PARTIES, BROKERS AND VOTER MOBILIZATION: HOW TURNOUT BUYING DEPENDS UPON THE PARTY'S CAPACITY TO MONITOR BROKERS*

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Despite its prevalence, little is known about when parties buy turnout. We emphasize the problem of parties monitoring local brokers with incentives to shirk. Our model suggests that parties extract greater turnout buying effort from their brokers where they can better monitor broker performance and where favorable voters would not otherwise turn out. Exploiting exogenous variation in the number of polling stations—and thus electoral information about broker performance—in Mexican electoral precincts, we find that greater monitoring capacity increases turnout and votes for the PAN and the PRI. Consistent with our theoretical predictions, the effect of monitoring capacity on PRI votes varies non-linearly with the distance of voters to the polling station: it first increases because rural voters—facing larger costs of voting—generally favor the PRI, before declining as the cost of incentivizing brokers increases. This non-linearity is not present for the PAN, who stand to gain less from mobilizing rural voters.

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Voter mobilization is an essential component of the electoral strategy of parties in every part of the world. When the ballot is secret, parties seek to ensure that voters that are likely to support the party turn out to vote (e.g. Cox and Kousser 1981; Nichter 2008). Common mobilization strategies—including door-to-door or telephone campaigns, transporting voters to the polling station, and turnout buying—rely on the superior knowledge of local mobilizers about the political preferences of individual voters, which enables them to identify supporters that would not have otherwise turned out. Mobilizers may not require payment when their interests are aligned with their party's.[1] However, parties must often hire brokers without aligned incentives.

In this article, we focus on voter mobilization through hired brokers. While the exchange of goods for voters turning out is widely reported in developing contexts (e.g. Nichter 2008; Nichter and Palmer-Rubin 2014), such turnout buying is not uncommon in the developed world.[2] Despite the apparent extent of this phenomenon—which has the potential to substantially alter electoral outcomes (Keefer 2007), and is illegal in many countries—little is understood about the conditions that explain its prevalence.

As far as turnout buying can be gauged, it varies substantially across localities and political parties. Theoretical work has only recently begun to explore when parties pursue different electoral strategies (Gans-Morse, Mazzuca and Nichter 2013), and has yet to incorporate the principal-agent relationship between parties and brokers. In this article, we extend existing theory and exploit a natural experiment in Mexico to address a major question in the voter mobilization literature: when

[1]For example, labor unions (Gray and Caul 2000; Larreguy, Montiel and Querubín 2014; Leighley and Nagler 2007), politically-motivated business and neighborhood associations (Cox, Rosenbluth and Thies 1998; Holland and Palmer-Rubin 2014), and partisan volunteer canvassers (Nickerson, Friedrichs and King 2006) often mobilize voters. Similarly, the career incentives of mobilizers may induce alignment with the party (e.g. Szwarcberg 2012*b*).

[2]In 2004, Democratic party operatives were convicted for turnout buying (Nichter 2008), while this practice has been part of elections in Texas for decades ("Texas Vote-Buying Case Casts Glare on Tradition of Election Day Goads," *The New York Times*, January 12th 2014). Vote buying was also widely documented in U.S. cities around the turn of the twentieth century (e.g. Cox and Kousser 1981; Rakove 1976; Wilson 1960), and has more recently been observed in southern Europe (e.g. Chubb 1982; Kitschelt and Wilkinson 2007).

do political parties hire brokers to mobilize potential voters?

While previous research has primarily focused on the monitoring problem between parties and voters under a secret ballot (e.g. Cox and Kousser 1981; Nichter 2008; Stokes 2005), limited attention has been paid to the relationship between parties and political brokers. This relative neglect is surprising given that brokers typically implement voter mobilization strategies on election day because they are better informed about the preferences of individual voters than political parties (e.g. Finan and Schechter 2012; Stokes et al. 2013). Stokes et al. (2013) treat this interaction between parties and brokers principally as a selection problem for political parties seeking to employ the best-connected brokers. However, because brokers are often hired contractors rather than actors with incentives closely tied to political parties, this misses a critical moral hazard concern: political parties hire brokers to mobilize likely supporters that would not otherwise turn out, but brokers face strong incentives to shirk given that parties cannot easily monitor their actions.

Guided by this party-broker monitoring problem and our qualitative understanding of party-broker relations in Mexico, we formalize a simple model predicting the conditions under which parties hire brokers to mobilize voters. In our model, voters vary in their cost of voting—determined by the distance to their polling station—and their ideological affinity, which determines their preference over parties. To capture differential knowledge of voter types, we assume parties do not observe the preferences of individual voters, whereas local brokers know which party each voter would vote for if they turned out. Parties thus hire political brokers to mobilize their pool of "potential voters"—favorable voters that face prohibitive costs of turning out. Brokers can exert costly effort to provide voters with incentives to turn out. However, the probability that a party is able to infer broker effort after the election varies across electoral precincts. Given brokers will shirk if they believe that they can go undetected and still receive payment, parties can buy more turnout in locations where their monitoring capacity is greater.

Furthermore, the magnitude of the positive effect of monitoring capacity on turnout buying differs across political parties and depends on the distance of voters to the polling station. First, parties

that are relatively popular among rural voters—who face higher costs of traveling to vote—have most to gain from the greater broker effort that increased monitoring capacity permits. Conversely, there are fewer potential voters for predominantly urban parties to mobilize. Second, where the cost to brokers of mobilizing voters increases sharply with distance, hiring brokers becomes prohibitively costly—even for predominantly rural parties—once voters live sufficiently far from the polling station. Among parties that do well in rural areas, our model thus predicts an "inverted-U" relationship between the average distance of voters to the polling station and turnout buying. Among urban parties, the increasing cost of hiring brokers quickly overpowers the declining pool of potential voters as the distance to the polling station increases.

We take these theoretical insights to the data in Mexico. Despite emerging from seven decades of one-party rule by the Institutional Revolutionary Party (PRI) in the 1990s, Mexican elections are still characterized by clientelism and electoral mobilization. We focus on turnout buying—which occurs outside deeply embedded clientelistic structures (see e.g. Cornelius 2004; Diaz-Cayeros, Estévez and Magaloni forthcoming; Fox 1994; Magaloni 2006)—just before and especially on election day. Mexico's main political parties continue to engage in extensive turnout buying, offering gifts in exchange for turning out and illegally hiring buses and taxis to drive voters to polling stations.[3] Brokers hired by political parties play the essential intermediary role in this process, mobilizing voters on election day in exchange for cash and bonuses (or sanctions) based on local electoral performance (Ugalde and Rivera Loret de Mola 2013).

To test the model's predictions for party vote shares, we leverage two sources of variation. First, differences in monitoring capacity arise from an electoral rule requiring that a new polling station is created for every 750 registered voters in an electoral precinct. Qualitative evidence indicates that political parties use polling station-level electoral outcomes to reward their brokers. Each additional polling station allows the party to better distinguish the effort of their broker from voter-

[3]See summaries such as Nichter and Palmer-Rubin (2014) and Ugalde and Rivera Loret de Mola (2013), and many reports including Alianza Cívica, Boletín de Prensa, July 3rd 2012 and those in footnote 8.

level shocks affecting turnout. Information from more electoral returns thus increase the signal to noise ratio surrounding the effect of broker effort on electoral outcomes, allowing the party to better detect when their broker has shirked. Since new polling stations are constructed adjacent to existing polling stations, the cost of traveling to the polling station remains constant. Second, we exploit variation in political preferences and the cost of voting by calculating the average distance that voters must travel to their precinct's polling booth. Like many other developing countries, including India, South Africa and Thailand, Mexico's urban-rural political divide means that more rural precincts where the average voter lives further from the polling station are less likely to turn out and more likely to support a particular party—the PRI, in the case of Mexico.

We use a regression discontinuity design to compare polling stations in essentially identical electoral precincts just above and just below the threshold for creating a new polling station. Our results provide evidence of turnout buying consistent with our theoretical model: each additional polling station increases electoral turnout by around one percentage point, significantly increasing the vote share of the right-wing National Action Party (PAN) and especially the PRI. The vote share of the Party of the Democratic Revolution (PRD), which has recently campaigned against vote-buying practices and likely inherited the weakest political machines from the PRI, is unaffected.

Following our theoretical model, we also examine how the effect of an additional polling station varies with distance. Consistent with our theory, the increase in the PRI vote at the discontinuity is non-linear with distance. At the effect's peak—where, on average, voters live around 1.5km from the polling station—the PRI gains the vote of more than one percent of registered voters. This interaction is if anything instead negative for the PAN, who stand to gain less from mobilizing rural voters. These heterogeneous effects also dismiss alternative explanations. First, reduced waiting time at the polling booth cannot explain why there is no increase in PRD votes or why the effect on the PRI votes is non-linear with distance from the polling station. Second, if parties were buying votes rather than turnout, we would expect to instead observe that an additional polling station would differentially benefit the PRI in urban areas and benefit the PAN and PRD in rural

areas.

Although our estimates only account for around a 2.5 percent increase in votes for the PRI and PAN, our empirical strategy only focuses on a single dimension of monitoring that can be cleanly identified. Furthermore, given the differences in monitoring capacity are relatively small, our estimates are quite substantial. Ultimately, our results demonstrate the importance of monitoring in explaining differences in turnout buying across parties and geographic locations, but only point at the tip of the iceberg of turnout-buying practices.

Our theoretical argument contributes to a nascent literature focusing on the intermediary role of political brokers.[4] This literature departs from extant work assuming that parties do not require brokers or that broker interests are always aligned with their parties. Whereas Stokes et al. (2013) treat hiring brokers as an adverse selection problem and Camp (2012) focuses on the collective action problem for brokers, our model emphasizes the moral hazard problem arising from the party's inability to always monitor broker effort. While Larreguy (2013) focuses on the signal extraction problem for brokers mediating clientelistic relationships, our model shows how heterogeneity in voter preferences and the costs of voting causes parties to face differential incentives when mobilizing voters outside clientelistic structures. Third, our model extends Gans-Morse, Mazzuca and Nichter (2013) by introducing an agency problem that de-links party strategies from voting outcomes. While their model suggests that the party-*voter* monitoring problem increases turnout buying, we show that the party-*broker* monitoring problem instead decreases turnout buying.

Empirically, our results extend the existing literature in several ways. First, unlike previous studies examining the effects of institutions on vote buying (Cox and Kousser 1981; León 2013), we instead explain variation in turnout buying and exploit a powerful research design to identify causal effects consistent with our monitoring explanation. Second, we identify the conditions

[4]There is also a growing formal literature examining the monitoring mechanisms employed by brokers, rather than parties, viś-a-viś voters (e.g. Gingerich and Medina 2013; Rueda forthcoming; Smith and Bueno de Mesquita 2012); Robinson and Verdier (2013) also consider the reverse credibility problem. Our study, however, focuses on party monitoring of brokers.

under which parties interact effectively with brokers in a way that exclusively qualitative and observational accounts cannot (e.g. Levitsky 2014; Stokes et al. 2013; Szwarcberg 2012*a*; Wang and Kurzman 2007). Finally, our study provides further evidence for the occurrence of turnout buying (see e.g. Nichter and Palmer-Rubin 2014), and suggests—like recent studies of vote buying (Cantú 2014*a*; Finan and Schechter 2012; Gingerich 2014; Gonzalez-Ocantos et al. 2012; Vicente 2014)—that it can be effective at gaining votes. Fourth, our findings reinforce claims from contexts as diverse as Chicago, Colombia and India that political parties use disaggregated electoral information to monitor the performance of their brokers (e.g. Rakove 1976, Rueda 2013).[5]

The article is structured as follows. We first provide a qualitative overview of elections and the role of brokers in Mexico. The following section presents our theoretical model. We then describe our data and explain our identification strategy, before presenting our results. We conclude with a discussion of our findings.

Qualitative evidence of electoral manipulation in Mexico

Mexico has experienced a long history of electoral malpractice. During its 71-year stranglehold on power extending back to 1929, the PRI was widely acknowledged to have engaged in clientelistic transfers, vote buying and electoral fraud (e.g. Cornelius 2004; Magaloni 2006). After allegations of widespread vote-rigging in the 1988 elections, and the rise of stronger challengers to the PRI's dominance, election monitoring—principally through the creation of the independent Federal Electoral Institute (IFE)—has become more effective at preventing the most flagrant electoral violations (Cornelius 2004).

However, according to an abundance of qualitative evidence contained in newspaper articles, surveys and election reports, Mexico's main political parties—particularly the PAN and the PRI—continue to pressure voters using more subtle tactics. This has occurred in spite of the PRI's

[5]For India: "EVMs will help parties catch 'lazy' workers," *The Times of India*, May 14th 2004.

ultimately victorious 2012 Presidential candidate, Enrique Peña Nieto, promising to break from the electoral manipulation often associated with the PRI. Unlike the PAN, which ceased to vocally campaign against electoral manipulation after winning the Presidency in 2000, such opposition remains an important feature of the PRD's election campaigns, despite the belief that the PRD inherited the PRI's machines in states where it split from it (e.g. Guerrero and Michoacán). In this article, we focus on when parties engage in turnout buying.

Vote and turnout buying

National legislative elections in Mexico are held every three years, with all of the House of Deputies and half of the Senate facing election to non-renewable three- and six-year terms respectively. Of Mexico's 500 Deputies, 300 are elected by plurality rule from single-member districts, while the remainder are elected via proportional representation. Furthermore, Presidential elections—which are the most hard fought—occur concurrent to every other legislative election.

On election day, mobilization efforts are organized locally. Reports of voters receiving gifts, including money, food, clothing and gift cards, from political parties are extensive. Although gifts that are not conditional on voting for a particular party are legal under Mexican law, vote buying—where gifts are exchanged for voting a particular way—is illegal and is still regarded as a regular phenomenon. In 2012, a list experiment conducted before Mexico's 2012 election found that 22% of voters received a gift from a political party (Nichter and Palmer-Rubin 2014). One of the most egregious examples from 2012 was the widely reported allegation that the PRI distributed millions of gift cards for the supermarket Soriana. Voters were told that these cards would become active upon the PRI winning the 2012 election, and this significantly increased the PRI's vote share in PRD strongholds (Cantú 2014*a*). Based on their election monitoring, Alianza Cívica estimate that a vote costs 100-800 pesos (8-60 U.S. dollars).[6]

However, not all gifts and incentives are provided in exchange for voters switching their vote

[6]Alianza Cívica, Boletín de Prensa, July 3rd 2012.

intention. Given the difficulty of parties and brokers monitoring voter behavior once inside the polling booth, voters may renege on their promises with impunity (Stokes 2005).[7] When voters cannot be effectively monitored, Nichter (2008) finds in Argentina that parties skirt the commitment problem by instead mobilizing voters that they expect to support the party but would not otherwise turn out to vote. Consistent with such turnout buying, Nichter and Palmer-Rubin (2014) found that gifts were most frequently targeted at weak PRI supporters.

