Making Policies Matter
Voter Responses to Campaign Promises

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Goals

1. Motivation
2. Empirical Model & Updating
3. Experiment & Data
4. Reduced Form
5. Structural Estimation
6. Conclusion

Motivation

- Work w/ C.Cruz, P. Keefer, J. Labonne on policy information
- Key step in understanding the democratic process is the transition from patronage/excludable club goods provision to public/non excludable goods.
- What drives the transition from parochial to programmatic politics? What changes voter beliefs? What role may information play in political behavior?

- Do voters in these settings simply lack sophistication or experience with electoral process?

What we do

Large body of literature in political economy of development on whether campaign information matters at all in clientelistic/ corruption ridden elections. Relevant questions:

- Can programmatic politics matter at all in elections that are neither free or fair & where media is deficient?
- Can we make policy salient in these contexts?
- Are voters learning anything from campaigns? Do they update their beliefs in real elections?
- What substantive messages affect them (if any)?

We tackle these issues in multiple real world **randomized campaigns**
We allow voter preferences to change in response to policy and valence

Voters are allowed to update on multiple candidate dimensions: **valence**

(Stokes 1963), **multiple policy dimensions,** at the same time they are targets of **vote buying.**

What we find

As a result of the intervention,

- treated voters are more knowledgeable and less uncertain about candidate promises (tighten beliefs distributions)
- treated voters are more likely to vote for the candidate whose current proposed policies are the closest to their own preferences
- salience plays a role independent from beliefs
- voters who are informed of the incumbent's past promises (in addition to current ones) are more likely to vote for her when she fulfilled her promises as they update along the valence dimension.

Literature Review

Consensus that communication had minimal effects dominated research in political science, psychology, and communications for decades. See DellaVigna & Gentzkow (2009); Bennet & Shanto (2008); Kalla & Brookman (2017)

Some evidence that campaign messaging matters in realistic settings. See Gerber et al. (2011); Kendall, Nannicini, & Trebbi (2015)

Important role played by canvassers: Dewan, Humpreys, & Rubenson (2014); Barton, Castillo, & Petrie (2014); Pons (2017)

Most of the evidence is in consolidated democracies. Unclear how the effects would translate in clientelistic political systems

Developing country voters respond to:

information on politician performance, attributes, campaigns:

- Ferraz and Finan (2008); Banerjee et al (2011); Humphreys and Weinstein (2013); Larreguy et al (2015); Bidwell et al (2016); Arias et al (2017); Buntaine et al (2017)

appeals to reduce clientelism and vote buying:

- Dekel, Jackson, and Wolinsky (2008); Hicken (2011); Vicente (2014); Aker et al (2011); Fujiwara and Wantchekon (2013); Gottlieb (2014)

Model setup

- Electoral (mayoral) race between candidates A and B .
- Voters enjoy private consumption, a vector of K public goods ($K = 10$) , & care about valence v_j for $j = A, B$
- Express each $k = 1, ..., K$ policy variable in terms of budget shares $1 \geq p^k \geq 0$ at .05 increments

Model setup (cont.)

- A policy vector $\mathbf{p} = \left[p^1, ..., p^K\right]$ belongs to the finite discrete **policy/ideology** simplex:

$$\mathcal{P} = \left\{ \mathbf{p} \in \mathbb{R}^K : p^k \geq 0, \sum_{k=1}^{K} p^k = 1 \right\}$$

- Heterogenous voters with bliss points $\mathbf{q}_i = \left[q_i^1, ..., q_i^K\right] \in \mathcal{P}$
- Elected mayor implements policy point $\mathbf{p}_j \in \mathcal{P}$ (Ansolabehere, Snyder, & Stewart 2001; Lee, Moretti, & Butler 2004)
- Before being elected, j may pay $z_{ij} \geq 0$ monetary value (vote buying, exchange based on family ties, etc.) to i

Model setup: Voter preferences

Utility of voter i of type $\mathbf{q}_i$ is:

$$U_i(z, v, \mathbf{p}) = \alpha_i z_{ij} + \gamma_i v_j - \omega_i \times \| \mathbf{p} - \mathbf{q_i} \|^{\zeta_i} + \varepsilon_{ij}$$

where $\mathbf{p}$ is policy of elected mayor j; α_i, γ_i, ζ_i, ω_i to be estimated; $\| \cdot \|^{\zeta_i}$ is a generic loss function; ε random utility component specific to i, j match

Voters' information set

- Indicate with $\phi_j = \left[\phi_j^1, ..., \phi_j^K\right] \in \mathcal{P}$ the policy platform that candidate j declares in his or her electoral campaign
- Indicate with $\phi_j^0 \in \mathcal{P}$ the previous term's electoral promises, available if j is a repeat candidate
- Also voters know $\mathbf{p}_j^0 \in \mathcal{P}$ previous term's policy, available if j is the incumbent

Voters' information set (cont.)

$f^{i,j}(v, \mathbf{p})$: Voter-i joint **prior** distribution function for $j = A, B$

$\Rightarrow$ discrete, but highly dimensional. To see this, recall that each of the $k = 1, ..., K = 10$ takes any of 20 values

$\Rightarrow$ prior beliefs may also depend on covariates or **q**

Experimental strategy implies exogenous variation in voters' information set. We randomly divide voters into types $H \in \{T1; T2; C\}$.
Three arms:

- $T1$: message about current policy platforms $\left\{ \phi_j \right\}_{j=A,B}$
- $T2$: message about current $\{\phi_j\}_{j=A,B}$ & past platforms $\left\{ \phi_j^0 \right\}_{j=A|B}$
- C: no message

$f^{i,j}(v, \mathbf{p}|H = h)$ is a type-h joint **posterior** distribution function.

Salience in preferences

We allow if i is treated h:

$$\begin{aligned}
\alpha_i &= \alpha^0 + \alpha^1(h) \\
\gamma_i &= \gamma^0 + \gamma^1(h) \\
\zeta_i &= \zeta^0 + \zeta^1(h) \\
\omega_i &= \omega^0 + \omega^1(h)
\end{aligned}$$

Voting behavior

Expected utility of voter i from the election of candidate $j = A, B$:

$$\mathbb{E}U_j^i(h) = \alpha_i z_{ij} + \sum_{v,\mathbf{p}} f^{i,j}(v,\ \mathbf{p}|h) \times \left(\gamma_i v_j - \omega_i \times \parallel \mathbf{p} - \mathbf{q_i} \parallel^{\zeta_i}\right) + \varepsilon_{ij}$$

Random utility setup with shocks ε_{ij}. The probability that voter i votes for A is:

$$\Pr\left[\mathbb{E}U_A^i(h) \geq \mathbb{E}U_B^i(h)\right]$$

We assume **extreme value distribution**: $\varepsilon_{i,j}$ i.i.d. $F(\varepsilon_{ij}) = exp\left(-e^{-\varepsilon_{ij}}\right)$

$$\begin{aligned}
\ln L(\theta) &= \sum_{i=1}^{N}\sum_{j} d_{ij} \ln \Pr\left(Y_i = j\right) \\
&= \sum_{i=1}^{N}\sum_{j} d_{ij} \ln \frac{e^{\left(\alpha_i z_{ij} + \sum_{v,\mathbf{p}} f^{i,j}(v,\ \mathbf{p}|h) \times \left(\gamma_i v_j - \omega_i \times \|\mathbf{p}-\mathbf{q_i}\|^{\zeta_i}\right)\right)}}{\sum_{l=A,B} e^{\left(\alpha_i z_{il} + \sum_{v,\mathbf{p}} f^{i,l}(v,\ \mathbf{p}|h) \times \left(\gamma_i v_l - \omega_i \times \|\mathbf{p}-\mathbf{q_i}\|^{\zeta_i}\right)\right)}}
\end{aligned}$$

Choice-based nonresponse correction as in Kendall et al. (2015).

Voters' subjective updating

We assume:

- Truthful information (official platforms)
- Rational (Bayesian) updating

Voter-i belief updating about candidate j implies:

$$f^{i,j}(v, \mathbf{p}|h) = \frac{\Pr^{i,j}(H = h|v, \mathbf{p})}{\Pr^{i,j}(H = h)} \times f^{i,j}(v, \mathbf{p}) \qquad h = T1, T2$$

Voters' subjective updating (cont.)

In fact, we will show that:

- $f^{i,j}(v, \mathbf{p}|H = T1) \neq f^{i,j}(v, \mathbf{p}|H = C)$ implying new information acquired (e.g. voters may not know current platforms)
- $f^{i,j}(v, \mathbf{p}|H = T2) \neq f^{i,j}(v, \mathbf{p}|H = C)$ if $\left\|\mathbf{p}_j^0 - \phi_j^0\right\|$ is low (i.e. when previous promises were kept)
- $f^{i,j}(v, \mathbf{p}|H = T2) = f^{i,j}(v, \mathbf{p}|H = C)$ if $\left\|\mathbf{p}_j^0 - \phi_j^0\right\|$ is high (i.e. when previous promises were not kept)
- No differential role of $\left\|\mathbf{p}_j^0 - \phi_j^0\right\|$ for $H = T1$ (e.g. voters may not know past platforms)

Voters' subjective updating (cont.)

