How Effective Are Monetary Incentives to Vote?

Evidence from a Nationwide Policy

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Which large-scale policies can help us raise voter turnout?

- Voter turnout has been dropping worldwide for the past 30 years
  - Turnout in most recent presidential elections in the Americas: 50-60%
- Low turnout raises concerns about legitimacy of outcomes, representativeness of elected officials, upholding of democratic values
- What are the evidence-based policy options available for implementation at scale?
  - Large-scale effectiveness of many localized and short-lived field experiments on voter mobilization remains unknown
  - Cost-effectiveness of most policy alternatives is uncertain and difficult to evaluate in the absence of a benchmark

How effective are pecuniary incentives for turnout?

- Publicly-provided monetary incentives are a scarcely studied but potentially powerful tool to increase voter turnout
  - e.g., tax breaks, lotteries, discounts on gvt. services, direct transfers
- Effectiveness is uncertain, as extrinsic incentives may crowd out intrinsic motivation to vote (Bénabou and Tirole, 2003, 2006)
- Large-scale provision may have other (general equilibrium) effects:
  - Social contagion
  - Informational constraints
  - Unintended consequences
- How important is the fine for the functioning of compulsory voting?

We study a reform to the value of the voter abstention fine in Peru

- Compulsory voting with a historically large, homogeneous, and moderately enforced fine for not voting
- A reform in 2006 differentially reduced the fine across districts, providing plausibly exogenous variation in the pecuniary incentive to vote
- Using admin. data, we study different dimensions of voters' responses: turnout and registration, information acquisition and electoral outcomes
    - Short run vs long run, different types of elections
- We exploit senior citizen exemption from compulsory voting to estimate aggregate effect and gauge importance of monetary incentives

Voters respond in sophisticated way to marginal monetary incentives

- ↑ S/10 fine (US$3 approx.) ⇒ ↑ 0.5 pp. turnout on average
  - Policy caused 5.5 pp. turnout gap between high- and low-fine districts
  - Effect is larger in the long run (0.8 pp.) and differs across election types
- ↑ S/10 fine ⇒ ↑ 1% registered voters
  - First-time voters misreport address to avoid potentially paying higher fine
  - Selection explains 10-20% of the effect of the fine on turnout
- Of every 10 votes issued due to the fine, 8.7 of them are invalid (minimal effects on representation)
- Fine-related internet searches rise disproportionately after the reform
- Turnout falls 10-20 pp. ages 70-72 ⇒ Fine explains 25-50% of CV

Contributions: voter turnout, compulsory voting and policy scale-up

- Study the effects of monetary incentives to vote in the wild
  (Loewen et al, '08; Panagaopoulos, '12; León, '17; Carpio et al., '18; Shineman, '18;)
- Estimate relative contribution of abstention fine to aggregate effect of compulsory voting on turnout
  (Funk, '07; Fowler, '13; Cepaluni & Hidalgo, '16; Hoffman et al., '17; Bechtel et al., '18)
- Voters' multidimensional response provides new evidence on challenges of policy **scale-up** and **targeting**
  (Deaton, '10; Camacho & Conover, '11; Allcott, '15; Cassan, '15; Al-Ubaydli et al., '17; Banerjee et al., '17; Davis et al., '17; Muralidharan and Niehaus, '17; Vivalt, '17; Bold et al., '18; Grossman et al., '18; Rosenzweig and Udry, '18)

Roadmap

1. Introduction
2. Background
3. Empirical strategy
4. Results
   - Voter turnout
   - Voter registration
   - Information acquisition
   - Aggregate effect of compulsory voting
5. Discussion

Voting is mandatory in Peru for ages 18-70 since 1933

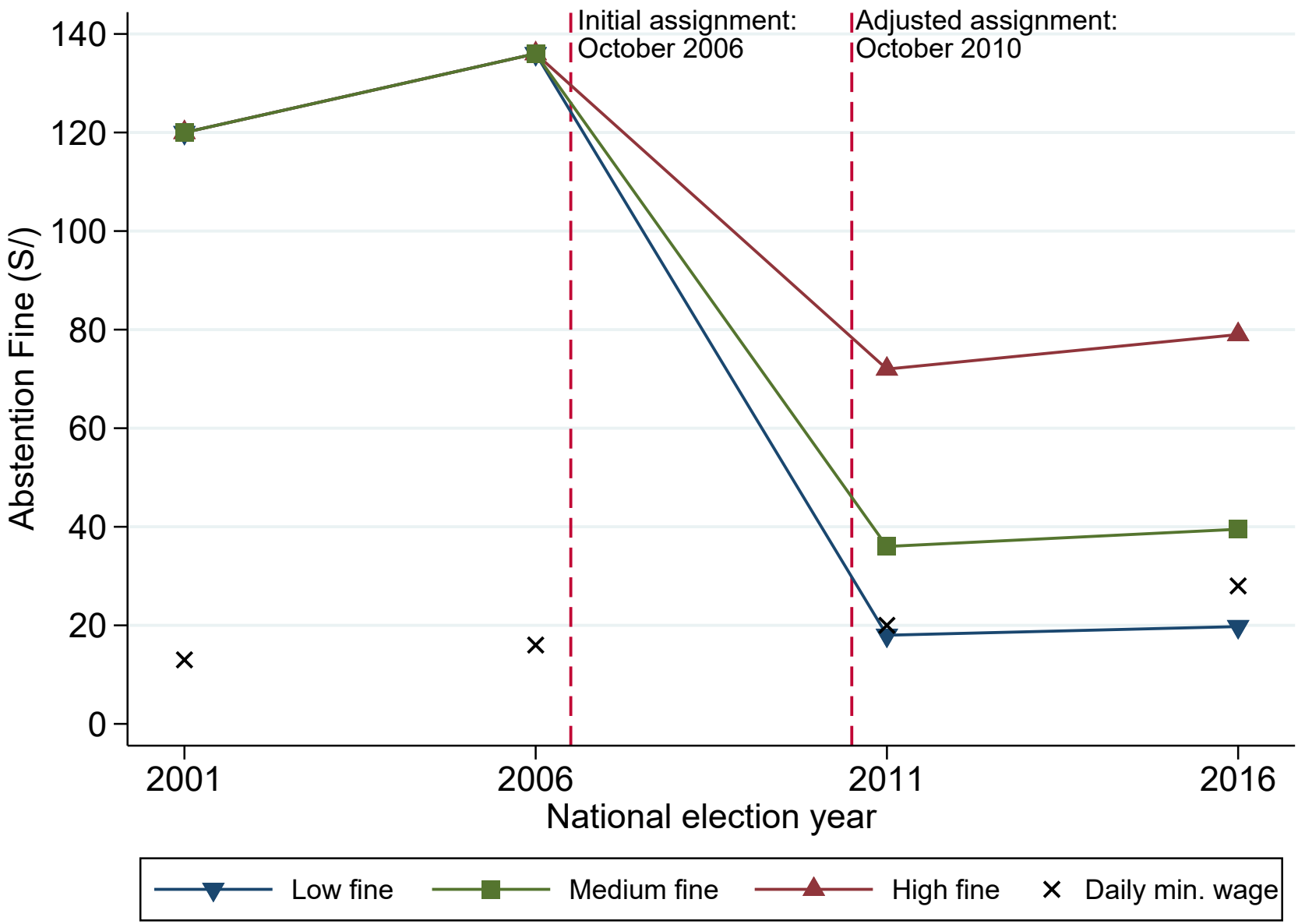
- Non-voters have restricted access to government/financial services until they pay a fine or provide an excuse (e.g., medical)
- Fines expire after 4 years, but enforcement improved in 2012
  - In mid-2018, 49% of 2016 fines settled v.s. 23% from 2011 Figure
- We study national elections taking place every five years
  - General election (legislative + presidential first round) on same day
  - Presidential run-off (top two candidates) two months later if needed
  - Average voter turnout of 85%, but dropping since 2006
    National Categories

Fine for electoral abstention was reduced and segmented in 2006

- Until 2006, the fine was uniform across districts ($\approx$ S/ 140)
- A reform after the national elections of that year placed districts in three groups: Extreme Poor, Poor, Non-Poor (unclear criteria)
- Fine was reduced by 50% in non-poor, 75% in poor, 87.5% in extr. poor
- Districts were reclassified in 2010 based on the category w/ largest population share, according to an official poverty map from 2007
  - First election post-reform in 2011 $\Rightarrow$ Use 2010 assignment
  - We control for 2006 assignment in our regressions

