Political Agency, Election Quality, and Corruption[*]

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Abstract

How does electoral manipulation affect elected officials' willingness to satisfy their constituents? Although the literature has highlighted the role of elections as mechanisms of accountability, we do not know how elections whose integrity is compromised influence elected officials' actions in office. We present a model of accountability that allows for electoral manipulation and derive three results: i) rent extraction increases with the level of electoral manipulation, ii) the value of holding office is *positively* related to rent extraction for high values of office, and iii) electoral manipulation increases with the value of office. Using a fuzzy regression discontinuity design that exploits rules determining the sizes of polling stations in Colombia, we estimate a positive causal effect of vote buying on the likelihood of the election winner being sanctioned for violating the disciplinary code of public officials. We also find that higher values of office are not linked to fewer sanctions, but are associated with more vote buying.

Keywords: Electoral accountability, vote buying, corruption.

Elections are generally thought of as mechanisms of political accountability. They can be seen as sanctioning devices used to punish under-performing politicians or as filters that help voters separate the "good" leaders from the rest (Bernard, Przeworksi and Stokes 1999; Fearon 1999). The desire to hold public office, paired with elections, should push politicians to deliver the outcomes that voters want. Yet, corruption, underprovision of public goods, and lack of responsiveness by elected officials are all common in many democracies. Why? A large literature has studied the role of voters' informational constraints and electoral institutions in determining deviations away from beneficial policies.[1] This paper shifts the focus to a pervasive feature of elections around the world that has not received the same attention: electoral manipulation.

The link between electoral manipulation and the unwillingness of politicians to act in favor of their constituents is exemplified by the recent electoral history of La Guajira, a state in northern Colombia. Since 2000, there have been six consecutive elected governors who have been prosecuted and found guilty on charges of embezzlement of public resources, irregularities in granting public contracts, and even murder.[2] Four of them had previously held public office as mayors or governors and they all belong to two political movements whose electoral support in the region remained steady despite the scandals. Elections are competitive, but they are not clean or fair. In fact, La Guajira has one of the highest number of reports of electoral irregularities in Colombia and two of these governors have been investigated on electoral manipulation charges as well.[3] Why have the prospects of continuing

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[1]For recent surveys of the literature see Ashworth (2012) and DeVries and Solaz (2017).

[2]See "Competencia de questionados en la Guajira" [Competition among suspects in la Guajira] in *La Silla Vacía*, October 23, 2016 and "El 'dossier' delictivo de Kiko Gomez" [The criminal dossier of Kiko Gomez] in *Semana* October 19, 2013.

[3]See "La Guajira quedó en manos de los aliados de Kiko" [La Guajira was left in the hands of Kiko's allies] in *La Silla Vacía*, June 1, 2014 and "Los líos que enredan a los últimos

a political career not pushed politicians to serve their constituencies better? Has the ability to engage in electoral irregularities encouraged elected officials to engage in administrative corruption and other illegal acts?

We first formulate a simple formal model to study these questions. In the model, an incumbent facing an election chooses a quantity of rents to take for herself from public resources and selects a level of effort to invest in electoral manipulation. If electoral manipulation is successful in influencing the outcome of the election, the incumbent has an electoral advantage regardless of past levels of rent extraction. If not, voters are free to vote for the incumbent or the challenger. In particular, voters observe the level of public goods—determined by the incumbent's unobserved capabilities and by the resources left after rent extraction—and decide whether to reelect the incumbent. The model generates three main findings: i) rent extraction increases with electoral manipulation, ii) electoral manipulation increases with the value of office, and iii) the value of holding public office is positively related to rent extraction for high office values.

The theory captures a basic intuition that links electoral malpractice with the responsiveness of public officials. Electoral manipulation reduces politicians' incentives to satisfy voters because it diminishes the influence of policy outcomes on the choices voters make at the ballot box. This observation has an important implication for how the value of holding public office shape incumbents' actions during their tenure. Unlike previous theories of electoral accountability (e.g., Ferejohn 1986; Banks and Sundaram 1993; Persson and Tabellini 2000), our theory does not predict that a politician will be more interested in pursuing the best policies when she values office more. The key insight that explains this result is that a more valuable office pushes the incumbent to increase electoral manipulation, which consequently shrinks the likelihood of the election being determined by voters' perceptions about

cinco gobernadores guajiros" [The troubles of the last five guajiran governors] in *El Heraldo*, October 23, 2013.

the incumbent based on past performance.

We explore the relationship between rent extraction and electoral manipulation using data on disciplinary sanctions of mayors and reports of vote buying in elections in Colombia in the period 2003–2011. Colombia is a particulary interesting case to test our theory given its long history with democratic institutions, free press, and its weak party system that reduce the explanatory power of alternative theories of electoral accountability. The disciplinary sanctions in our data are imposed by the Office of the Inspector General (*Procuraduría General de la Nación*) most commonly for embezzlement of public resources, violations of contracting laws, and other actions linked to administrative corruption, but not for electoral irregularities. For the measure of electoral manipulation, we use citizens' reports of vote buying, the most common and widespread form of electoral malpractice in Colombia.[4]

We find that mayors elected in elections with more reports of vote buying are significantly more likely to be prosecuted, found guilty, and removed from office for corruption during their terms. We also find support for two additional predictions of the model: there is a robust positive correlation between two proxies for value of office (the salaries of mayors and discretionary revenues of the municipality) with reports of vote buying and these measures of value of office are not negatively correlated with disciplinary sanctions.

While finding a positive association between disciplinary sanctions and vote buying is consistent with the main prediction of the theory, there are alternative mechanisms that could account for this finding. Incumbent politicians can use public resources to finance their vote buying efforts (De La O 2015) and disillusioned voters in corrupt environments might be more open to clientelism (Cleary and Stokes 2006). Similarly, voters might be less likely to report vote buying and cases of administrative corruption because they distrust the institutions that investigate these practices. To address these concerns and others related to

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[4]We define vote buying as the distribution of excludable material benefits to individuals in exchange for their votes.

3

mismeasurement of electoral and administrative corruption, we implement an instrumental variables strategy that exploits differences in polling station sizes as plausible sources of exogenous variation in vote buying. We do this informed by the literature on clientelism that predicts more vote buying in places where parties have access to more disaggregated election results (Smith and Bueno de Mesquita 2012; Gingerich and Medina 2013; Larreguy, Marshall and Querubin 2016; Rueda 2015, 2017). In Colombia, those are the municipalities with smaller polling stations, as vote totals are published at the polling station level. The instrumental variables estimates are also in line with the theoretical expectations.