We **elicit posteriors** from survey (no distributional assumptions)

We impose no restrictions on the signaling game between A, B, and voters; and we then **assess subjective updating** from data

Assumption

Under SUTVA, voter-i posterior distribution on candidate j is:

$$f^{i,j}(v, \mathbf{p}|h, W) = \frac{\Pr^{i,j}(H = h|v, \mathbf{p})}{\Pr^{i,j}(H = h)}$$

$$\times \frac{\Pr^{j}(W|v, \mathbf{p})}{\Pr^{j}(W)} \times f^{i,j}(v, \mathbf{p}) \qquad h = T1, T2$$

$$f^{i,j}(v, \mathbf{p}|H = C, W) = \frac{\Pr^{j}(W|v, \mathbf{p})}{\Pr^{j}(W)} \times f^{i,j}(v, \mathbf{p})$$

Elicitation of (multivariate) posteriors

Direct elicitation of the individual belief distributions is, even for expert responders, unfeasible with $K = 10$.

Assumption

Subjective beliefs are independent between v and $\mathbf{p}$

Assumption

Subjective belief distributions are unimodal

We enquire about the **mode** $\pi_{i,j} = [\pi^1_{i,j}, ..., \pi^K_{i,j}]$ of posteriors:

$Q1$: *Which budget allocation will each candidate j most likely choose?*

Belief distributions: Uncertainty

To capture the amount of probability mass each individual places off the mode, we ask the following question concerning the overall degree of uncertainty over all allocations:

$$Q2: \textit{How uncertain are you about the set } \{\pi_{i,j}\}_{j=A,B}\textit{?}$$

$$A2: \textit{ Certain; Rather Uncertain;}$$

$$\textit{Very Uncertain; Don't know. } u = \{1, 2, 3, 4\}$$

We employ an approach similar to Kendall et al. (2015) to use $Q2$ in determining the variance of the belief distribution.

Belief distributions: Uncertainty (Cont'd)

We define the probability mass $\Psi(u)$ on the mode $\{\pi_{i,j}\}_{j=A,B}$ and we will impose based on the amount of uncertainty lower model mass the more uncertain the voter is: $\Psi(1) = 1 > \Psi(2) > \Psi(3)$.
We further ask:

$Q3$: *What budget areas are you most uncertain about?*

$A3$: $U = \{max\ 3\ areas\ listed\}$

Example

Suppose i indicates uncertainty about $k \in U_i = \{1, 2, K\}$ & declares $u_i = 3$ (*very uncertain*). Based on answer to $Q1$ define the budget share allocated over policy dimensions that are *not* declared uncertain:

$$\chi_{i,j} = \sum_{k=1, k \notin U_i}^{K} \pi_{i,j}^{k}.$$

$\chi_{i,j}$ represents the part of the policy vector budget shares allocation of each candidate j voter i is not uncertain about.
We allow beliefs $f^{i,j}(\mathbf{p}_j|h)$ to have positive mass over support $\mathcal{S}_{i,j}$
$\mathcal{S}_{i,j}$ includes for the uncertain dimensions $k \in U_i$ all possible policy combinations of $\left(p_j^1, p_j^2, p_j^K\right)$ such that $p_j^1 + p_j^2 + p_j^K = 1 - \chi_{i,j}$, while all other dimensions $k \notin U_i$ are set at the mode. Back: Main Slide Back: Appendix Menu

Belief distributions

We assume that the beliefs probability distribution $f^{i,j}(\mathbf{p}_j)$ decays linearly away from the mode.
A total $1 - \Psi_j(u_i)$ probability mass off the mode along $k \in U_i$, leaving $\Psi_j(u_i)$ probability mass on the mode.

Notice that we allow a different $\Psi_j(u_i)$ for every j, hence **different uncertainty** about different candidates' policies.
More precisely, we employ:

$$f^{i,j}(\mathbf{p}_j) = \begin{cases} 0 & \text{if } \mathbf{p}_j \notin \mathcal{S}_{i,j} \\ (1-\Psi_j(u_i)) \times w(\mathbf{p}_j) & \text{if } \mathbf{p}_j \in \mathcal{S}_{i,j}, \mathbf{p}_j \neq \pi_{i,j} \\ \Psi_j(u_i) & \text{if } \mathbf{p}_j = \pi_{i,j} \end{cases}$$

$$\textit{where } w(\mathbf{p}_j) = \frac{1-\|\mathbf{p}_j - \pi_{i,j}\|}{\Omega}$$

$$\textit{and } \Omega = \sum_{\mathbf{p}_j \in \mathcal{S}_{i,j}} (1-\|\mathbf{p}_j - \pi_{i,j}\|)$$

& $\|.\|$ indicates Euclidean distance.

Intuition for belief distributions

Under our linear decay assumption, if for example voter i indicates $\chi_{i,A} > \chi_{i,B}$ & there is an identical probability mass on the mode $\Psi(u_i)$ for both A and B, it must follow that voter i's considerations about uncertainty mostly concern candidate B as the policy dimensions in U_i account for a larger share of policy budget for him/her.

Mayoral politics

Decentralized framework:

- Philippines: Mayor, vice-mayor and 8 municipal councilors elected for 3 year terms
- Like in many contexts, including US, Italy, mayors have access to significant resources
- Fiscal transfers represent a large share of municipal budget
- 20 percent of fiscal transfers to be allocated for development projects.

Legal Background

- Mayors can use funds with limited oversight (*'Budget Dictators'*)

Mayoral politics (cont.)

Elections:

- 82% turnout
- Strong incumbency advantage; voting tends to be clientelistic & nonprogrammatic
- 40% direct vote buying in 2016 (presidential election year); 14% in 2013 (non-presidential election year)

The field experiment

Together with our partner NGO, PPCRV, we:

- Collected data from candidates on how they would allocate the resources across 10 sectors Instructions
- 100% of candidates complied
- Prepared two sets of flyers: Promises of the candidates in 2013 and in 2016
- Distributed them through door-to-door visits in randomly selected villages
- All households in treated villages were targeted

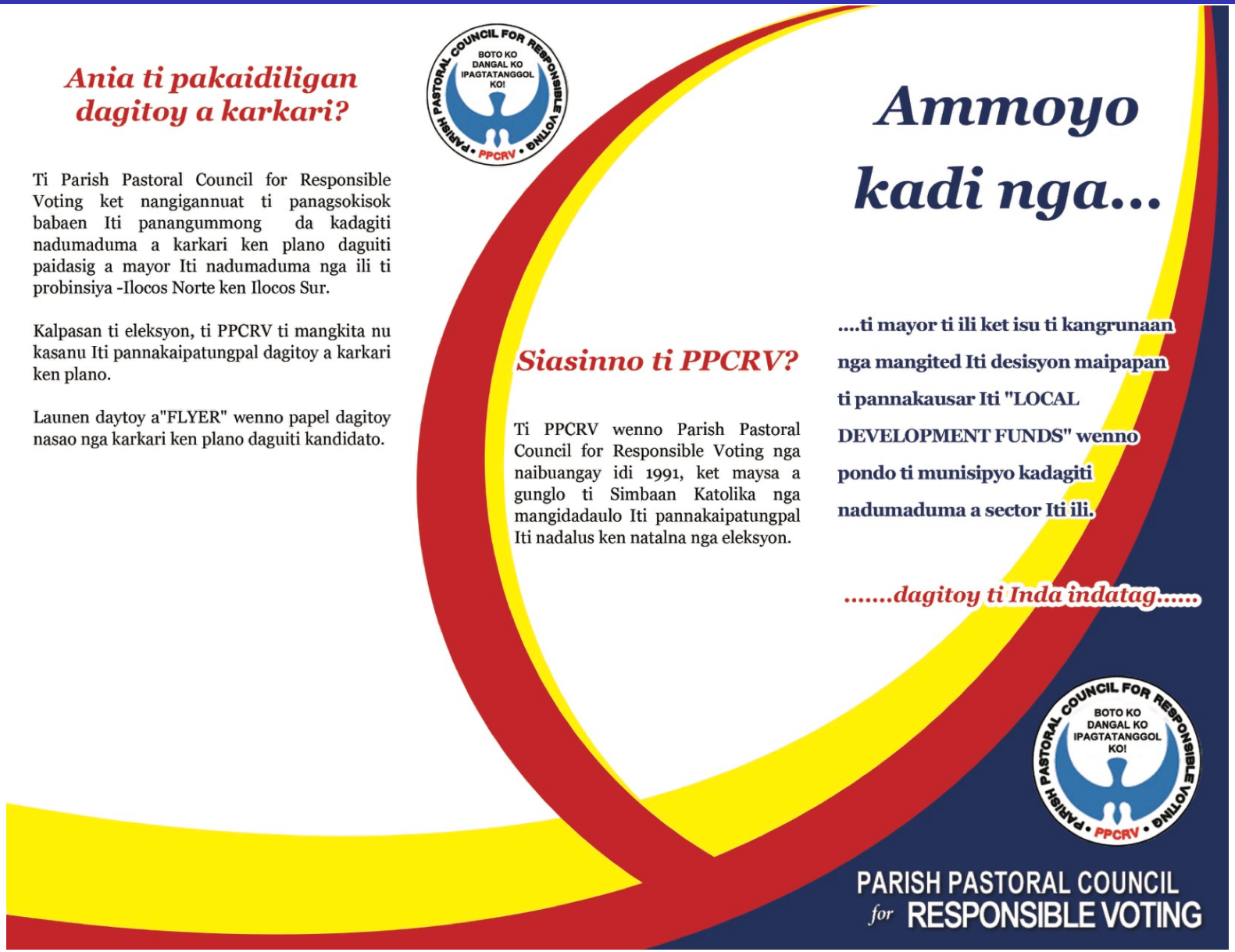
Outcomes of interest: political knowledge, beliefs about candidate policies, candidate preferences, and vote choice.