Map 2006 classification | Map 2010 classification | Transition matrix

We observe two election cycles before the reform and two others after



We estimate event-study and dose-response models using admin. data

We first estimate the effect of being assigned to a poverty/fine category on different outcomes:

$$y_{d,p,e} = \sum_k \sum_t \beta_{k,t} \left[\mathbb{1}(e = t) \times \mathbb{1}(c_{10} = k)\right] + \alpha_d + \delta_{p,e,c_{06}} + \epsilon_{d,p,e} \quad (1)$$

- $y_{d,p,e}$ is an outcome for district d in province p and election cycle t
- $\beta_{k,t}$ represent the causal effect of being assigned to category k at election cycle t
- α_d and $\gamma_{p,c06,e}$ are Election x Province x '06 category FE

- Standard errors clustered by province (192 units)
- Weights: number of registered voters for 2001 elections
- Balanced panel of 1,755 districts (94% of total, 96% of population)

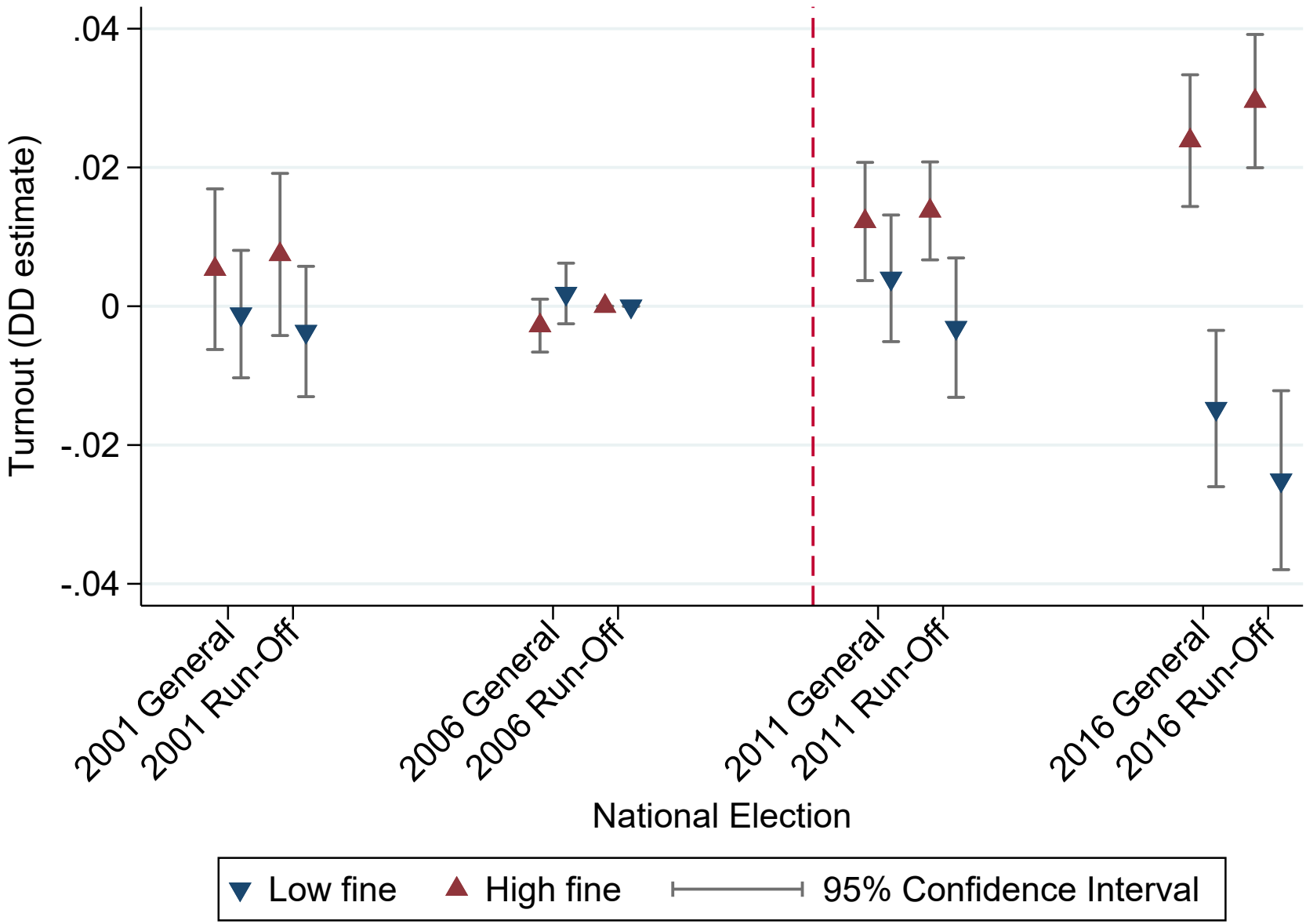
We estimate event-study and dose-response models using admin. data

Exploiting the variation in the level of the fine, we estimate the effect of marginal changes in the value of the fine:

$$y_{d,p,e} = \nu \text{ fine}_{d,e} + \alpha_d + \gamma_{p,c06,e} + u_{d,p,e} \tag{2}$$

- ν represents the causal effect of a marginal change in the monetary incentives to vote
- We also run the regressions in logs to estimate elasticities

Event study shows no pre-trends and large long-run effects on turnout



S/10 fine ↑ ⇒ 0.5 pp. turnout ↑ on average

	Baseline	Election-province FE	Poverty shares	Education shares	Polling stations
	(1)	(2)	(3)	(4)	(5)
Panel A - Dependent variable: Voter Turnout$_{i,t}$ (Mean: 0.85)					
Fine value$_{i,t}$ (S/ x 100)	0.049***	0.046***	0.035***	0.061***	0.049***
	[0.008]	[0.010]	[0.011]	[0.011]	[0.008]
Panel B - Dependent variable: ln Voter Turnout$_{i,t}$ (Mean: -0.17)					
ln Fine value$_{i,t}$	0.030***	0.028***	0.023***	0.037***	0.030***
	[0.005]	[0.006]	[0.007]	[0.007]	[0.005]
Observations	13,536	14,040	13,536	10,152	13,536
Districts	1692	1755	1692	1692	1692
District FE	Yes	Yes	Yes	Yes	Yes
Election-Province-Category '06 FE	Yes	No	Yes	Yes	Yes
Election-Province FE	No	Yes	No	No	No
Election-Poverty shares FE	No	No	No	Yes	No
Education shares	No	No	No	Yes	No
Polling stations	No	No	No	No	Yes

... but large heterogeneity

Dependent variable:	Turnout$_{i,t}$ (Mean=0.85)			ln Turnout$_{i,t}$ (Mean=-0.17)		
	Long-run	Run-off	Poverty	Long-run	Run-off	Poverty
	(1)	(2)	(3)	(4)	(5)	(6)
(ln) Fine value$_{i,t}$ (S/ x 100) [a]	0.020**	0.039***	-0.022	0.011**	0.023***	-0.021
	[0.008]	[0.009]	[0.022]	[0.005]	[0.006]	[0.022]
(ln) Fine value$_{i,t}$ $\times$ $\mathbb{1}$(2016)$_t$ [b]	0.051***			0.038***		
	[0.005]			[0.003]		
(ln) Fine value$_{i,t}$ $\times\mathbb{1}$(Run-Off)$_t$ [b]		0.019***			0.014***	
		[0.004]			[0.003]	
(ln) Fine value$_{i,t}$ $\times$ Share Poor$_i$ [b]			0.072***			0.058**
			[0.021]			[0.025]
Observations	13,536	13,536	13,536	13,536	13,536	13,536
Districts	1692	1692	1692	1692	1692	1692
R-squared	0.03	0.02	0.03	0.03	0.02	0.03
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Election x Province x Category '06 FE	Yes	Yes	Yes	Yes	Yes	Yes