While we are able to control for a large set of municipality characteristics which make the validity of the exclusion restriction more plausible, we additionally check the robustness of these results with a fuzzy regression discontinuity (RD) design. In Colombia, most polling stations are capped at 400 registered voters. If there are more registered voters in the precinct, a new polling station is installed. The fuzzy RD compares municipalities whose number of registered voters are right below and above a multiple of 400 registered voters. The municipalities right below would tend to have a larger average polling station size, while the ones above would tend to have smaller polling stations on average. The first group of municipalities should have less expected vote buying than the second, but they should be similar in all other determinants of mayors' disciplinary violations as well as in factors driving misreporting of these violations or vote buying. We find that a 10% increase in reports of vote buying increases the probability of the mayor being prosecuted for violations of the disciplinary code during her tenure by 4.8 percentage points and that of being found guilty and removed from office by 3.6 and 2.6 percentage points, respectively.

Our paper is part of the literature on electoral accountability and corruption. The key question of this work is what factors provide elected officials with incentives to follow voters' wishes. Voters' information about the incumbents (Ferraz and Finan 2008; Winters and Weitz-Shapiro 2013; Chong et al. 2015), heterogeneities within the electorate (Anduiza,

Gallego and Munoz 2013; Weitz-Shapiro and Winters 2016; Klašnja 2017), and institutional characteristics like term limits, reelection, ballot structure, and the value of holding office (Kunicová and Rose-Ackerman 2005; Ferraz and Finan 2011; Gingerich 2013; Klašnja and Titiunik 2017) have been identified as some of the determinants of politicians' willingness to deviate from citizens' desired policies. The link between the quality of the electoral process and accountability has received less attention and, with few exceptions (Nyblade and Reed 2008; Singer 2009; De La O 2015), the literature has often lumped together practices of administrative corruption and electoral malfeasance. De La O (2015) and Singer (2009) study perceptions of corruption and their relationship with vote buying and find a positive association. Both studies argue that corruption generates resources used for clientelistic campaigns. Nyblade and Reed (2008) study the determinants of administrative corruption and clientelism in Japan, but not the causal links between them. This paper provides a new theory of electoral accountability when electoral manipulation is common and presents evidence of a positive causal effect of vote buying on administrative corruption.

Finally, this paper also contributes to the literature that studies the effects of electoral manipulation (Simpser 2012; Vicente 2013; Gingerich 2014; Imai, Park and Greene 2015; Cantu 2016; Hidalgo and Nichter 2016). The focus of this work has been the estimation of "first order" effects on voting choices and turnout. Our results complement these findings by showing that the quality of elections is an important determinant of actions taken by elected officials during their terms.

A Simple Model

In this section, we follow Persson and Tabellini (2000) and adapt their career concerns framework to allow for electoral manipulation during the campaign. Consider a game in which there are two time periods denoted by $t \in \{1, 2\}$. In each of these periods, a politician

in office chooses rents, $r_t \in [0, \bar{r}]$. We can think of r_t as the diversion of public resources for private use, or more generally, as anything that benefits the politician but not the citizens. We assume that the total resources available to the politician, R, cannot be completely exhausted by rents and so $\bar{r} \in (0, R)$.

When choosing the rents, the politician faces the budget constraint, $g_t = \eta(R - r_t)$, where g_t denotes the level of public good provision and η the competence of the politician. According to this expression, a competent politician is able to provide more public goods using the same resources than one whose η is lower. We assume that η is distributed uniformly over $\left[1 - \frac{1}{2\xi}, 1 + \frac{1}{2\xi}\right]$. Once η is realized, it remains as a feature of the politician.

An election is held in the first period. Before the election, the incumbent politician chooses a level of effort to invest in electoral manipulation, $m \in [0, 1]$. Since electoral manipulation is not always effective, we assume that with probability m electoral manipulation influences the results of the election. In this case, the incumbent will win the election with probability $\frac{1}{2} + \chi$ (with $\chi \in (0, 1/2]$). A positive χ captures the electoral advantage that successful manipulation efforts give to the incumbent.[5] With probability $1 - m$, on the other hand, election results are not influenced by manipulation efforts, in which case the electorate is free to vote as they please. Engaging in electoral irregularities can be costly. These costs are captured by a function c that is twice continuously differentiable and has strictly positive first and second derivatives for non-zero values of m.

Besides setting the second period rents, the politician who wins the election gets a payoff of E, which represents ego-rents, wages, or other perks of holding office. The payoffs over the two periods of the incumbent are then $r_1 - c(m) + p(E + r_2)$, where p denotes the probability of the incumbent winning the election.[6] Voters care about the level of public

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[5]When $\chi \leq 0$ the model collapses to the standard electoral accountability model, which gives the incumbent a probability of winning of $1/2$ in equilibrium.

[6]We assume a discount factor of 1. No substantive result is affected by this choice.

goods received in both periods.

The timing of events is as follows: 1) the incumbent chooses the level of rents and effort invested in electoral manipulation. 2) The value of η, the ability of the incumbent, is realized and voters observe the policy outcome, g_1, but neither the incumbent's ability nor the level of extracted rents, r_1. 3) Elections take place. 4) The winner of the elections chooses the rents in the second period.

The assumption that η is realized after rents and levels of manipulation are chosen is consistent with on-the-job learning by the politician. In particular, a politician who is in her first term might not know with certainty how effective her efforts at providing public goods will be. An alternative setting in which the politician knows her ability before choosing rents and in which the fraction of voters that vote for the incumbent regardless of her actions is exogenous is studied in Besley (2007). The main relationship predicted by our model between manipulation and rent extraction also holds in this alternative setting.

The model also assumes that only the incumbent engages in electoral manipulation. This assumption is common in the literature of clientelism and it captures the advantage that access to public resources gives the incumbent during the campaign (Stokes 2005; Nichter 2008; Gingerich and Medina 2013; Smith and Bueno de Mesquita 2012; Rueda 2015). Incumbents also control security forces and are in a better position to influence election commissions' officials. Nevertheless, in Appendix **??**, we present an extension in which we allow the challenger to engage in electoral irregularities. Below, we discuss the differences in the conclusions reached with this alternative setting.