The field experiment (cont.)

Treatment implementation:

- 158 villages (54 T1; 50 T2; 54 C) in 7 municipalities
- Match villages on the following variables (based on Mahalanobis distance):
  1. number of registered voters
  2. number of precincts
  3. urban/rural dummy
  4. incumbent vote share in 2013
  5. prevalence of vote buying in 2013
  6. salience of budget allocation in 2013
  7. knowledge of electoral promises in 2013
- Randomize treatment within triplet after matching

The flyer: the outside

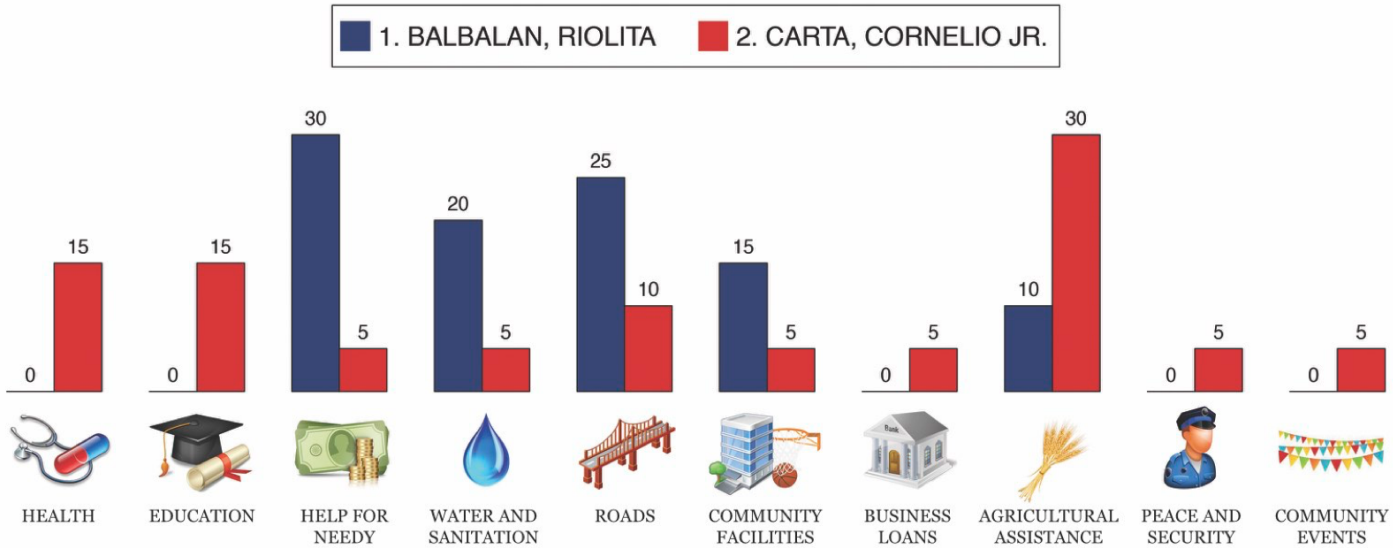


The flyer: the inside

BURGOS

Ammoyo kadi nga...

2016



Anya pay ti karkarida?

Riolita Balbalan (LP)

- Mangted ti pang taltalon nga makinarya para Tabaco; mangted ti organic nga abono ken padanum kadagiti mannalon ti nateng, mangted ti hybrid nga bukbukel kadagiti mannalon ti bagas; panagtaraken ti baboy ken nuwang
- Mangted ti scholarship para kolehiyo ken sabali pay nga sistemati panagisuro wennu mangted ti scholarship para ti bokasyunal nga kurso kadagiti hanpay nga nakalippas ti kolehiyo
- Agpatatder ti health centers ken mangted ti agas ken tulong ti sakit kadagiti tattao nga adayo ti babalay jay ele

Cornelio Carta Jr. (IND.)

- Tulong para kadagiti mannalon kas iti abono, makinarya ken dadduma pay a masapsapol iti talon
- Pannakatarimaan dagiti nadumaduma nga fasilidades dagiti es-eskwela, pannakanayon ti bilang dagiti manursuro, scholarship para kadagiti estudyante nga adda iti sekondarya ken kolehiyo
- Pannakaipatakder to bente kuatro oras nga ospital, nalaklaka a pannakaited to barangay health center, tulong para kadagiti umili nga agkasapulan nangnangruna dagiti PWDs (Person with disabilities)

Where did we do it?

Eligible municipalities: all municipalities in Cruz et al. (2017) with at least 2 candidates in 2016.

The timeline

Date	Activity
April	Candidate interviews
May 3-6	Flyer distribution (door-to-door visits)
May 9	Elections
End of May/June	Household survey

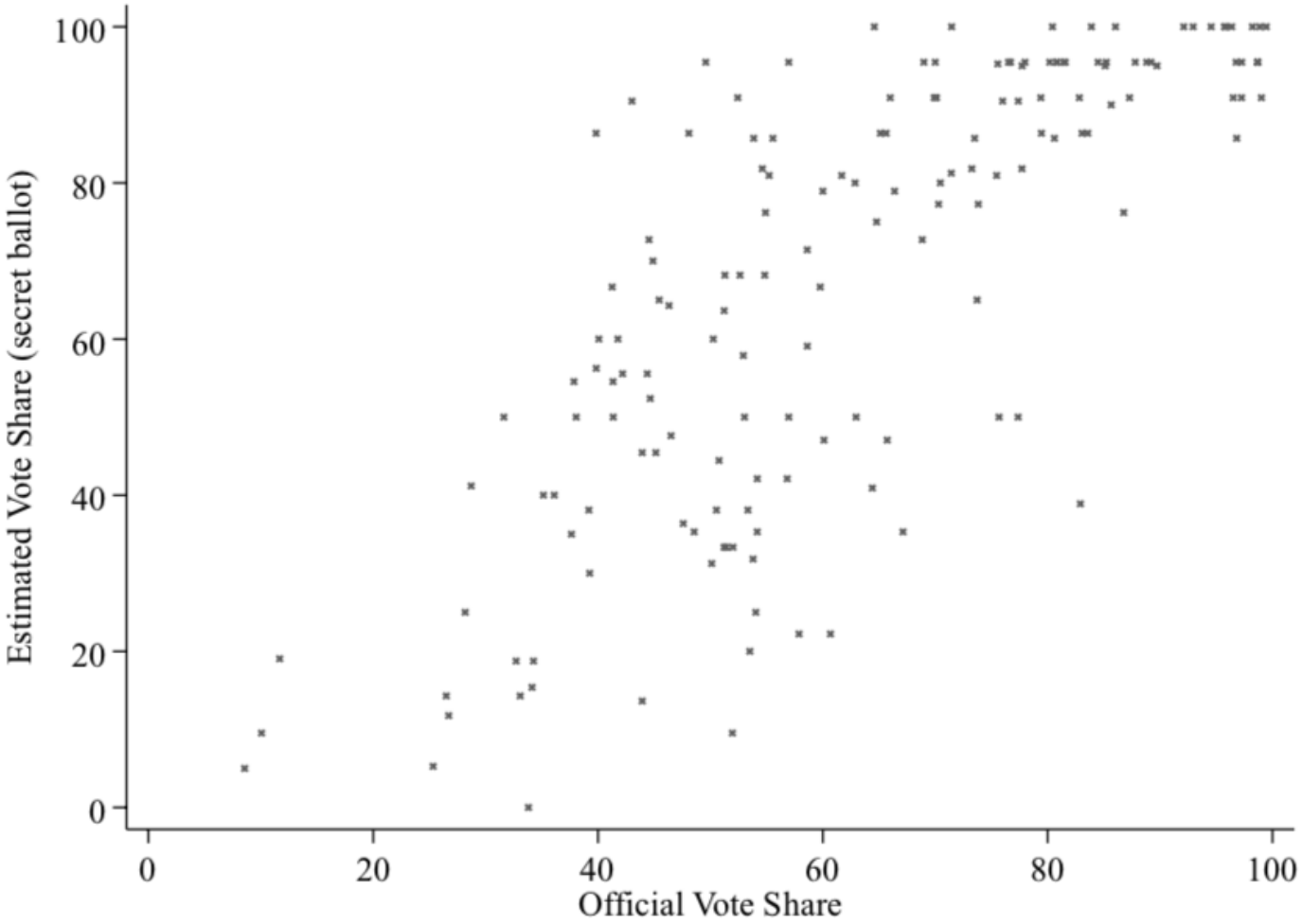
The data

- Flyers: All households in treatment village
- HH survey: 22 households per village
- Data on basic household characteristics, policy preferences, beliefs about policies and candidate valence and, voting behavior