We estimate an average (long-run) elasticity of 0.03 (0.05) Figure

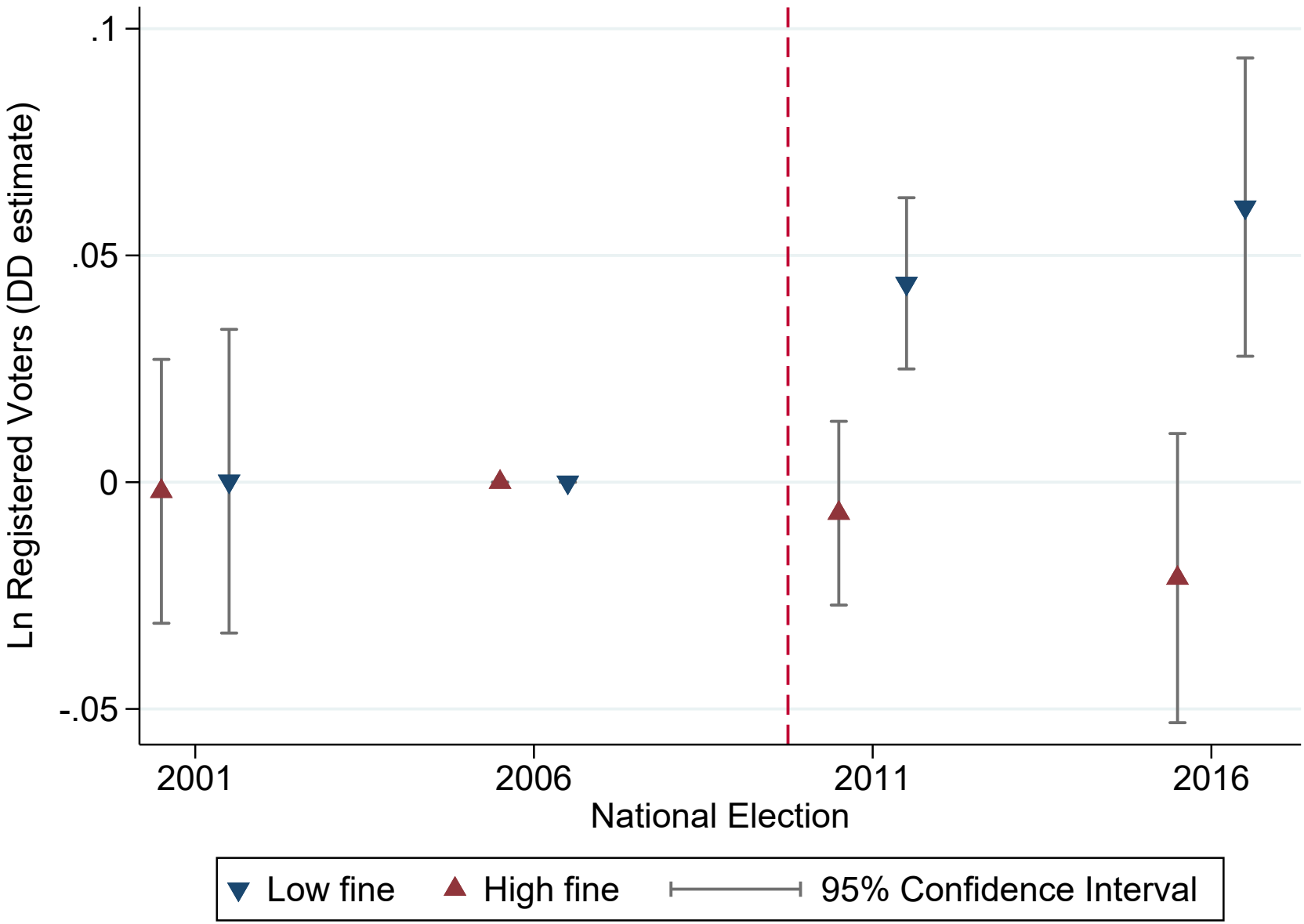
Improved enforcement after 2012 doesn't explain turnout effects

- We use data on the number of fines issued, paid and excused since the subnational elections of 2006 to study enforcement of the fine
- Enforcement improved following creation of collections unit in 2012
  - Debtor's bank account can be frozen + fine doesn't expire
  - Improved enforcement may have affected richer districts more
  - Results for 2011 unaffected, but potentially confounded for 2016
- Improved enforcement explains 30% of the long-run effect of the abstention fine on turnout Table

Did the reform affect voter registration? Is this driving turnout effect?

- We can decompose turnout into the number of votes (numerator) and the number of voters (denominator) to study underlying mechanism
- Reform provides an incentive for voters to irregularly change registration address to districts with a lower fine
  - There is anecdotal evidence on address misreporting
- We replicate the previous analysis using 'ln registered voters' as dependent variable
  - No further registration for run-off $\Rightarrow$ 1 observation per district/cycle
- We examine contribution of selection to observed effect on turnout

Voter registration rises disproportionately in extreme-poor districts



Registration effect is driven by young (mostly 1st-time) voters

	Dependent variable: ln(Registered Voters)$_{i,t}$							
	All	All	18-20	21-29	30-35	36-50	51-75	75+
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln Fine value$_{i,t}$	-0.046***	-0.045**	-0.276***	-0.055***	-0.031	-0.021	-0.017	-0.057
	[0.015]	[0.019]	[0.043]	[0.020]	[0.022]	[0.020]	[0.024]	[0.051]
Observations	6,768	5,076	5,076	5,076	5,076	5,076	5,076	5,076
Districts	1692	1692	1692	1692	1692	1692	1692	1692
R-squared	0.002	0.001	0.030	0.001	0.0003	0.0002	0.0001	0.0008
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Time FE: Election x province x '06 category. SE clustered by province. *** p<0.01, ** p<0.05, * p<0.1

- We verify that the results are not driven by real migration, differences in economic activity (nighlights), differences in local cohort sizes or percentage of people with a DNI

Is the effect driven by registration? Bounding the effect

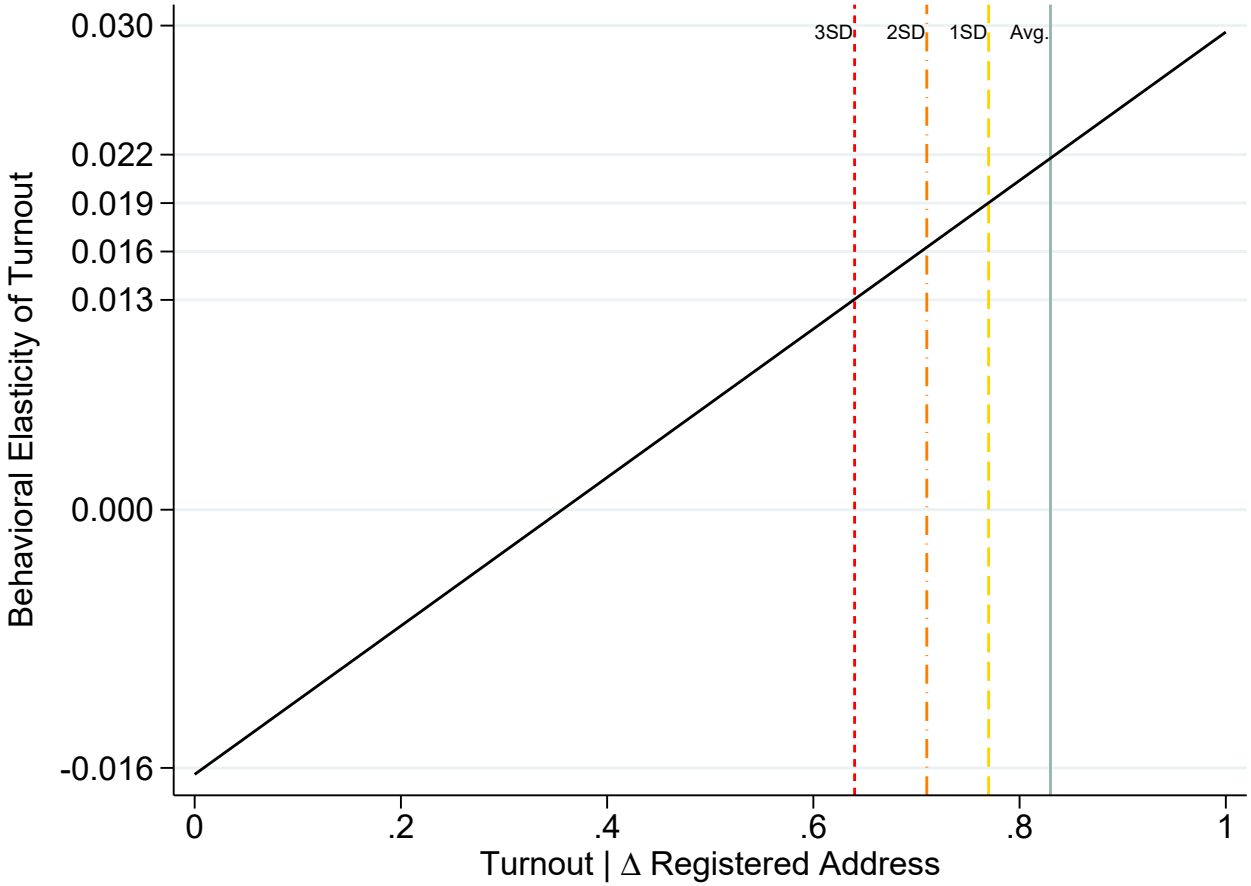
- Assume that log votes is a function of the log value of the fine and of log voters, which is itself also a function of the fine:

$$\ln V = \ln V(\ln R(\ln F), \ln F)$$

$$\Rightarrow \frac{d \ln V}{d \ln F} = \underbrace{\frac{\partial \ln V}{\partial \ln R}}_{\substack{\text{Turnout} \\ \Delta\text{registration}}} \frac{d \ln R}{d \ln F} + \underbrace{\frac{\partial \ln V}{\partial \ln F}}_{\substack{\text{Behavioral} \\ \text{elasticity}}} \tag{3}$$