Theoretical Results

In the second period nothing prevents the politician who wins the election from extracting the maximum level of rents and so $r_2 = \bar{r}$ regardless of what happened before. This implies that voters receive $g_2 = \eta(R - \bar{r})$. Since this level of public goods is increasing in

ability, voters are better off electing the candidate they perceive to be the most competent. Given the information voters have at the time of the election, they would want to reelect the incumbent whenever $\mathbb{E}[\eta|g_1] \geq \mathbb{E}[\eta]$. That is, voters use the provision of public goods in the first period to infer the competence of the incumbent and vote for her when they think the incumbent is more competent than the average challenger. When manipulation does influence the election, however, the incumbent has an electoral advantage regardless of the observed provision of public goods.

The next result describes the relationship between equilibrium electoral manipulation and rents and presents comparative statics. The proof is in Appendix **??**.

Proposition 1. *The following statements characterize the interior equilibrium in the electoral manipulation game.*

1. *There is a positive relationship between the equilibrium levels of electoral manipulation, m^*, and the rents in period one, r^*.*

2. *There is a positive relationship between the value of office, $E + \bar{r}$, and equilibrium rents, r^*, for high values of office. Moreover, depending on the shape of the cost function, c, this relationship might be positive for all values of office.*

3. *Equilibrium levels of manipulation, m^*, are strictly increasing in the value of holding office, $E + \bar{r}$, and the advantage given by successful manipulation, χ.*

4. *The probability of the incumbent winning is strictly increasing in the electoral manipulation efforts, m^*, and the advantage given by successful manipulation, χ.*

The intuition regarding the first statement of the proposition is straightforward. When manipulation increases, it is more likely that the level of public goods will not influence the election results. This reduces the negative electoral consequences of extracting rents in the first period. With high manipulation, a low provision of public goods gives

voters reason to vote for a challenger but their votes are effectively cancelled by the electoral irregularities. This makes rent accumulation an attractive option for the incumbent. One observable implication of this result is that electoral manipulation should have a causal effect on actions that favor the incumbent at the expense of the public.

Standard accountability models predict that the greater the reward to winning, the more responsive incumbents will be to the citizens' needs (e.g., Ferejohn 1986; Banks and Sundaram 1993; Persson and Tabellini 2000; Besley 2007). The second and third statements of the proposition indicate that this is no longer true with electoral irregularities. In other models, the desire to obtain the prize associated with winning pushes politicians to do what the public wants. This accountability mechanism, however, can be trumped by the effect of a higher value of office on electoral manipulation. A more valuable office gives the incumbent incentives to win by any means, including breaking the electoral rules. An incumbent with a greater interest in obtaining office would increase electoral manipulation efforts, which in turn reduces the need to please an electorate who rewards low rent extraction.

The model rules out a monotonic negative relationship between the value of office and equilibrium rents in the presence of manipulation. However, there are costs of manipulation functions for which this negative relationship might still exist for some ranges of low values of office. For some others, the relationship might be positive for all possible values of office.[7] Strictly increasing rents in value of office are the product of high marginal costs of manipulation that need to be compensated by higher rents.

The last statement of the proposition tells us that electoral manipulation gives an electoral advantage to the politician that engages in it. The empirical literature has already provided evidence consistent with this theoretical finding. In particular, turnout and vote buying do seem to be associated with higher vote shares for the manipulators (Vicente 2013;

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[7]An example of the first situation is $c(m) = m^2$, where rents would be decreasing in $[0, 1/\chi)$. An example of a cost function that induces increasing rents on m is $c(m) = e^m - 1$.

Cantu 2016; Larreguy, Marshall and Querubin 2016). In the rest of the paper, we focus on evaluating the empirical evidence relating to the first three statements of the proposition using data from Colombia.

If we allow the challenger to exert effort to manipulate election results, we find similar substantive conclusions regarding the relationships between overall manipulation and rents, manipulation and value of office, and value of office and rents. However, there is now a major difference regarding the effect of manipulation on the probability of winning. In a symmetric interior equilibrium, both parties manipulate, which causes their manipulation efforts to cancel each other. More manipulation still incentivizes rent seeking by diminishing the likelihood of a free vote, but it doesn't increase the probability of winning, as now the manipulation from one party invites a similar response from the other. This highlights the importance of taking into account the actions of rivals when trying to estimate the effects of one party's manipulation on electoral outcomes.

Colombian Institutions and Electoral Context

Before describing our empirical analysis, we highlight characteristics of the Colombian electoral environment and institutions that are important for our empirical strategy.

Historically, Colombia has had a strong central government run either by the Conservative party or the Liberal party (Bushnell 1993). In the eighties and nineties, however, several reforms were enacted to decentralize the country. One of the most influential ones came in 1986 with the introduction of elected mayors in municipalities. Following these changes, the 1991 constitutional reform increased fiscal and social spending descentralization. A major goal behind the reforms was to boost the responsiveness of local officials.

Currently, mayors are in charge of designing the budget and implementing an annual development plan in municipalities. Although most municipalities receive transfers from the

central government that are tied to specific expenses, mayors have discretion over an average of 26% of all local spending.[8] Most of the discretionary resources come from property-tax revenues (Martínez 2017). These resources are used for the provision of education, health insurance, water, and sanitation projects.

Public officials in Colombia, and mayors in particular, are overseen by the Office of the Inspector General. This institution initiates, pursues, and rules on investigations into public officials for violations of their disciplinary code. The possible sanctions include fines, suspensions, removal from office, or even bans from future public employment. Most sanctions are related to administrative mismanagement, corruption, and violation of procurement and contracting norms. Importantly for our empirical strategy, the Office of the Inspector General does not investigate violations of the electoral law, which are the responsibility of the Attorney General (*Fiscalía General de la Nación*).

The Office of the Inspector General does not report to the judiciary, the legislative bodies, or the executive and is considered an independent entity. The Inspector General is appointed by the Senate for a four year term and chosen from a triad nominated by the President, Supreme Court, and Council of State. Investigations can start based on information presented by citizens or commonly by the watchdog agency, *Contraloría General*. In the period of analysis, regional *contralores*—those who audit mayors—were appointed by department assemblies and municipal councils from triads nominated by superior tribunals (*Tribunales Superiores de Distrito y de lo Contencioso Administrativo*).[9] Regional Inspectors General oversee investigations against mayors and are appointed directly by the Inspector General. These institutional arrangements limit the direct influence of mayors on their investigations.

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[8]Data from the 2004–2007 period.

[9]Officials who were elected in the previous year cannot be considered in these triads. See Articles 272, 276 of the Colombian constitution.