The groups are well-balanced Preferences Pairwise Matching Household Characteristics Household Assets Social Capital and Media

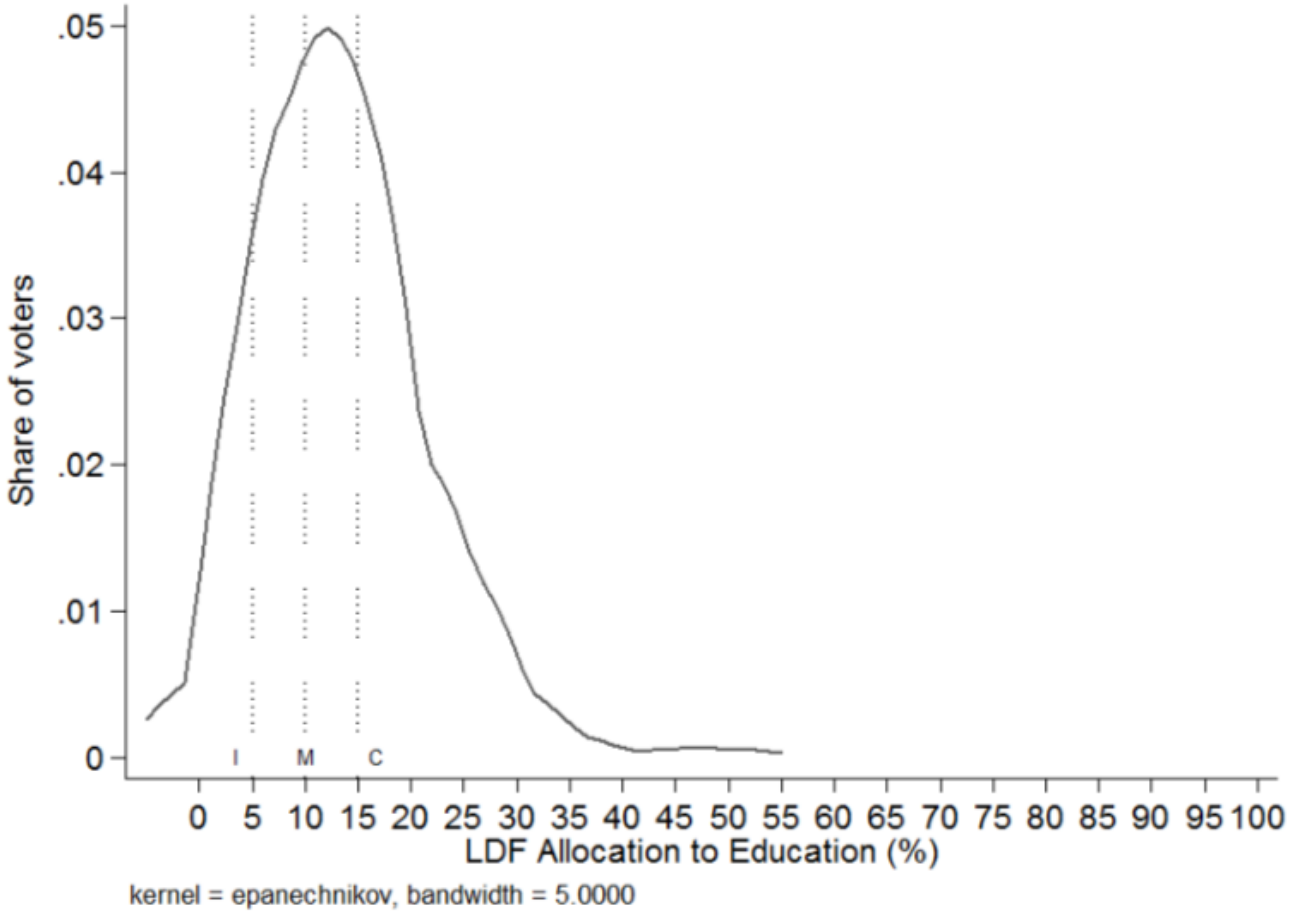
Precinct-level results: turnout & vote-share for all candidates (2013 & 2016) Quality