One of the most widespread turnout buying practices, *acarreo*, involves transporting voters to polling stations. *Acarreo* is illegal under Article 403 of the Mexican Federal Penal Code. Nevertheless, newspaper accounts from across the country reported extensive use of *acarreo* in 2012 by hired coaches and especially groups of taxi drivers.[8] Alianza Cívica report that the proportion of voters brought to polling stations increased in both 2009 and 2012 to reach 14%.[9] Transportation of this sort appears to have been particularly prevalent in areas where the polling station is not easily accessible to voters. Although the PAN and PRD have also been accused of engaging in *acarreo*, it has predominantly been associated with the PRI. In fact, one report suggests that the PRI attempted to disguise its taxis with PRD stickers.[10] Another popular practice, known as *operación tamal*, entails gathering a large group of voters together for breakfast before transporting them to the polling station in exchange for additional gifts.[11]

[7] Although voters can be observed in the booth by children or provided with mobile phones to photograph their marked ballot (Ugalde and Rivera Loret de Mola 2013), Alianza Cívica reports that only 21% of votes were not conducted in secret.

[8] For example, see: "Gana PRI en Huauchinango en medio de señalamientos de compra de votos, acarreo de gente e intimidaciones," Diario Reforma, July 3rd 2000; "Compra de votos, falta de boletas en casillas especiales y acarreo, las quejas recurrentes," SinEmbargo.mx, July 1st 2012; "Evidente acarreo de votantes en elecciones del PRD," ABC Tlaxcala, April 8th 2013; "Gana Pri En Huauchinango En Medio De Sealamientos De Compra De Votos, Acarreo De Gente E Intimidaciones," El Imparcial de la Sierra Norte, July 3rd 2013; 'Acusan Al PRI De 'Acarreo'," *El Siglo de Torreón*, July 8th 2013; "Vecinos denuncian presunto acarreo en Miguel Hidalgo," *El Universal*, September 1st 2013.

[9] Alianza Cívica, Boletín de Prensa, July 3rd 2012. Levitsky (2014) finds that brokers perform a similar role in Argentina.

[10] "Muchos ojos, pero pocos votos, en la zona conurbada y rural de Acapulco," *La Jornada*, July 6th 2009.

[11] Such practices could also incorporate vote buying as well. This is what Gans-Morse, Mazzuca and Nichter (2013) call "double persuasion". Our empirical analysis, however, provides good reasons to believe that we are identifying turnout buying rather than vote buying.

The role of brokers

Given the scale and extensive information requirements of such turnout buying operations, parties often hire non-party local operatives to implement these strategies on the ground. Political brokers are typically designated to electoral precincts, and possess detailed knowledge of the vote intentions of the local population that state and municipal officials lack.[12]

Political brokers—who provide transportation, round up groups of potential voters, monitor voting at polling stations, and distribute gifts—are available to the highest bidder (Ugalde and Rivera Loret de Mola 2013).[13] In general, brokers are paid throughout the campaign and receive a bonus—in terms of either cash or political favors—for strong electoral performance (Ugalde and Rivera Loret de Mola 2013). Taxi drivers can be paid up to 2,000 (150 U.S. dollars) pesos for a day's work repeatedly ferrying voters to polling stations in their electoral precinct.

Since the monitoring problem between parties and brokers is less severe than that between parties and voters, monitoring brokers is more feasible than monitoring voters. However, given the small scale of broker activities and their inability to verify whether brokers are truly targeting favorable voters that would not have voted otherwise, it is both costly and difficult for parties to directly monitor performance.

The challenge for parties is to differentiate the effects of broker activity from other factors determining local vote outcomes. In some areas, parties request lists of voters whom the broker intends to bring to the polling station. These lists can be cross-checked using the "bingo system", whereby party representatives at the polling station on election day with access to the list of citizens that voted compare the two lists (Mercado 2013). Figure 1 depicts an example of such a list

[12] In Argentina and Paraguay, respectively, Stokes et al. (2013) and Finan and Schechter (2012) provide survey evidence indicating that brokers possess sufficient information to target voters that they expect to reciprocate or favor a given party. More qualitative work also supports the importance of reciprocity (Auyero 2000) and broker centrality in local networks (Levitsky 2014; Szwarcberg 2012*a*).

[13] Szwarcberg (2012*b*) points to a similar logic in Argentina, where local brokers are aspiring politicians who learn about the preferences of local voters. Brokers in Argentina appear to differ from Mexican brokers in that they are more interested in rising in the party hierarchy.

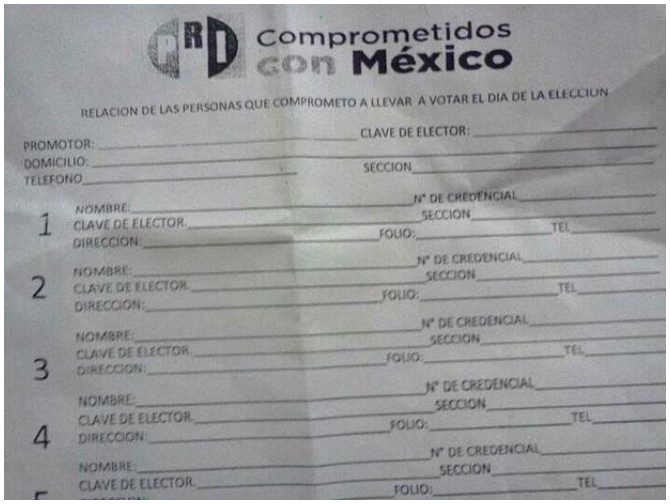

Figure 1: List of promised voters for the PRI to be completed by a political broker in a given electoral precinct

Notes: The top of the sheet (first three rows) indicates the name of the broker, address, telephone number and electoral precinct. Below this are the details of voters, including their name, electoral card number, electoral precinct, address and phone number.

embossed with the PRI logo, where the broker would fill in the address, electoral precinct and voter ID of voters they promise to bring to the polls.

However, in most locations parties rely upon electoral outcomes to measure broker performance. Based on interviews with Mexican politicians, Ugalde and Rivera Loret de Mola (2013) explain that parties evaluate the effectiveness of their voter mobilization apparatus at the precinct or polling station level, rather than at the voter level. Realizing that parties cannot easily identify departures from agreed efforts to mobilize voters, brokers have an incentive to shirk. Consequently, where brokers fail to meet electoral expectations, a strong indication of shirking, payments or rewards can be withheld.

Theory of turnout buying

This section first formalizes a simple model of the relationship between parties, brokers and voters. We then show how the model's predictions apply in the Mexican context, and generate testable

hypotheses for our empirical analysis.

Formal model

Our model examines turnout buying by political parties using brokers at the electoral precinct level. The key feature of the model is the moral hazard problem faced by political parties: parties hire political brokers with the local knowledge required to mobilize favorable local voters, but cannot always effectively monitor the effort exerted by political brokers in this task. Where parties are better able to monitor brokers, they can generate more electoral support by engaging in more extensive turnout buying. The second main feature of the model is that voters' political preferences and costs of turning out, as well as the cost of compensating brokers, vary with their distance from the polling station. Depending on the location of their supporters, parties face differential incentives to use brokers to mobilize voters facing high costs of turning out.

Setup

Consider a country containing N electoral precincts. At each electoral precinct there exists a continuum of voters, whose mass we normalize to unity. Electoral precincts differ in the distance $d > 0$ that voters must travel to their polling station. For simplicity, all voters at a given polling station travel the same distance.[14] Importantly, electoral precincts also differ in the probability $p \in (0,1)$ that political parties can perfectly infer the behavior of their broker. Although parties never fully observe broker behavior in practice, this simplifying assumption captures our main point that in some precincts parties are more capable of reliably inferring broker actions from electoral returns.[15] Without loss of generality, we consider an electoral precinct defined by distance d

[14] We obtain very similar results if there is a distribution of voters because d can be thought of as the average voter.

[15] The electoral signal of broker performance could be modeled in a more complex manner, but the essence of the model is the same. For example, electoral outcomes could represent a noisy signal of broker effort (Bolton and Dewatripont 2005: ch. 4). In that case, receiving multiple signals of performance provides the party with clear information about the broker's effort level and can condition a broker's wage

and probability p of observing broker effort.

Parties. We consider two political parties $i = A, B$ competing for votes in each electoral precinct. Parties maximize their vote share Π^i in the precinct.[16] However, although parties are aware of their underlying support in any given precinct, they cannot themselves identify which supporters to mobilize. Party i thus chooses an effort-wage contract $(\hat{e}_i, \hat{w}_i)$ to induce a single broker to exert effort $e_i \in [0,1]$ to mobilize voters that favor party i. If the party observes the broker's effort and the broker complied with the agreed effort level, such that $e_i \geq \hat{e}_i$, then she receives wage $\hat{w}_i$; if the broker is found to not have complied with the agreed effort level, then she receives no payment.[17] If the party cannot observe e_i, the broker receives wage $\hat{w}_i$.

Brokers. Political brokers enjoy an informational advantage over political parties: brokers can identify the individual voters in their electoral precinct that would vote for party i if they turned out.[18] To keep the model tractable, we assume that brokers cannot discriminate between voters by their likelihood of turning out to vote, and thus exert effort e_i equally across voters that would vote for party i.[19] This simplification is also empirically plausible because brokers are not always completely aware of individual costs of voting, or cannot exclude specific voters when mobilizing large groups, while voters that always turn out may defect if they do not receive gifts from their preferred party (Diaz-Cayeros, Estévez and Magaloni forthcoming; Nichter and Peress 2014). Furthermore, to focus on the moral hazard dimension of the problem, we assume all brokers

on the electoral outcome accordingly. Larreguy (2013) and Gingerich and Medina (2013) model signal extraction in similar contexts to ours.

[16] If parties instead maximized their probability of winning districts (or the Presidency) or a legislative majority, the implications of our model are unchanged. Accordingly, parties maximize precinct vote share for simplicity.

[17] Brokers have limited liability in that parties cannot punish brokers beyond refusing to pay their wage after observing $e_i < \hat{e}_i$. We assume parties have resolved the commitment problem of paying the broker for satisfactory performance. It is easy to rationalize this by considering repeated interactions between brokers and parties across elections. Stokes (2005) shows how this can occur between parties and voters.

[18] Although there is good evidence that brokers are well informed about voter preferences (see Finan and Schechter 2012; Stokes et al. 2013), this is a strong assumption. However, the logic of our model only requires that brokers are better informed about vote intentions than political parties.

[19] We focus on the simple case without loss of intuition because targeting specific voters would produce qualitatively similar results at the cost of unnecessarily complicating the model.

are equally effective at mobilizing voters.[20]

However, exerting effort e_i—which could constitute calling in favors, hiring coaches and drivers, or providing material incentives to voters—entails a cost $C(d,e_i) = \frac{1}{2}\gamma_i d e_i^2$ to the broker, where $\gamma_i > 0$ is the cost parameter for mobilizing supporters of party i. Consequently, exerting no effort is costless to brokers, while the cost of exerting additional effort is convex and increasing in d. If brokers are not hired by political parties, we assume they receive zero utility. Conditional upon engaging in a contract with party i, a strategy for a broker is to choose their effort level e_i.

Voters. Voters in each electoral precinct differ in the ideological shock σ toward party B that they receive.[21] This ideological shock is an expressive benefit (e.g. Brennan and Hamlin 1998; Gans-Morse, Mazzuca and Nichter 2013), such that it is only received by voters when they turn out and vote for their preferred candidate.[22] The shock is distributed over support $\left[-\frac{1}{2\psi}, \frac{1}{2\psi}\right]$, where a large $\psi > 0$ implies that variation in the expressive value of voting is low, according to the following density function (drawn independently of d at each polling station):

$$g(\sigma;d) = \psi[1 - b(d)\sigma]. \tag{1}$$

This distribution function formalizes our insight that the ideological shock depends upon the distance to the polling station through $b(d) \in [-\psi, \psi]$, where b is a monotonic function.

Integrating over the distribution of ideological shocks, the expected ideological shock toward party B, in an electoral precinct of type d, is $\mathbb{E}[\sigma|d] = -\frac{b(d)}{12\psi^2}$. The term $b(d)$ represents the bias

[20] Since we lack the data to capture heterogeneity across brokers—something which Stokes et al. (2013) discuss in terms of the adverse selection problem—we abstract from this issue and simply assume that brokers are identical in our model.

[21] Voters' policy utility is not included in the model because that is not the focus of this analysis. We could easily introduce policy utility $u(i,v)$ for voter type v from the platform of party i. However, allowing policy utilities to vary across voters does not affect the insights of the model, so we effectively assume $u(A,v) = u(B,v)$ for all voters and focus on our main parameters of interest.

[22] Since an individual's marginal effect on the probability of winning is zero with a continuum of voters, we use expressive voting to ensure non-negligible turnout (see Palfrey and Rosenthal (1985) for low turnout in large elections).

in favor of party A. Party A benefits on average in electoral precincts where $b(d) > 0$, because this reduces the likelihood that voters receive a pro-B ideological shock. In competitive precincts, where $b(d) = 0$, the vote is split equally in expectation. To capture rural-urban divisions, we assume $b'(d) > 0$ such that party A gains relatively more support vis-à-vis party B as the distance to the polling station increases.[23]

Voters also face a cost of turning out to vote. We define this cost as $c(d, e_i) = \alpha d(1 - e_i) \in [0, \frac{1}{\psi}]$, where $\alpha > 0$ is a cost parameter. The cost of voting thus increases in the distance d to the polling station, but this can be counteracted by broker mobilization effort e_i. A strategy for a voter receiving ideological shock σ is the decision to vote for party A, party B or not turn out: $v(d, e_A, e_B; \sigma) \in \{A, B, \emptyset\}$. Since brokers only target voters with an ideological shock toward their party, a voter only ever receives incentives to turn out from the broker of one party.

