; Coviello et al., '22; Daniele & Giommoni, '22; Gamalerio & Trombetta, '23)
- Mixed findings on the political consequences of fiscal consolidation:
  - Backlash: Fetzer ('19); Ponticelli & Voth ('20); Hübscher et al. ('21); Bojar et al. ('22); Wiedemann ('22)
  - No backlash: Alesina et al. ('98, '13); Drazen & Eslava ('10); Arias & Stasavage ('19)
  - It depends: Ardanaz et al. ('20); Bansak et al. ('21)
- Our contributions:
  - **Golden** rule (i) improves fiscal health (ii) w/o affecting public goods  $\Rightarrow$   $\downarrow$  Waste
  - Fiscal rule aligns policy with voters' preferences amid weak electoral incentives

# Roadmap

Introduction

Background

Empirical Strategy

Results: Fiscal Outcomes

Results: Public Goods

Results: Political Outcomes

Discussion

## Colombian municipalities offer an ideal laboratory for our analysis

- We study small municipalities with identical institutional complexity  $\approx$  90% of total
- Decentralization in early 1990s, spearheaded by 1991 constitution, awarded substantial powers and resources to subnational governments
- Municipal governments grew dramatically over the following decade:
  - In 2000, 50% of municipalities had operating expenditures exceeding current revenue
  - Cumulative aggregate current deficit 1996-2000 equal to 1.7% of central gvt's budget

## Law 617 of 2000: **operating expenditures** $\leq$ **80%** of current revenue

### - **Operating expenditures:**

- Mostly salaries of bureaucrats and elected officials + procurement for central administration
- Local public goods (education, health, etc.) fall under separate “capital” spending
- Operating expenses averaged 30% of total spending before the reform

### - **Current revenue:** local taxes + fines and fees + disposable share of transfers

### - Enforcement by fiscal watchdog (CGR) $\Rightarrow$ Fiscal and disciplinary sanctions

- Transition period with increasingly stringent cap between 2001-2004
- Non-compliance seems driven by shocks and leads to swift adjustment Event study

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We exploit *de facto* differences in exposure to the fiscal rule across municipalities

$$\text{Overspending ratio} \equiv \frac{\text{Operating Expenses}}{\text{Current Revenue}}$$

- Municipality is **affected** by the reform if average overspending ratio<sub>96-00</sub>  $\geq 1$ 
  - Results are robust to other thresholds, continuous measure or restricted bandwidth
- Affected municipalities are located throughout the country [Map](#), but differ in some predetermined characteristics (e.g., more distant from Bogotá) [Table](#)
- Former mayors report that both *active* and *passive* waste drive pre-reform overspending (e.g., corruption and lack of expertise in public administration) ([Bandiera et al., 2009](#))

Our main analysis uses a difference-in-difference design with municipality and dpt-year FE

$$y_{mt} = \alpha_m + \delta_{d(m)t} + \beta(\text{Affected}_m \times \mathbb{1}[t > 2000]_t) + \varepsilon_{mt}$$

- $\alpha_m$  and  $\delta_{d(m)t}$  are municipality and department-year fixed effects
- $\beta$  is our coefficient of interest (i.e., relative change in outcome  $y$  in affected municipalities after the introduction of the fiscal rule)
- We address potential time-varying effects of unbalanced covariates in various ways:
  - Year dummies  $\times$  predetermined covariates showing significant differences (or all)
  - Propensity-score weighting (Hirano and Imbens, 2001) Balance Support
- $\varepsilon_{mt}$  is clustered two-way by municipality and department-year (Cameron et al., 2011)

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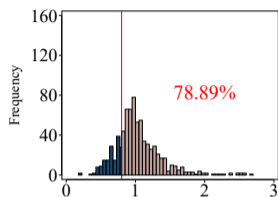
Results: Political Outcomes

Discussion

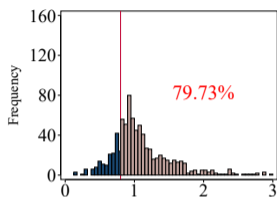
## We use detailed municipal fiscal data from DNP between 1996 and 2018

- Our main fiscal outcomes of interest are the overspending ratio (i.e., the target of the fiscal rule) and the current deficit
- We next break down the overspending ratio into its subcomponents (operating expenses and current revenue) to shed light on mechanisms
- Finally, we look at the remaining components of the budget (e.g., capital expenditures) to study creative accounting and the overall fiscal impact

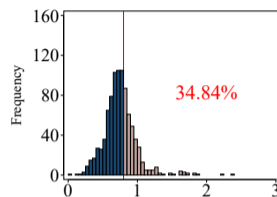
## Distribution of overspending ratio shows rapid compliance with the fiscal rule after 2000



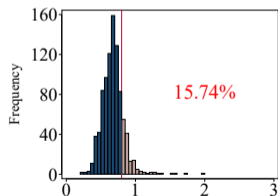
(a) 1996



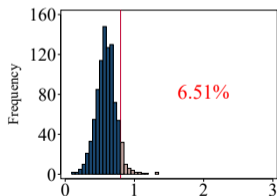
(b) 2000



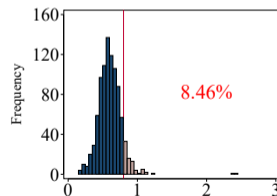
(c) 2004



(d) 2008

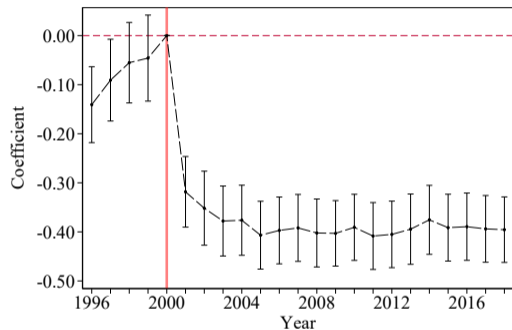


(e) 2012

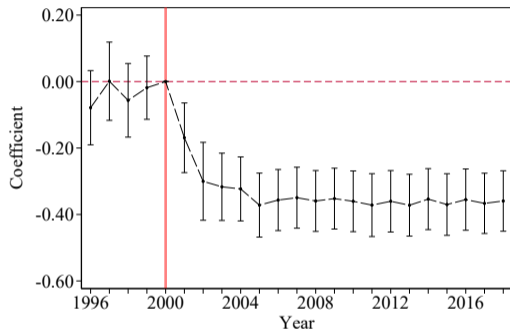


(f) 2016

## Large reductions in the overspending ratio and the probability of a current deficit



(a) Overspending ratio



(b) Current deficit (=1)

## Large reductions in the overspending ratio and the probability of a current deficit

	Overspending Ratio		Current Deficit (=1)	
	(1)	(2)	(3)	(4)
Affected $\times \mathbb{1}[t > 2000]$	-0.32*** (0.015)	-0.32*** (0.015)	-0.32*** (0.019)	-0.31*** (0.019)
Municipality FE	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓
Controls		✓		✓
Observations	20,151	20,151	20,151	20,151
Municipalities	920	920	920	920
Pre-Reform DV Mean	1.07	1.07	0.66	0.66

Propensity-score weighting

## Results are robust to inclusion of additional controls or changes in sample or variables

- Exposure to fiscal rule:
  - Other thresholds
  - Subset of pre-reform years
  - Continuous measure
  - Different bandwidths
- Construction of variables:
  - Per capita values
  - No winsorization
  - Inverse hyperbolic sine
- Alternative DiD estimators
- Parallel trends violations
- Sample composition:
  - Category 6: Constant or pre-reform
  - Balanced panel
  - Dropping any department
  - Dropping recession years
  - Dropping misreporting munis
- Other fiscal reforms:
  - SGP transfers in 2001
  - Bankruptcy in 1997
  - Eliminated comptroller in 2000
  - Drop new municipalities since 1986
  - Disaggregate results for council/ombudsman

## Fiscal adjustment mostly driven by cuts to spending

	Operating Expenses (Logs)				Disposable Current Revenue (Logs)			
	Total	Personnel	General	Paid Transfers	Total	Tax Revenue	Non-Tax Revenue	Disposable Transfers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Affected $\times \mathbb{1}[t > 2000]$	-0.20*** (0.018)	-0.16*** (0.020)	-0.24*** (0.030)	-0.14** (0.057)	0.08*** (0.017)	0.14*** (0.036)	0.31*** (0.054)	0.10*** (0.030)
Municipality FE	✓	✓	✓	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Observations	20,151	20,151	20,151	20,151	20,151	20,151	20,151	20,151
Municipalities	920	920	920	920	920	920	920	920
Pre-Reform DV Mean	1390.37	709.50	476.58	307.09	1384.44	465.49	280.52	640.10