Elections

Regional elections have been held every four years since 2003. In each election, members of local administrative juntas, municipal councils, department assemblies, municipality mayors, and governors are elected. Mayors and governors are elected by plurality and members of legislative bodies are elected by party-list proportional representation.[10]

Colombia uses the Australian Ballot (*El Tarjetón*). The 1991 reform eliminated the old system in which citizens could only vote using ballots that were distributed by the parties, making the ballot effectively secret. The most disaggregated electoral results available are those of polling stations. These are published on the website of the National Registrar's Office shortly after the elections.

The size and location of the polling stations are determined by the National Registrar's Office. The Registrar's Office defines the maximum number of voters allowed to vote per polling station in the months before an election. The maximum size varies according to the type of precinct and its location. For the years 2003 and 2007, the size of most polling stations was 400 voters.[11]

Importantly, there is no consecutive reelection for mayors, but many continue their political careers by running for congress, governorships, or municipal councils. Some of them also run for mayor of the same municipality in later years. A famous example among Colombians is former congressman Enrique Peñaloza, who ran for mayor of Bogotá—Colombia's capital—in 1991 and 1994, was elected for the first time in his third attempt in 1997, ran again and lost in 2007 and 2010, and regained office in 2015. More generally, 62% of mayors

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[10]The D'Hondt formula is used for assigning seats.

[11]Special voting centers like Corferias in Bogotá can take more voters, but our data does not allow us to know the fraction of polling stations for which the special rules apply. See National Registrar's resolution 1883 of 2007, which can be found at http://www.imprenta.gov.co/diariop/diario2.portal.

in 1988 had participated in elections after their terms, some of them successfully.[12] Former mayors constituted 14% of all members of congress in 2010, 22% of governors in 2011, and 16% of mayors in 2015. This indicates that, consistent with the model, mayors often rely on their constituencies for future electoral support.[13]

Data

One immediate challenge when empirically examining the predictions of our theory is that it is not possible to observe the true levels of rent extraction or electoral manipulation. Even in weak institutional settings, corrupt candidates still want to hide their illegal actions. Moreover, in a competitive political setting, false claims of illegal activities against rivals could overstate the level of illegality.

We address these problems of measurement error using two strategies. The first is to use different proxies for rent extraction and general mismanagement by mayors. Finding consistently similar evidence across multiple indicators should increase the confidence that the results are not driven by measurement problems specific to any of them. The second relies on an instrumental variables strategy that, under plausible assumptions, allows us to account for potential biases caused by measurement error in reported electoral malpractice and sanctions.

In the models that explore the link between electoral malpractice and mayors' actions, we first use as a dependent variable an indicator of whether the mayor of a municipality was prosecuted for a violation of norms that govern public officials during her term. For each

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[12]In our sample, 37.79% run in the future and 25.71% run for mayor of the same municipality.

[13]For evidence of electoral accountability driven by future political aspirations without immediate reelection see Micozzi (2014*b,a*) and Kerevel (2015).

of these prosecution cases, we have information on the outcome of the investigation. This allows us to create an indicator of whether the mayor was declared guilty. The last dependent variable used in these models is an indicator of whether the mayor was removed from office once declared guilty. The data, collected by Martínez (2017), cover the period 2003-2011 and were originally taken from news bulletins published by the Office of the Inspector General of Colombia on its website. Complementing these data, we collect information from the same sources to determine whether the elected mayors had a previous history of sanctions at the time of the election.

An advantage of the guilty indicator over the prosecution one is that it has less contamination from false accusations of corruption. This is because, generally, to reach a guilty ruling, more evidence is required than to start a prosecution. While the impeachment indicator is superior to the guilty one for the same reasons, it ignores less serious offenses that can also be affected by electoral accountability pressures. This suggests that the guilty indicator more closely captures our theoretical concept of rents while being relatively more robust to false positives than prosecutions.

In addition to the three variables of disciplinary sanctions from the Office of the Inspector General, we check the robustness of the results by using a cross section of municipalities for which indices of the risk of administrative corruption from Transparency International Colombia are available. This information is summarized in the Transparency Index, for which higher values denote less risk of corruption. An advantage of this measure relative to the disciplinary sanctions information is that it does not suffer from measurement error generated by citizens' misreporting. A limitation, however, is that we only have this measure for a cross section of 252 municipalities that responded in 2005 and 2006 to the questionnaires sent by Transparency International used to compute the index.

Our measure of electoral manipulation is the number of reports of vote buying incidents filed at regional offices of the Attorney General. These data contain the number

of reports from every municipality for the two elections covered in the analysis, 2003 and 2007. Vote buying is the most common form of manipulation in Colombian regional elections. According to the Latin American Public Opinion Project in 2003 and 2007, 16.44% of respondents reported having been offered bribes in exchange for their votes, while only 1.75% and 1.14% reported having been pressured into abstaining or threatened to vote for a given candidate. Moreover, relative to ballot stuffing, tampering with registration lists, or other irregularities related to the administration of elections, citizens can more easily observe vote buying.

The last two variables of interest are measures of the value of office. The first is the maximum salary that a mayor of a given municipality can earn, which is determined according to fixed institutional rules by the municipality population and the amount of non-earmarked revenues.[14] The second is the amount of these non-earmarked or discretionary revenues. The resources over which the mayor has discretion increase the mayor's visibility and influence.

Violations of the disciplinary code are common in the data. In 24.22% of municipality-period observations the mayor was prosecuted, the chance of a mayor being found guilty is 16.36%, and that of being removed from office is 9.46%. There is also a high probability of being found guilty conditional on having been prosecuted. A mayor who is prosecuted is found guilty 67.53% of the time. Furthermore, one who is found guilty has a 57.82% chance of having committed a serious offense that justified her removal from office.[15]

The average number of reports of vote buying in the municipality per 1,000 people is 0.027. This is a low rate if we compare it to the percentage of respondents of the Latin

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[14]Law 617 of 2000 defines different categories for municipalities according to population and discretionary revenues. The president decides on the maximum salaries for mayors of municipalities in a given category.

[15]Appendix **??** presents summary statistics of all variables used in the analysis.

American Public Opinion survey approached by brokers (16.44%). Informal conversations with election monitors, candidates, and party operatives indicate that citizens might not want to report vote buying incidents because it is time consuming and the reports are not anonymous. In what follows, we present our baseline empirical results, discuss how our inferences are affected by misreporting of vote buying, and offer a strategy to address these problems.