Compare actual and survey vote shares



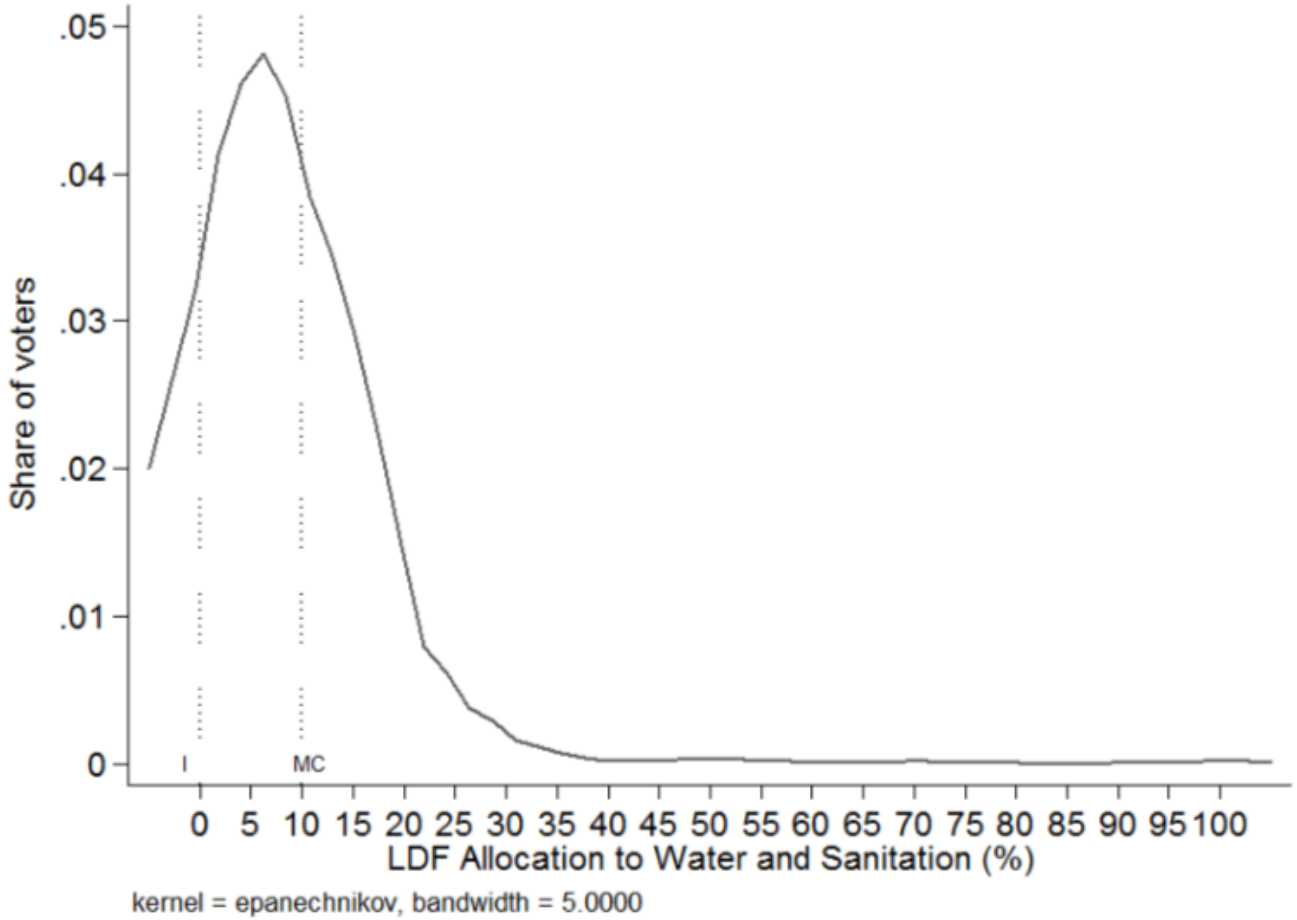
Linear correlation 0.772

Distribution of bliss points and promises: Lidlidda



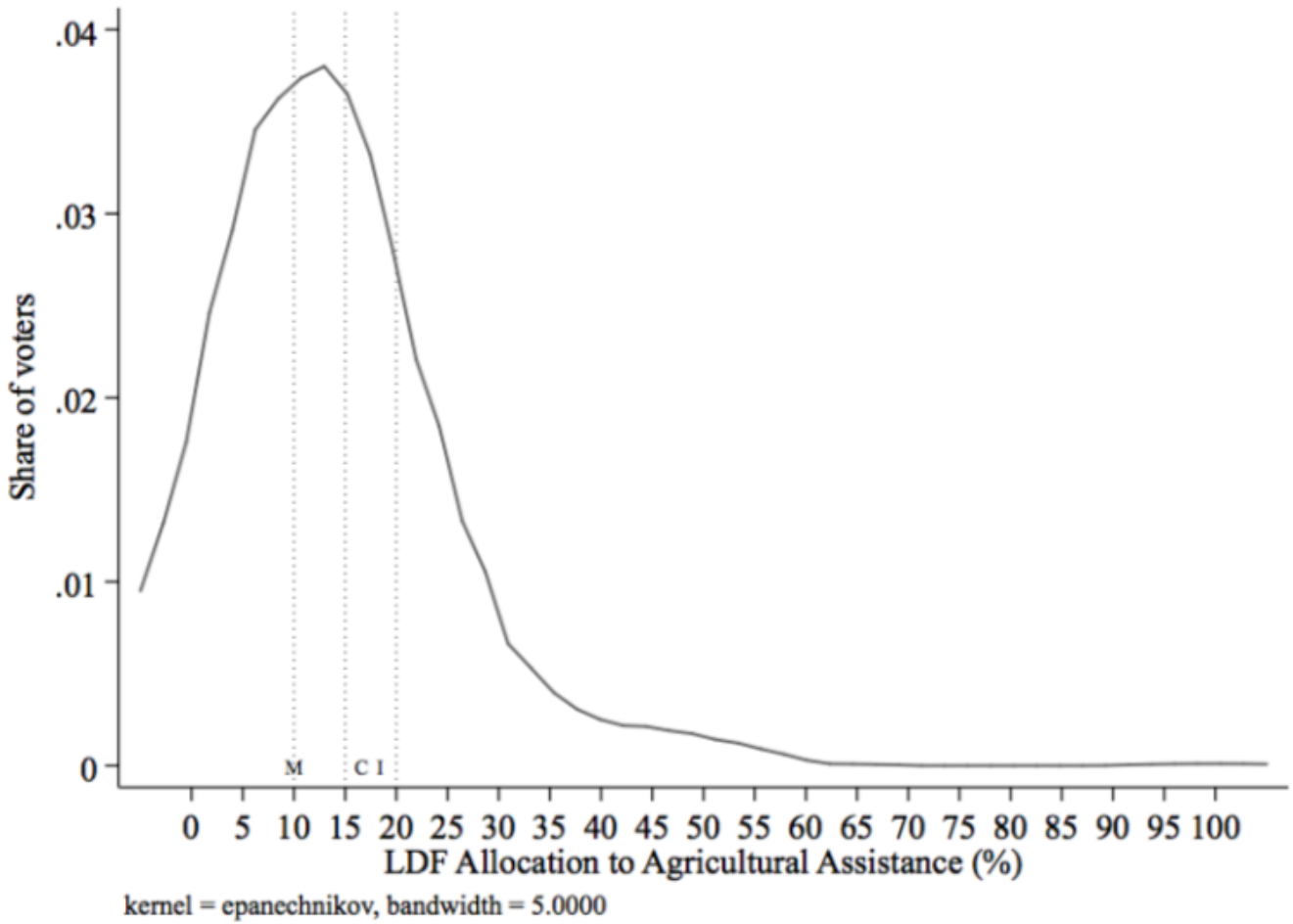
M- median, I- incumbent, C- challenger.

Distribution of bliss points and promises: San Juan



M- median, I- incumbent, C- challenger.

Distribution of bliss points and promises: Paoay



M- median, I- incumbent, C- challenger.

Overlap candidate promises/voter preferences

Similarity between voter i bliss point $\mathbf{q}_i$ & expected politician j's policy $\pi_{i,j}$

$$\text{Similarity}_{ij} = 1 - \sqrt{\frac{1}{2}\sum_{k=1}^{K}\left|\pi_{i,j}^{k} - q_i^k\right|^2}$$

We also generate a related measure where we substitute each $\pi_{i,j}^{k}$ (belief mode) with ϕ_j^k (actual announced policy platforms).

Overlap candidate promises/voter preferences (2)

To better understand vote choice, we take the difference between similarity with the incumbent and similarity with the challenger.

We compute the measure for individual i's top sector, top 2 sectors, top 3 sectors, health/education/ag, all sectors.

Testing the intervention's impacts

Estimate regressions of the form:

$$Y_{ivl} = \alpha T_{vl} + \beta \Delta Similarity_{ivl} + \gamma T_{vl} \times \Delta Similarity_{ivl} + v_l + u_{ivl} \quad (1)$$

where Y_{ivl} is whether individual i in village v in triplet l reported voting for the incumbent in the 2016 elections.

$\Delta Similarity_{ivl}$ is the difference between the overlap promises/preferences for the incumbent & for the challenger.

Standard errors are clustered at the village-level.

Treated voters are more likely to vote for the candidate whose policies are closer to their own preferences.

Dep var: vote for incumbent					
Similarity:		Top Sector		Health,	All
	1	2	3	Edu, Ag.	Sectors
Treatment	-0.00048	-0.00065	-0.00055	-0.00075	-0.00055
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
ΔSimilarity	0.011	0.049	0.034	-0.18	0.084
	(0.14)	(0.14)	(0.13)	(0.14)	(0.14)
Treat*ΔSimilarity	0.44**	0.40**	0.35*	0.56***	0.32*
	(0.18)	(0.20)	(0.19)	(0.19)	(0.17)
Observations	3155	3155	3155	3155	3155
R^2	0.30	0.30	0.30	0.30	0.30

A one standard deviation increase in the measure of ΔSimilarity increases likelihood of voting for the incumbent by 3-4 percentage points (control group mean: 68.9).

Incumbent Vs. Challenger Beliefs

Effects are stronger for T1

Dep var: vote for incumbent					
Similarity:	Top Sector			Health,	All
	1	2	3	Edu, Ag.	Sectors
T1 (current only)	0.0033	0.0033	0.0035	0.0036	0.0038
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
T2 (current and past)	-0.0046	-0.0050	-0.0050	-0.0044	-0.0048
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
ΔSimilarity	0.011	0.048	0.034	-0.18	0.083
	(0.14)	(0.14)	(0.13)	(0.14)	(0.14)
T1*ΔSimilarity	0.59**	0.62**	0.54*	0.53*	0.40*
	(0.26)	(0.28)	(0.28)	(0.27)	(0.23)
T2*ΔSimilarity	0.31	0.23	0.22	0.57***	0.26
	(0.20)	(0.22)	(0.21)	(0.21)	(0.19)
Observations	3155	3155	3155	3155	3155
R^2	0.30	0.30	0.30	0.30	0.30

Treated voters are more certain about candidate promises

Dep var:	Certainty	
Treatment	0.066**	
	(0.03)	
T1 (current only)		0.081**
		(0.04)
T2 (current and past)		0.052
		(0.04)
Observations	3417	3417
R^2	0.03	0.03

Control group mean: 2.89 (std. dev.: 0.87)

Treated voters are better informed

Dep var: Distance between actual promises and expected policies					
		Top Sector		Health,	All
	1	2	3	Edu, Ag.	Sectors
Panel A					
Treatment	-0.0053	-0.0030	-0.0060*	-0.0019	-0.0059*
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
C mean	.105	.140	.162	.114	.221
Obs.	3414	3414	3414	3414	3414
R^2	0.19	0.29	0.41	0.23	0.59
Panel B					
T1	-0.0089**	-0.0055	-0.0088**	-0.0048	-0.0084**
	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)
T2	-0.0020	-0.00072	-0.0035	0.00059	-0.0036
	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)
Obs.	3414	3414	3414	3414	3414

Why are the effects weaker for T2?