Dependent variable:	ln Voters$_{i,t}$		ln Votes$_{i,t}$	
	(1)	(2)	(3)	(4)
ln Fine value$_{i,t}$ [a]	-0.046***	-0.035***	-0.016	-0.024*
	[0.015]	[0.012]	[0.016]	[0.014]
ln Fine value$_{i,t}$ $\times$ $\mathbb{1}(2016)_t$ [b]		-0.022***		0.015*
		[0.009]		[0.009]
Observations	6,768	6,768	13,536	13,536
Districts	1692	1692	1692	1692
R-squared	0.002	0.002	0.0002	0.0003
Mean of dependent variable	10.68	10.68	10.50	10.50
p-value H_0: a+b=0		0.002		0.646
District FE	Yes	Yes	Yes	Yes
Election x Province x Category '06 FE	Yes	Yes	Yes	Yes

Behavioral elasticity of turnout corresponds to 73% of that of turnout

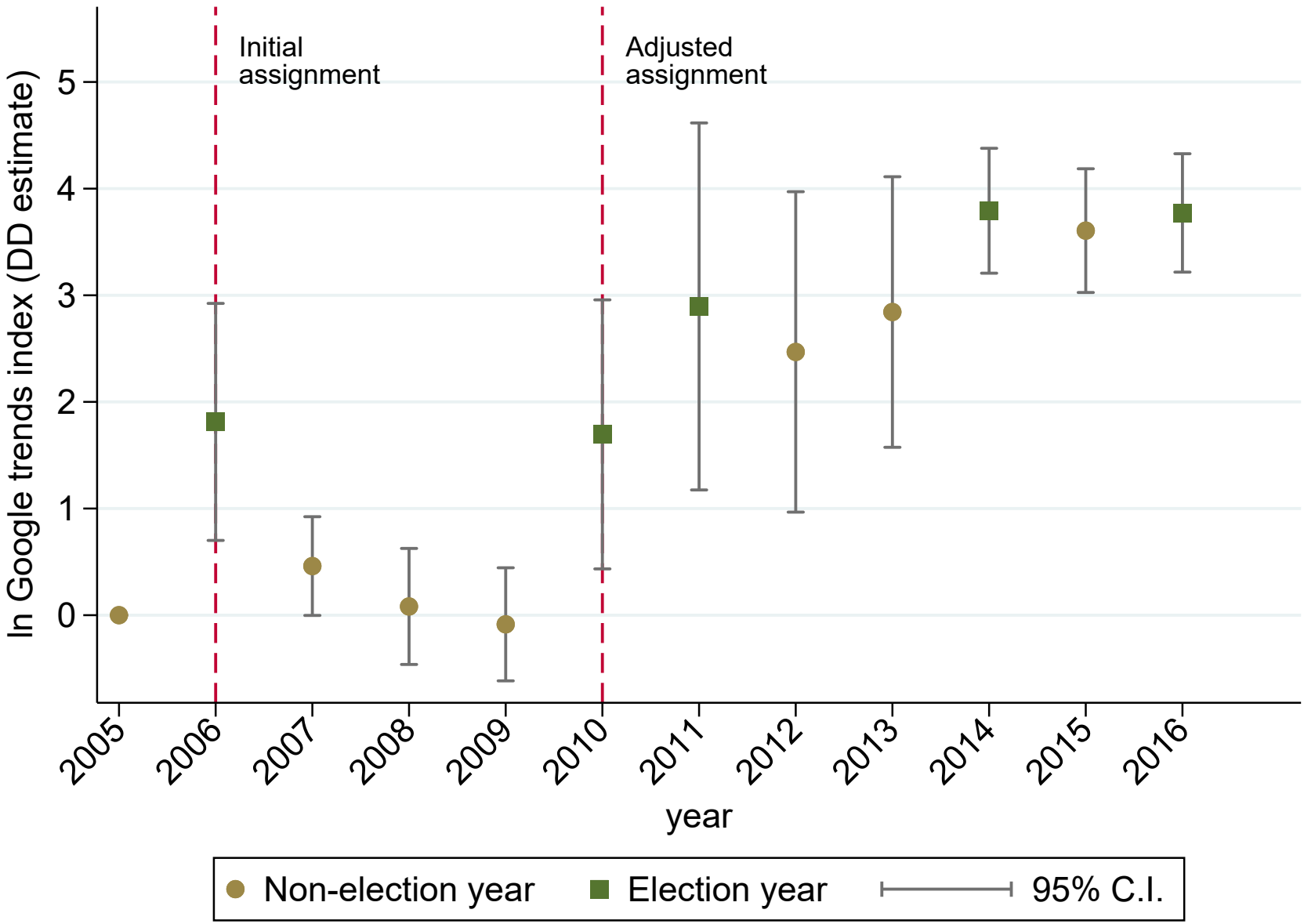


Notes: The graph shows the implied behavioral elasticity of turnout corresponding to different values of the probability of voting (i.e., turnout) for those that changed the address on their DNI to districts with a lower fine for abstention. Solid vertical line shows average turnout in 2011/16. Dashed, dash-dot and dotted lines display turnout rates that are respectively one, two and three standard deviations below the average.

Have voters got the necessary info. for such a sophisticated response?

- Previous results indicate a sophisticated response by voters to the incentives provided by the reform
- We look for evidence on information acquisition using a diff-in-diff design with data on internet searches from Google Trends
  - Internet use: 31% in 2007, 46% in 2016
- Do we observe an increase in the number of web searches related to the abstention fine after the reform?
  - Dataset includes 44 search terms, 3 related to the fine
  - Monthly observations between 2005 and 2016, w/ national coverage
  - Google Trends index normalized at 100 for "vicepresident" in 04/16
  - Event study including search-term and year (or month) fixed effects

Fine-related web searches increase disproportionately after the reform



Effects on Preference Aggregation

Dependent variable:	Turnout$_{i,t}$		Blank votes$_{i,t}$		Invalid votes$_{i,t}$	
	(1)	(2)	(3)	(4)	(5)	(6)
Fine value$_{i,t}$ (S/ x 100) [a]	0.043***	0.017*	0.027***	0.018***	0.010**	0.004
	[0.009]	[0.009]	[0.005]	[0.006]	[0.005]	[0.006]
Fine value$_{i,t}$ $\times$ $\mathbb{1}(2016)_t$ [b]		0.045***		0.016***		0.011**
		[0.005]		[0.004]		[0.005]
Observations	6,768	6,768	6,768	6,768	6,768	6,768
Districts	1692	1692	1692	1692	1692	1692
R-squared	0.015	0.024	0.011	0.013	0.002	0.003
Mean of dep. var	0.851	0.851	0.0890	0.0890	0.0334	0.0334
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Election x Province x Category '06 FE	Yes	Yes	Yes	Yes	Yes	Yes
p-value H_0: a+b=0		0.000		0.000		0.006