Disciplinary Sanctions and Vote Buying

Recall that in the model, the possibility of engaging in electoral irregularities in the election induces greater rent extraction. If current levels of manipulation give politicians an indication of how much elections can be manipulated in the future, we would expect to find a causal effect of observed electoral irregularities on violations of the electoral code. To test this, we estimate equations of the form

(1)
$$s_{i,t} = b_{i,t} \ \gamma + \mathbf{x}_{i,t-1} \ \beta + \zeta_i + \varepsilon_{i,t},$$

where $s_{i,t}$ is a measure of disciplinary sanctions of the mayor in municipality i committed for violations in the period following the election of year t and $b_{i,t}$ is the logged number of vote buying reports. The vector $\mathbf{x}_{i,t-1}$ includes the average margin of victory of all races, an indicator of the presence of guerrillas or paramilitary forces, the share of local revenues in total revenues of the municipality, the share of the population living in rural areas, and the share of under-performing schools based on the national standardized ICFES test results.[16] Given that vote buying is measured in levels, all models also include the logged

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[16]For more detailed definitions of control variables, see Appendix **??**.

municipality population. These controls are lagged or measured in the previous election. For some specifications, we also include municipality fixed effects denoted by ζ_i. Since most of our dependent variables are dichotomous, we provide estimates for nonlinear models as robustness checks in Appendix **??**. All standard errors are clustered at the municipality level.

Table 1: Disciplinary sanctions and vote buying

Dep. Variable:	Prosecuted			Guilty			Removed		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Vote buying	0.077***	0.077***	0.074*	0.068**	0.068**	0.071*	0.036	0.036	0.055*
	(0.029)	(0.029)	(0.043)	(0.027)	(0.027)	(0.039)	(0.022)	(0.022)	(0.032)
Previous sanctions		0.031	-0.002		0.020	-0.003		0.022	0.005
		(0.029)	(0.039)		(0.025)	(0.033)		(0.020)	(0.029)
Fixed effects	no	no	yes	no	no	yes	no	no	yes
Municipalities	1,086	1,086	1,086	1,086	1,086	1,086	1,086	1,086	1,086
Observations	2,072	2,072	2,072	2,072	2,072	2,072	2,072	2,072	2,072

This table reports OLS coefficients. All models include baseline controls. Fixed effects denotes models with municipality fixed effects. Robust standard errors clustered at the municipality level are in parentheses. *** p<0.01, **p<0.05, *p<0.1.

Table 1 presents the results for the disciplinary sanctions models. We see that there is a positive association between the reports of vote buying and the three sanctions variables. According to model 1, an increase of 10% in the number of vote buying reports is associated with an increase of 0.77 percentage points ($\frac{0.077}{100} \times 10$) in the probability of the mayor being prosecuted. We see a similar pattern when the dependent variable is whether the mayor was declared guilty. When it is an indicator of removal (model 7), the coefficient is still positive but smaller and it is only significant at the 11% level.

It is important to reiterate that the dependent variable does not include sanctions for violations of the electoral rules and that separate institutions are in charge of investigating sanctions to the disciplinary code and electoral irregularities, which rules out that the previous findings are driven by the way our corruption proxies are measured. It is possible, however, that the positive association between the likelihood of sanctions and vote buying is

17

explained by omitted variables and not by the weakening of electoral accountability pressures as our theory suggests. For example, candidates who are good at manipulating elections are also those who are more likely to engage in administrative corruption once they are elected. It can also be that certain cultural and historic unobserved factors make the electorate of certain municipalities less likely to reject all forms of corruption (electoral and non-electoral).

The first strategy to address the candidate selection issue is to find a measure of the mayor's "type" and control for it. We gather information from the Office of the Inspector General on whether the candidate who won the election had any disciplinary sanctions imposed by this institution at the time of the campaign. The models in columns 2, 5, and 8 compare the likelihood of being involved in a violation of the disciplinary code for mayors who have the same history of previous sanctions, but who differ in the manipulation of the campaign that led to their election. The results are almost unchanged. The models in columns 3, 6, and 9 add municipality fixed effects. These models account for unobserved confounders that are invariant over the period of analysis like institutional quality and an entrenched corruption culture. We see that the coefficient on vote buying is still positive and significant for all the dependent variables examined, and for the model of removal from office, its magnitude is slightly larger.

Measurement Error and Unobserved Determinants of Corruption

The previous results give us the first approximation to the relationship between vote buying and administrative corruption and should be interpreted with caution. Even if our set of controls allows us to isolate the theoretical mechanism proposed by the theory, it is possible that mismeasurement in the proxies of violations of the disciplinary code and vote buying is affecting these results.

In particular, OLS estimates of the effect of vote buying would tend to be understated if there is more vote buying in municipalities where violations of the disciplinary code are

not investigated. This could happen if citizens are disillusioned with the fraudulent elections and are therefore less likely to report mayors' illegal actions or if the mayors of those municipalities are better at avoiding investigations. On the other hand, it is also possible that voters tend to underreport vote buying and administrative corruption in places where they perceive institutions to be ineffective. Furthermore, some regions might lack the capacity to enforce laws against administrative and electoral corruption. In these last two cases, the estimated coefficient on vote buying would be biased upwards. An upward bias also arises if mayors use public resources to finance vote buying efforts or if voters become more open to clientelism in corrupt environments.

We undertake two separate instrumental variables (IV) strategies that address concerns associated with measurement error, potential confounders, and reverse causality. For an IV approach to give us sensible estimates, we need to find sources of exogenous variation in vote buying that are not related to factors driving citizens' misreporting or other causes of mismeasurement. Moreover, the instrument should not affect violations of the disciplinary code through channels other than vote buying and it must be a strong predictor of actual vote buying once we partial out the effects of other controls. Appendix ?? derives an expression for the large sample biases of OLS under the conditions of interest and shows that a valid instrument that is also orthogonal to errors of measurement of vote buying and administrative corruption allows for consistent estimation of the effect of interest.

The first instrument we propose is the average number of citizens voting in a polling station in a municipality. The literature offers two explanations for why the size of polling stations determines the incidence of vote buying in secret ballot elections. The first highlights how small polling stations and more disaggregated electoral results give more fine-grained information about voting behavior that helps to enforce vote buying contracts (Smith and Bueno de Mesquita 2012; Gingerich and Medina 2013; Rueda 2015, 2017). The second explanation hinges on the actions taken by parties to prevent their brokers from shirking or

misallocating vote buying resources. When there are many polling stations (smaller average polling stations), parties have more information regarding the performance of brokers who mobilize voters in the area (Larreguy, Marshall and Querubin 2016). In this way, more polling stations facilitate a solution to the moral hazard problem faced by parties who try to control unaligned brokers.