[Raw figure](#)
[Event study plots](#)
[Propensity-score weighting](#)
[Disaggregate taxes](#)
[Dropping 99-00](#)

## No change in capital revenue or spending $\Rightarrow$ lower probability of total deficit

	Capital Revenue	Capital Expenses	Total Deficit (=1)	Net Credit Inflows (=1)	Interest Payments	Negative Balance (=1)
	(1)	(2)	(3)	(4)	(5)	(6)
Affected $\times \mathbb{1}[t > 2000]$	0.01 (0.023)	0.04 (0.027)	-0.10*** (0.024)	0.00 (0.018)	-0.05 (0.102)	-0.11*** (0.023)
Municipality FE	✓	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Observations	20,151	20,151	20,151	20,151	20,151	20,151
Municipalities	920	920	920	920	920	920
Pre-Reform DV Mean	3889.82	3867.08	0.56	0.37	442.53	0.48

Event study plots

Propensity-score weighting

SGP transfers

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**Results: Public Goods**

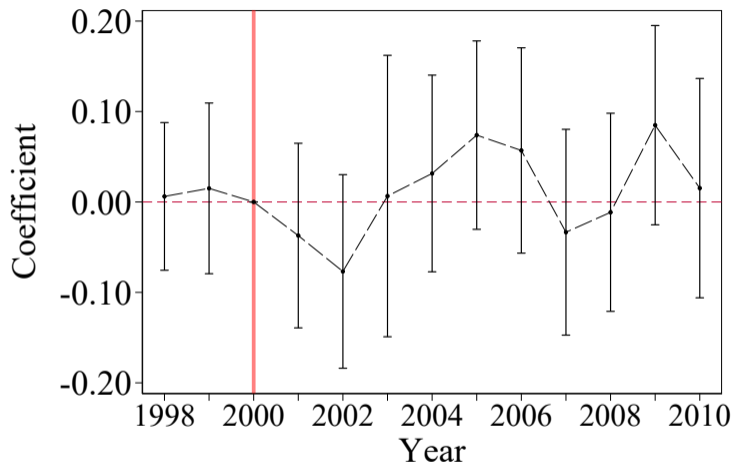
Results: Political Outcomes

Discussion

## Did the fiscal adjustment affect public goods or living standards?

- Despite null effect on capital spending, public goods could be affected by changes in the *quality* of spending or broader policy design/oversight Composition of capital spending unchanged
- We study 16 different measures of public goods and living standards:
  - Education: Number of schools, teachers and students
  - Health: Subsidized insurance for the poor, birth outcomes, infant vaccination rates
  - Firm providing water, sewage disposal, or garbage collection based in municipality
  - Economic activity: Property values, night lights (Henderson et al., 2012)
  - Emergencies: Victims of natural disasters
  - Illegal activities: Corruption sanctions, armed group presence, coca cultivation
- We also aggregate these outcomes into a covariance-weighted index (Anderson, 2008)

## We find no meaningful change in the standardized index of local public goods



## No meaningful differences in bureaucratic services by reform exposure in recent years

- The null impact of the fiscal adjustment on local public goods suggests **wasteful spending** before the reform, in line with anecdotal evidence from interviewed mayors
- However, the previous public goods outcomes may be too detached from the administrative services affected by the reform
- Using data from recent years, we show that public administration is comparable in municipalities affected and not affected by the fiscal rule:
  - Municipal bureaucracy: Number, qualifications, job tenure (DAFP, 2021) [Figure](#)
  - Administrative services: Number, % online, days to completion (DAFP, 2021) [Figure](#)
  - Covid vaccination rates (Ministry of Health, 2022) [Figure](#)
  - Public contracts: tendered bids %, time overruns, overcosts (SECOP, 2015-2018) [Figure](#)
  - Citizen perceptions on local government and public services (LAPOP, 2004-2008) [Figure](#)

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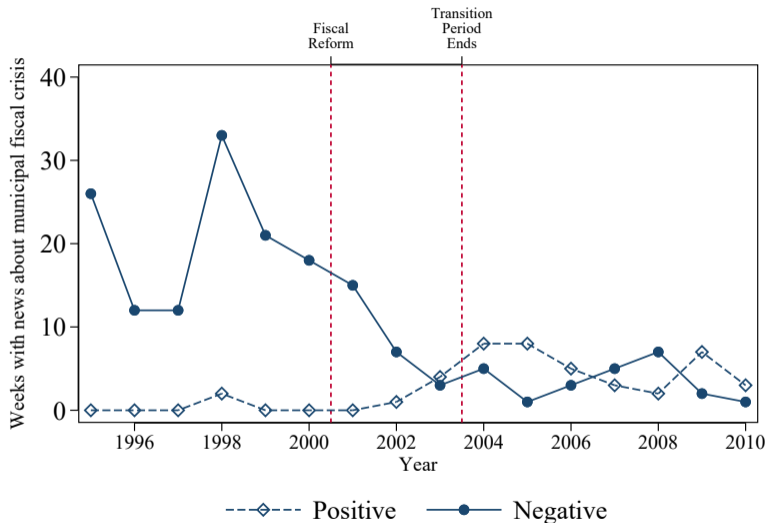
**Results: Political Outcomes**

Discussion

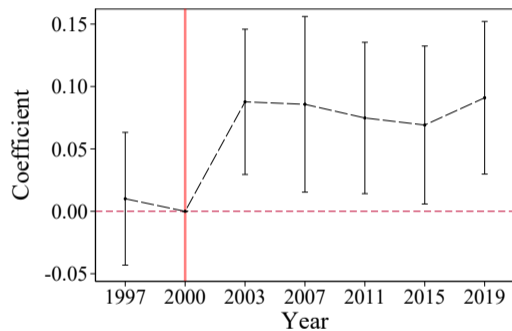
## What are the political consequences of the fiscal rule?

- Mayor is elected every four years and is the top municipal authority
- Mayors face a one-term limit, so we focus on party incumbency
  - Data availability: winning party since 1990 and party vote shares since 1997
- Protests provide a complementary measure of political preferences
  - Event-based proprietary dataset from think tank CINEP for period 1995-2015
- We hand-collected data from the country's largest newspaper (El Tiempo) to study the availability of information about the municipal fiscal crisis (1995-2010)

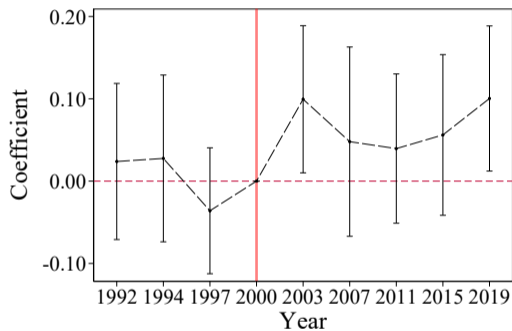
## News coverage switches from abundant and negative to infrequent but positive



## Electoral support for the **party** of the incumbent mayor increases



(a) Vote Share for Incumbent Party



(b) Incumbent Party Re-elected (=1)

## Electoral support for the party of the incumbent mayor increases

	Incumbent Vote Share		Incumbent Wins (=1)	
	(1)	(2)	(3)	(4)
Affected $\times \mathbb{1}[t > 2000]$	0.06** (0.025)	0.08*** (0.025)	0.06** (0.028)	0.06** (0.028)
Municipality FE	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓
Controls		✓		✓
Observations	5,860	5,860	7,557	7,557
Municipalities	919	919	920	920
Pre-Reform DV Mean	0.49	0.49	0.52	0.52
Pre-Reform DV Std. Dev.	0.39	0.39	0.50	0.50

## Protests against municipal government unchanged (but reduction in labor disputes)

	Any Protest (=1)		Cause (=1)		
			Public Services	Labor Disputes	Other
	(1)	(2)	(3)	(4)	(5)
Affected $\times \mathbb{1}[t > 2000]$	-0.003 (0.0037)	-0.004 (0.0037)	0.003 (0.0025)	-0.005** (0.0024)	-0.002 (0.0017)
Municipality FE	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓
Controls		✓	✓	✓	✓
Observations	18,400	18,400	18,400	18,400	18,400
Municipalities	920	920	920	920	920
Pre-Reform DV Mean	0.009	0.009	0.004	0.005	0.001

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## How to reconcile our fiscal, economic, and political findings?