Timing. Finally, the game proceeds as follows:

1. Parties $i = A, B$ offer brokers a contract $(\hat{e}_i, \hat{w}_i)$ to induce voters to turn out.
2. The ideological shock σ is realized for all voters, but is only observed by voters and brokers.
3. A broker employed by party i exerts effort e_i to mobilize its voters.
4. Voting occurs according to $v(d, e_A, e_B; \sigma)$, and e_A and e_B are respectively observed by parties A and B each with probability p.
5. The election outcome and broker payment occur, and payoffs are realized.

We now proceed to identify the contracts that define the subgame perfect Nash equilibrium (SPNE) of this game.

[23] This is without loss of generality in that we could equally have chosen $b'(d) < 0$.

Equilibrium

The central component of the contracting problem is the number of voters that political parties can expect brokers to mobilize to turn out. Absent broker inducements to turn out ($e_i = 0$), voters always vote for party B if $\sigma \geq c(d,0)$, and always vote for party A if $-\sigma \geq c(d,0)$. However, if $c(d,0) > |\sigma|$, a voter will not turn out without inducements. Figure 2 depicts this graphically for a given distance d, showing that only voters receiving a large expressive benefit of voting for their preferred party turn out. The solid density function depicts a case where A benefits on average, while the dotted density function depicts a case where B benefits on average.

Since individual vote choices cannot be bought, political parties care about mobilizing their *potential voters*—voters who would vote for the party if they reached the polling booth, but do not vote because the cost of turning out is too high.[24] In Figure 2 these are the voters for whom the absolute value of the ideological shock is less than $c(d,0)$. Party i hires a broker to exert effort e_i to mobilize their potential voters. Integrating over the distribution of voter ideologies, the share of the electorate voting for each party at any given level of broker effort is:

$$\Pi^A(d,e_A) \equiv \frac{1}{2} + \frac{b(d)}{8\psi} - \psi c\left(d,e_A\right)\left[1 + \frac{1}{2}b\left(d\right)c\left(d,e_A\right)\right], \tag{2}$$

$$\Pi^B(d,e_B) \equiv \frac{1}{2} - \frac{b(d)}{8\psi} - \psi c\left(d,e_B\right)\left[1 - \frac{1}{2}b\left(d\right)c\left(d,e_B\right)\right]. \tag{3}$$

The second term reflects the average bias toward party A in an electoral precinct where the distance to the polling station is d. The final term in each expression captures the central features of the model. First, an increase in the cost of voting, $c(d,e_i)$, reduces the number of votes each party receives, but increases the number of potential voters that could be mobilized. Second, A has relatively more potential voters (as well as guaranteed voters) if the bias is in their favor ($b(d) > 0$).

[24] Our distinction between certain and potential voters is similar to that drawn by Nichter (2008), who considers which voters a party should target when voters vary in their partisanship and their costs of voting (see also Dunning and Stokes 2008; Gans-Morse, Mazzuca and Nichter 2013).

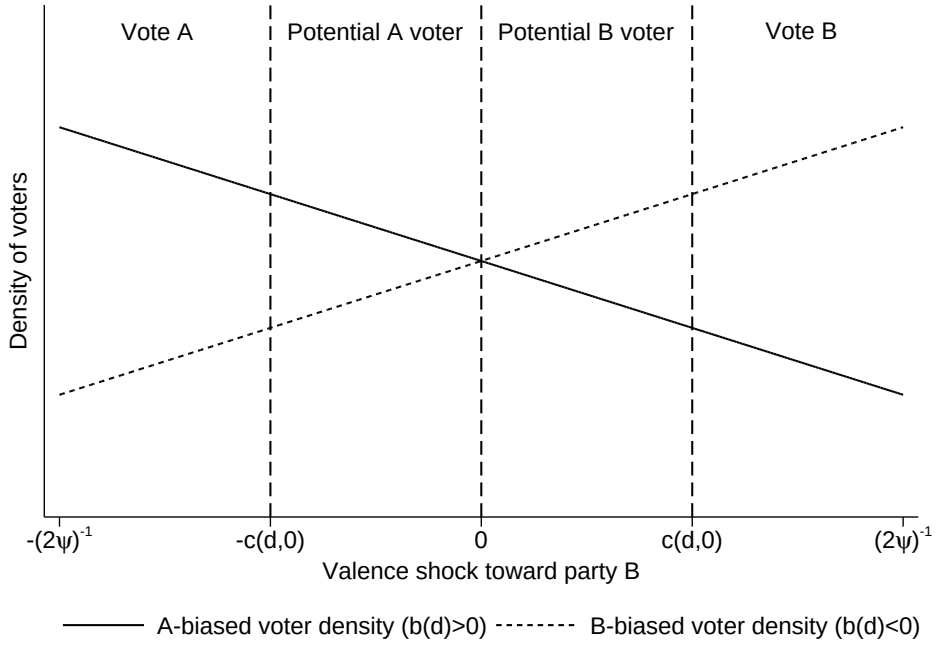

Figure 2: Vote choices at a given polling station

Third, and most importantly, holding e fixed, A's number of potential voters increases with distance from the polling station because $b'(d) > 0$. The effect of distance on B's number of potential voters is only positive when the bias toward A is small and $b'(d)$ is not too large. Consequently, party A generally has a stronger incentive to engage in turnout buying, and especially in rural areas, because it can mobilize more favorable voters.

Both parties maximize $\Pi^i(d, e_i)$, and have incentives to engage in turnout buying since the final term in equations (2) and (3) is decreasing in e_i. However, parties must offer brokers a contract $(\hat{e}_i, \hat{w}_i)$ to induce a given level of turnout buying effort.[25] To achieve their desired level of broker effort, two constraints must be satisfied: brokers must choose to undertake the contract in the first place (individual rationality (IR) constraint), and then be induced to exert the desired level of effort (incentive compatibility (IC) constraint). In particular, the IC constraint induces the broker to exert

[25]Given the monotonically increasing one-to-one mapping from effort to votes, parties could equally contract on votes.

effort $e_i = \hat{e}_i$ at cost $C(d, e_i)$,[26] rather than choose $e_i = 0$ and receive $\hat{w}_i$ if their shirking is not caught (with probability $1-p$) and receive zero when their shirking is caught (with probability p). Party i thus solves the following program:

$$\begin{aligned} \max_{\hat{e}_i, \hat{w}_i} \quad & \Pi^i(d, \hat{e}_i) - \hat{w}_i \qquad \text{subject to} \\ & (IC): \quad \hat{w}_i - \frac{1}{2}\gamma_i d \hat{e}_i^2 \geq (1-p)\hat{w}_i, \\ & (IR): \quad \hat{w}_i - \frac{1}{2}\gamma_i d \hat{e}_i^2 \geq 0. \end{aligned} \tag{4}$$

Solving this problem leads immediately to our equilibrium result:

Proposition 1 *When $\gamma_A + p\psi\alpha^2 db(d) > 0$ and $\gamma_B - p\psi\alpha^2 db(d) > 0$, there exists a unique SPNE $[(\hat{e}_A^*, \hat{w}_A^*), (\hat{e}_B^*, \hat{w}_B^*), e_A^*, e_B^*, v^*(d, e_A^*, e_B^*; \sigma)]$ defined by:*

$$e_A^* = \hat{e}_A^* = \begin{cases} 0 & \text{if } 1 + \alpha db(d) \leq 0 \\ \frac{p\psi\alpha[1+\alpha db(d)]}{\gamma_A + p\psi\alpha^2 db(d)} & \text{if } 1 + \alpha db(d) > 0 \text{ and } \gamma_A > p\psi\alpha \\ 1 & \text{otherwise} \end{cases}$$

$$e_B^* = \hat{e}_B^* = \begin{cases} 0 & \text{if } 1 - \alpha db(d) \leq 0 \\ \frac{p\psi\alpha[1-\alpha db(d)]}{\gamma_B - p\psi\alpha^2 db(d)} & \text{if } 1 - \alpha db(d) > 0 \text{ and } \gamma_B > p\psi\alpha \\ 1 & \text{otherwise} \end{cases}$$

$$\hat{w}_i^* = \frac{\gamma_i d e_i^{*2}}{2p},$$

$$v^*(d, e_A^*, e_B^*; \sigma) = \begin{cases} L & \text{if } \sigma \leq -c(d, e_A^*) \\ \emptyset & \text{if } \sigma \in (-c(d, e_A^*), c(d, e_B^*)) \\ R & \text{if } \sigma \geq c(d, e_B^*) \end{cases}.$$

[26] The broker does not choose $e_i > \hat{e}_i$ because this entails a cost without increasing their wage.

Equilibrium turnout is $T(d, e_A^*, e_B^*) \equiv \sum_{i \in \{A,B\}} \Pi^i(d, e_i^*)$.

All proofs are in the Online Appendix.

In equilibrium, parties offer brokers a contract to just induce optimal effort. The optimal amount of effort reflects two competing forces: the effectiveness of brokers at procuring additional votes, which depends crucially on the number of potential voters, and the cost of effort—adjusted for the probability of being monitored—for which the broker must be compensated for. The conditions for the existence of an equilibrium, given at the beginning of Proposition 1, guarantee that the maximization problems of both parties are well defined. An interior solution for each party exists under two intuitive conditions provided in the proposition. First, the bias $b(d)$ toward the other party is never large enough that there are insufficient potential supporters of a party for it to be able to justify the cost of hiring a broker to mobilize voters. Second, γ_i must be sufficiently large to prevent a party from always mobilizing all voters.

Comparative statics

The following proposition identifies the central testable predictions of the model:

Proposition 2 *In the unique SPNE identified in Proposition 1, the following comparative statics hold at any interior solution:*

1. *T, e_A and e_B are increasing in p.*
2. *Let $\varepsilon(d) \equiv \frac{db'(d)}{b(d)} > -1$ and $\gamma_i > 2p\psi\alpha$. Then:*
   (a) *There exists a $\overline{d}_A > 0$ such that the effect of p on e_A^* is increasing in d for $d \in (0, \overline{d}_A]$ and strictly decreasing in d for $d > \overline{d}_A$.*
   (b) *The effect of p on e_B^* is decreasing in d.*

Part 1 has a simple interpretation: increased monitoring capacity increases turnout buying by both parties. Intuitively, this is because parties can better monitor their brokers and can therefore more effectively threaten brokers with receiving a low wage. Consequently, parties can obtain more turnout buying for a relatively low wage.[27]

The most novel predictions of the model concern the effect of distance to the polling station on the impact of increased monitoring on turnout buying. While Part 1 of Proposition 2 shows that greater monitoring capacity always increases turnout buying, Part 2(a) shows that this effect is increasing in distance for party A until the distance becomes sufficiently large.[28] In other words, monitoring's impact on party A's turnout buying is greatest at intermediate distances. As the distance to the polling station increases, there are more favorable voters for party A to buy, both because more rural voters favor party A and because their turnout is lower. However, the cost of hiring a broker to mobilize distant voters becomes prohibitively large for voters living sufficiently far from the polling station, despite their high support for party A. This non-linear prediction holds under two conditions. First, $\varepsilon(d) > -1$ implies that the elasticity of bias with respect to d is never too negative. In other words, this assumption implies that the urban-rural divide is greater than any bias toward B. Second, $\gamma_i > 2p\psi\alpha$ implies that the cost to brokers of exerting effort relative to the cost to voters of turning out is sufficiently large. If hiring brokers was both cheap and highly effective, then both parties would often mobilize virtually all voters.

The final part of Proposition 2 shows that the effect of monitoring capacity on turnout buying changes with distance very differently for party B. In particular, the increase in turnout buying due to greater monitoring capacity is lower when voters live further from the polling station. Intuitively, this is because party B—which does well primarily among urban voters—has fewer potential voters to mobilize in precincts where the distance from the polling station is large, in addition to having to pay brokers higher wages in such precincts.

[27]The Online Appendix shows that the effect of p on e_i carries over to Π^i for $i = A, B$.

[28]The Online Appendix demonstrates that when the first-order effects dominate, the differential effects of p on e_i by d carry over to Π^i for $i = A, B$.

Observable implications for Mexico

The theoretical model has clear predictions for our Mexican case, to which the model applies well. Most regions of Mexico are dominated by two large parties: between 2000 and 2012, only 14% of electoral precincts had a third party with more than 20% of the vote. Furthermore, as consistently shown in U.S. studies (see Brady and McNulty 2011; Gimpel and Schuknecht 2003), Figure 3 demonstrates that polling station turnout declines with the average distance to the polling station. Moreover, as discussed above, there is considerable qualitative evidence pointing to the importance of local brokers in mobilizing voters for a given party at the precinct level.

A central prediction of the model is that turnout buying—captured by an increase in the total number of votes for a party—is more prevalent where parties are more effective at monitoring their brokers. This is because monitoring reduces the incentive for brokers to shirk. Although monitoring could work in a variety of ways, this article focuses on how the number of polling stations within an electoral precinct affects turnout. In particular, we argue that a larger number of polling stations improves monitoring capacity by producing multiple signals of broker performance.