Recall that T2 reminded voters of the promises the incumbent made in 2013

We assess whether the incumbent fulfilled the promises made in 2013

We interact that dummy variable with the treatment dummies

Voters who are reminded of past promises reward incumbents who fulfilled them

Dep var: vote for incumbent		
Treatment	-0.0019	
	(0.02)	
Kept	-0.031	-0.027
	(0.04)	(0.04)
Treat * Kept	0.077*	
	(0.04)	
T1		0.012
		(0.03)
T2		-0.015
		(0.03)
T1*Kept		-0.0025
		(0.05)
T2*Kept		0.13**
		(0.06)
Observations	2946	2946

Voters who are reminded of past promises are more likely to rate incumbents who fulfilled them as honest, capable

Dep var:	Approachable	Experienced	Honest	Connected	Capable
T1	0.011	0.011*	0.0063	0.016*	0.0046
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
T2	-0.0020	-0.0022	-0.012	-0.0089	-0.011
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Kept	-0.0083	-0.012	-0.013	-0.0067	-0.032
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
T1*Kept	0.018	0.0030	0.018	0.017	0.012
	(0.03)	(0.02)	(0.03)	(0.03)	(0.02)
T2*Kept	0.037	0.030	0.052*	0.026	0.070**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Observations	3130	3140	3109	3122	3129
R^2	0.04	0.06	0.03	0.03	0.03

Both stories hold when analyzed simultaneously

DV: vote for incumbent					
Similarity:		Top Sector		Health,	All
	1	2	3	Edu, Ag.	Sectors
T1	0.010	0.011	0.011	0.011	0.011
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
T2	-0.016	-0.016	-0.016	-0.016	-0.015
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
ΔSimilarity	-0.051	0.0099	0.000006	-0.22	0.050
	(0.14)	(0.16)	(0.15)	(0.15)	(0.15)
T1*ΔSimilarity	0.59**	0.63**	0.53*	0.51*	0.44*
	(0.28)	(0.31)	(0.31)	(0.29)	(0.25)
T2*ΔSimilarity	0.34	0.21	0.19	0.56**	0.22
	(0.24)	(0.26)	(0.25)	(0.25)	(0.22)
Kept	-0.025	-0.023	-0.024	-0.025	-0.023
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
T1*Kept	0.0033	0.0051	0.0050	0.0027	0.0036
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)

The effects are weaker for voters with clientelistic ties to one of the candidates

Dep var: vote for incumbent					
Similarity:		Top Sector		Health,	All
	1	2	3	Edu, Ag.	Sectors
Client	0.026	0.026	0.026	0.028	0.026
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
T*Client	-0.00060	-0.00049	-0.00043	-0.00057	-0.00099
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
T*Not Client	0.00060	0.00038	0.000056	0.00019	0.0010
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
ΔSimilarity*Client	0.075	0.22	0.16	-0.059	0.15
	(0.18)	(0.18)	(0.15)	(0.16)	(0.14)
ΔSimilarity*Not Client	-0.098	-0.17	-0.16	-0.37	-0.028
	(0.23)	(0.25)	(0.26)	(0.24)	(0.25)
T*ΔSimilarity*Client	0.20	0.13	0.091	0.24	0.12
	(0.27)	(0.28)	(0.26)	(0.25)	(0.24)
T*ΔSimilarity*Not Client	0.65**	0.68**	0.62**	0.89***	0.50*

Controlling for clientelism

The treatment has no effects on vote buying:

- both T, T1 and T2 and when interacted with whether the incumbent fulfilled her promises Main vote-buying
- even when we interact T with our measure of overlap with candidate promises VB interactions
- even when we interact T1 and T2 with our measure of overlap with candidate promises VB interactions

Our main results are robust to controlling for vote-buying:

Vote-choice Beliefs Knowledge

Primitives

Montecarlo simulations under multivariate posteriors prove identification.
We are able to estimate:

- α_i, γ_i, ζ_i, ω_i: the preference parameters of the relative importance of vote buying, valence, policy loss, policy weights
- the distribution of beliefs and the degree of learning
- degree of heterogeneity in parameters

Unrestrictred model with salience

	Treated			Control	
	est	s.e.		est	s.e.
α	0.38	0.13	α_0	0.66	0.21
$\gamma 1$	1.63	0.16	$\gamma 1_0$	1.69	0.31
$\gamma 2$	0.61	0.12	$\gamma 2_0$	0.71	0.22
$\gamma 3$	0.91	0.29	$\gamma 3_0$	0.98	0.3
$\gamma 4$	0.35	0.13	$\gamma 4_0$	-0.18	0.2
$\gamma 5$	0.86	0.18	$\gamma 5_0$	0.44	0.26
ω	1.04	0.28	ω_0	0.28	379.86
ζ	0.22	0.04	ζ_0	5.4	1910.44
$\psi 2$	0.99	0.25	$\psi 2_0$	0.94	687.22
$\psi 3$	0.93	0.31	$\psi 3_0$	0.1	952.04
$LL = -1686$					

Note: Asymptotic standard errors computed with OPG.

Restrictred model

	est	s.e.
α	0.48	0.10
$\gamma 1$	1.63	0.14
$\gamma 2$	0.62	0.10
$\gamma 3$	0.95	0.19
$\gamma 4$	0.17	0.10
$\gamma 5$	0.72	0.14
ω	0.68	0.21
ζ	0.23	0.07
$\psi 2$	0.82	8.50
$\psi 3$	0.00	46.87
$LL = -1695$		

Note: Asymptotic standard errors computed with OPG.

Additional implications

Specification tests indicate that the unrestricted model is superior.

The estimated variance-covariance matrix of beliefs of voters are tighter for treated than for control voters (the difference between those two matrices is positive semi-definite).

In terms of reduction of the second moments of individual beliefs (averaging across all policies, all municipalities and all voters): relative to the Control group, Treatment 1 reduces belief variance by 49 percent, while Treatment 2 reduces variance by 34 percent based on the model estimated belief distributions

In-sample fit

Municipality	Proportion of correctly predicted votes
Bangui	0.51
Burgos	0.77
Dingras	0.89
Lidlidda	0.62
Paoay	0.50
Passuqin	0.60
San Juan	0.96

We also perform out-of-sample fit exercises where we estimate the model leaving out one municipality at a time and use the estimated parameters to predict vote shares in the excluded municipality. Model fit is very stable across those 7 leave-one-out exercises.

Counterfactuals

Our main counterfactuals from the structural model are:

1. What would have happened to the elections without vote buying?
2. What would have happened to the elections with only vote buying?
3. What would have happened to the elections with incumbent platform at the geometric median of voters?

To do:

1. What would have happened to the 2016 elections with full credibility?
2. What would have happened to the 2016 elections with only salience of policy?

Comparison of Costs

By household

- Distributing flyer: \$3-5 USD[1]
- Vote buying: \$30-50 USD

By municipality:

- Distributing flyers to treatment villages: \$5700 USD
- Mean cost to run for mayor (as reported by candidates): \$38,550 USD

[1] Includes cost of collecting data from candidates, printing flyers, training enumerators, and delivering by hand

Cost-Benefit Analysis: Why Buy Votes?

Assuming that candidates can target an information treatment exactly to the voters whose policy interests are aligned and produce a one standard deviation shift in beliefs:

- Treating 100 households (400 people) at \$5 per flyer is \$500
- This yields 16 votes (one standard deviation in similarity yields 4% increase in likelihood of voting)

- Per vote cost of information treatment: \$31.25 per vote
- Per vote cost of vote buying: \$12.50 (\$50 per household, 4 people per household)

Conclusion

As a result of the intervention, several interesting dimensions treated voters:

- appear more knowledgeable and certain about candidate promises
- appear more likely to vote for the candidate whose proposed policies are closest to their own preferences
- and voters who are reminded of the incumbent's past promises are more likely to vote for her when she fulfilled her promises
- preference appear sensitive to policy salience
- clientelistic ties kill role for information
- structural model organizes all components of voting behavior and produces quantitative implication for the use/costs of information in elections

Additional Slides

LDF — Legal Background | Instructions

Balance Tests — Preferences | Pairwise Matching | Household Characteristics | Household Assets | Social Capital and Media

Data quality — Quality

Main Results — Incumbent Vs. Challenger | Beliefs

Vote-buying — Vote-choice | Beliefs | Knowledge | Vote-buying | Vote-Buying interacted | Vote-Buying interacted

Local Development Fund

- Section 287 of the Local Government Code states that *Each local government unit shall appropriate in its annual budget no less than twenty percent (20%) of its annual internal revenue allotment for development projects. Copies of the development plans of local government units shall be furnished the Department of Interior and Local Government.*
- In its Memorandum Circular 2010-138, the Department of Interior and Local Government further clarified that *development means the realization of desirable, social, economic and environmental outcomes essential in the attainment of the constitutional objective of a desired quality of life for all.*
- Those guidelines were further refined in the Joint Memorandum Circular 2011-1, issued on April 13, 2011 by the Department of Interior and Local Government and the Department of Budget and Management.