- Voters dislike overspending in bureaucracy and punish the incumbent party for deficit
  - Voters support austerity in public administration (Ardanaz et al., 2020; Bansak et al., 2021)
  - News stories and strikes by unpaid municipal employees provide salient information
  - Null impact on public goods  $\Rightarrow$  lack of political backlash (Fetzer, 2019)
- Mayors have weak incentives to reduce administrative overspending
  - Mayors face a one-term limit and rarely progress in or return to politics Figure
  - Interviews reveal personal costs of compliance: communications, extra work, grievances
  - Weak parties cannot impose fiscal consolidation (Klašnja and Titiunik, 2018; Mainwaring, 2018)
- **Fiscal rule aligns policy with voters' preferences when political incentives fail**
  - We use a simple model of political agency to formalize our argument

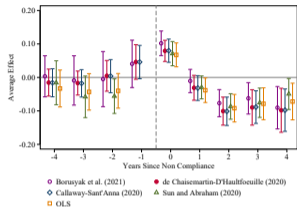
## Concluding remarks

- A golden fiscal rule reduces operating expenses and fiscal deficit in Colombian municipalities for almost two decades
- No change in local public goods or administrative services suggest waste in public administration before the reform
- Fiscal consolidation is popular with voters when it reduces administrative spending without compromising public services

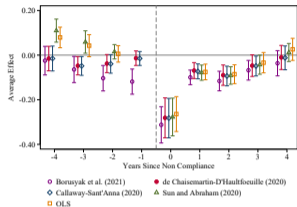
## APPENDIX

# Non-compliance seems driven by shocks and leads to swift adjustment (2010-2018)

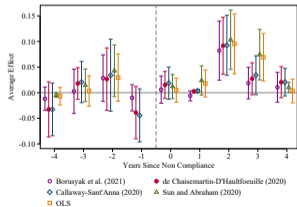
Back



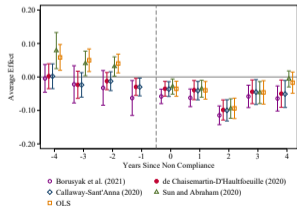
(a) Operating expenses



(b) Current revenue

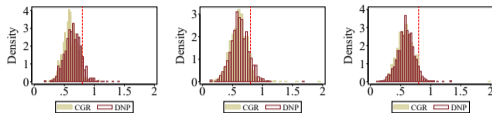


(c) Audit (=1)

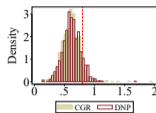


(d) Transfers

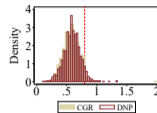
## Our proxy for overspending fits well actual data from CGR



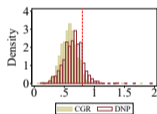
(a) 2010



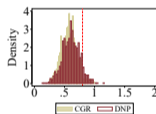
(b) 2011



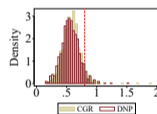
(c) 2012



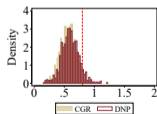
(d) 2013



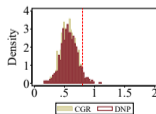
(e) 2014



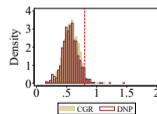
(f) 2015



(g) 2016

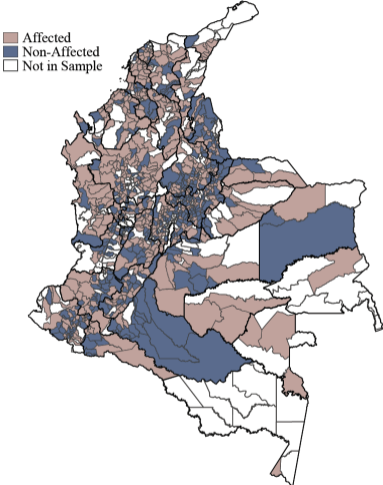


(h) 2017



(i) 2018

# Affected municipalities are spread out throughout the country



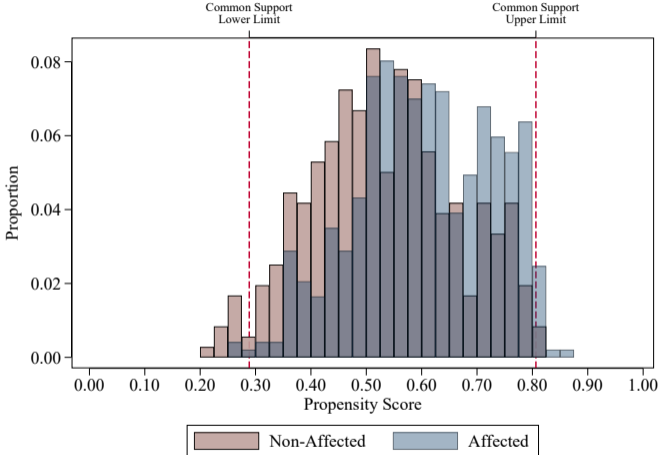
## Affected municipalities differ in some predetermined characteristics

	Mean	No Controls		Department FE	
		$\beta$	SE	$\beta$	SE
	(1)	(2)	(3)	(4)	(5)
Foundation year	1,873.739	22.003***	6.940	10.225	6.541
Foundation year $\geq$ 1980 (=1)	0.125	0.021	0.022	-0.005	0.020
Area ( $km^2$ )	815.500	9.110	224.202	19.334	107.209
Altitude (1,000 meters above sea level)	1.173	-0.338***	0.059	-0.081*	0.043
Distance to department capital (1,000 $km$ )	0.081	0.003	0.004	-0.002	0.003
Distance to nearest market (1,000 $km$ )	0.123	0.009	0.005	0.000	0.003
Distance to Bogotá (1,000 $km$ )	0.310	0.057***	0.012	0.008**	0.004
Share of rural population (mean 1995-2000)	0.660	-0.016	0.013	0.019	0.012
Public schools in 1996 (=1)	0.960	0.006	0.013	0.021*	0.013
Unmet Basic Needs index in 1993	56.112	4.224***	1.211	0.727	0.934
Notary office in 1996 (=1)	0.392	0.000	0.033	-0.011	0.031
Agricultural Bank branch in 1996 (=1)	0.928	0.004	0.017	0.033**	0.017
Tax collection office in 1996 (=1)	0.420	0.054	0.033	0.026	0.034
Health center or hospital in 1996 (=1)	0.741	0.030	0.029	-0.005	0.029
FARC demilitarized zone and neighbors (=1)	0.021	-0.018*	0.010	-0.010	0.008
Guerrilla presence between 1996 and 2000 (=1)	0.656	0.065**	0.032	0.033	0.030
Paramilitary presence between 1996 and 2000 (=1)	0.362	0.065**	0.032	-0.046*	0.026
Coca crops between 1999 and 2000 (=1)	0.184	0.023	0.026	0.027	0.023
Mayor sanctioned for corruption (=1) (96-00)	0.358	0.023	0.033	-0.003	0.034
Political kidnappings (96-00)	0.190	0.014	0.026	-0.009	0.026
Population (1,000 inhabitants)	14.661	1.555*	0.818	-0.188	0.712
Share of votes for Liberal Party (mean 1997-2000)	0.134	0.004	0.011	-0.016	0.010
Share of votes for Conservative Party (mean 1997-2000)	0.082	-0.013	0.008	0.007	0.008
Mayoral elections HHI (mean 1997-2000)	0.372	0.004	0.008	0.009	0.008

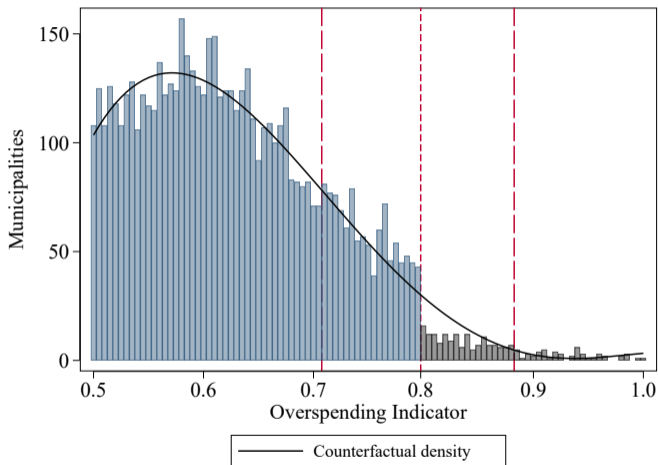
## Propensity-score weighting largely solves imbalance in covariates