Intuitively, parties struggle to differentiate voter-level shocks from the turnout buying effort of their brokers when examining precinct-level electoral returns. For example, if all voters vote at a single polling station and the party experiences electoral performance below its expectations, it is difficult to disentangle whether this was due to a negative voter-level shock or because the broker shirked. An additional polling station, and thus an extra signal of electoral performance, allows parties to better differentiate random voter-level shocks that affect their vote share from broker effort. Observing more signals of precinct-level performance always conveys more information unless the shocks are perfectly correlated.[29] For example, if voters are randomly allocated across

[29]To see this mathematically, compare receiving one or two signals of broker's effort from election results in a given precinct. The single signal for a whole precinct has mean μ and variance σ^2. When receiving two different signals s_i, after randomly splitting voters into two polling stations, the common mean is $\mu/2$, the variance is $\sigma^2/4$ and the covariance is $\rho\sigma^2/4$, where ρ is the correlation between the two signals. Then, the variance of receiving two signals, $V[s_1+s_2] = (1+\rho)\sigma^2/2$, is less than σ^2 provided the two signals

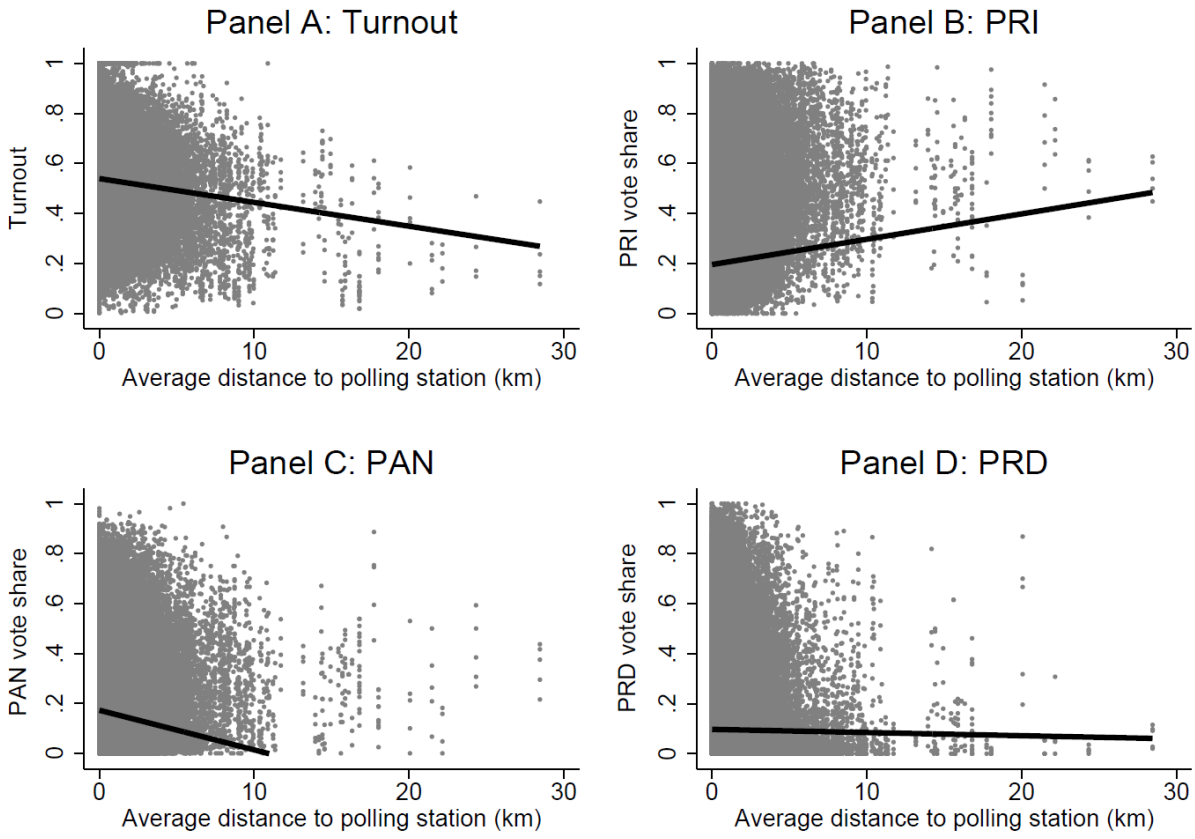

Figure 3: Polling station turnout (as a proportion of registered voters) and vote share (as a proportion of turnout), by average distance of voters to the polling station

Notes: The black line is the best linear fit; the correlations are highly statistically significant when controlling for district fixed effects and clustering by state. Grey dots represent 556,531 polling station-years.

polling stations parties will expect broker efforts to equally affect voting across all polling stations in a given electoral precinct. After observing poor electoral performance in a precinct but a large difference between polling stations, the party infers that an abnormal voter-level shock was the main determinant of lower electoral performance, and thus cannot blame the broker for the electoral outcomes. In sum, additional information always improves monitoring capacity, regardless of the number of brokers operating in an electoral precinct.[30]

are not perfectly correlated (i.e. $\rho < 1$).

[30]If multiple brokers were segmented by polling stations within electoral precincts, we could recast the

Given that we cannot observe broker effort empirically, we focus on the implications for electoral outcomes. We therefore hypothesize that:

H1. Turnout and the share of votes for each political party (both as a proportion of registered voters) increases in the number of polling stations (monitoring capacity) in an electoral precinct.

Mexican politics is also defined by a rural-urban divide. The PRD and especially the PAN are best-supported in more urban areas, among educated voters, and where clientelistic ties are weaker. Conversely, the PRI continues to win a large proportion of more rural voters. Figure 3 illustrates these relationships, and clearly indicates that $b'(d) > 0$ generally holds (where the PRI can be regarded as party A and the PAN or PRD as party B). In some southern areas where the PAN and PRD are locally dominant, the rural-urban division is less salient. Accordingly, $b'(d) \approx 0$ and any interaction between distance and turnout buying should be weaker. In this case, we expect the effect of monitoring to decline with distance or not depend on distance. Combining these insights with the second part of Proposition 2, we only expect the effect of monitoring on turnout buying to depend non-linearly on distance for the PRI:

H2. The effect of an improvement in monitoring capacity on the PRI vote share (as a proportion of registered voters) will first increase in distance from the polling station before decreasing. The effect of an improvement in monitoring capacity on the PAN and PRD vote share will instead decrease or exhibit no relationship with distance.

Empirical design

This section first describes the data used to test the hypotheses derived above. We then explain how we exploit a discontinuity in the number of polling stations in an electoral precinct to estimate

problem as one of "moral hazard in teams". In that case, polling station level data is a powerful tool for ascertaining relative performance (Holmstrom 1982). Given voters are assigned to polling stations by surname (see below), this type of separation is very unlikely.

the effects of monitoring on turnout buying. Given that we cannot directly observe turnout buying, we also examine heterogeneous effects by distance to the polling station to ensure that our findings are consistent with the monitoring effects predicted by the model in ways that cannot be explained by alternative theories.

Data

Mexico's 300 electoral districts are divided into around 67,000 electoral precincts. These, as will be explained in more detail below, are in turn composed of polling stations. The average precinct contains 1.97 polling stations. The IFE has collected detailed polling station level data since 2000, including the coordinates of polling stations for recent election years. We use this data to analyze polling station electoral returns for the 2000, 2003, 2006, 2009 and 2012 national legislative elections (excluding the Federal District). Combined, this produces a maximum sample of 561,256 polling stations.[31] Detailed variable definitions and summary statistics are provided in the Online Appendix.

Dependent variables

We use two main measures of voting behavior. We first measure polling station *Turnout* as a proportion of the total number of voters registered at a given polling station. Turnout includes all votes for political parties or coalitions, including null votes and non-registered votes. To measure the beneficiaries of increased turnout, we measure *PAN/PRD/PRI vote share* as the number of votes for the party as a proportion of the total number of *registered* voters. By not conditioning on turnout, this outcome is independent of the mobilization efforts of other political parties.

[31] In our analysis, we restrict attention to the *casilla básica* and *casilla contigua* polling stations that are relevant for the electoral rule we exploit. Less than 1% of polling stations are special or extraordinary polling stations, which include temporary residents or were created to address challenging sociocultural or geographic circumstances (see Cantú 2014*b*). Due to the existence of such polling stations, the electoral rule for splitting polling stations can be violated in certain precincts. We remove all such polling stations, and subtract the number of voters registered at such polling stations from the precinct totals.

Independent variables

To capture the ability of political parties to monitor their brokers, we measure the *Number of polling stations* in a given electoral precinct. Polling stations may contain up to 750 registered voters, while the number of registered voters in a precinct will play a central role in determining the number of voters per polling station (see below). With the formation of the IFE in 1990, precincts were redrawn to contain 750 voters. Demographic changes have since caused this number to change in some precincts.

To test the heterogeneous effects in H2, we computed the average *Distance* (in kilometers) of voters to their polling station. The average distance entailed calculating the electorate-weighted distance to the polling station among the set of registered voters in each electoral precinct using locality-level population data provided by IFE.[32] Since all the polling stations in a given precinct in our sample are located in the same place, and we cannot distinguish the geographic distribution of voters registered at different polling stations within an electoral precinct, the weighted distance varies by precinct rather than polling station. Polling stations are almost invariably located in the largest locality in the precinct, and our measure is thus strongly correlated with population density and geographic area.[33] The average distance to the polling station is 0.2 kilometers.

Identification strategy

In order to identify the effects of changes in monitoring incentives on turnout buying, we leverage exogenous variation in the number of polling stations in an electoral precinct—and thus the capacity of political parties to monitor their brokers—that arises from Mexico's electoral rules. Specifically, once the registered electorate in the precinct exceeds 750 (or any such multiple) due

[32]Due to the difficulties of matching localities to polling station coordinates, we only use the voter geographic distributions and polling station coordinates for 2012. While relatively few suburban precincts have split into new precincts, we restrict our sample to those that have not changed during our period of analysis.

[33]The correlations between weighted distance, population density (log), and area (log) in the full sample are -0.52 and 0.58 respectively.

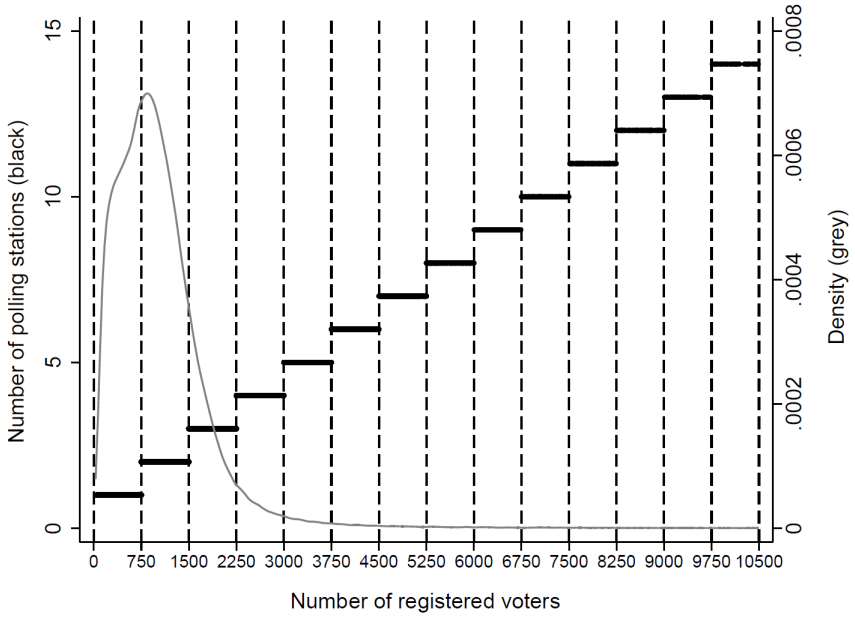

Figure 4: Number of polling stations per electoral precinct

Notes: Black points represent electoral precincts. The grey kernel density plot shows the distribution of total registered voter by electoral precinct. We use the bandwidth which minimizes the mean square error if the distribution were Gaussian.

to demographic changes, an additional polling station is added and voters are reallocated equally between all polling stations. Figure 4 shows this procedure in our data.

Each new polling station must be located in the same building or an adjacent building, and voters are divided alphabetically (by surname) between polling stations. The addition of a new polling station therefore does not affect the distance that voters must travel to vote. Given surname does not predict voter behavior in Mexico (Cantú 2014*b*), the assignment of voters to polling stations is exogenous with respect to our voting outcomes.

We employ a regression discontinuity (RD) design to compare polling station returns in electoral precincts that just exceeded the threshold required to split into more polling stations to polling stations in precincts that fell just below the threshold. The "running variable" determining whether a precinct is treated with a new polling station is the number of registered voters in the electoral precinct. Given new polling stations are created at each multiple of 750 voters, there exist many

discontinuities (at 750, 1,500, 2,250, etc. voters). We pool all discontinuities by defining our running variable—*Registered voters deviation*—as the deviation from the nearest multiple of 750 registered voters in a given precinct, which ranges from -375 to 375.[34] Our treatment indicator for an additional polling station in electoral precinct j at time t is defined by:

$$Split_{jt} \equiv 1(Registered\ voters\ deviation_{jt} > 0). \tag{5}$$

The RD framework identifies the local average treatment effect of an additional polling station under relatively weak assumptions. In particular, identification of causal effects at the discontinuity requires that potential outcomes are continuous across the discontinuity such that as we approach the discontinuity precincts that were not split are effectively identical to those that were split (see Imbens and Lemieux 2008). We now verify the validity of this assumption.

Validity of the RD design

A key concern with any RD design is the possibility of sorting around the discontinuity. In our case, this could occur if electorate sizes or precinct boundaries are subject to political manipulation. Figure 5 shows that there is no evidence of systematic bunching around the first six discontinuities. This is particularly clear around the first two discontinuities where the vast majority of our data is located. Furthermore, a McCrary (2008) density test similarly fails to reject the null hypothesis of equal density either side of each discontinuity.[35]

In the absence of bunching around the discontinuity, it is hard to imagine that electoral precincts with just above 750 registered voters systematically differ from those with just below 751. Nevertheless, we show that precinct splits are equally distributed across the country and that other variables are continuous at the discontinuity. Specifically, we consider precincts within 20 voters

[34]The smallest electoral precincts containing less than 375 voters do not feature in our analysis.

[35]Specifically, we cannot reject the possibility that the density of electoral precincts is identical either side of the discontinuity. We used a unit bin size and a bandwidth of five voters.