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Instructions

- We're going to provide you with a list of sectors in a worksheet. Given that the average local development fund (LDF) in your municipality is [ENUMERATORS FILL IN THE BUDGETARY FIGURES PER MUNICIPALITY], how would you propose to allocate this money for projects? Please indicate what percentage of the LDF you would spend on the following sectors. We're going to give you 20 tokens, and each token represents 5% of the LDF. You can allocate your tokens in any way and you do not need to specify an allocation for every sector'you can even put all of your tokens on one sector if you want. Once you're satisfied with your proposed allocation, we will record.
- **Sectors**:
  - Public Health Services (including hospital/clinic/barangay health station construction);
  - Public Education Services (including school/classroom construction);
  - Cash or in-kind transfer/loans/job assistance for emergencies or for individual needy households;
  - Water and sanitation infrastructure; Road construction and rehabilitation;
  - Construction of community facilities (multipurpose halls, basketball courts);
  - Business loans and other private economic development programs;
  - Agricultural assistance/irrigation systems;
  - Peace and security;
  - Community events/festivals/fiestas

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The treatment and control groups are well-balanced

	T1	T2	Control	β_T	β_{T1}	β_{T2}
	(1)	(2)	(3)	(4)	(5)	(6)
Health	18.34	18.25	18.09	0.10	0.26	-0.09
	(13.00)	(11.97)	(12.40)	[0.82]	[0.59]	[0.87]
Education	15.80	16.56	16.21	-0.19	-0.40	0.05
	(10.75)	(11.69)	(11.67)	[0.66]	[0.42]	[0.92]
Help for Needy	9.18	8.90	9.07	-0.03	0.12	-0.19
	(8.64)	(9.02)	(8.77)	[0.92]	[0.76]	[0.56]
Water and Sanitation	8.41	8.22	8.32	0.13	0.09	0.18
	(7.61)	(8.55)	(8.06)	[0.67]	[0.80]	[0.63]
Roads	11.02	10.05	10.45	0.20	0.57	-0.20
	(9.96)	(8.72)	(9.99)	[0.64]	[0.25]	[0.69]
Community Facilities	6.39	5.89	6.04	0.14	0.35	-0.10
	(6.57)	(6.18)	(6.37)	[0.57]	[0.23]	[0.70]
Business Loan	4.83	4.99	5.39	-0.47	-0.57	-0.37
	(6.51)	(6.44)	(7.09)	[0.03]	[0.02]	[0.14]
Agricultural Assistance	15.62	16.20	15.76	0.10	-0.15	0.37

Comparing overlaps

	T1	T2	Control	β_T	β_{T1}	β_{T2}
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Beliefs						
Top sector	-0.002	0.002	0.001	-0.001	-0.004	0.001
	(0.072)	(0.068)	(0.073)	[0.558]	[0.181]	[0.606]
Top 2 sectors	-0.002	0.002	-0.001	0.000	-0.001	0.002
	(0.073)	(0.066)	(0.073)	[0.893]	[0.594]	[0.374]
Top 3 sectors	-0.003	0.001	-0.001	0.000	-0.002	0.002
	(0.073)	(0.066)	(0.076)	[0.866]	[0.403]	[0.507]
Health/Educ/Ag.	-0.004	0.002	0.000	-0.001	-0.004	0.003
	(0.073)	(0.063)	(0.074)	[0.775]	[0.192]	[0.317]
All sectors	-0.004	0.001	-0.001	0.000	-0.002	0.002
	(0.085)	(0.076)	(0.088)	[0.922]	[0.460]	[0.501]
Panel B: Stated Promises						
Top sector	-0.025	-0.018	-0.026	0.001	0.001	0.001
	(0.091)	(0.072)	(0.085)	[0.676]	[0.802]	[0.640]
Top 2 sectors	-0.034	-0.026	-0.036	0.001	0.002	0.001

The treatment and control groups are well-balanced

	T1	T2	Control	β_{T1}	β_{T2}
	(1)	(2)	(3)	(4)	(5)
Registered voters	524.30	571.82	504.56	19.74	47.52
	(367.53)	(390.19)	(294.74)	[0.75]	[0.46]
Inc. Vote Share (2013)	51.84	52.67	50.53	1.31	1.98
	(16.31)	(15.21)	(14.38)	[0.55]	[0.38]
Nb precincts	1.07	1.10	1.11	-0.04	-0.02
	(0.33)	(0.36)	(0.32)	[0.59]	[0.79]
Rural	0.91	0.94	0.93	-0.02	0.01
	(0.29)	(0.24)	(0.26)	[0.73]	[0.85]
Vote buying (2013)	0.19	0.20	0.16	0.03	0.03
	(0.18)	(0.19)	(0.17)	[0.24]	[0.32]
Salience sectors (2013)	0.79	0.81	0.70	0.10	0.10
	(0.41)	(0.52)	(0.54)	[0.25]	[0.29]
Knowledge. promises (2013)	0.07	0.06	0.01	0.06	0.04
	(0.35)	(0.36)	(0.36)	[0.20]	[0.43]

The standard deviations are in (parentheses) (Columns 1-3). Each cell in Columns and 4 and 5 is either the coefficient on the

The treatment and control groups are well-balanced

	T1	T2	Control	β_T	β_{T1}	β_{T2}
	(1)	(2)	(3)	(4)	(5)	(6)
Length stay	34.97	36.98	36.39	-0.46	-1.42	0.62
	(19.97)	(19.73)	(19.85)	[0.49]	[0.07]	[0.39]
HH size	5.00	5.15	5.04	0.05	-0.04	0.15
	(2.26)	(2.26)	(2.07)	[0.49]	[0.67]	[0.11]
Number kids (0-6)	0.47	0.44	0.46	0.00	0.02	-0.01
	(0.82)	(0.79)	(0.77)	[0.90]	[0.54]	[0.65]
Number kids (6-14)	0.58	0.59	0.64	-0.05	-0.05	-0.05
	(0.98)	(0.99)	(0.99)	[0.09]	[0.10]	[0.18]
Female	0.30	0.33	0.31	0.01	0.00	0.03
	(0.46)	(0.47)	(0.46)	[0.61]	[0.87]	[0.27]
Age	49.23	50.49	49.85	0.06	-0.55	0.76
	(15.58)	(14.57)	(15.18)	[0.93]	[0.50]	[0.28]
Education (years)	9.47	9.63	9.23	0.30	0.24	0.37
	(3.48)	(3.49)	(3.53)	[0.05]	[0.19]	[0.03]
Remittances abroad	0.31	0.34	0.32	0.01	-0.01	0.03

The treatment and control groups are well-balanced

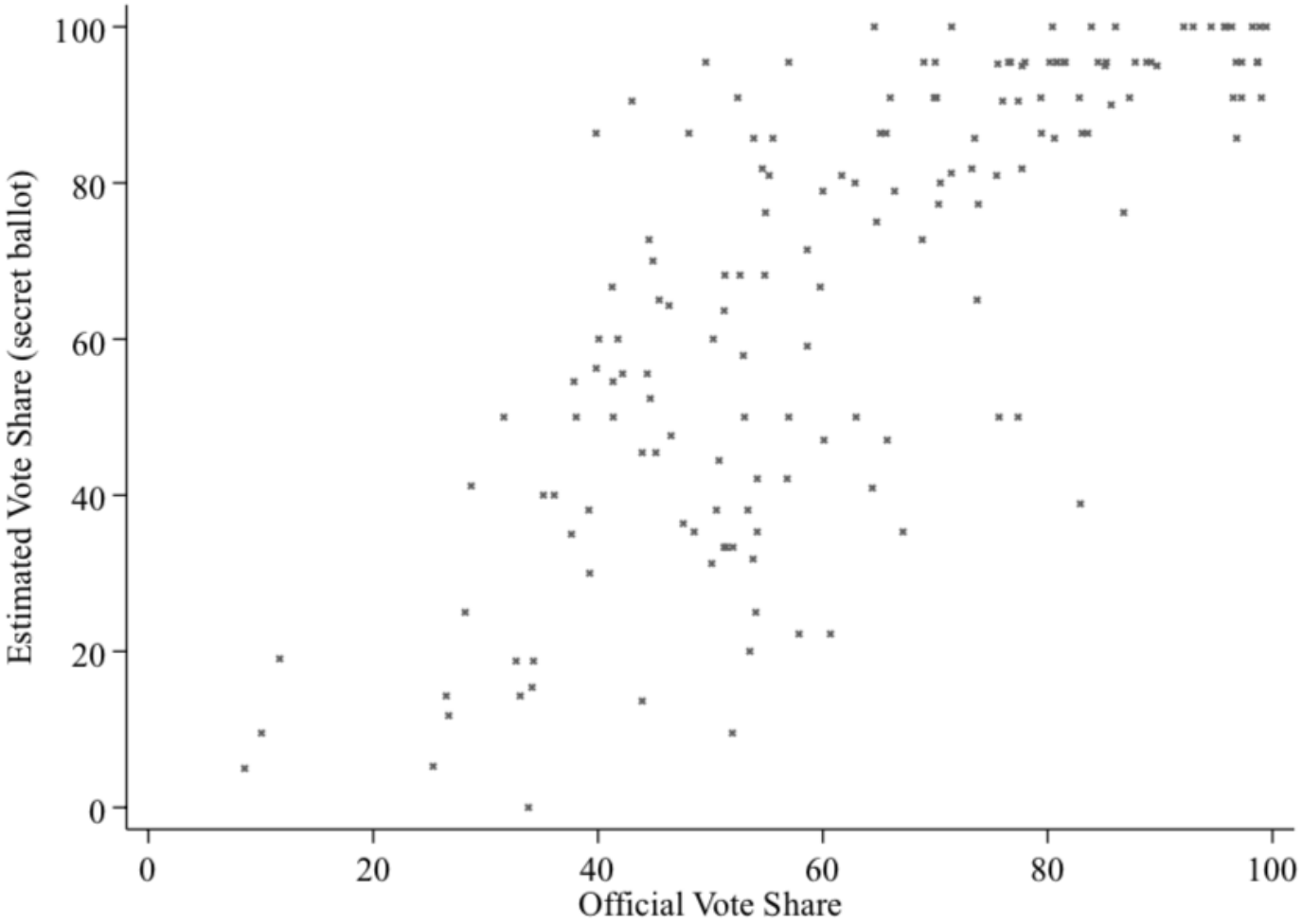
	T1	T2	Control	β_T	β_{T1}	β_{T2}
	(1)	(2)	(3)	(4)	(5)	(6)
Radio	0.71	0.74	0.73	-0.01	-0.02	0.00
	(0.45)	(0.44)	(0.45)	[0.67]	[0.41]	[0.88]
TV	0.88	0.90	0.89	0.00	-0.01	0.00
	(0.32)	(0.30)	(0.31)	[0.74]	[0.50]	[0.87]
Washing Machine	0.44	0.46	0.43	0.02	0.01	0.02
	(0.50)	(0.50)	(0.50)	[0.41]	[0.65]	[0.29]
Fridge	0.53	0.57	0.57	-0.03	-0.04	0.00
	(0.50)	(0.49)	(0.49)	[0.18]	[0.04]	[0.85]
Gas stove	0.61	0.69	0.67	-0.02	-0.06	0.03
	(0.49)	(0.46)	(0.47)	[0.35]	[0.02]	[0.28]
Motorcycle	0.63	0.63	0.64	-0.01	-0.01	-0.02
	(0.48)	(0.48)	(0.48)	[0.43]	[0.72]	[0.29]
Car	0.09	0.10	0.11	-0.02	-0.02	-0.01
	(0.28)	(0.30)	(0.31)	[0.14]	[0.11]	[0.30]