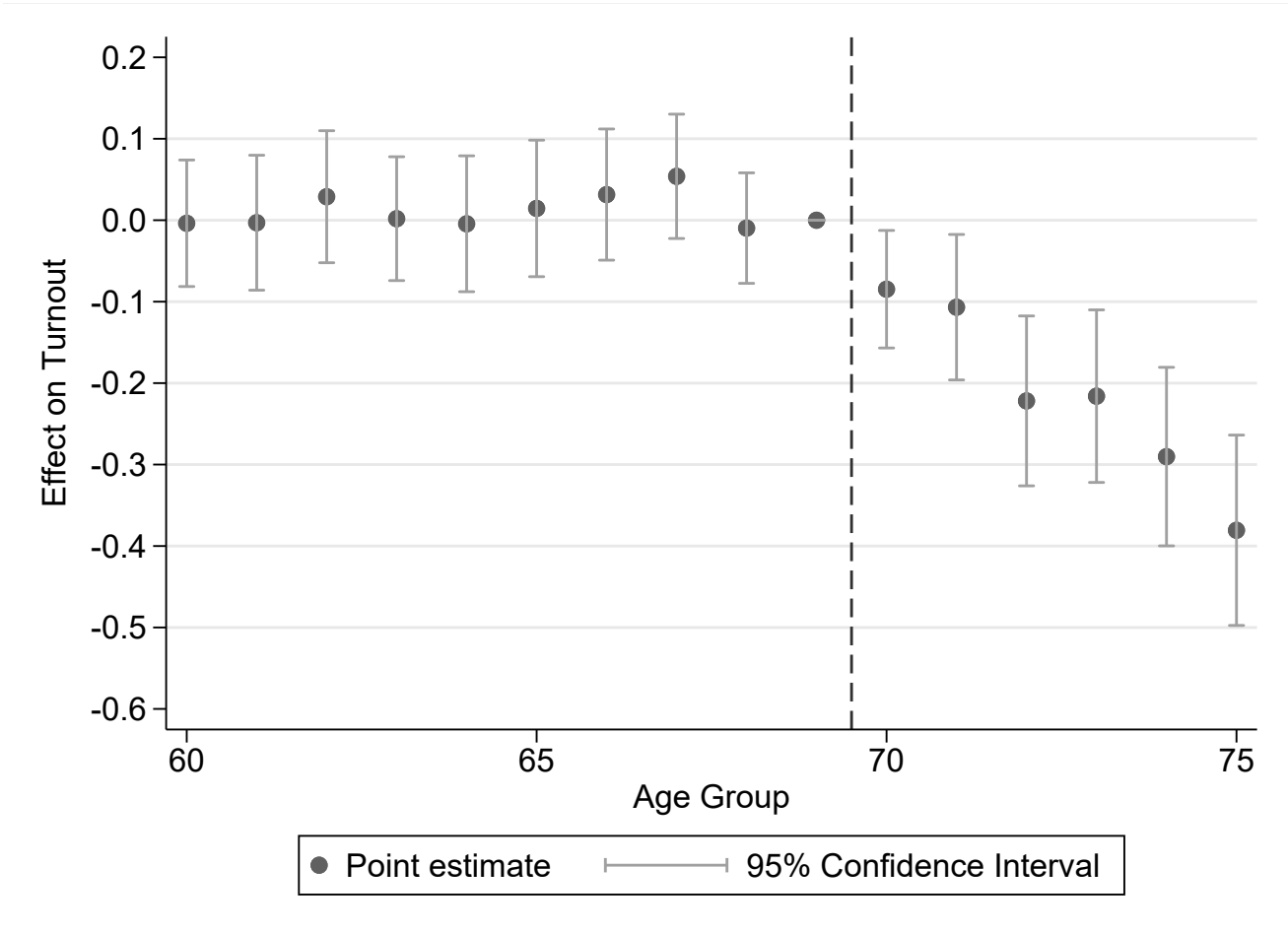
Standard errors clustered by province (192 units). *** p<0.01, ** p<0.05, * p<0.1

- 8.7 out of 10 new votes due to the fine are invalid
- Survey evidence indicates that a larger fine weakly decreases political engagement with political affairs

How important is the fine for the effectiveness of compulsory voting?

- Literature on compulsory voting mostly studies introduction/removal (Funk, '07; Fowler, '13; Hoffman et al., '17; Bechtel et al., '18)
- Estimated impact on turnout of 5-10 pp., even in settings with tiny fines or low enforcement, attributed to expressive function of the law
- We use within-polling-station variation in age structure of electorate in 2016 to estimate effect of CV exemption on turnout at age 70
  - Detailed data on age composition of electorate at 'voting-booth' level
  - Regress booth's turnout on the share of registered voters with ages in each group in $\{16,...,122\}$, omitting age 69
  - RDD estimate for Brazil of 0.044 (Cepaluni & Hidalgo, 2016)

Voter turnout drops 10 pp. at CV exemption threshold



Notes: The graph shows point estimates and 95% confidence intervals of a regression of table-level turnout on the fraction of the electorate registered at that table belonging to each age group from 16 to 122 (estimates for ages below 60 and above 75 not shown). The omitted category is the fraction with age 69. Regression includes district fixed effects, as well as an election dummy for the presidential run-off. Data includes the general election and presidential run-off from 2016. Sample includes 148,448 observations (voting tables) from 4,723 polling stations in 1,854 districts. Standard errors are clustered at the district level. Tables are weighted by the number of registered voters for the 2016 national elections. Table

Discussion: Lessons for Policy Scale-up and Targeting

- How do our estimates compare to previous experimental result?

  Our effects on turnout in the same ballpark as Panagaopoulos, '12, but an order of magnitude smaller than León, '17

- Such 'voltage drop' is not uncommon when the effects of large-scale policies are compared to those of field experiments at a lower scale (Al-Ubaydli et al., 2017).

  In this case, not difference in implementing partner, but rather information about the institutional setting $\rightarrow$ lessons for experiments in pol econ.

- Recurrent concern in policy scale-up: external validity or context dependence findings from localized field experiments

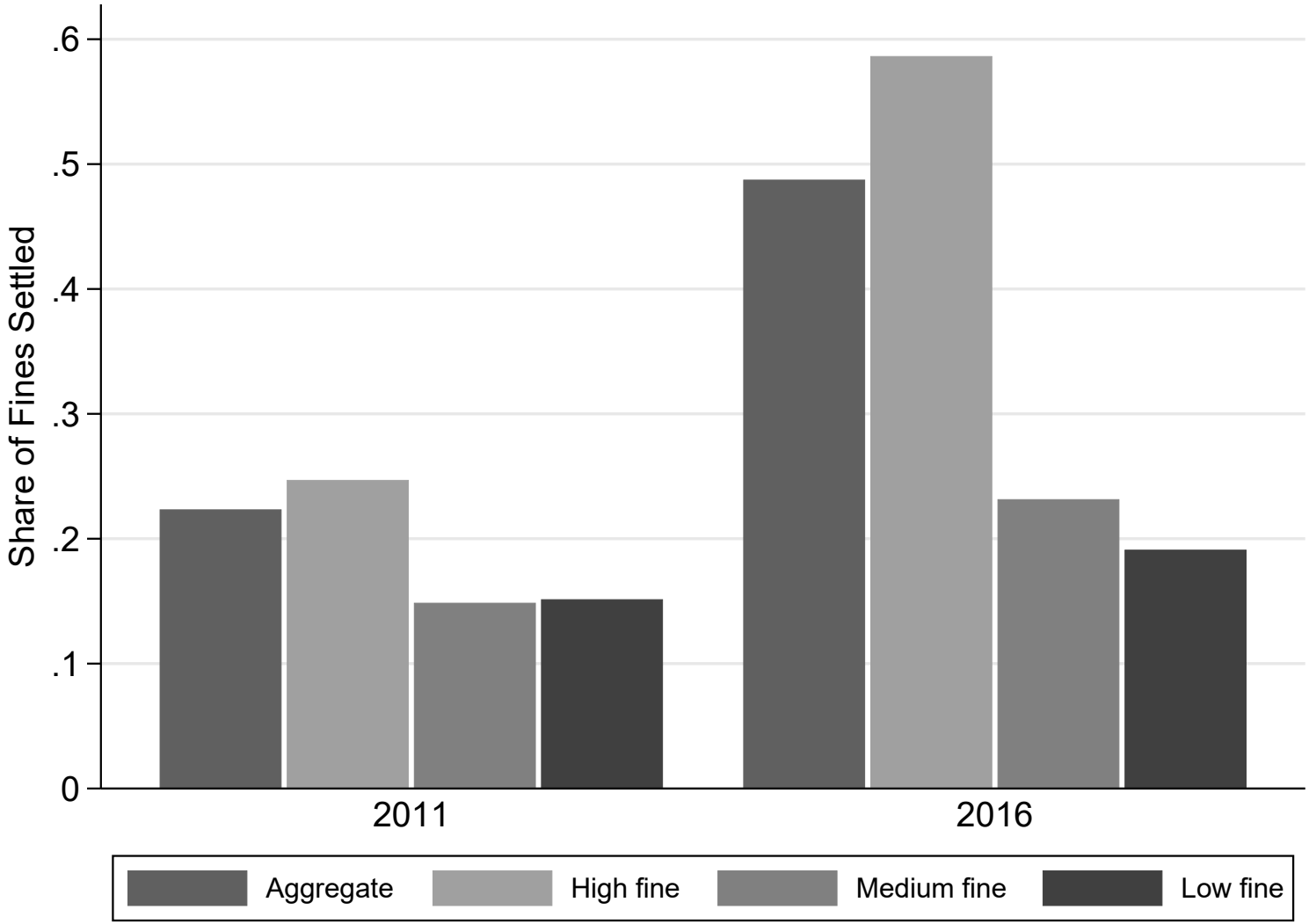
  Eg. Heterogeneous effects by election type and other GE effects (registration, social interaction/habit formation)