One concern with using polling station size as an instrument of vote buying is that places where polling stations are small tend to be rural areas where voters are less educated and where underreporting of any crimes might be common. This would violate the exclusion restriction and also the orthogonality of the instrument to the measurement error in vote buying. A similar concern is that in places where illegal armed groups operate, voters would fear reporting any irregularities. To account for this, we control for lagged measures of education quality, population size, presence of armed actors, and the percentage of the population living in rural areas. The results of this instrumental variable approach are very similar whether or not we control for these regressors, suggesting these concerns are unlikely to be important in practice. We additionally control for the main determinant of the size of the polling station which is the logged number of registered voters in the previous election.

Table 2 presents the results in columns 1, 2, and 3. We see that the estimated coefficient on vote buying is large and still significant. A 10% increase in vote buying reports raises the likelihood of the mayor being prosecuted by 7.4 percentage points. This represents a large increase in the magnitude of the effect relative to the OLS estimates, suggesting that a smaller rate of investigations where vote buying is common and where disciplinary violations occurred was biasing the previous estimates downwards.[17] There is a similar effect on finding the mayor guilty on corruption charges. As for removal from office, the effect is smaller, but still substantively important. Panel B of the table shows that, consistent with

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[17]In addition to this negative bias in OLS, Appendix **??** shows that OLS estimates are attenuated.

Table 2: Disciplinary sanctions and vote buying (IV estimates)

Dep. Variable:	IV (instrument: actual polling station size)			Fuzzy RD (instrument: predicted polling station size by rules)					
	Prosecuted	Guilty	Removed	Prosecuted		Guilty		Removed	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A. Second stage results									
Vote buying	0.735*	0.695**	0.379*	0.482***	0.332	0.365***	0.646**	0.261**	0.298
	(0.377)	(0.377)	(0.225)	(0.150)	(0.324)	(0.117)	(0.265)	(0.102)	(0.246)
Panel B. First stage results									
Polling station size (Rule)	−0.249***	−0.249***	−0.249***	−0.292***	−0.217***	−0.292***	−0.217***	−0.292***	−0.217***
	(0.070)	(0.070)	(0.070)	(0.071)	(0.082)	(0.082)	(0.071)	(0.082)	(0.071)
F-statistic	12.8	12.8	12.8	16.8	7	16.8	7	16.8	7
Sample	Full	Full	Full	Full	Discontinuity	Full	Discontinuity	Full	Discontinuity
Observations	2,072	2,072	2,072	2,237	581	2,237	474	2,237	474

This table reports two stage least squares results. F-statistic denotes the Kleibergen-Paap rk Wald F statistic value from the first stage. The discontinuity sample includes only municipalities whose number of registered voters are within 40 from a discontinuity point. Models in columns 1, 2, and 3 include baseline controls, the previous year's logged registered voters, and an indicator of whether the mayor had a disciplinary sanction at the time of the election. All others models control for the log of registered voters. Robust standard errors clustered at the municipality level are in parentheses. *** p<0.01, **p<0.05, *p<0.1.

the theories of clientelism summarized above, there is a strong negative relationship between the average size of the polling station and the reports of vote buying.

Discontinuities in Polling Station Sizes and Vote Buying

An alternative, and perhaps more robust, identification strategy relies on variation in the average size of the polling stations induced by institutional rules that cap the sizes of polling stations using a fuzzy regression discontinuity design. The institutional rule predicts sharp reductions in the average size of polling stations every time the number of registered voters reaches a multiple of the maximum number of citizens (400) allowed to vote. This is explained because a new polling station needs to be added, reducing the average size of polling stations in that municipality. These reductions should impact the levels of vote buying and are used to estimate this variable's causal effect on corruption. This is done by using the average size of polling stations predicted by the institutional rule as an instrument for vote buying levels.

The intuition for this strategy is simple. A municipality whose number of registered voters is right above the threshold that determines the number of polling stations should be similar to one whose registered number of voters is right below.[18] The difference is that the first one would have smaller polling stations on average and, because of this, more vote buying, while the second one would have larger polling stations on average and less vote buying. This indicates that there should be sharp changes in the levels of vote buying above and below the thresholds determined by the sizes of polling stations, but the sources of measurement error in vote buying and all determinants of disciplinary violations (or the factors behind misreporting of those violations) are unlikely to experience such discontinuities.

The dotted line in Figure 1 shows the predicted size of the average polling station in 2003 if all the registered voters in the municipality were divided equally among the stations

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[18]Below we check that these municipalities are indeed similar.

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Figure 1: Polling station sizes and registered voters in 2003
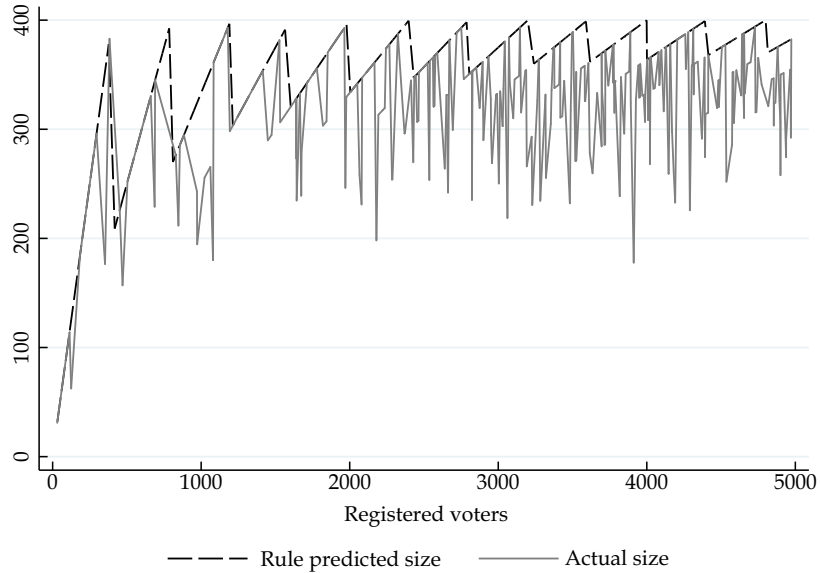
with sizes limited by the regulation, Rule-based size$_{i,t}$. It is computed as

$$(2) \qquad \text{Rule-based size}_{i,t} = \frac{\text{Registered}_{i,t}}{int((\text{Registered}_{i,t} - 1)/\text{Max. size}_t) + 1},$$

where Max. size$_t$ is the maximum size imposed by the regulation and $int(.)$ is a function that returns the integer part of the number. The solid lines represent the actual size of the average polling stations in the data. The figure reflects the expected discontinuities at every multiple of 400 explained by the need to include additional polling stations. The function represented by the dotted line serves as the instrument for vote buying. As with any regression discontinuity design, identification relies on the ability to distinguish the relationship between the dependent variable (sanctions for disciplinary violations) and the discontinuous function from the effect of smooth functions of the running variable (registered

voters). Because of this, we include as a control the logged number of registered voters. Note that the logged number of registered voters has the same slope as $\log (\text{Ruled-based size}_{i,t})$. Once the trend effects of registered voters are controlled for, there should be no need to hold any other regressors fixed as only the variation around the discontinuities is being used for identification (Angrist and Lavy 1999).[19]