	Mean	No Controls		Department FE	
		$\beta$	SE	$\beta$	SE
	(1)	(2)	(3)	(4)	(5)
Foundation year	1,873.739	-2.604	6.525	-2.473	6.384
Foundation year $\geq$ 1980 (=1)	0.125	0.015	0.023	0.022	0.020
Area ( $km^2$ )	815.500	113.718	168.715	12.014	99.357
Altitude (1,000 meters above sea level)	1.173	0.012	0.066	0.066	0.047
Distance to department capital (1,000 km)	0.081	-0.001	0.005	-0.006	0.005
Distance to nearest market (1,000 km)	0.123	0.002	0.006	-0.001	0.004
Distance to Bogota (1,000 km)	0.310	0.001	0.014	0.003	0.006
Share of rural population (mean 1995-2000)	0.660	-0.006	0.015	0.011	0.013
Public Schools in 1996 (=1)	0.960	-0.004	0.006	0.005	0.005
Unmet Basic Needs index in 1993	56.112	-0.626	1.411	-0.817	1.109
Notary office in 1996 (=1)	0.392	0.016	0.038	0.003	0.035
Agricultural Bank branch in 1996 (=1)	0.928	-0.003	0.013	0.006	0.011
Tax collection office in 1996 (=1)	0.420	0.007	0.039	-0.011	0.036
Health center or hospital in 1996 (=1)	0.741	-0.002	0.031	-0.018	0.027
FARC demilitarized zone and neighbors (=1)	0.021	-0.000	0.006	0.004	0.006
Guerrilla presence between 1996 and 2000 (=1)	0.656	-0.022	0.034	-0.024	0.031
Paramilitary presence between 1996 and 2000 (=1)	0.362	-0.026	0.039	-0.088***	0.029
Coca crops between 1999 and 2000 (=1)	0.184	-0.020	0.033	0.022	0.028
Mayor sanctioned for corruption (=1) (96-00)	0.358	0.008	0.038	-0.011	0.037
Political kidnappings (96-00)	0.190	-0.003	0.032	-0.012	0.033
Population (1,000 inhab.)	1.466	0.020	0.106	-0.012	0.098
Share of votes for Liberal Party (mean 1997-2000)	0.134	0.004	0.011	-0.012	0.010
Share of votes for Conservative Party (mean 1997-2000)	0.082	-0.001	0.008	0.006	0.008
Mayoral elections HHI (mean 1997-2000)	0.372	-0.007	0.009	-0.003	0.009

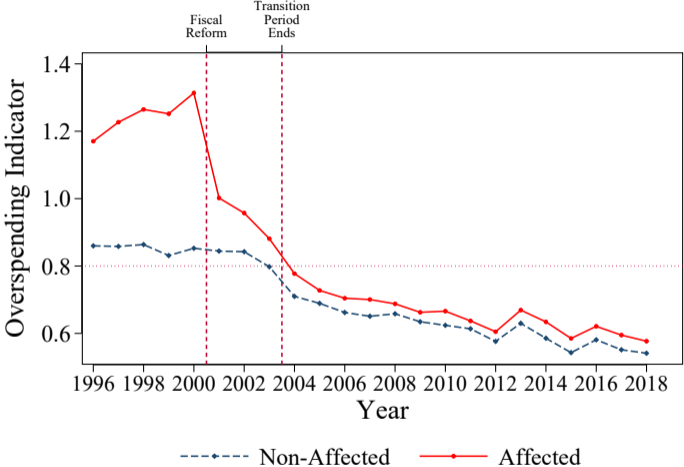
# Common support of propensity score for Affected status



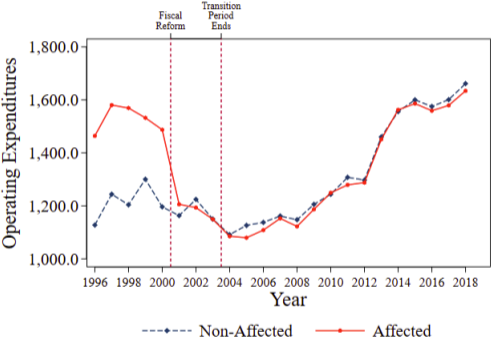
## Discontinuity in overspending indicator at legal cap (2010-2018)



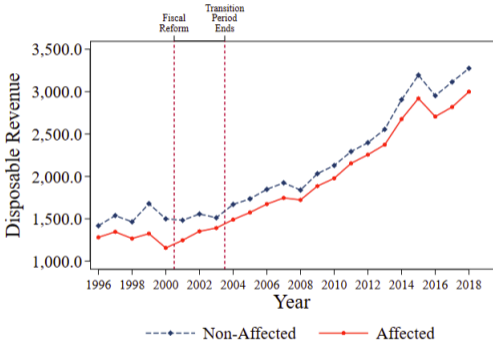
# Group means show rapid convergence in overspending indicator



# Fiscal adjustment mostly driven by cuts to spending



(a) Operating Expenditures



(b) Disposable Current Revenues

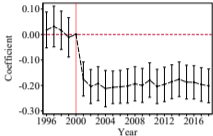
## Fiscal results are robust to propensity-score weighting

	Main Outcomes		Operating Expenses (Log)				Disposable Current Revenue (Log)			
	Overspending Ratio	Current Deficit (=1)	Total	Personnel	General	Paid Transfers	Total	Tax Revenue	Non-Tax Revenue	Disposable Transfers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Affected $\times 1[t > 2000]$	-0.33*** (0.015)	-0.31*** (0.020)	-0.22*** (0.020)	-0.17*** (0.023)	-0.25*** (0.033)	-0.16*** (0.062)	0.07*** (0.018)	0.11*** (0.040)	0.29*** (0.065)	0.07** (0.034)
Municipality FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Propensity Score Weighting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	18,031	18,031	18,031	18,031	18,031	18,031	18,031	18,031	18,031	18,031
Pre-Reform DV Mean	1.07	0.66	1390.37	709.50	476.58	307.09	1384.44	465.49	280.52	640.10
Pre-Reform DV Std. Dev.	0.38	0.47	1030.18	2998.82	1126.69	528.29	1098.63	691.75	486.89	353.69

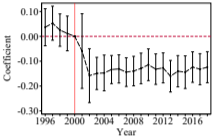
## Effects on revenue become smaller if we drop recession years (1999-2000)

	Operating Expenses (Logs)				Disposable Current Revenue (Logs)			
	Total	Personnel	General	Paid Transfers	Total	Tax Revenue	Non-Tax Revenue	Disposable Transfers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>Panel A: Full Sample</u>								
Affected $\times \mathbb{1}[t > 2000]$	-0.20*** (0.018)	-0.16*** (0.020)	-0.24*** (0.030)	-0.14** (0.057)	0.08*** (0.017)	0.14*** (0.036)	0.31*** (0.054)	0.10*** (0.030)
Observations	20,151	20,151	20,151	20,151	20,151	20,151	20,151	20,151
<u>Panel B: Dropping 1999-2000</u>								
Affected $\times \mathbb{1}[t > 2000]$	-0.22*** (0.020)	-0.17*** (0.023)	-0.28*** (0.030)	-0.08 (0.068)	0.04** (0.018)	0.07* (0.037)	0.26*** (0.065)	0.05* (0.025)
Observations	17,972	17,972	17,972	17,972	17,972	17,972	17,972	17,972
Municipality FE	✓	✓	✓	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Pre-Reform DV Mean	1390.37	709.50	476.58	307.09	1384.44	465.49	280.52	640.10

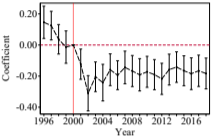
# Fiscal adjustment mostly driven by cuts to operating expenditures



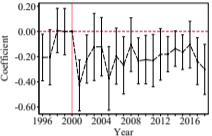
(a) Total Exp.



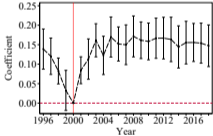
(b) Personnel



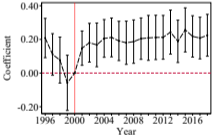
(c) General



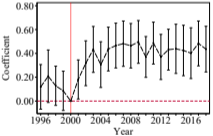
(d) Transfers



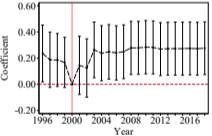
(e) Total Rev.