Concluding Remarks

- Voter turnout is responsive to monetary incentives provided through a large-scale public policy, but there is voltage drop relative to expts.
- The effectiveness of compulsory voting depends almost equally on monetary and non-monetary incentives
- Voters adapt over time and in a sophisticated manner to policy incentives, despite limited information
- Policy scale-up of experimental interventions must be wary of informational constraints and adaptation

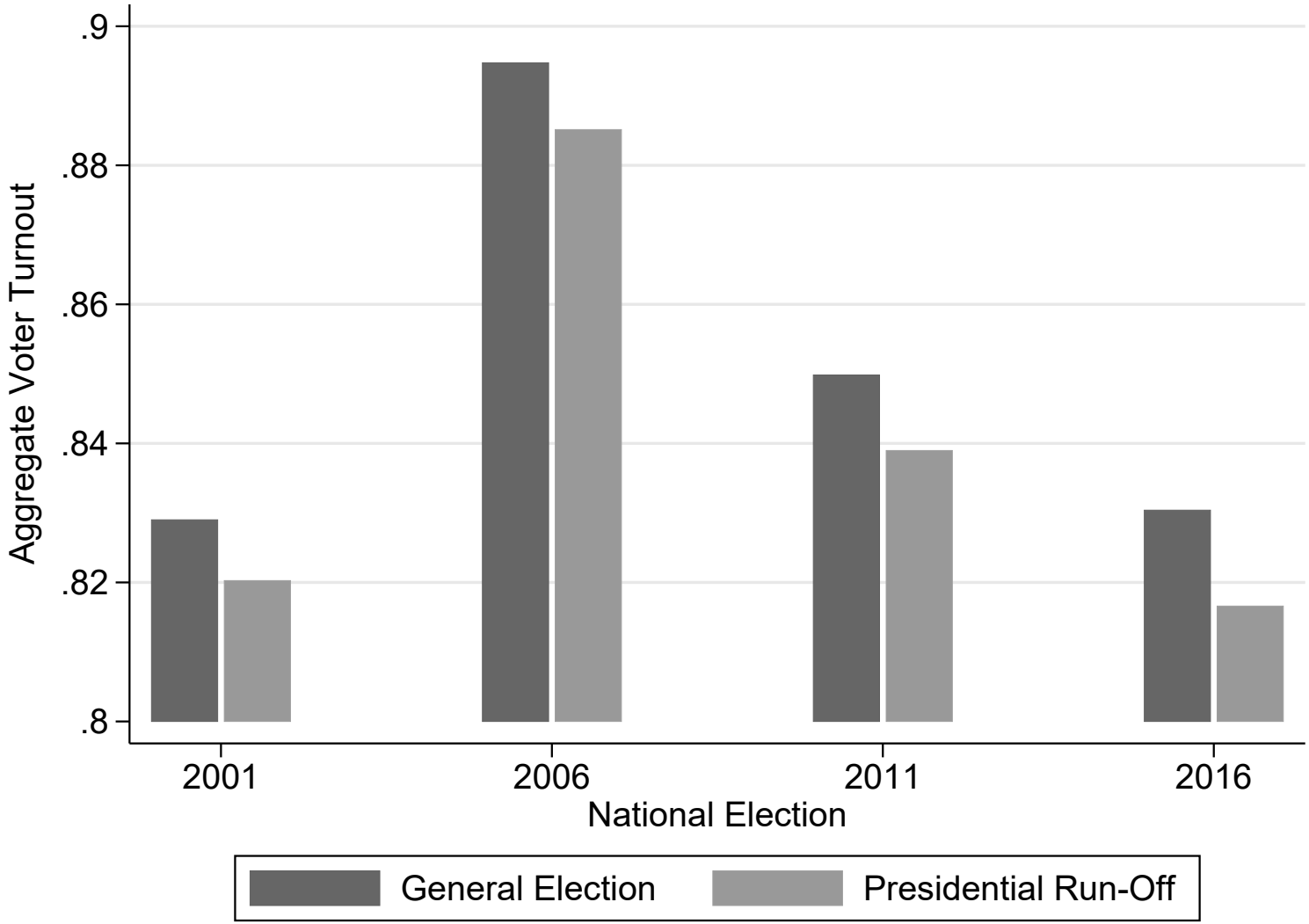
APPENDIX: EXTRA SLIDES

Share of fines settled doubled between 2011 and 2016



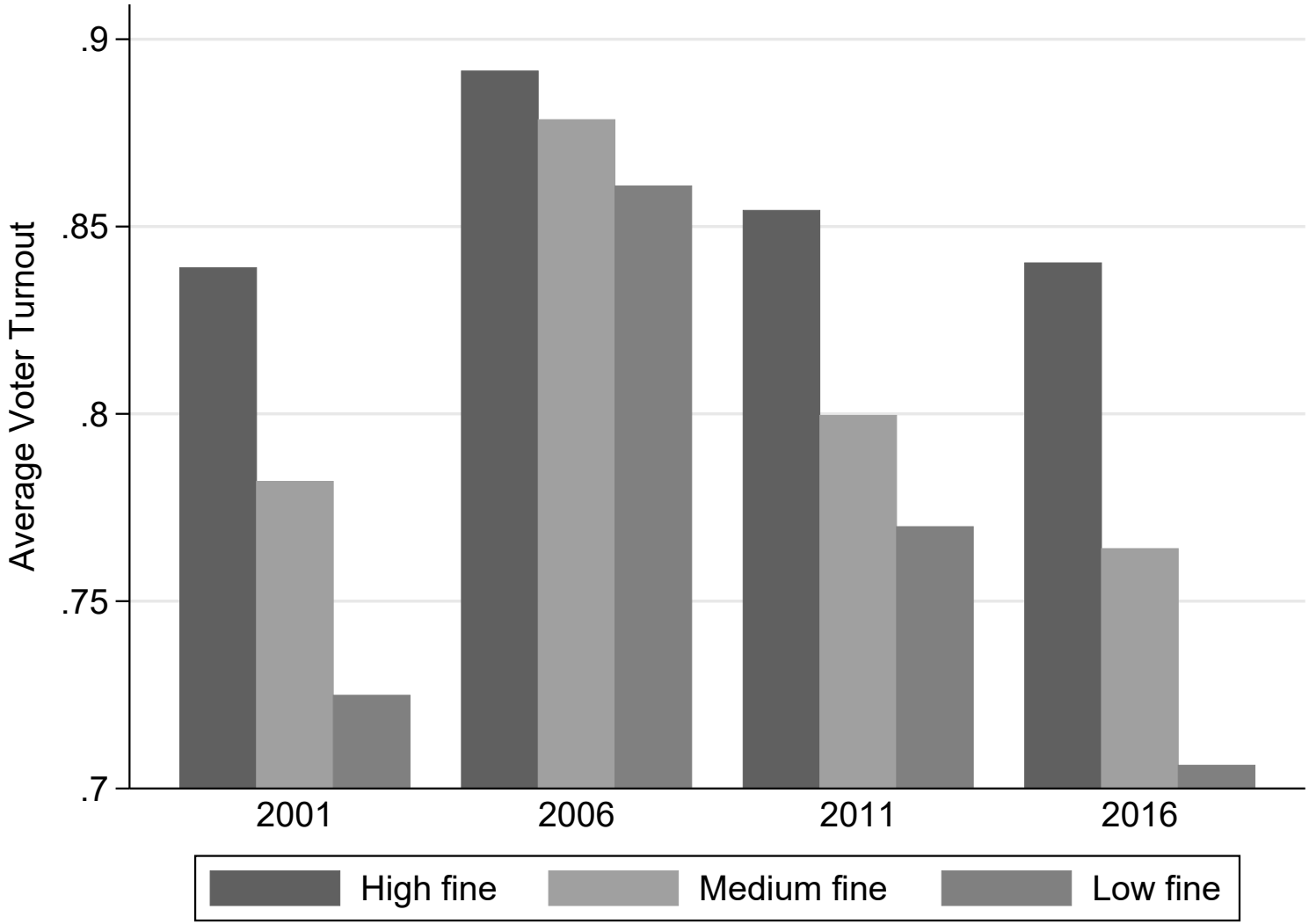
Back

Turnout for national elections has been declining since 2006



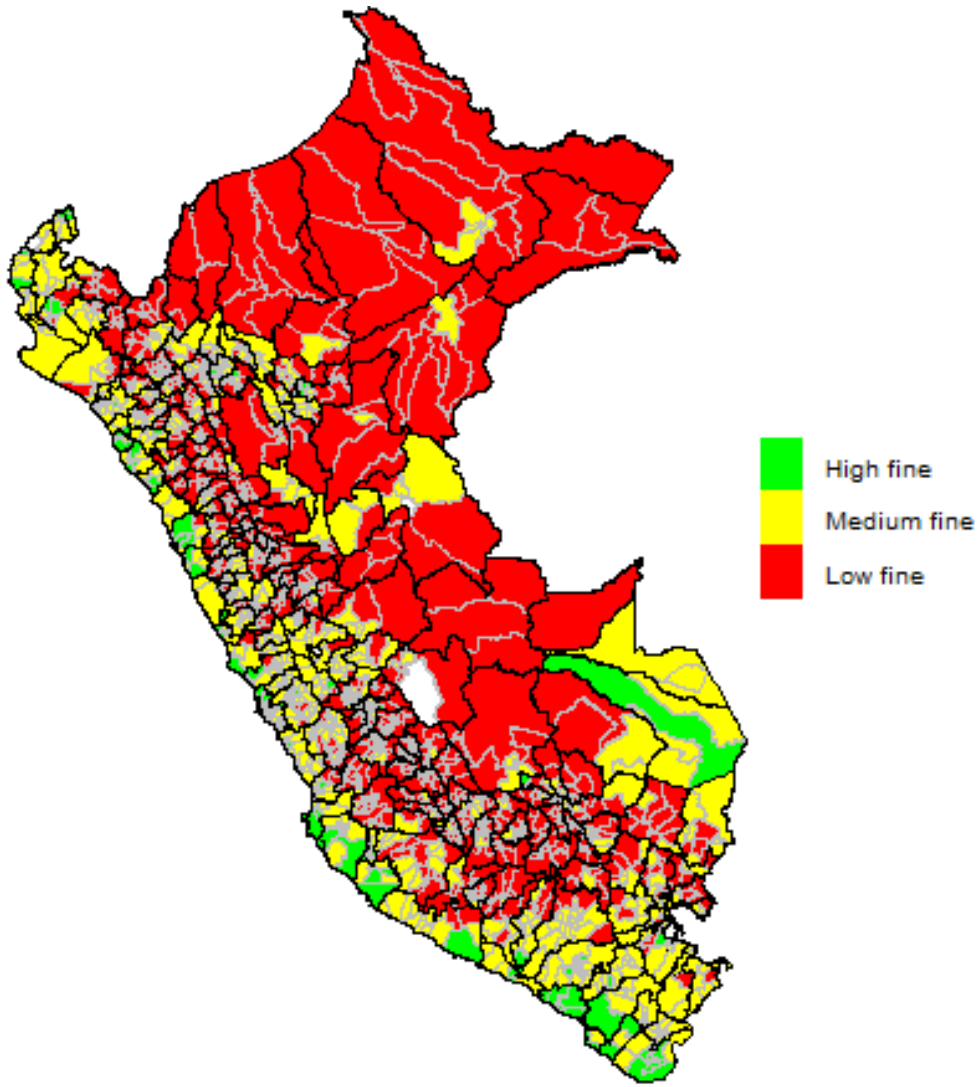
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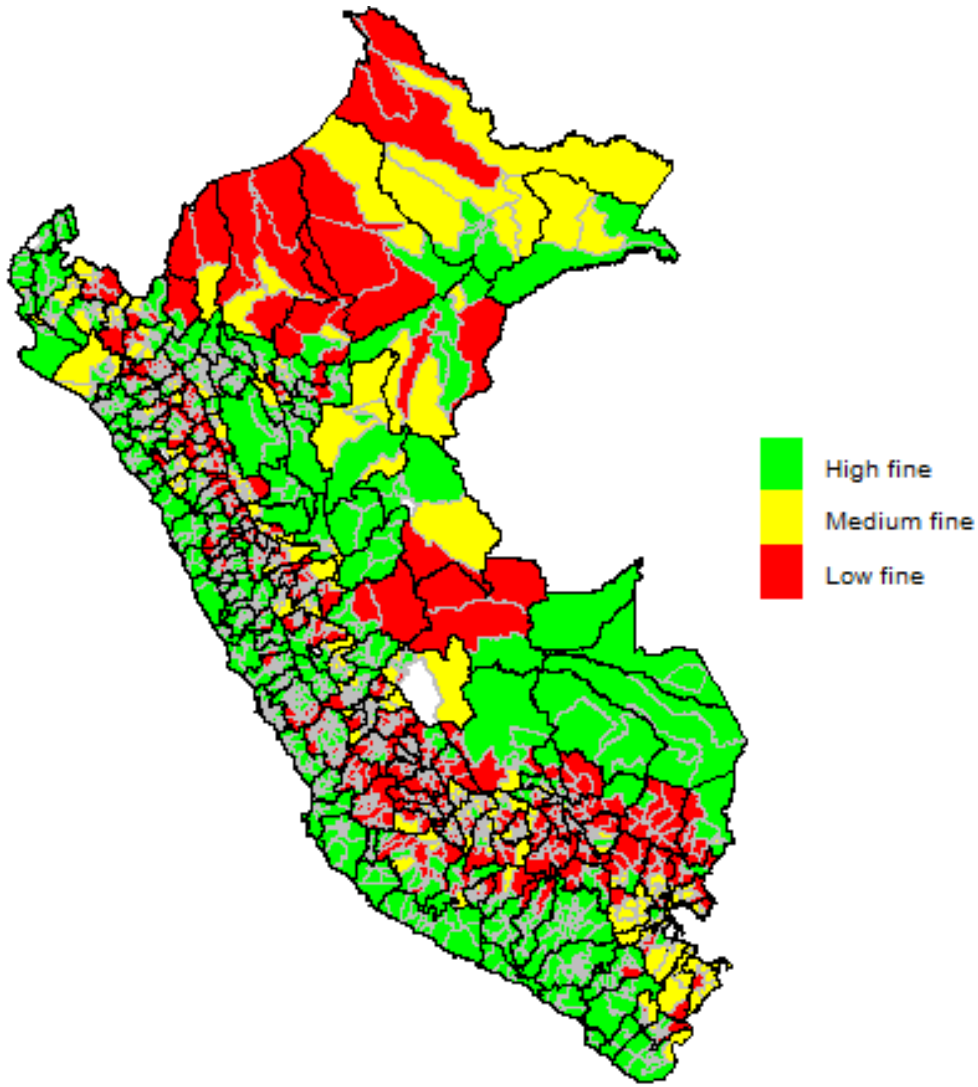
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Initial classification in 2006 was based on unclear criteria