Table 1: Balance checks—splitting polling stations and political, economic and demographic characteristics of electoral precincts

	(1) PRI vote share (lag)	(2) PAN vote share (lag)	(3) PRD vote share (lag)	(4) Area (log)	(5) Voter density	(6) Distance to polling station	(7) Share economically active	(8) Share employed
Split	0.0019	0.0013	-0.0013	-0.0080	-74.9247	-0.0123	-0.0024***	-0.0002
	(0.0014)	(0.0013)	(0.0012)	(0.0245)	(68.7363)	(0.0119)	(0.0008)	(0.0005)
Observations	22,674	22,674	22,674	24,406	24,406	27,417	27,458	27,458
	(9) Share medical insurance	(10) Share illiterate	(11) Incomplete primary school	(12) Complete primary school	(13) Incomplete secondary school	(14) Complete secondary school	(15) Share owns house	(16) Share basic amenities
Split	-0.0023	0.0001	0.0018	-0.0010	-0.0016	-0.0018	0.0000	-0.0005
	(0.0018)	(0.0006)	(0.0034)	(0.0026)	(0.0018)	(0.0017)	(0.0015)	(0.0035)
Observations	27,455	27,455	27,455	27,455	27,455	27,455	27,460	27,460
	(17) Share with radio	(18) Share with TV	(19) Share with fridge	(20) Share washing machine	(21) Share with car	(22) Share with telephone	(23) Share with cell phone	(24) Share with internet
Split	-0.0037**	-0.0005	-0.0017	-0.0036	-0.0033	-0.0030	-0.0075**	-0.0017
	(0.0016)	(0.0013)	(0.0022)	(0.0025)	(0.0031)	(0.0031)	(0.0034)	(0.0034)
Observations	27,460	27,460	27,460	27,460	27,460	27,460	27,460	27,460

Notes: Each coefficient estimates the effect of splitting a polling station on a pre-treatment outcome, and is estimated separately from an OLS regression including district-year fixed effects. This is the form of our main specifications. Block-bootstrapped standard errors are clustered by state (1,000 resamples). Such specifications are identical to our main empirical analysis. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

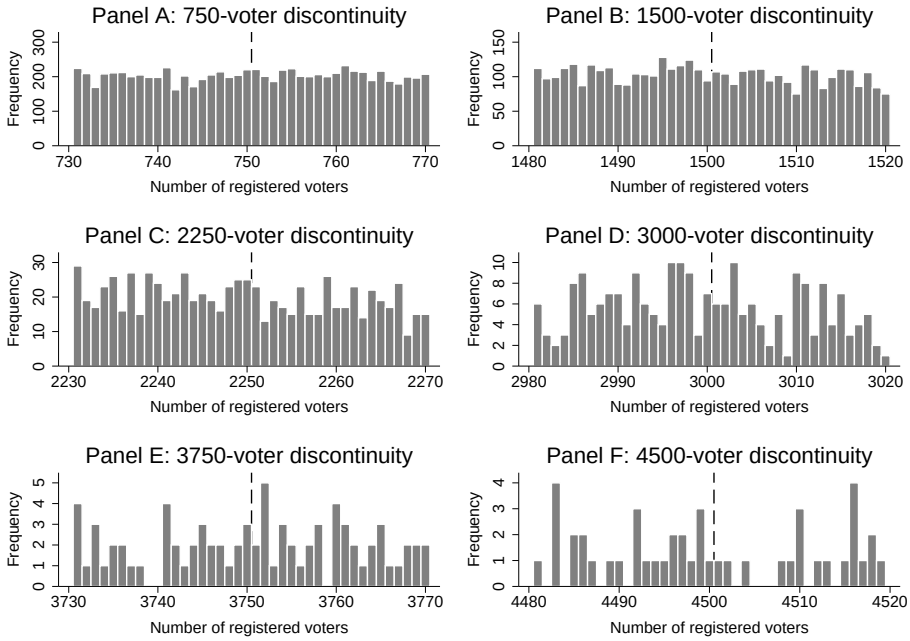

Figure 5: Histograms of the number of electoral precincts either side of the discontinuity

of being split to precincts that exceeded a multiple of 750 by less than 20 voters. This yields a sample of 26,697 polling stations from 13,452 precincts that were close to being split at a given election. As depicted in Figure 6, the 10,970 different electoral precincts that are included in our analysis at least once are equally distributed across the country.[36]

Table 1 presents 24 observable political, economic and demographic characteristics of these polling stations, and shows that treated and control units are well balanced across these variables.[37] The few differences are extremely small relative to their sample means. Nevertheless, we include all variables as controls as a robustness check in the Online Appendix. Throughout we include district-year fixed effects to ensure that our results cannot be driven by any race, district or state-

[36] As shown in the Online Appendix, the share of polling stations from each state in the discontinuity sample almost exactly reflects the population distribution.

[37] The Online Appendix plots these variables from contemporaneous IFE electoral data and the 2010 Census as a function of our running variable, and similarly supports continuity across the discontinuity. Census data for earlier years is not available at the precinct level.

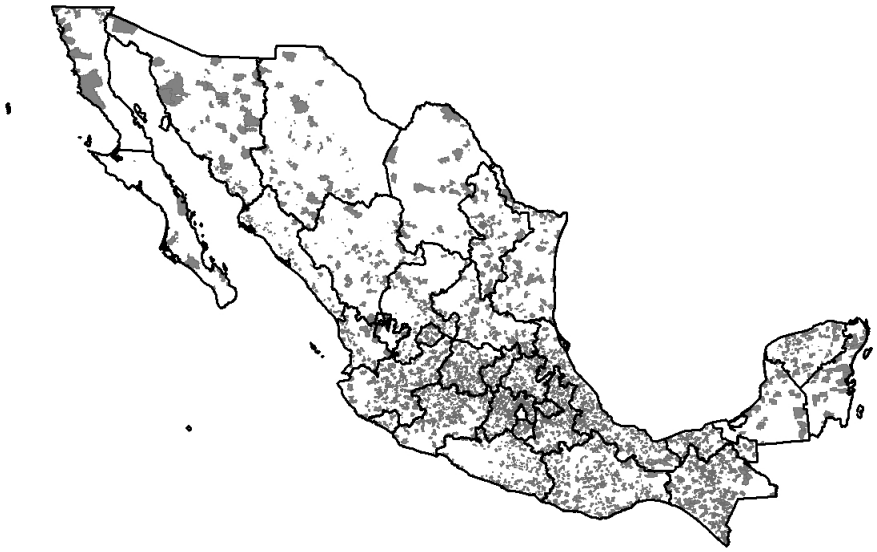

Figure 6: Electoral precincts included in the discontinuity sample

Notes: Shaded in grey are the 10,970 electoral precincts that appear at least once in our discontinuity sample.

specific variation such as local campaigning or state governorship.

Estimation

We first estimate the effect of an additional polling station in an electoral precinct on polling station-level turnout and party vote share. Our RD design uses a narrow bandwidth, including only precincts within a bandwidth of 20 voters either side of the discontinuity. We estimate the following simple equation using OLS:

$$Y_{ijdst} = \beta Split_{jt} + \mu_{dt} + \xi_{ijdst}, \tag{6}$$

where Y_{ijdst} is a voting outcome at polling station i in precinct j in district d in state s, and μ_{dt} are district-year fixed effects. Throughout we conservatively cluster standard errors by state, computed

using a block bootstrap based on 1,000 resamples. We show below that our results are insensitive to the choice of bandwidth and robust to including trends via a local linear regression.

To test the distance-specific predictions of the theory, we also estimate the following quadratic interaction specifications:

$$Y_{ijdst} = \beta Split_{jt} + \sum_{k=1}^{2} \tau_{0k} Distance_j^k + \sum_{k=1}^{2} \tau_{1k} \left(Split_{jt} \times Distance_j^k \right) + \mu_{dt} + \xi_{ijdst}, \tag{7}$$

where $Distance_j^k$ measures the average distance of voters to the polling station(s) in precinct j. We use a quadratic interaction for simplicity, but obtain similar results using less parametric specifications. To demonstrate that distance is not simply proxying for another variable, we also control for interactions with our balancing variables as a robustness check.

Results

Our results provide support for the theoretical model, and thus for the presence of greater turnout buying in areas where parties can better monitor the performance of their brokers. We first show a jump in turnout and PRI and PAN vote shares at the discontinuity determining the creation of a new polling station. Distinguishing our monitoring mechanism from potentially confounding explanations, we then show that the effect of an additional polling station increases and then decreases with distance—but only for the PRI. Finally, we show that our results are highly robust across a wide range of alternative specifications.

Average effects of an additional polling station

Before estimating equation (6), we first depict our variation graphically. Panel A of Figure 7 shows a jump in turnout of nearly one percentage point once a polling station is split. Panels B-D examine party vote share, and suggest that the PRI—traditionally Mexico's most clientelistic and

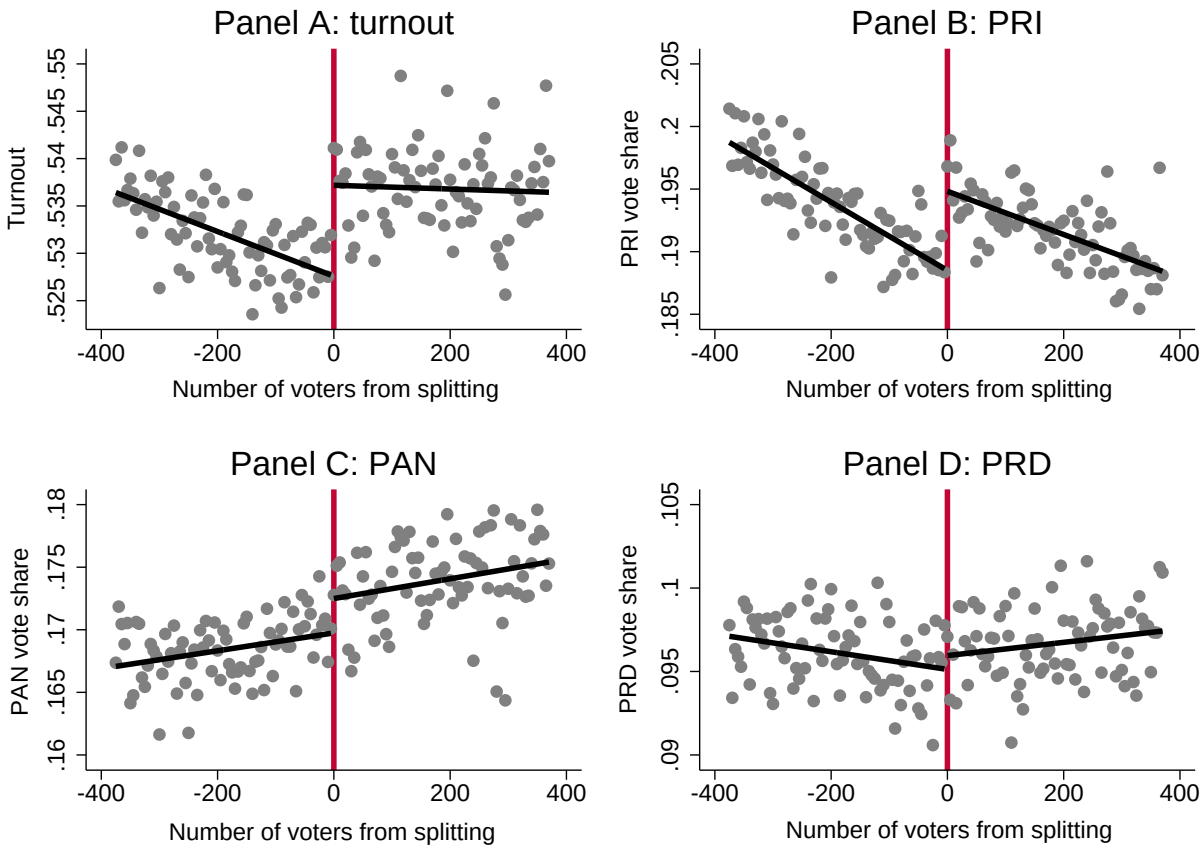

Figure 7: The effect of splitting polling stations on turnout and party vote share

Notes: Points in each graph represent the mean outcome for bins of registered voters of size five. The black line is the best linear fit either side of the discontinuity.

fraudulent political party—and the PAN—which held the Presidency between 2000 and 2012—are the principal beneficiaries of adding a new polling station. Conversely, there is little evidence that the PRD, which has regularly denounced vote buying and likely inherited the weakest political machines from the PRI, experienced a change in their vote share. We now test these relationships more formally.

The regression results in Table 2 support the changes identified in Figure 7. Column (1) shows that, on average, splitting a precinct increases polling station turnout by 0.85 percentage points. Given average turnout is just over 50%, this represents nearly a two percent increase in the propor-

tion turning out to vote. This finding is consistent with our argument (in H1) that parties are better able to monitor their brokers in electoral precincts with more polling stations.

Columns (2)-(4) examine changes in vote share by party. The results reiterate that the PRI and PAN are the main beneficiaries, respectively increasing the number of votes they receive in the average precinct by 0.45 and 0.41 percentage points. This represents a 2.5 percent increase in both party's vote share. The results imply that turnout buying is most prevalent by the PRI, although the PAN is engaged in almost as much turnout buying. Given that the PAN and PRI were the largest parties between 2000 and 2012, on average, they stood to gain most votes from buying turnout; this is consistent with the predictions of our model.

Our findings for the PRI are supported by our accounts above and the existing literature. While apparently inconsistent with the literature on clientelism that highlights that clientelistic exchanges are concentrated among poor voters (Diaz-Cayeros, Estévez and Magaloni 2007, Weitz-Shapiro 2012), the results for the PAN—traditionally associated with middle-class voters—are probably driven by poor voters in urban and suburban areas. Furthermore, some accounts indicate that some PAN mayors pay taxi drivers for sticking the PAN logo in their cars and driving voters to the polls.

However, there is no evidence of PRD turnout buying. The estimate in column (4), which is precisely estimated, indicates that an additional polling station does not increase the vote share of the PRD. The Online Appendix also confirms that even in states with a PRD governor, where turnout buying is likely to be most prevalent, there is no evidence that an additional polling station increases PRD turnout.[38] While consistent with the PRD's campaigning, this finding might be counter intuitive since the PRD is known for endorsing former PRI candidates that bring their political machines with them (Garrido de Sierra 2013*a*,*b*, Langston 2012). A possible explanation is that those candidates switching to the PRD were those with the weakest machines. Garrido de Sierra (2013*a*) points out that defectors were often disgruntled PRI members who decided to leave the party after not being nominated as candidates, suggesting that they faced worse elec-

[38]Focusing on only Guerrero and Michoacán, there is also no evidence of PRD turnout buying.

Table 2: Effect of split polling station on voting behavior by polling station

	Turnout (1)	PRI vote share (2)	PAN vote share (3)	PRD vote share (4)
Split	0.0085***	0.0045***	0.0041**	0.0003
	(0.0012)	(0.0011)	(0.0016)	(0.0008)
Observations	27,697	27,697	27,697	27,697
Outcome mean	0.54	0.19	0.17	0.10
Outcome standard deviation	0.14	0.08	0.11	0.09

Notes: All specifications include district-year fixed effects, and are estimated using OLS. All results are for a 20 voter bandwidth. Block-bootstrapped standard errors are clustered by state (1,000 resamples). * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

toral prospects. Nevertheless, it is important to emphasize that the PRD could be buying turnout in a different way from the one which our empirical design captures.