(f) Tax



(g) Non-tax



(h) Transfers

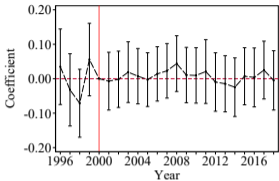
## Fiscal results are robust to propensity-score weighting

	Capital Revenue	Capital Expenses	Total Deficit (=1)	Net Credit Inflows (=1)	Interest Payments	Positive Balance (=1)
	(1)	(2)	(3)	(4)	(5)	(6)
Affected $\times \mathbb{1}[t > 2000]$	-0.00 (0.027)	0.04 (0.030)	-0.11*** (0.024)	0.00 (0.020)	-0.05 (0.125)	0.12*** (0.024)
Municipality FE	✓	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓	✓
Propensity Score Weighting	✓	✓	✓	✓	✓	✓
Observations	18,031	18,031	18,031	18,031	18,031	18,031
Pre-Reform DV Mean	3889.82	3867.08	0.56	0.37	442.53	0.48
Pre-Reform DV Std. Dev.	3487.08	3187.40	0.50	0.48	13148.37	0.50

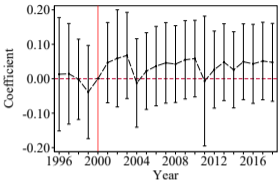
## Increase in tax revenue mostly driven by other taxes

	Property Tax	Cadastral Update	Gross Receipts Tax	Other Taxes
	(1)	(2)	(3)	(4)
Affected $\times \mathbb{1}[t > 2000]$	0.04 (0.029)	-0.01 (0.007)	0.07 (0.048)	0.29*** (0.060)
Municipality FE	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Observations	20,151	14,633	20,151	20,151
Pre-Reform DV Mean	218.65	0.13	98.46	148.36
Pre-Reform DV Std. Dev.	287.04	0.34	339.80	314.21

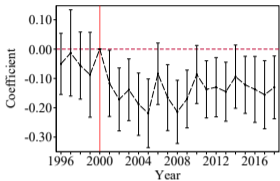
# No change in capital revenue/spending, lower prob. of total deficit



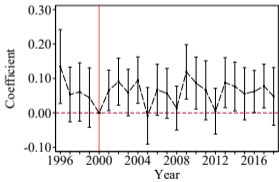
(a) Capital revenue



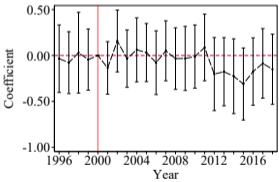
(b) Capital spending



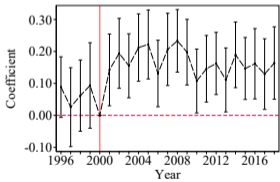
(c) Total deficit (=1)



(d) Net Credit Infl. (=1)



(e) Interest Payments

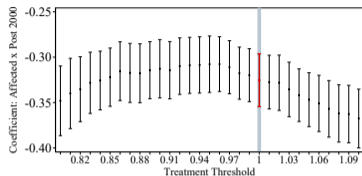


(f) Positive Balance (=1)

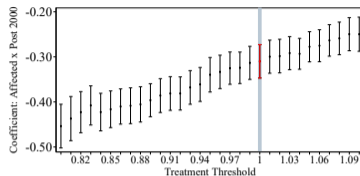
## No change in formula-determined SGP transfers for education/health

	Total	Education	Health	General Purpose
	(1)	(2)	(3)	(4)
Affected $\times \mathbb{1}[t > 2000]$	0.02 (0.012)	-0.04* (0.025)	-0.02 (0.021)	0.06*** (0.023)
Municipality FE	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Observations	20,151	20,151	20,151	20,151
Pre-Reform DV Mean	3347.71	786.78	655.65	1820.27
Pre-Reform DV Std. Dev.	2050.38	512.39	426.99	1042.20

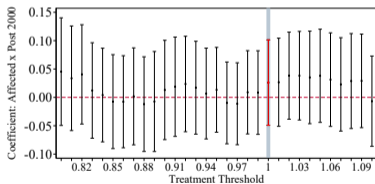
## Results are robust to other cutoffs for exposure to fiscal rule



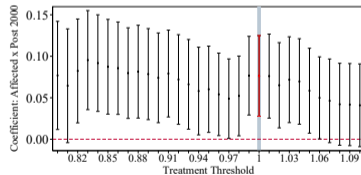
(a) Overspending indicator



(b) Current Deficit (=1)



(c) Public Goods Index



(d) Vote Share Incumbent

## Results are robust to other measures of exposure to fiscal rule

	Dependent variable: Overspending indicator							
	Baseline	Excluding one year from calculation					60% rule	Continuous measure
		1996	1997	1998	1999	2000		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Affected $\times \mathbb{1}[t > 2000]$	-0.32*** (0.015)	-0.30*** (0.022)	-0.31*** (0.017)	-0.30*** (0.017)	-0.30*** (0.018)	-0.30*** (0.015)	-0.26*** (0.017)	-0.89*** (0.026)
Pre-Reform DV Mean	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Pre-Reform DV Std. Dev.	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38

## Results look similar for per capita fiscal variables

	Operating Expenses				Disposable Current Revenue			
	Total	Personnel	General	Paid Transfers	Total	Tax Revenue	Non-Tax Revenue	Disposable Transfers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Affected $\times 1[t > 2000]$	-0.18*** (0.020)	-0.13*** (0.023)	-0.22*** (0.031)	-0.14** (0.061)	0.10*** (0.018)	0.16*** (0.037)	0.33*** (0.057)	0.10*** (0.029)
Municipality FE	✓	✓	✓	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Observations	18,569	18,569	18,569	18,569	18,569	18,569	18,569	18,569
Pre-Reform DV Mean	1185.73	566.84	417.07	242.63	1178.55	339.82	237.62	593.10
Pre-Reform DV Std. Dev.	767.23	1507.88	648.16	393.87	744.94	458.93	384.81	312.61

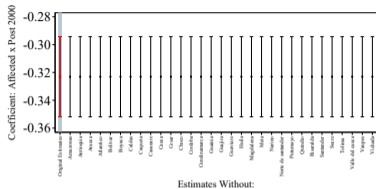
## Results are robust to non-winsorized fiscal outcomes

	Overspending Indicator	Operating Expenses	Disposable Current Revenue
	(1)	(2)	(3)
Affected $\times \mathbb{1}[t > 2000]$	-0.73*** (0.254)	-0.22*** (0.019)	0.08*** (0.018)
Municipality FE	✓	✓	✓
Department-year FE	✓	✓	✓
Controls	✓	✓	✓
Observations	18,569	18,569	18,569
Pre-Reform DV Mean	1.25	1504.77	1388.50
Pre-Reform DV Std. Dev.	6.73	4578.19	1124.32

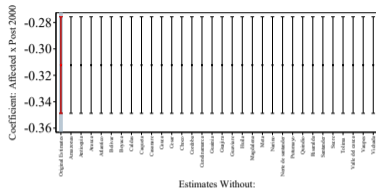
## Results are robust to exclusion of municipalities changing category

	Overspending Indicator		Current Deficit (=1)	
	(1)	(2)	(3)	(4)
Affected $\times \mathbb{1}[t > 2000]$	-0.31*** (0.017)	-0.31*** (0.017)	-0.34*** (0.023)	-0.33*** (0.024)
Municipality FE	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓
Controls		✓		✓
Observations	9,887	9,887	9,887	9,887
Pre-Reform DV Mean	1.07	1.07	0.65	0.65
Pre-Reform DV Std. Dev.	0.37	0.37	0.48	0.48

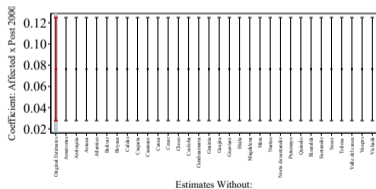
# Results are robust to exclusion of any department



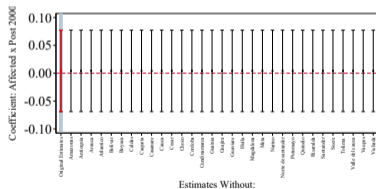
(a) Overspending indicator



(b) Deficit (=1)



(c) Incumbent share



(d) Public goods

## Results are robust to exclusion of recession years

	Overspending Indicator		Current Deficit (=1)	
	(1)	(2)	(3)	(4)
Affected $\times \mathbb{1}[t > 2000]$	-0.34*** (0.019)	-0.34*** (0.019)	-0.34*** (0.022)	-0.33*** (0.022)
Municipality FE	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓
Controls		✓		✓
Observations	16,789	16,789	16,789	16,789
Pre-Reform DV Mean	1.06	1.06	0.69	0.69
Pre-Reform DV Std. Dev.	0.35	0.35	0.46	0.46