Back

Districts were classified in 2010 according to largest population share



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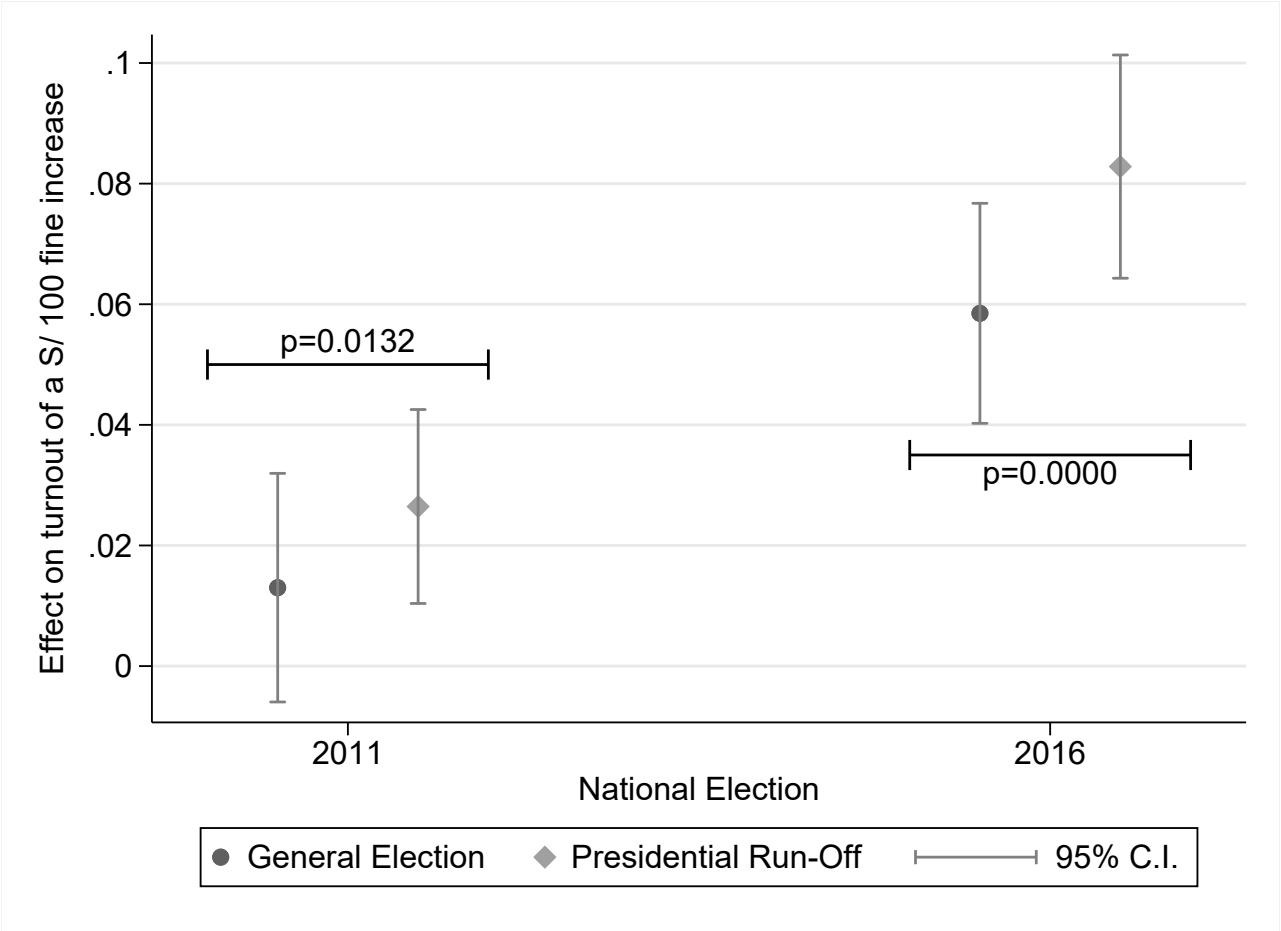
A substantial share of poor and extreme poor districts are reclassified

3*2010 assignment	2006 assignment			
	High fine	Medium fine	Low fine	Total
High fine	182	570	165	917
Medium fine	0	119	195	314
Low fine	0	73	451	524
Total	182	762	811	1,755

Notes: Districts with incomplete election data (including newly created ones) or with inconsisten
in the assignment are dropped. Final sample of 1,755 districts corresponds to 94.7% of the t
number of districts in Peru.

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Turnout effect varies by election type in same year $\Rightarrow \neq$ Mg. voters



Notes: The graph shows point estimates and 95% confidence intervals of a regression of district-level turnout on the value of the fine for abstention interacted with a full set of election-date dummies. Data includes national elections (General: Legislative and Presidential first round; Presidential Run-Off) for the years 2001, 2006, 2011 and 2016. The abstention fine is the same for all districts until the 2006 elections. Regression includes district and province-election-category fixed effects (using 2006 classification). Regression includes 13,536 observations from 1,692 districts. Districts are weighted by the number of registered voters for the 2001 elections. Standard errors are clustered by province (192 units).

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Larger fine not associated with higher growth in lights, no migration

Dependent variable:	ln Lights DN$_{i,t}$	ln Voters$_{i,t}$		Share born in district$_{i,t}$	ln Voters$_{i,t}$	
	(1)	(2)	(3)	(4)	(5)	(6)
Fine value$_{i,t}$ (S/ x 100)	0.056	-0.076**	-0.085**	-0.074	-0.152***	-0.160***
	[0.064]	[0.031]	[0.035]	[0.085]	[0.047]	[0.047]
ln Night lights DN$_{i,t}$			0.170*			
			[0.090]			
Share born in district$_{i,t}$						-0.113**
						[0.049]
Observations	5,076	5,076	5,076	2,319	2,319	2,319
Districts	1692	1692	1692	913	913	913
R-squared	0.0007	0.0008	0.02	0.001	0.01	0.02
Mean of dependent variable	2.36	10.62	10.62	0.33	11.08	11.08
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Year x Province x Category '06 FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Dependent variable in the header. ln Night lights digital number (0-63) in column 1; natural log of the number of registered voters in columns 2,3,5,6; the share of population that reports being born in the district in the ENAHO national survey in column 4. The sample in columns 1-3 includes the national election years 2001, 2006 and 2011. The sample in columns 4-6 includes the national election years 2006, 2011 and 2016. The value of the fine is measured in 100s of current Peruvian Soles (S/). All columns include district fixed effects and year by province by 2006 poverty category fixed effects. Regressions are weighted by the number of registered voters for the elections in 2001. Standard errors clustered by province (192 units in columns 1-3, 175 units in columns 4-6). *** p<0.01, ** p<0.05, * p<0.1

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Improved enforcement explains 30% of long-run turnout effect

	Dependent variable: Turnout$_{i,t}$					
	Targeted districts	Drop Lima & Callao	Province capitals	Drop capitals	Δ fines settled	All
	(1)	(2)	(3)	(4)	(5)	(6)
Fine value$_{i,t}$ (S/ x 100)	0.0197**	0.0173**	0.0197**	0.0180**	0.0197**	0.0197**
	[0.00849]	[0.00872]	[0.00849]	[0.00898]	[0.00849]	[0.00850]
Fine value$_{i,t}$ × 𝟙(2016)$_t$	0.0511***	0.0509***	0.0458***	0.0509***	0.0413***	0.0375***
	[0.00493]	[0.00509]	[0.00539]	[0.00514]	[0.00610]	[0.00622]
𝟙(Targeted District)$_i$ × 𝟙(2016)$_t$	0.00596					0.0107**
	[0.00363]					[0.00448]
𝟙(Province capital)$_i$ × 𝟙(2016)$_t$			0.00840***			0.00821***
			[0.00193]			[0.00182]
Δ fines settled$_i$ × 𝟙(2016)$_t$					0.0241***	0.0203***
					[0.00799]	[0.00707]
Observations	13,536	12,192	13,536	12,048	13,386	13,386
Districts	1,692	1,524	1,692	1,506	1,692	1,692
R-squared	0.029	0.029	0.037	0.026	0.028	0.038
Mean of dependent variable	0.845	0.829	0.845	0.847	0.846	0.846
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Election x Province x Category '06 FE	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors clustered by province. *** p<0.01, ** p<0.05, * p<0.1

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Abstention fine explains 50% of the total effect of CV on turnout

	Dependent variable: Turnout$_i$				
	Full sample (1)	Registered voters $\approx$ 300 (2)	Only general election (3)	Only presid. run-off (4)	Polling station FE (5)
Fraction with age 68$_i$	-0.00968	-0.0348	-0.0408	0.0215	0.0113
	[0.0346]	[0.0365]	[0.0356]	[0.0391]	[0.0379]
Fraction with age 70$_i$	-0.0847**	-0.0969***	-0.0924***	-0.0770*	-0.103***
	[0.0368]	[0.0322]	[0.0356]	[0.0432]	[0.0337]
Observations	148,448	109,462	74,205	74,205	148,448
Districts	1854	1109	1835	1835	1854
Polling stations	4723	2725	4705	4705	4723
R-squared	0.799	0.835	0.804	0.822	0.809
District FE	Yes	Yes	Yes	Yes	No
Polling station FE	No	No	No	No	Yes
Mean dependent variable	0.82	0.82	0.83	0.82	0.82

Notes: Dependent variable is voter turnout (0-1). Data at the table level for the national elections (General: Legislative and Presidential first round; Presidential Run-Off) of 2016. The regressors are the fraction of the electorate registered to vote at the table for each age group from 16 to 122. The omitted category is the group with age 69. Estimates for age groups other than 68 and 70 are not shown. Columns 1-4 include district fixed effects, while column 5 includes polling-station fixed effects. Column 2 only includes voting tables that have a number of registered voters between 280 and 300. Column 3 only includes the general election of 2016, while column 4 only includes the presidential run-off. All regressions are weighted by the number of registered voters at the table for the 2016 national elections. Standard errors clustered by district. *** p<0.01, ** p<0.05, * p<0.1

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