Furthermore, our estimates imply that the methods of the PAN and PRI are fairly effective at identifying potential voters. Using the discontinuity as an instrument for turnout, 2SLS estimates (provided in the Online Appendix) show that the PRI vote share increases by 0.53 percentage points for every percentage point increase in overall turnout while the PAN vote share increases by 0.48 percentage points. Given that turnout buying by the PRI and PAN may be occurring simultaneously in some precincts, these estimates are almost certainly lower bounds on the proportion of mobilized voters that vote for the party mobilizing them. While this finding clearly fits with anecdotal and newspaper accounts of the election, it considerably exceeds survey estimates of the proportion of voters who reported that a gift influenced their vote choice or decision to turn out (e.g. Mercado 2013, Nichter and Palmer-Rubin 2014). Our results therefore suggest that survey measures may suffer from considerable social desirability bias. However, because we do not observe the effort of brokers, we cannot truly evaluate the effectiveness of turnout buying by measuring the proportion of targeted voters that actually reach the polling station.

Although our identification strategy does not permit causal claims away from the discontinuity,

Table 3: Correlation between number of polling stations and voting behavior in the full sample

	Turnout (1)	PRI vote share (2)	PAN vote share (3)	PRD vote share (4)
Number of polling stations	0.0106***	0.0082***	0.0012	0.0007
	(0.0014)	(0.0017)	(0.0008)	(0.0005)
Registered voters at electoral precinct (1000s)	-0.024***	-0.017***	-0.004***	-0.001*
	(0.002)	(0.003)	(0.001)	(0.001)
Observations	561,256	561,256	561,256	561,256
Outcome mean	0.54	0.20	0.17	0.10
Outcome standard deviation	0.14	0.09	0.11	0.09

Notes: All specifications include district-year fixed effects, and are estimated using OLS. Block-bootstrapped standard errors are clustered by state (1,000 resamples). * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

Table 3 explores the correlation between the number of polling stations in an electoral precinct and voting in the full sample. Indicating that the discontinuity sample is relatively typical of the population, the outcome means and standard deviations are almost identical to those in Table 2.[39] The results paint a similar picture, with each additional polling station increasing turnout and support for the PRI. These estimates for an additional polling station are fairly similar to the RD estimates, and broadly support the validity of our estimates away from the discontinuity. Consistent with our qualitative account, the results suggest that PRI turnout buying is significantly more prevalent than PAN turnout buying on average across the country.

However, other explanations could still account for these changes at the discontinuity. Although less likely, especially since there is no change in PRD vote share, increased turnout could reflect an increased incentive to turn out if the expected duration of queuing declines, or if electoral administration improves. Even if monitoring explains the discontinuous change in voting, our results could be capturing vote buying rather than turnout buying. To differentiate our theoretical

[39]The summary statistics in the Online Appendix show that the discontinuity sample is similar across a range of other characteristics.

Table 4: Effect of split polling station by distance

	Turnout (1)	PRI vote share (2)	PAN vote share (3)	PRD vote share (4)
Split	0.0084***	0.0034***	0.0042**	0.0006
	(0.0014)	(0.0011)	(0.0018)	(0.0011)
Distance	-0.0067	0.0058	-0.0089***	-0.0017
	(0.0049)	(0.0036)	(0.0032)	(0.0020)
Distance squared	-0.0003	-0.0006	0.0003	0.0000
	(0.0007)	(0.0007)	(0.0006)	(0.0003)
Split × Distance	0.0014	0.0110***	-0.0035	-0.0002
	(0.0047)	(0.0036)	(0.0028)	(0.0031)
Split × Distance squared	-0.0009	-0.0030**	0.0010*	-0.0005
	(0.0014)	(0.0013)	(0.0006)	(0.0007)
Observations	27,420	27,420	27,420	27,420

Notes: All specifications include district-year fixed effects, and are estimated with OLS. All results are for a 20 voter bandwidth. Block-bootstrapped standard errors are clustered by state (1,000 re-samples). Locality-weighted distance to the polling station was unavailable for 347 electoral precincts. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

explanation from such alternative interpretations, we test the heterogeneous effects by distance exclusively predicted by our turnout buying model.

Heterogeneous effects of additional polling stations by distance

To test our hypothesis that increased monitoring capacity only translates into turnout buying when there exist potential voters that can be bought at relatively low cost, we estimate equation (7). The first, fourth and fifth rows in Table 4 show the differential effects of an additional polling station by average distance to the polling station: the first coefficient identifies the effect of an additional polling station in urban areas where the distance to the polling station is essentially zero, while the two interaction terms (fourth and fifth coefficients) allow for the effect of splitting a polling station to vary with distance.

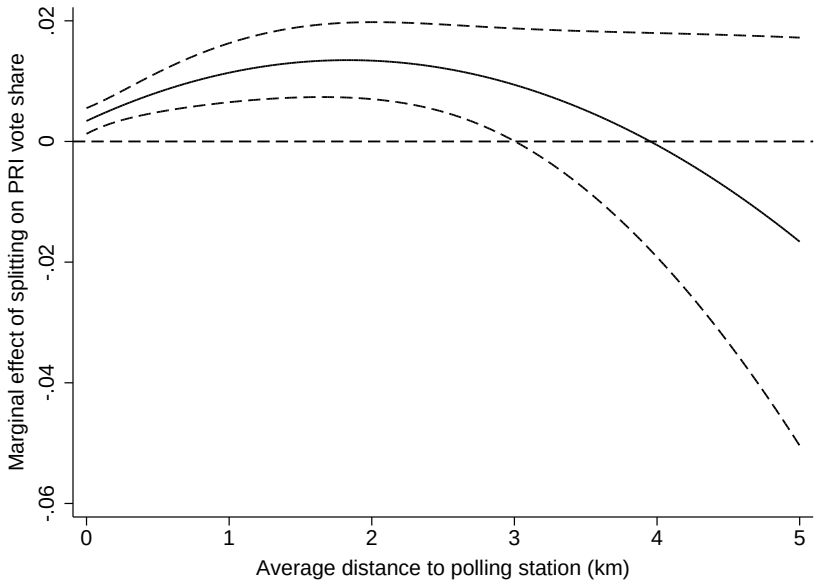

Figure 8: Marginal effect of splitting polling stations on PRI vote share by distance (with 95% confidence interval)

We find non-linear effects of monitoring capacity in line with H2. The interaction estimates in column (2) show that splitting a polling station particularly increases the PRI vote share in locations where voters are not too close but not too far from the polling station. Figure 8 illustrates the result graphically, showing that the effect of an additional polling station is maximized where the average voter lives around 1.75km from the polling station.[40] Where the effect of monitoring is largest, the PRI vote share increases by nearly 1.5 percentage points, or nearly 10 percent of their total vote. These results for the PRI are consistent with our theoretical claim that the average effect at the discontinuity is picking up differences in monitoring capacity, rather than any other change associated with new polling stations.

Conversely, column (3) shows that the benefits of splitting polling stations for the PAN operate very differently. Comparing the estimates in the first row, we find that the PAN benefits slightly more from turnout buying than the PRI in the most urban areas where a polling station serves only

[40]We also defined indicators for different distances and found similar results, suggesting that the monitoring effect is largest when the distance from the polling station is around 1km on average.

one locality. Unlike for the PRI, but consistent with H2, this effect does not increase with distance. Rather, the PAN vote share generally declines with distance: although the linear interaction with distance is not quite significantly negative, the linear effect of distance shows there is already a strong decline in vote share on the other side of the discontinuity. These results fit with the differential predictions of our model across parties, suggesting that the lack of potential PAN voters living further from polling stations means that it is not worth hiring brokers to reach these areas.

Column (4) shows no differential effects for the PRD. This is consistent with our finding above that the PRD is not engaging in significant turnout buying of the sort captured by our identification strategy.

These heterogeneous effects are not consistent with the most plausible alternative explanations for the effects of an additional polling station. First, if improved electoral administration or lower waiting time at the polling booth simply reduces the costs of turning out, the Online Appendix shows that this should increase the vote share of all parties. However, we find no positive effect on the PRD vote share. Furthermore, the increased number of votes for the PRI should be monotonically increasing in distance, while the increased number of votes for the PAN and PRD are expected to be monotonically decreasing in distance. Thus, the congestion explanation cannot explain the finding that the marginal effect of a new polling station on the PRI vote share decreases in distance for a sufficiently large distance. Second, a mechanical effect driven by added electoral officials present at the additional polling station—assuming that they would have not turned out otherwise—could similarly explain neither why only the PRI and PAN benefit to begin with nor why the non-linear effects with distance occur only for the PRI. Third, monitoring could be facilitating vote buying rather than turnout buying. However, vote buying would imply the reverse relationship with distance because there are more opposition votes for the PRI to convert in the less rural areas where more PAN and PRD voters reside. Similarly, we would expect the PAN and PRD vote shares to increase with distance.

Robustness checks

Although we demonstrated that split polling stations occur effectively randomly, there remain several important robustness checks to undertake. First, we show that our results do not depend on our RD specification choices. Second, we show that the interaction with distance at the discontinuity is not confounded by omitted variables.

To demonstrate that our results are not specification-dependent, we employ a variety of sensitivity analyses. First, Figure 9 considers bandwidths in multiples of five ranging from 5 to 100. The results show that the average effect at the discontinuity is very similar across bandwidth choices, and always statistically significant for turnout and PRI vote share. The smaller effects for the PAN are slightly less robust, but only further away from the discontinuity. Second, the Online Appendix shows that the results are robust to the inclusion of linear trends in the running variable on either side of the discontinuity. That this local linear approach yields essentially identical results is not surprising given that our bandwidth choice produces a relatively trendless sample around the discontinuity.

The second main concern is that the interaction with distance to the polling station is actually proxying for another variable. A particular worry is that in using distance, we are simply picking up characteristics like poverty that are also correlated with support for the PRI. Although such arguments are unlikely to entail the non-linear effects we observe, we included all the variables that we demonstrated balance on as quadratic interactions and show (in the Online Appendix) that the quadratic effects of monitoring by distance to the polling station on the PRI vote share are remarkably stable. In no specification did the non-linear interaction between splitting polling stations and distance become statistically insignificant. Furthermore, to dismiss any concern that district-specific characteristics might act differentially across the discontinuity, we confirm in the Online Appendix that the results are also robust to identifying our effects entirely out of within-district variation in the effect of an additional polling station, by interacting district fixed effects

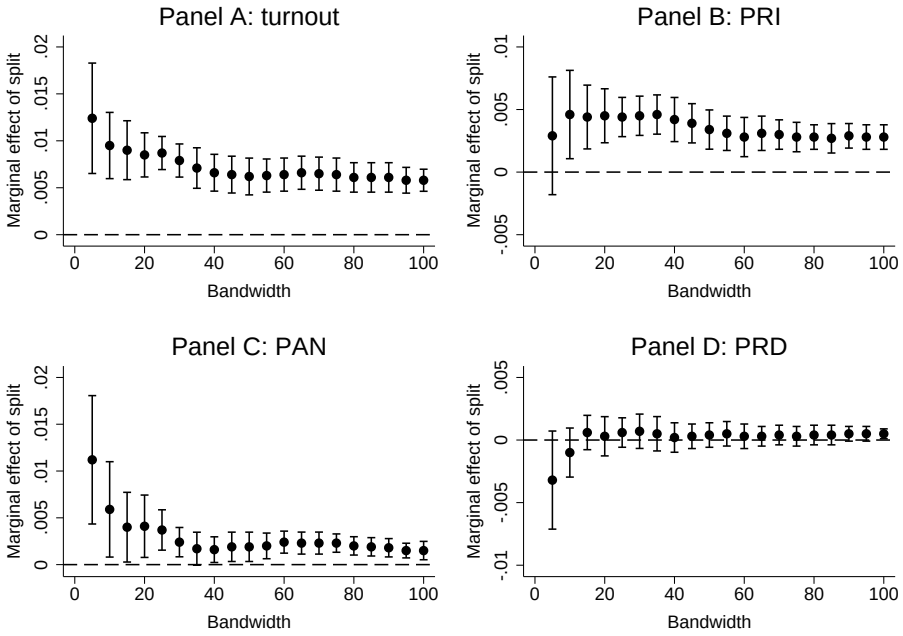

Figure 9: Marginal effect of splitting polling stations by bandwidth choice (with 95% confidence interval)

Notes: All estimates are from specification equivalent to those in Table 2, with the exception that the bandwidth varies from 5 to 100 voters (in five voter intervals) either side of the discontinuity.

with the discontinuity.

Conclusion

While turnout buying is prevalent in nascent and consolidating democracies, little is known about when parties engage in turnout buying. In this article, we argue that the capacity of parties to monitor the mobilization of voters by their brokers—who are indispensable due to their differential knowledge, but also face incentives to shirk—is an essential determinant of the effectiveness of turnout buying in different parts of the country. In electoral precincts in Mexico where parties can better monitor their brokers, we find significantly higher electoral turnout. By virtue of Mexico's rural-urban political divide, the extent of turnout buying by the PAN and PRI varies with the

precinct-specific costs and benefits of hiring brokers. Better monitoring capacity enables turnout buying where a party has many potential supporters who face prohibitive costs of turning out, but less so once the costs of hiring brokers become too large to justify mobilizing an additional voter.

Our findings have important implications for understanding when parties deploy different electoral strategies, and thus contribute more broadly to the politics of targeted distribution (Cox and McCubbins 1986; Lindbeck and Weibull 1987). First, unlike the party-voter interaction that previous research has focused on, or the selection of brokers, we emphasize the role of parties monitoring their brokers. The empirical component of our study—the first, to our knowledge, to isolate the causal effect of monitoring on turnout buying—shows that electoral returns provide parties with valuable information about broker performance. Although electoral returns are an important monitoring device, and have also been exploited in countries as diverse as Colombia, India and the U.S., they probably only represent one of a plethora of monitoring mechanisms. Monitoring issues are particularly relevant in the current U.S. context, where Enos and Hersh (forthcoming) find that the Obama 2012 campaign struggled to overcome the agency problem that their activists, who are typically ideologically extreme and unpaid, fail to convey messages designed by the party to mobilize centrist voters.