## Results are robust to controlling for other reforms

	Overspending Indicator					
	(1)	(2)	(3)	(4)	(5)	(6)
Affected $\times \mathbb{1}[t > 2000]$	-0.32*** (0.015)	-0.32*** (0.015)	-0.32*** (0.015)	-0.32*** (0.015)	-0.32*** (0.015)	-0.32*** (0.015)
Municipality FE	✓	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Control for SGP Transfers		✓				
Control for Certified Municipalities			✓			
Dropped New Municipalities				✓		
Control for Law 550/99					✓	
Control for Removed Contralorias						✓
Observations	18,569	18,569	18,569	17,860	18,569	18,569
Pre-Reform DV Mean	1.07	1.07	1.07	1.07	1.07	1.07
Pre-Reform DV Std. Dev.	0.38	0.38	0.38	0.38	0.38	0.38

## Larger fiscal adjustment in munis w/ restructuring agreement

	Overspending Indicator		Current Deficit (=1)		Disposable Current Revenue		Operating Expenses	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Affected $\times 1[t > 2000]$	-0.32*** (0.015)	-0.32*** (0.015)	-0.32*** (0.019)	-0.32*** (0.019)	0.07*** (0.017)	0.07*** (0.018)	-0.21*** (0.018)	-0.21*** (0.018)
Affected $\times 1[t > 2000] \times$ Law 550 (=1)		-0.07*** (0.027)		-0.02 (0.024)		-0.02 (0.028)		-0.09*** (0.030)
Municipality FE	✓	✓	✓	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Observations	18,569	18,569	18,569	18,569	18,569	18,569	18,569	18,569
Pre-Reform DV Mean	1.07	1.07	0.66	0.66	1387.27	1387.27	1395.47	1395.47
Pre-Reform DV Std. Dev.	0.38	0.38	0.47	0.47	1097.34	1097.34	1038.36	1038.36

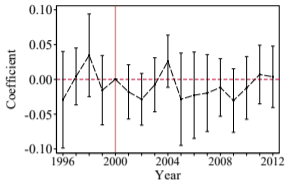
## Larger fiscal adjustment in municipalities that eliminate comptroller

	Overspending Indicator		Current Deficit (=1)		Disposable Current Revenue		Operating Expenses	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Affected $\times$ 1[t > 2000]	-0.32*** (0.015)	-0.31*** (0.015)	-0.32*** (0.019)	-0.32*** (0.019)	0.07*** (0.017)	0.08*** (0.018)	-0.21*** (0.018)	-0.20*** (0.018)
Affected $\times$ 1[t > 2000] $\times$ No Contraloria (=1)		-0.15*** (0.045)		-0.00 (0.038)		-0.05 (0.044)		-0.17*** (0.040)
Municipality FE	✓	✓	✓	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Observations	18,569	18,569	18,569	18,569	18,569	18,569	18,569	18,569
Pre-Reform DV Mean	1.07	1.07	0.66	0.66	1387.27	1387.27	1395.47	1395.47
Pre-Reform DV Std. Dev.	0.38	0.38	0.47	0.47	1097.34	1097.34	1038.36	1038.36

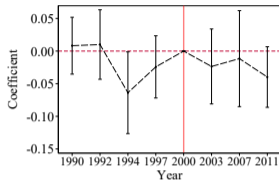
## Composition of capital spending remains largely unchanged (1996-2006)

	(1)	(2)	(3)	(4)	(5)	(6)
	Education	Health	Water & Sewerage	Sports & Culture	Housing	Other
Affected $\times \mathbb{1}[t > 2000]$	-0.01*** (0.003)	0.00 (0.005)	0.00 (0.003)	-0.00 (0.001)	-0.00* (0.001)	0.00 (0.004)
Municipality FE	✓	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Observations	9,186	9,186	9,186	9,186	9,186	9,186
Pre-Reform DV Mean	0.25	0.23	0.17	0.05	0.02	0.25
Pre-Reform DV Std. Dev.	0.06	0.09	0.06	0.02	0.03	0.09

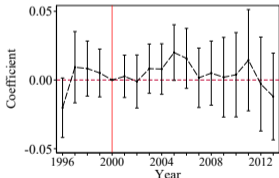
# No change in other policies, night lights or conflict



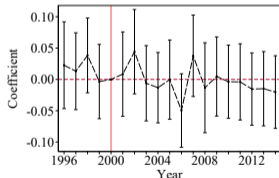
(a) Cadastral update



(b) Corruption (=1)



(c) Night Lights



(d) Conflict (=1)

# No change in measures of public goods or living standards

	Health Outcomes				Education Outcomes			Public Services			Other Outcomes				Public Goods Index		
	Subsidized Health Insurance	Infant Vaccination Rate	Low Birth Weight	Average Prenatal Visits	Schools per 10,000 inh.	Teacher-Pupil Ratio	Student Enrollment	Aqueduct	Sewage Disposal	Public Sanitation	Corruption Sanctions (=1)	Night Lights	Cadastral Value	Emergency Victims		Conflict Events (=1)	Coca Crops (=1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Affected × 1[t > 2000]	-0.01 (0.008)	0.01 (0.010)	2.26 (1.830)	0.02 (0.036)	0.03 (0.396)	0.00 (0.000)	0.01 (0.032)	-0.04* (0.022)	-0.03 (0.021)	-0.03 (0.021)	-0.00 (0.016)	0.00 (0.009)	-0.02 (0.017)	29.21 (52.752)	-0.02 (0.015)	0.01 (0.011)	0.00 (0.037)
Municipality FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	6,440	11,953	12,874	12,869	16,441	16,478	16,478	21,160	21,160	21,160	8,639	16,560	11,466	19,305	17,480	18,400	11,867
Municipalities	920	920	920	920	920	920	920	920	920	920	920	920	821	920	920	920	920
Pre-Reform DV Mean	0.78	0.57	60.65	4.07	30.86	0.05	7.65	0.45	0.30	0.31	0.15	0.94	17.05	288.31	0.44	0.13	-0.08
Pre-Reform DV Std. Dev.	0.43	0.32	36.63	0.97	15.79	0.01	1.28	0.50	0.46	0.46	0.36	0.76	1.12	1373.90	0.50	0.34	1.02

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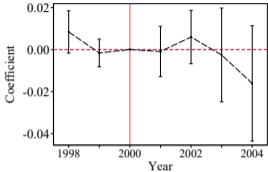
[Propensity-score weighting](#)

## No change in measures of public goods or living standards (PSW)

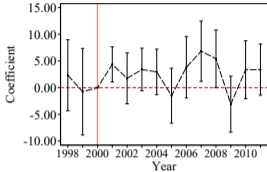
	Health Outcomes				Education Outcomes			Public Services			Other Outcomes						Public Goods Index
	Subsidized Health Insurance	Infant Vaccination Rate	Low Birth Weight	Average Prenatal Visits	Schools per 10,000 inh.	Teacher-Pupil Ratio	Student Enrollment	Aqueduct	Sewage	Public Sanitation	Corruption Sanctions (=1)	Night Lights	Cadastral Value	Emergency Victims	Conflict Events (=1)	Coca Crops (=1)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
Affected $\times$ 1[ $t > 2000$ ]	-0.02 (0.010)	0.00 (0.013)	3.75** (1.692)	-0.00 (0.040)	0.10 (0.455)	-0.00 (0.001)	-0.04 (0.029)	-0.04* (0.025)	-0.03 (0.025)	-0.03 (0.025)	0.00 (0.017)	-0.00 (0.010)	-0.02 (0.023)	41.94 (78.945)	0.01 (0.020)	-0.00 (0.012)	-0.06 (0.042)
Municipality FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Propensity Score Weighting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	5,733	10,646	11,465	11,464	14,701	14,699	14,699	18,837	18,837	18,837	7,964	14,742	10,105	17,196	15,561	16,380	10,593
Pre-Reform DV Mean	0.78	0.57	60.65	4.07	30.86	0.05	7.65	0.45	0.30	0.31	0.15	0.94	17.05	288.31	0.44	0.13	-0.08
Pre-Reform DV Std. Dev.	0.43	0.32	36.63	0.97	15.79	0.01	1.28	0.50	0.46	0.46	0.36	0.76	1.12	1373.90	0.50	0.34	1.02
Sample first year	1998	1998	1998	1998	1996	1996	1996	1996	1996	1996	1990	1996	2000	1998	1996	1999	1998
Sample final year	2004	2010	2011	2011	2013	2013	2013	2018	2018	2018	2019	2013	2013	2018	2014	2018	2010