Columns 4 through 9 in Table 2 report the fuzzy RD results. Here, our estimand corresponds to the weighted average across cutoff points of the local average effects at each of these cutoffs (Cattaneo et al. 2016). Models in columns 4, 6, and 8 use the full sample. We see that the effect of vote buying is smaller but substantively important and more precisely estimated that in the regressions that used the actual size of polling stations as instruments. Columns 5, 7, and 9 restrict the sample to municipalities with polling stations that are within 40 voters of a discontinuity point. Not surprisingly, with this small sample size, the precision of our estimates as well as the instrument's explanatory power in the first stage is reduced, but importantly, the estimates are positive and stable. In Appendix ?? we show that, in fact, the estimated coefficients are stable for multiple bandwidths around the discontinuity points when using the indicators of guilty and removed from office.

To test the validity of the fuzzy RD design we carried out a number of checks. One concern is that corrupt candidates engaging in manipulation may exploit the rule capping polling station sizes to their advantage by artificially inflating the number of registered voters to have more and, on average, smaller polling stations. In this case, the exogeneity of the predicted size of a polling station by the institutional rule around the cutoff would be called into question. Although possible, this type of manipulation is hard to carry out, as politicians would have to make very good predictions of the actual number of registered voters in order to know how many voters are needed to add new polling stations. Nevertheless, to see if this

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[19]Results are robust to using vote buying in levels while controlling for a piecewise linear function whose slope coincides with the slope of (2) out of the discontinuity points.

concern is important in practice, we examined the distribution of the number of registered voters looking for differences below and above the cutoffs. If politicians exploit the rule and change the average size of polling stations, we should see a higher frequency of municipalities that are right above the discontinuity points. Appendix **??** reports results of two sorting tests indicating that this is not a feature of the data.

Finally, we examine whether there are effects of having smaller average polling stations on the observed characteristics of the municipalities (other than vote buying) near the discontinuities. If there were, this would cast doubt on the assumption that the municipalities below and above these thresholds are similar in all aspects related to corruption or measurement of our variables of interest. Appendix **??** shows that there are no significant differences in observed characteristics between municipalities above and below the cutoffs.

Value of Office

Our theory offers two additional observable implications derived from Proposition 1 (parts 2 and 3) regarding the relationships between value of office, manipulation, and violations of the disciplinary code of public officials. The first is that we should observe a positive association between the value of office and vote buying. Table 3 presents the results of linear models where the dependent variable is the logged number of vote buying reports.[20] The models in columns 1 and 2 have as the explanatory variable the salary of mayors. These specifications also control for the full set of baseline controls used in the disciplinary sanctions models. The coefficient on salary is positive in both models but it is not precisely estimated once municipality fixed effects are added to the model. The smaller insignificant fixed effects estimate is explained by the fact the salary is almost invariant over time within

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[20]We include 2011 observations as vote buying reports and value of office measures are available for this year. OLS results with baseline controls are robust to excluding this year.

a municipality given that it is determined by rules according to ranges of population size and discretionary revenues.

Table 3: Vote buying and value of office

Dep. Variable:	Vote Buying			
	(1)	(2)	(3)	(4)
Discretionary revenue			0.048***	0.031*
			(0.015)	(0.018)
Mayor's salary	0.028***	0.009		
	(0.007)	(0.012)		
Fixed effects	no	yes	no	yes
Observations	3,105	3,105	3,128	3,128
Municipalities	1,095	1,095	1,093	1,093

This table reports OLS coefficients. All models include baseline controls and an indicator of whether the mayor had previous disciplinary sanctions at the time of the election. Fixed effects denotes models with municipality fixed effects. Robust standard errors clustered at the municipality level in parentheses. *** p<0.01, **p<0.05, *p<0.1.

To circumvent this limitation with salaries, we use as an alternative measure of value of office the logged discretionary revenues in the municipality. This measure is particularly close to our theoretical concept of value of office that captures not only the ego rents and perks from office (E), but also the maximum level of rents that can be taken by the politician $(\bar{r})$. Moreover, Colombian mayors, especially in large municipalities, have plenty of discretion over the allocation of public resources and it is the ability to sign government contracts that motivates many candidates to run.

We see in Table 3 that, consistent with the model's prediction, there is a positive and significant coefficient on discretionary revenue in models with and without municipality effects. The most conservative estimate from the model in column 4 indicates that an increase of 10% in discretionary resources in the municipality is associated with a 0.3% increase in the number of reports of vote buying (close to a standard deviation of the dependent variable).

The second observable implication regarding value of office is that, in the presence

of electoral manipulation, we should not expect to find a monotonic negative relationship between measures of value of office and levels of corruption as other theories would predict. Table 4 shows that, if anything, there seems to be a positive relationship between values of office and the likelihood of the mayor being prosecuted, declared guilty, or removed from office for a sample of municipalities where vote buying was reported.

Table 4: Disciplinary sanctions and value of office

Dep. Variable:	Prosecuted		Guilty		Removed	
	(1)	(2)	(3)	(4)	(5)	(6)
Discretionary revenue	0.071	0.233	0.097*	0.413	0.017	0.605**
	(0.060)	(0.225)	(0.058)	(0.259)	(0.050)	(0.302)
P-value (Wald one-sided test)	0.88	0.85	0.95	0.94	0.63	0.98
Observations	297	297	297	297	297	297
Fixed effects	no	yes	no	yes	no	yes
Municipalities	262	262	262	262	262	262

This table reports OLS coefficients. All models include baseline controls and an indicator of whether the mayor had previous disciplinary sanctions at the time of the election. Fixed effects denotes models with municipality fixed effects. The sample includes municipalities where there was at least one report of vote buying. P-values from a Wald one-sided test of the coefficient on discretionary revenue being positive. Robust standard errors clustered at the municipality level are in parentheses. *** $p<0.01$, **$p<0.05$, *$p<0.1$.