Second, we confirm empirically the theoretical insight of Gans-Morse, Mazzuca and Nichter (2013) that the distribution of voter preferences and costs of turning out are central in explaining which parties engage in turnout buying in which locations. This finding buttresses the literature demonstrating that political parties target their voter mobilization efforts strategically (e.g. Berry, Burden and Howell 2010; Martin 2003). In addition to showing that political parties are sensitive to these considerations, we also find that the interaction with structural features determining the ability of parties to implement turnout buying may be just as important. In this respect our findings dovetail with previous research showing that institutions like the secret ballot (Cox and Kousser 1981; Nichter 2008), compulsory voting (León 2013) and party machines (Rakove 1976; Stokes et al. 2013) affect election day strategies.

The specific monitoring instrument examined in this article—additional polling stations—also has implications for policy-makers designing electoral systems. El Salvador's "voto residencial" program, for example, has recently increased the number of polling stations available to voters, while Pakistan introduced a similar reform in 2014.[41] Similarly, India's recently-introduced electronic voting machines allow parties to assess the relative contributions of their workers manning each polling booth. Our findings highlight an important trade-off facing policy-makers seeking to expand the number of polling stations. On the one hand, disaggregated electoral data can be used by election observers to more effectively detect electoral fraud, while increasing the number of polling stations may increase political participation by reducing the costs of voting. On the other hand, our results suggest that parties can use more detailed data to buy more turnout because they can better monitor their brokers. What is best is likely to depend on the context, although relative ease with which these changes could be achieved is worth noting. This contrasts with prominent accounts emphasizing the role of slow-changing structural factors like economic development, political competition and income inequality in reducing vote buying (e.g. Stokes et al. 2013; Weitz-Shapiro 2012).

The concerns about turnout buying are premised on the assumption that it is bad for democracy. However, its effect probably varies across contexts. To the extent that turnout buying increases the participation of previously under-represented groups, it could be regarded as socially beneficial. Conversely, the advantage given to some parties—especially previously dominant parties like the PRI, who already possess the networks and resources to buy votes—may counteract the participatory benefits. Our theory and evidence suggest that careful electoral design could mitigate turnout buying –in those contexts where the negative effects of turnout buying for democracy are clear– by recognizing where dominant parties are most likely to exploit turnout buying potential.

[41] "ECP to increase number of polling stations," *Dunya News*, December 10th 2014.

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ONLINE APPENDIX: PARTIES, BROKERS AND VOTER MOBILIZATION: HOW TURNOUT BUYING DEPENDS UPON THE PARTY'S CAPACITY TO MONITOR BROKERS

HORACIO LARREGUY* JOHN MARSHALL† PABLO QUERUBÍN‡

1 Proofs

Proof of Proposition 1: The argument in the text derives voter behavior $v^*(d, e_A^*, e_B^*; \sigma)$, which pins down e_i^* for parties using backward induction. The individual rationality (IR) constraint in the program of equation (4) of the main text is clearly satisfied if the incentive compatibility (IC) constraint is satisfied. Note that the IC constraint comes from parties optimally choosing to punish, by withdrawing the wage, when they observe effort $e_i < \hat{e}_i$. The parties will clearly then let the IC bind at any interior optimum. Substituting for $\hat{w}_i$ using the binding IC constraint yields the following first-order condition in $\hat{e}_i$:

$$\psi\alpha d[1+\alpha d(1-\hat{e}_A)b(d)] \leq \frac{\gamma_A d\hat{e}_A}{p}, \tag{1}$$

$$\psi\alpha d[1-\alpha d(1-\hat{e}_B)b(d)] \leq \frac{\gamma_B d\hat{e}_B}{p}, \tag{2}$$

for parties A and B respectively. The second-order conditions for a unique equilibrium are satisfied when $\gamma_A + p\psi\alpha^2 db(d) > 0$ for party A and $\gamma_B - p\psi\alpha^2 db(d) > 0$ for party B. These necessary conditions are given at the beginning of the proposition.

When $1+\alpha db(d) \leq 0$, A's first order condition is weakly negative for any value of $\hat{e}_A$, and thus $\hat{e}_A^* = 0$. Similarly, when $1-\alpha db(d) \leq 0$, B's first order condition is weakly negative for any value of $\hat{e}_B$, and thus $\hat{e}_B^* = 0$.

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However, when $1+\alpha db(d)>0$ and $1-\alpha db(d)>0$ respectively hold, parties A and B respectively engage in turnout buying. Solving solving first order conditions respectively yields:

$$\hat{e}_A^* = \frac{p\psi\alpha[1+\alpha db(d)]}{\gamma_A + p\psi\alpha^2 db(d)}, \tag{3}$$

$$\hat{e}_B^* = \frac{p\psi\alpha[1-\alpha db(d)]}{\gamma_B - p\psi\alpha^2 db(d)}, \tag{4}$$

where it follows that $p\psi\alpha<\gamma_A$ and $p\psi\alpha<\gamma_B$ must hold for an interior solution where $\hat{e}_A^*<1$ and $\hat{e}_B^*<1$, respectively. Otherwise, $\hat{e}_A^*=\hat{e}_B^*=1$.

The binding IC constraint then determines the optimal wage $\hat{w}_i^*$. By virtue of satisfying the IC constraint, the broker optimally chooses $e_i^*=\hat{e}_i^*$. ■

Proof of Proposition 2: Given the closed form solutions in Proposition 1, the comparative statics are straight-forward to identify for any interior solution (as defined by the conditions in Proposition 1).

The first result follows from differentiating e_i^* with respect to p to yield:

$$\frac{\partial e_A^*}{\partial p} = \frac{\psi\alpha\gamma_A[1+\alpha db(d)]}{[\gamma_A + p\psi\alpha^2 db(d)]^2} \geq 0, \tag{5}$$

$$\frac{\partial e_B^*}{\partial p} = \frac{\psi\alpha\gamma_B[1-\alpha db(d)]}{[\gamma_B - p\psi\alpha^2 db(d)]^2} \geq 0. \tag{6}$$

Both differentials are positive at any interior solution because $e_i^*\in(0,1)$ and thus the numerators of the solutions for each e_i^* must also be positive; the denominators are positive in any equilibrium.[1]

We now turn to the second result. We first differentiate $\frac{\partial e_A^*}{\partial p}$ by d to yield:

$$\frac{\partial^2 e_A^*}{\partial p\partial d} = \frac{\psi\gamma_A\alpha^2[b(d)+db'(d)]\Big[\gamma_A - p\psi\alpha[2+\alpha db(d)]\Big]}{[\gamma_A+\psi\alpha^2 pdb(d)]^3}. \tag{7}$$

From our existence condition (given in Proposition 1), the denominator is positive. $\psi\gamma_A\alpha^2[b(d)+db'(d)]$ is always positive, given the assumption that $b(d)+db'(d)>0$ (i.e. $\varepsilon(d)>-1$). The cross-partial thus depends on the term in large brackets in the numerator. As $d\downarrow 0$, the condition $\gamma_A>2p\psi\alpha$ ensures that this term is positive, and thus equation (7) is positive for $d\downarrow 0$. Since the term in large brackets term is monotonically decreasing in d, given that $b'(d)>0$, and is negative as $d\to\infty$, there must then exist a cut-point $\overline{d}_A>0$ such that $\gamma_A - p\psi\alpha[2+\alpha\overline{d}_A b(\overline{d}_A)]=0$ and equation (7) is negative for $d>\overline{d}_A$.

The result similarly follows for party B from

$$\frac{\partial^2 e_B^*}{\partial p\partial d} = -\frac{\psi\gamma_B\alpha^2[b(d)+db'(d)]\Big[\gamma_B - p\psi\alpha[2-\alpha db(d)]\Big]}{[\gamma_B-\psi\alpha^2 pdb(d)]^3} < 0. \tag{8}$$

[1]Note that since Π^i is increasing in e_i^* (or $\hat{e}_i^*$), these results for e_i^* (or $\hat{e}_i^*$) equally apply to Π^i.

As above, our existence conditions ensures that the denominator is positive. Given $\varepsilon(d) > -1$, the cross-partial thus again depends on the term in large brackets in the numerator. As $d \downarrow 0$, the condition $\gamma_B > 2p\psi\alpha$ ensures that this term is positive, and thus $\frac{\partial^2 e_B^*}{\partial p \partial d} < 0$. Since the term in large brackets is monotonically increasing in d, $\frac{\partial^2 e_B^*}{\partial p \partial d} < 0$ always holds.[2] ■

2 Effects of congestion on party vote share

As noted in the main text, an important concern is that our results are instead driven by a reduction in congestion costs. To identify the implications of this concern, we re-examine the implications of the model. In particular, we assume that no turnout buying occurs ($e_i = 0$) and voters instead face the cost $c(d, f) = \alpha d + f$, where $f > 0$ is the cost associated with congestion. To identify the implications of congestion, we simply differentiate the party vote share (as a proportion of registered voters)—Π^A and Π^B—by f, before examining the cross-partial effect with distance d.

Unsurprisingly, the vote share for each party decreases in f:

$$\frac{\partial \Pi^A}{\partial f} = -\psi[1 + b(d)(\alpha d + f)] < 0, \tag{9}$$

$$\frac{\partial \Pi^B}{\partial f} = -\psi[1 - b(d)(\alpha d + f)] < 0. \tag{10}$$

The signs follow from $b(d) \in [-\psi, \psi]$ and $c(d, f) \in [0, \frac{1}{\psi}]$ (in the main text). A reduction in congestion thus increases the vote share of both parties, and particularly the party experiencing the bias (e.g. $b(d) > 0$ for a bias toward A and $b(d) < 0$ for a bias toward B).

Differentiating again to examine the heterogeneous effects of congestion by distance yields:

$$\frac{\partial^2 \Pi^A}{\partial f \partial d} = -\psi[\alpha[b(d) + db'(d)] + b'(d)f] < 0, \tag{11}$$

$$\frac{\partial^2 \Pi^B}{\partial f \partial d} = \psi[\alpha[b(d) + db'(d)] + b'(d)f] > 0, \tag{12}$$

where the signs follow from the condition $b(d) + db'(d) > 0$. These cross-partial effects demonstrate that the increased number of votes for the PRI—or rural party A—due to reduce congestion costs should be monotonically increasing in distance, while the increased number of votes for the PAN and PRD are expected to be monotonically decreasing in distance.

[2] Differentiating Π^i to examine when these results for e_i^* carry over to the vote shares of parties A and B: $\frac{\partial^2 \Pi^i}{\partial p \partial d} = \frac{\partial^2 e_i^*}{\partial p \partial d} \frac{\gamma_i d e_i^*}{p} + \frac{\partial e_i^*}{\partial p} \frac{\gamma_i e_i^*}{p}$, where we exploit the envelope condition that $\partial e_i^* / \partial d = 0$ and substitute using the first-order conditions. Given $\frac{\gamma_i e_i^*}{p} \geq 0$, the sign of $\frac{\partial^2 e_i^*}{\partial p \partial d}$ determines the first term of $\frac{\partial^2 \Pi^i}{\partial p \partial d}$. We call this the "first-order effect". Whenever this exceeds the second term, the first-order effect dominates, and thus follows the sign of $\frac{\partial^2 \Pi^i}{\partial p \partial d}$.

3 Variable definitions and summary statistics

Our variables are defined below. Summary statistics are provided in Table 1 for our main variables; summary statistics for our balancing variables are available in our replication code. Most of the data was obtained from the IFE using freedom of information requests. Codebooks defining our Census and other balancing variables are available upon request.

Turnout. Proportion of voters at a given polling station (within an electoral precinct) that turned out at the legislative election. This includes all votes, not just valid votes. Source: IFE.

PAN/PRD/PRI vote share. PAN/PRD/PRI legislative vote share, as a proportion of the registered electorate, at a given polling station. Source: IFE.

Registered voters in electoral precinct. Number of voters registered to vote in a given electoral precinct. Source: IFE.

Registered voters deviation. Difference in the number of registered voters in a given electoral precinct from the nearest multiple of 750.

Split. Indicator coded one if registered voters deviation is greater than zero. (as defined in the main text).

Registered voters in polling station. Number of voters registered to vote at a given polling station. Source: IFE.

Year. National legislative election year; 2000, 2003, 2006, 2009 or 2012.

Distance. We used the set of IFE localities, which differ from National Institute of Statistics and Geography (INEGI) localities because the INEGI groups individuals in bigger localities, and calculated the Euclidean distance (in kilometers) from each locality to the locality of the polling stations in the section. We assigned zero distance to the voters who voted in the locality where the polling station was located since we do not know the spatial distribution of the voters within the locality. Computing the voter-weighted distance of each locality from the polling stations in the section required three types of data that we obtained from the IFE through various freedom of information requests. These three types of data are: a) data on the number of registered voters in each IFE locality (available for 2006, 2009, and 2012), b) data on the coordinates of each IFE locality (available for 2006, 2009, and 2012), and c) the coordinates of each polling station (available for 2006, 2009, and 2012). While the three types of data provide an IFE locality code, these do not always matched across the different data sets. However, using a fuzzy name matching algorithm in Stata (reclink), together with extensive matching by hand, we were able to match the localities that represented at least 95% of the registered voters for each electoral precinct for 99.5% of the precincts. Finally, to calculate the average distance of voters to the polling station, we summed all distances weighting by the locality registered population divided by the total registered population in the electoral precinct. Due to the time required to complete the name matching procedure that had to be done by hand, we only executed the full matching procedure, and thus computed the average distance measure, for almost all the electoral precincts for the year 2012, which we use for all years. However, restricting attention to those electoral precincts where the fuzzy name matching algorithm matched the localities that represented at least 95% of the registered voters, we observe an extremely high correlation in the average distance measure across years.

PRD state governor. Indicator coded one if the state governor is from the PRD at the time of

the election.

Area (log). The natural logarithm of the electoral precinct area in kilometers.

Voter density (log). The natural logarithm of the registered precinct electorate divided by total area in kilometers.

Share economically active. Percentage of electoral precinct population that is economically active. Source: 2010 Census.

Share employed. Percentage of electoral precinct population that is employed. Source: 2010 Census.

Share medical insurance. Percentage of electoral precinct population that has medical insurance. Source: 2010 Census.

Share illiterate. Percentage of electoral precinct population above 15 that is illiterate. Source: 2010 Census.

Incomplete primary school. Percentage of electoral precinct population above 15 with incomplete primary schooling. Source: 2010 Census.

Complete primary school. Percentage of electoral precinct population above 15 with complete primary schooling. Source: 2010 Census.