The standard deviations are in (parentheses) (Columns 1-3). Each cell in Columns 4-6 is either the coefficient on the dummy

The treatment and control groups are well-balanced

	T1	T2	Control	β_T	β_{T1}	β_{T2}
	(1)	(2)	(3)	(4)	(5)	(6)
Group	0.34	0.35	0.34	0.02	0.01	0.02
	(0.48)	(0.48)	(0.47)	[0.47]	[0.72]	[0.38]
Bgy assembly	0.95	0.94	0.96	-0.01	-0.01	-0.01
	(0.23)	(0.24)	(0.21)	[0.23]	[0.35]	[0.25]
Bayanihan	0.95	0.92	0.93	0.01	0.02	0.00
	(0.23)	(0.27)	(0.25)	[0.60]	[0.22]	[0.75]
Religion: never	0.05	0.04	0.06	-0.02	-0.01	-0.02
	(0.21)	(0.19)	(0.24)	[0.02]	[0.11]	[0.00]
Religion: weekly	0.42	0.43	0.39	0.04	0.03	0.05
	(0.49)	(0.50)	(0.49)	[0.03]	[0.16]	[0.02]
Radio daily	0.44	0.45	0.44	0.00	0.00	0.01
	(0.50)	(0.50)	(0.50)	[0.91]	[0.97]	[0.80]
TV daily	0.73	0.76	0.73	0.01	0.00	0.03
	(0.45)	(0.43)	(0.44)	[0.56]	[0.82]	[0.19]
Newspaper daily	0.02	0.02	0.01	0.00	0.00	0.01

Compare actual and survey vote shares



Linear correlation 0.772

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Treated voters do not appear to shift their preferences to match those of their preferred candidate

Dep var: similarity between voter preferences and perceived policies of the candidate they voted for					
Similarity:	Top Sector 1	Top Sector 2	Top Sector 3	Health, Edu, Ag.	All Sectors
Panel A:					
Treatment	0.0034	0.0014	0.0024	0.0029	0.0027
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observations	3182	3182	3182	3182	3182
R^2	0.05	0.05	0.04	0.04	0.04
Panel B:					
T1	0.0052	0.0028	0.0036	0.0030	0.0038
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)
T2	0.0019	0.00022	0.0013	0.0028	0.0017
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)

Estimating the effects separately for incumbents and challengers

Dep var: vote for incumbent					
Similarity:		Top Sector		Health,	All
	1	2	3	Edu, Ag.	Sectors
Treatment	-0.00064	-0.00090	-0.00070	-0.0011	-0.00069
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Similarity Inc.	-0.028	-0.00085	0.0057	-0.24*	0.060
	(0.14)	(0.15)	(0.14)	(0.14)	(0.15)
Similarity Cha.	-0.053	-0.10	-0.070	0.11	-0.11
	(0.14)	(0.15)	(0.14)	(0.15)	(0.14)
Treat*Similarity Inc.	0.45**	0.43**	0.38*	0.62***	0.32*
	(0.18)	(0.20)	(0.20)	(0.20)	(0.19)
Treat*Similarity Cha.	-0.42**	-0.36*	-0.33	-0.50**	-0.32*
	(0.20)	(0.22)	(0.21)	(0.22)	(0.18)
Observations	3155	3155	3155	3155	3155
R^2	0.30	0.30	0.30	0.30	0.30

The main results hold when we control for vote buying

Dep var: vote for incumbent					
Similarity:		Top Sector		Health,	All
	1	2	3	Edu, Ag.	Sectors
T1	0.012	0.012	0.012	0.013	0.013
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
T2	-0.018	-0.017	-0.017	-0.018	-0.017
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
ΔSimilarity	-0.027	0.039	0.024	-0.20	0.068
	(0.14)	(0.15)	(0.14)	(0.15)	(0.15)
T1*ΔSimilarity	0.55**	0.60*	0.50	0.48*	0.42*
	(0.27)	(0.30)	(0.31)	(0.29)	(0.24)
T2*ΔSimilarity	0.32	0.18	0.16	0.53**	0.20
	(0.23)	(0.26)	(0.25)	(0.25)	(0.21)
Kept	-0.031	-0.030	-0.030	-0.032	-0.029
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
T1*Kept	-0.0019	-0.00031	-0.00039	-0.0026	-0.0021
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)

Treated voters are more certain about candidate promises (even when controlling for vote-buying)

Dep var:	Certainty	
Treatment	0.068**	
	(0.03)	
Vote-Buying	-0.084**	-0.084**
	(0.04)	(0.04)
T1		0.085**
		(0.04)
T2		0.053
		(0.04)
Observations	3368	3368
R^2	0.04	0.04

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Treated voters are better informed (even when controlling for vote-buying)

Dep var: Distance between actual promises and expected policies					
Similarity:	Top Sector			Health,	All
	1	2	3	Edu, Ag.	Sectors
T1	-0.0088**	-0.0053	-0.0087**	-0.0047	-0.0086**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
T2	-0.0026	-0.00095	-0.0035	0.00051	-0.0039
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Vote-Buying	-0.0057	-0.0079**	-0.0086**	-0.0025	-0.0042
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observations	3365	3365	3365	3365	3365
R^2	0.19	0.29	0.41	0.22	0.59

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Treated voters are not more likely to be targeted for vote buying.

Dep var: targeted for vote-buying				
Treatment	-0.0015		-0.023	
	(0.03)		(0.03)	
T1		0.0074		-0.013
		(0.03)		(0.04)
T2		-0.0096		-0.031
		(0.03)		(0.04)
Kept			-0.13**	-0.13**
			(0.06)	(0.06)
T*Kept			0.055	
			(0.08)	
T1*Kept				0.032
				(0.10)
T2*Kept				0.071
				(0.09)
Observations	3423	3423	3111	3111

Treated voters whose preferences are closer to incumbent policies are not more likely to be targeted for vote buying.

Dep var: targeted for vote-buying					
Similarity:	Top Sector			Health,	All
	1	2	3	Edu, Ag.	Sectors
Treatment	-0.00053	-0.00066	-0.00044	-0.00040	-0.00014
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
ΔSimilarity	-0.0050	0.095	-0.0015	0.0046	0.037
	(0.21)	(0.19)	(0.21)	(0.25)	(0.20)
T*ΔSimilarity	0.31	0.12	0.24	0.26	0.25
	(0.25)	(0.24)	(0.25)	(0.31)	(0.23)
Observations	3409	3409	3409	3409	3409
R^2	0.12	0.12	0.12	0.12	0.12

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Treated voters whose preferences are closer to incumbent policies are not more likely to be targeted for vote buying.

Dep var: targeted for vote-buying					
Similarity:	Top Sector			Health,	All
	1	2	3	Edu, Ag.	Sectors
T1	0.0089	0.0086	0.0087	0.0084	0.0085
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
T2	-0.0071	-0.0073	-0.0073	-0.0079	-0.0072
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
ΔSimilarity	0.093	0.12	0.060	0.0061	0.035
	(0.19)	(0.20)	(0.18)	(0.19)	(0.15)
T1*ΔSimilarity	0.044	0.073	0.083	0.19	0.16
	(0.29)	(0.29)	(0.28)	(0.27)	(0.25)
T2*ΔSimilarity	-0.15	-0.23	-0.14	-0.22	-0.057
	(0.27)	(0.28)	(0.26)	(0.25)	(0.23)
Observations	3334	3334	3334	3334	3334
R^2	0.12	0.12	0.12	0.12	0.12

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