Back

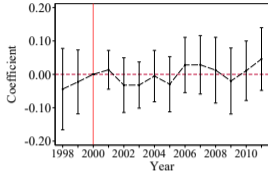
# No change in education or health measures



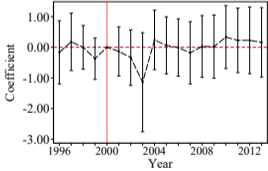
(a) Health insurance



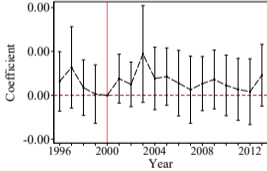
(b) Low birth weight



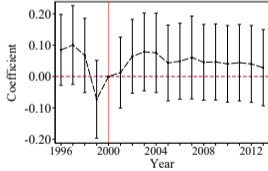
(c) Prenatal checks



(d) Schools



(e) Teacher-pupil ratio



(f) Enrollment

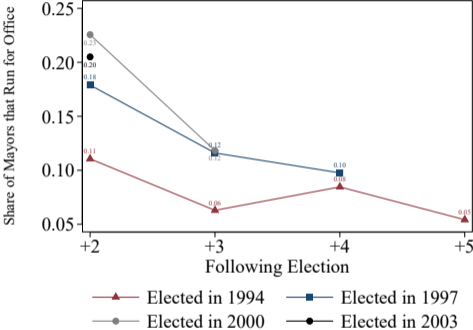
## Null effect on corruption robust to other precision cut-offs

	DV: Corruption Sanctions (=1)			
	Name Matching Scores			
	70/100	80/100	90/100	100/100
	(1)	(2)	(3)	(4)
Affected $\times \mathbb{1}[t > 2000]$	-0.02 (0.017)	-0.01 (0.017)	-0.01 (0.016)	-0.00 (0.015)
Municipality FE	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Observations	6,499	6,499	6,499	6,499
Pre-Reform DV Mean	0.23	0.19	0.15	0.10
Pre-Reform DV Std. Dev.	0.42	0.39	0.36	0.30

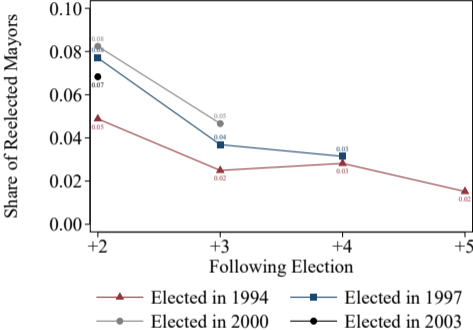
## Null effect on corruption robust to other measures

	Mayor Sanctions (=1)		Mayor's Party Sanctions (=1)	Municipality Sanctions (=1)	Candidate Sanctions (=1)
	Before Term	After Term			
	(1)	(2)	(3)	(4)	(5)
Affected $\times \mathbb{1}[t > 2000]$	-0.00 (0.015)	-0.00 (0.004)	0.00 (0.017)	0.01 (0.006)	-0.03 (0.021)
Municipality FE	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓
Observations	6,499	6,499	6,878	21,944	4,050
Pre-Reform DV Mean	0.15	0.01	0.43	0.05	0.30
Pre-Reform DV Std. Dev.	0.35	0.08	0.49	0.21	0.46

# Incumbents have a very low probability of running or winning again

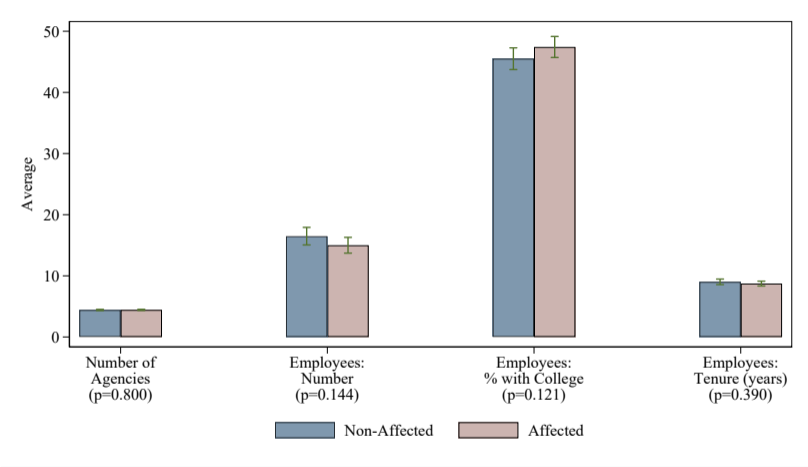


(a) Running

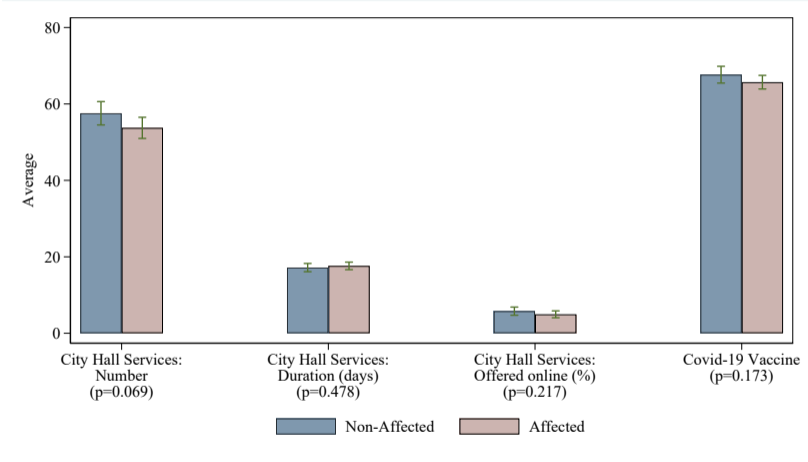


(b) Winning

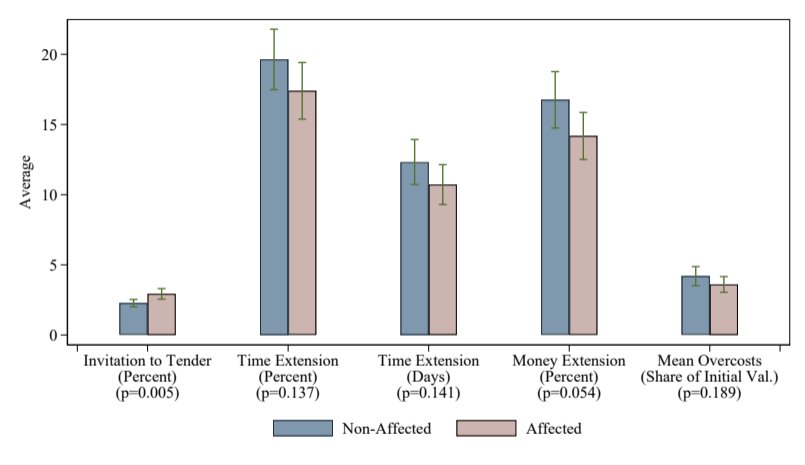
# Bureaucracy is similar today across municipalities with varying exposure to fiscal rule



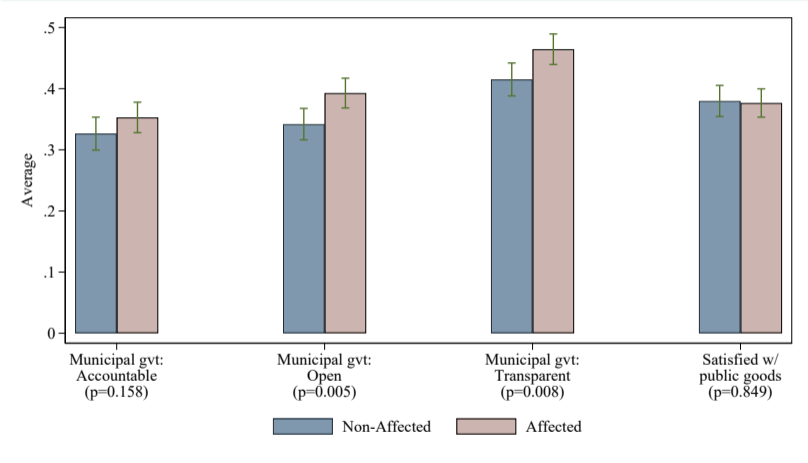
# Administrative services are similar today across municipalities with varying exposure to fiscal rule