Given that the relationship between value of office and corruption predicted by the model can be non-monotonic, as Proposition 1 part 2 indicates, we check whether the results hold for a less restrictive characterisation of this relationship by using semi-parametric estimation techniques. Appendix **??** presents results from a double residual semi-parametric regression (Robinson 1988) showing that the relationship between vote buying and our measures of rents is not monotonically decreasing and actually has a positive slope for most values of vote buying in the sample.[21]

It is important to note that we need to be cautious giving a causal interpretation to the results in this section, as the econometric analysis is carried out under the assumption

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[21]This model assumes that the controls enter the equation linearly but it does not impose a functional form on how the variable of interest impacts the outcome.

that our proxies for value of office are exogenous. A concern is that corrupt politicians who are also good at organizing clientelistic campaigns seek to run in places where the mayor has discretion over substantial resources. The previous results, however, also control for the number of sanctions of the elected mayor in that municipality at the time of the election. Finally, the results are not driven by higher values of office generating more competition in an election, which in turn brings more reports of corruption or vote buying. We control for the average margin of victory in all regional previous elections.

Future Political Aspirations and Transparency Index

Our theory explores the incentives of mayors for whom reputational concerns are important. A concern with the baseline results of the link between electoral manipulation and disciplinary sanctions is that they could be driven by mayors without future political aspirations. These mayors might care less about voters' electoral responses to corruption and might want to be elected to extract rents. We gather information on whether the mayors in the sample end up being candidates in subsequent mayoral elections in the same municipality and estimate the marginal effect of vote buying on the likelihood of sanctions conditional on running in the future.[22] Figure 2 suggests that the positive association between vote buying and sanctions is not driven by mayors uninterested in continuing their political careers. The marginal effect of vote buying on the likelihood of the mayor being found guilty and removed from office is positive and significant for those who run for mayor again in the future. For the others, the effect is also positive, but the point estimates are less than half that of the future runners and not significant.

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[22]The models include baseline controls, municipality fixed effects, a dummy for running in future mayoral races, and its interaction with vote buying. Results are robust to controlling for interactions of these dummies with all other explanatory variables.

Figure 2: Sanctions, vote buying, and future participation in elections
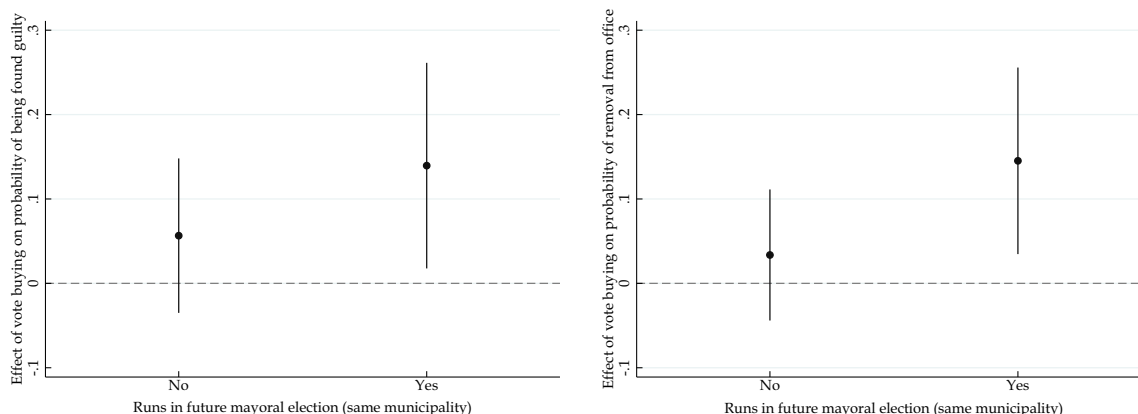
An alternative to the instrumental variables approach to deal with mismeasurement of violations of the law by mayors is to explore the relationships of interest with other measures of corruption that are not subject to the same sources of error. We do this by using the Transparency Index built by Transparency International Colombia. We find that, consistent with Proposition 1 part 1, there is a significant negative association between vote buying and the index of transparency (higher values of the index denote less risk of corruption). Moreover, we find that this relationship is driven by the *visibility* component. This suggests that in places with more vote buying, the local officials do not facilitate opportunities for citizens to monitor the municipality's public finances. We also find that the relationship between the index of transparency and discretionary revenues does not appear to be positive for larger values of office. Appendix **??** provides a more detailed description of these results.

Conclusions

The question of how to achieve effective electoral accountability is a fundamental one to the study of democratic institutions. Work in this area has mostly assumed that elections' participants respect the electoral law. In such theories, voters evaluate policy platforms or

use information on observed outcomes to infer which candidate will provide them with better outcomes in the future. Here we propose a different theoretical framework that is consistent with the realities of many developing democracies by accounting for electoral irregularities.

Our theory's main prediction is that there should be a causal effect of electoral manipulation on actions taken by the incumbent against their constituents' interests. Electoral manipulation makes electoral results less responsive to policy outcomes, as the influence of citizens who vote according to those outcomes diminishes with the irregularities. Using data from Colombian regional elections, we find that an increase in reports of vote buying during an election significantly increases the probability that the winner of the election is prosecuted, found guilty, and removed from office for violating the disciplinary code of public officials. Our empirical strategies indicate that these findings are not driven by misreporting in our measures of sanctions or vote buying, by poor law enforcement capacity of certain municipalities, by administrative corruption being used to finance vote buying campaigns, or by politicians who have a talent for stealing elections and public resources once in office.

Our theory also casts doubt on the idea that a more valuable office unconditionally provides incentives for incumbents to deliver what voters want. In environments where electoral manipulation is common, a more valuable office can in fact be associated with worse outcomes for society in which politicians extract more rents and double down on electoral manipulation. Using different measures of values of office, we found robust correlations that are consistent with those expectations.

These findings highlight the importance of enforcing the electoral laws before attempting to increase the compensation of elected officials or to give them more discretion over allocation of resources to increase responsiveness. During the eighties and nineties, fiscal decentralization processes complemented by the adoption of direct elections at the regional level were common in numerous developing countries. In light of our theory, it is not surprising that the promise of more responsive local governments that these institutional changes

30

intended was not fulfilled.

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