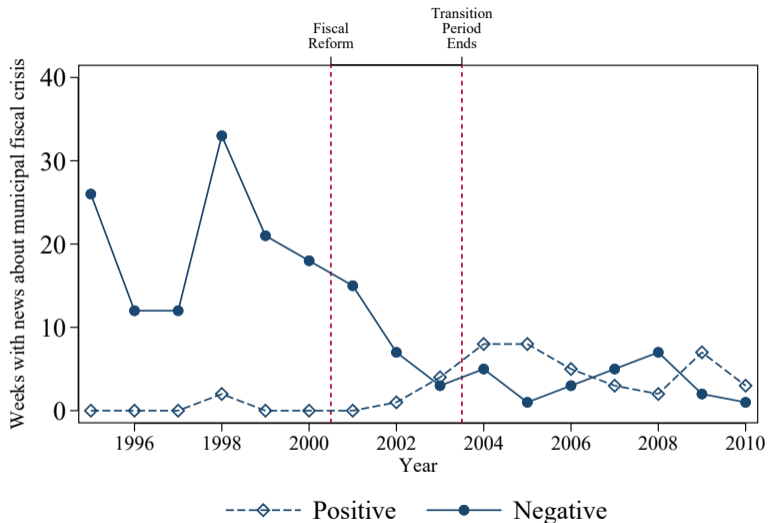
# Public contracts are similar today across municipalities with varying exposure to fiscal rule



# Citizen perceptions are similar today across municipalities with varying exposure to fiscal rule



## News coverage switches from abundant and negative to infrequent but positive



## Electoral results are robust to propensity-score weighting

	Incumbent Vote Share	Incumbent Wins (=1)
	(1)	(2)
Affected $\times \mathbb{1}[t > 2000]$	0.06** (0.026)	0.05* (0.030)
Municipality FE	✓	✓
Department-year FE	✓	✓
Propensity Score Weighting	✓	✓
Propensity Score Weighting		
Observations	5,467	7,037
Pre-Reform DV Mean	0.49	0.52
Pre-Reform DV Std. Dev.	0.39	0.50

## Other political outcomes (i.e., competition) are largely unaffected

	Number of Candidates	Golosov Index	HHI	Margin of Victory	Share Winner
	(1)	(2)	(3)	(4)	(5)
Affected $\times \mathbb{1}[t > 2000]$	-0.01 (0.012)	0.01 (0.012)	-0.01 (0.006)	-0.01 (0.008)	-0.00 (0.004)
Municipality FE	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓
Observations	6,059	6,054	6,054	6,053	8,633
Pre-Reform DV Mean	6.23	2.09	0.37	0.20	0.54
Pre-Reform DV Std. Dev.	1.45	0.65	0.14	0.20	0.13

## Increase in Conservative vote share, but main results robust to party FE

	Vote Share Conservative	Vote Share Liberal	Vote Share Incumbent 01-03	Vote Share Incumbent	Incumbent Wins (=1)
	(1)	(2)	(3)	(4)	(5)
Affected $\times \mathbb{1}[t > 2000]$	-0.00 (0.007)	0.02** (0.009)	0.03* (0.017)	0.06*** (0.020)	0.06** (0.023)
Municipality FE	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓
Incumbent Party FE				✓	✓
PS Weighting					
Observations	6,054	6,054	5,500	5,458	7,158
Pre-Reform DV Mean	0.08	0.14	0.56	0.49	0.52
Pre-Reform DV Std. Dev.	0.13	0.17	0.35	0.39	0.50

## A simple model of political agency I: basic set-up

- Two-period model with an election in-between (easily extended to multiple periods if voter is not dynamically sophisticated)
- Incumbent observes public revenue (high or low) and chooses public spending (high or low), with no restriction initially
- Voter then observes revenue and spending and decides whether to re-elect the **incumbent party**
  - Voter prefers high spending|high revenue and low spending|low revenue

## A simple model of political agency II: parties and politicians

- Two types of politician: congruent and dissonant (private info)
  - Congruent politicians have the same preferences as the voter
  - Dissonant politicians prefer high spending irrespective of revenue
- Each party (A and B) has a fixed share of congruent politicians  $\theta_i$
- Each period, nature draws a candidate from each party's Bernoulli distribution, with respective parameters  $\theta_A$  and  $\theta_B$
- Parties only care about winning and would implement policy in line with voter's preferences, but are weak and cannot enforce this

## A simple model of political agency III: Voter's beliefs

- Voter's prior on  $\theta_i \sim \text{Beta}(\alpha_i > 0 \text{ and } \beta_i > 0) \Rightarrow E[\theta_i] = \frac{\alpha_i}{\alpha_i + \beta_i}$
- Little structure (i.e.,  $\alpha_i = \beta_i = 1$  corresponds to uniform prior)
- Beta is the conjugate prior of Bernoulli (i.e. posterior is also Beta distributed with hyperparameters  $\alpha'_i$  and  $\beta'_i$ ):
  - If incumbent is revealed as congruent:  $\alpha'_i = \alpha_i + 1$
  - If incumbent is revealed as dissonant:  $\beta'_i = \beta_i + 1$
  - Otherwise, hyperparameters unchanged

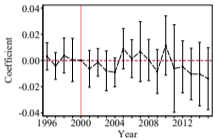
## A simple model of political agency IV: Initial PBE

- In equilibrium, each type of politician chooses most preferred spending level conditional on revenue
  - $(r_H, g_H) \Rightarrow$  No information
  - $(r_L, g_H) \Rightarrow$  Dissonant incumbent  $\Rightarrow \beta'_I = \beta_I + 1$
  - $(r_L, g_L) \Rightarrow$  Congruent incumbent  $\Rightarrow \alpha'_I = \alpha_I + 1$
  - $(r_H, g_H) \Rightarrow$  Off equilibrium  $\Rightarrow$  Assume dissonant
- Re-elect  $\iff E[\theta_I | r, g] \geq E[\theta_{-I} | r, g]$
- Key features:
  - Policy may not reflect voter's preferences, but is informative about  $\theta_I$
  - If priors are close enough, a dissonant incumbent can cause the voter to not re-elect the incumbent party

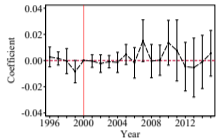
## A simple model of political agency V: Fiscal rule

- Assume now that a fiscal rule does not allow spending to be high when revenue is low
  - Now both types pool at high spending when revenue is high and low spending when revenue is low
  - Voter does not learn from policy outcome, but is unaffected as policy reflects her preferences
  - Without any learning, voter is happy to re-elect the incumbent party
- ⇒ Fiscal rule solves the agency problem

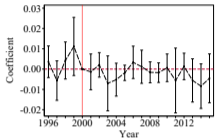
# Weak decrease in protests, but fewer strikes due to labor disputes



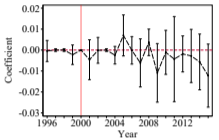
(a) Any



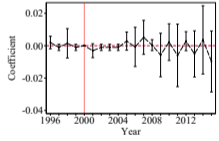
(b) Public services



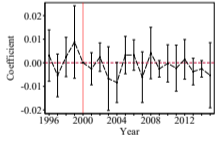
(c) Labor disputes



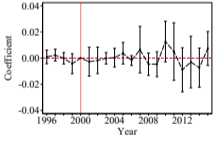
(d) Other causes



(e) Demonstration



(f) Strike



(g) Roadblock

## Protest results are robust to propensity-score weighting

	Any Protest (=1)	Cause (=1)			Type (=1)		
		Public Services	Labor Disputes	Other	Demonstration	Strike	Roadblock / Occupation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Affected $\times \mathbb{1}[t > 2000]$	-0.005 (0.0044)	0.005 (0.0034)	-0.008*** (0.0029)	-0.002 (0.0020)	-0.000 (0.0023)	-0.007** (0.0030)	0.003 (0.0031)
Municipality FE	✓	✓	✓	✓	✓	✓	✓
Department-year FE	✓	✓	✓	✓	✓	✓	✓
Propensity Score Weighting	✓	✓	✓	✓	✓	✓	✓
PS Weighting							
Observations	16,380	16,380	16,380	16,380	16,380	16,380	16,380
Pre-Reform DV Mean	0.009	0.004	0.005	0.001	0.002	0.006	0.002
Pre-Reform DV Std. Dev.	0.096	0.062	0.070	0.029	0.039	0.078	0.049