Incomplete secondary school. Percentage of electoral precinct population above 15 with incomplete secondary schooling. Source: 2010 Census.

Complete secondary school. Percentage of electoral precinct population above 15 with complete secondary schooling. Source: 2010 Census.

Share owns house. Percentage of electoral precinct owning a house. Source: 2010 Census.

Share basic amenities. Percentage of households in the electoral precinct with all electricity, piped water, toilet and drainage. Source: 2010 Census.

Share with radio. Percentage of households in the electoral precinct with radio. Source: 2010 Census.

Share with TV. Percentage of households in the electoral precinct with a television. Source: 2010 Census.

Share with fridge. Percentage of households in the electoral precinct with a refrigerator. Source: 2010 Census.

Share washing machine. Percentage of households in the electoral precinct with a washing machine. Source: 2010 Census.

Share with car. Percentage of households in the electoral precinct with a car or truck. Source: 2010 Census.

Share with telephone. Percentage of households in the electoral precinct with a landline telephone. Source: 2010 Census.

Share cell phone. Percentage of households in the electoral precinct with a cellphone. Source: 2010 Census.

Share with internet. Percentage of households in the electoral precinct with internet access. Source: 2010 Census.

Table 1: Summary statistics: discontinuity and full (national) samples

	Discontinuity sample (20 voter bandwidth)					**Full sample**				
	Obs.	Mean	Std. dev.	Min.	Max.	Obs.	Mean	Std. dev.	Min.	Max.
Turnout	27,697	0.54	0.14	0.06	1	517,255	0.53	0.14	0.00	1
PRI vote share	27,697	0.19	0.08	0	0.83	517,255	0.19	0.08	0	1.00
PAN vote share	27,697	0.17	0.11	0	0.86	517,255	0.17	0.11	0	0.86
PRD vote share	27,697	0.10	0.09	0	0.99	517,255	0.10	0.09	0	0.99
Registered voters in electoral precinct	27,697	1585.45	1638.26	731	24010	517,255	1618.22	1524.21	375	24010
Registered voters deviation	27,697	2.62	11.21	-19	20	517,255	1.75	215.70	-375	375
Split	27,697	0.61	0.49	0	1	517,255	0.53	0.50	0	1
Registered voters in polling station	27,697	570.56	154.08	375	750	517,255	575.04	100.58	375	750
Year	27,697	2006.44	4.21	2000	2012	517,255	2006.40	4.20	2000	2012
Distance	27,417	0.22	0.65	0	18.03	512,774	0.22	0.67	0	24.33

4 Continuity around the discontinuity

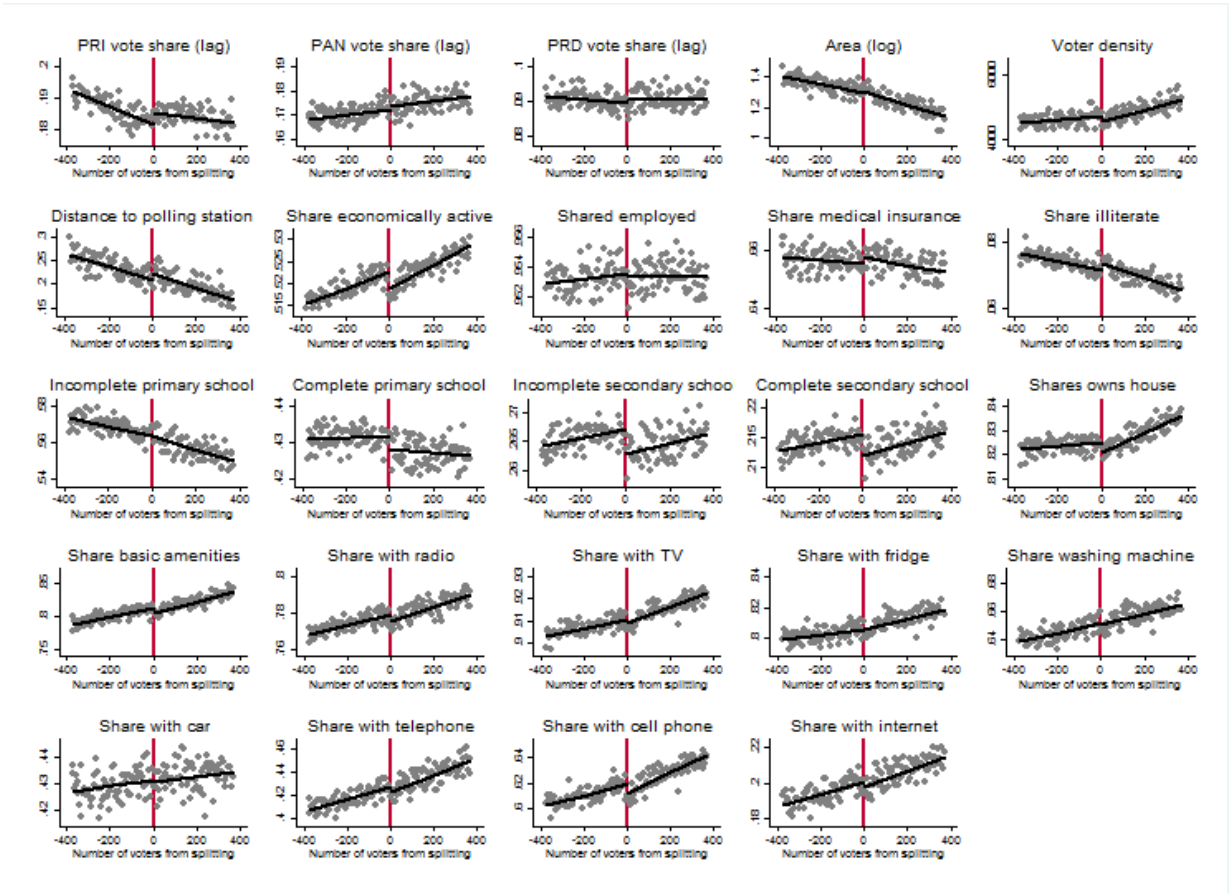

Figure 1: Scatter plots in the running variable for each balancing variable

5 Distribution of polling station splits

Our main analysis examines electoral precincts within 20 registered voters of receiving an additional polling station. As the Figure in the main text suggests, these precincts are evenly split across the country. Table 2 shows this claim more clearly, demonstrating that the proportion of precincts from each state in our discontinuity sample almost exactly reflects the proportion of all available electoral precincts. Table 3 shows that the distribution across election years is also similar.

6 Efficacy of turnout-buying

Table 4 instruments for turnout using our polling station discontinuity in order to estimate the effectiveness of turnout buying on a party's total vote share (as a percentage of registered voters).

Table 2: Distribution of polling stations across states: discontinuity and full (national) samples

State	Discontinuity sample (20 voter bandwidth), % of total			Full sample, % of total
	All	Split	Unsplit	
Aguascalientes	1.16	1.17	1.15	1.06
Baja California	3.13	3.15	3.09	2.97
Baja California Sur	0.52	0.51	0.53	0.55
Campeche	0.73	0.80	0.61	0.79
Chiapas	2.62	2.85	2.27	2.63
Chihuahua	0.49	0.52	0.44	0.61
Coahuila	4.00	3.71	4.46	3.58
Colima	4.30	4.63	3.79	3.99
Durango	1.94	2.09	1.71	1.89
Guanajuato	5.45	5.68	5.09	5.31
Guerrero	3.01	2.97	3.07	3.79
Hidalgo	2.50	2.34	2.76	2.65
Jalisco	7.16	7.05	7.35	6.96
Mexico	13.22	12.73	13.99	13.26
Michoacan	4.57	4.58	4.56	4.46
Morelos	1.83	1.86	1.78	1.76
Nayarit	1.20	1.08	1.38	1.17
Nuevo Leon	4.77	4.44	5.29	4.34
Oaxaca	3.63	3.68	3.56	3.71
Puebla	5.25	5.44	4.96	4.97
Queretaro	1.47	1.50	1.42	1.51
Quintana Roo	1.35	1.28	1.45	1.04
San Luis Potosi	2.30	2.27	2.35	2.66
Sinaloa	1.83	1.86	1.79	3.76
Sonora	2.66	2.70	2.59	2.55
Tabasco	2.01	1.94	2.13	2.07
Tamaulipas	3.43	3.68	3.05	3.27
Tlaxcala	0.98	0.89	1.11	1.11
Veracruz	8.61	8.67	8.53	7.62
Yucatan	1.92	1.74	2.20	1.88
Zacatecas	1.94	2.19	1.54	2.08

Table 3: Distribution of polling stations across election years: discontinuity and full (national) samples

Election year	Discontinuity sample (20 voter bandwidth), % of total			Full sample, % of total
	All	Split	Unsplit	
2000	17.06	17.30	16.67	17.59
2003	18.32	18.38	18.22	18.66
2006	20.58	20.13	21.29	20.23
2009	21.15	21.08	21.26	21.50
2012	22.90	23.11	22.56	22.01

The results, as cited in the main text, indicate that turnout buying is relatively effective: a percentage point increase in turnout translates into a 0.62 percentage point increase in votes for the PRI, and a 0.48 percentage point increase in votes for the PAN. As noted in the main text, this is likely to be an under-estimate if multiple parties simultaneously buy turnout in some precincts.

Table 4: IV estimates of the effect of turnout on vote share

	PRI vote share (1)	PAN vote share (2)	PRD vote share (3)
Turnout	0.5339***	0.4791***	0.0324
	(0.1496)	(0.1548)	(0.0980)
Observations	27,697	27,697	27,697
First stage F statistic	9.4	9.4	9.4
Observations	27,770	27,770	27,770

Notes: All specifications include district-year fixed effects, and are estimated with 2SLS. All results are for a 20 voter bandwidth. Standard errors are clustered by state. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

7 Effect of an additional polling station in PRD strongholds

Using interactions, Table 5 shows that there is no evidence of PRD turnout buying in states with a PRD governor. Unreported robustness checks show that in Michoacán and Guerrero, states where the PRD inherited the PRI's local apparatus, the interaction coefficient is negative.

Table 5: Effect of an additional polling station in PRD strongholds

	PRD vote share
Split	-0.0002
	(0.0010)
Split × PRD governor	0.0032
	(0.0025)
Observations	27,697

Notes: All specifications include district-year fixed effects, and are estimated with OLS. All results are for a 20 voter bandwidth. Standard errors are clustered by state. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

8 Robustness checks

Tables 6 and 8 report the additional robustness checks cited in the main text. Table 6 shows the local linear regression estimates where linear trends in the running variable are included either side of the discontinuity. Although the estimates are somewhat noisier, the effect sizes generally rise (although the larger coefficient for the PAN ceases to be statistically significant). This increase is not especially surprising given that the main text shows that the trend either side of the discontinuity is declining; although the slope around the discontinuity is relatively shallow, in general such trends imply that comparing means will underestimate the effect at the discontinuity.

Table 7 presents our results when controlling linearly for our balance test variables. The estimates show that our findings are highly robust to such controls, which is not surprising given that the discontinuity design works well. The estimates do change slightly because we lose around a quarter of the sample.

Table 8 shows the PRI interaction results with distance when controlling for our balancing variables. This table also includes the district-year-discontinuity fixed effects, cited in the main text, in specification (24); these capture a wide variety of possible concerns such as interactions with race-specific characteristics and the party of the state governor. The results indicate that our theoretical claims are robust: the non-linear PRI interaction with distance is highly robust to the inclusion of Census variables. The distance interactions also weaken in ways consistent with our model when we control for interactions with lagged vote share and (log) area. First, since lagged vote share is (like distance to the polling station) also a good proxy for the number of potential voters in a precinct, it is not surprising to find that both distance and lagged vote share are capturing similar variation. This explains the smaller coefficients in the first three specifications, and in fact indicates that distance is doing a job at capturing potential voters. Nevertheless, our results indicate that the interaction with distance generally remains statistically significant, which is encouraging since lagged vote share is a good proxy for potential voters but does not as effectively capture the costs of mobilizing brokers. Second, area is highly correlated ($\rho > 0.5$) with distance to the

Table 6: Local linear regression estimates

	Turnout (1)	PRI vote share (2)	PAN vote share (3)	PRD vote share (4)
Panel A: Average effects				
Split	0.0102***	0.0052**	0.0049	0.0003
	(0.0024)	(0.0025)	(0.0032)	(0.0015)
Observations	27,697	27,697	27,697	27,697
Panel B: Heterogeneous effects				
Split	0.0108***	0.0042*	0.0053*	0.0007
	(0.0023)	(0.0024)	(0.0031)	(0.0015)
Distance	-0.0067	0.0058	-0.0089***	-0.0017
	(0.0049)	(0.0038)	(0.0031)	(0.0021)
Distance squared	-0.0003	-0.0006	0.0003	0.0000
	(0.0006)	(0.0008)	(0.0006)	(0.0003)
Split $\times$ Distance	0.0014	0.0110***	-0.0035	-0.0002
	(0.0052)	(0.0038)	(0.0029)	(0.0031)
Split $\times$ Distance squared	-0.0009	-0.0030**	0.0010*	-0.0005
	(0.0016)	(0.0013)	(0.0006)	(0.0007)
Observations	27,417	27,417	27,417	27,417

Notes: All specifications include district-year fixed effects, and are estimated with OLS. All results are for a 20 voter bandwidth. Block-bootstrapped standard errors are clustered by district. Locality-weighted distance to the polling station was unavailable for a small number of electoral precincts. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

Table 7: Controlling for balance variables

	Turnout (1)	PRI vote share (2)	PAN vote share (3)	PRD vote share (4)
Panel A: Average effects				
Split	0.0070***	0.0031***	0.0031***	0.0005
	(0.0010)	(0.0008)	(0.0010)	(0.0007)
Observations	20,788	20,788	20,788	20,788
Panel B: Heterogeneous effects				
Split	0.0073***	0.0029***	0.0030***	0.0008
	(0.0012)	(0.0007)	(0.0009)	(0.0009)
Distance	-0.0016	-0.0027	-0.0002	-0.0001
	(0.0037)	(0.0023)	(0.0025)	(0.0017)
Distance squared	-0.0000	0.0002	0.0001	-0.0000
	(0.0007)	(0.0003)	(0.0004)	(0.0003)
Split × Distance	-0.0013	0.0035	0.0003	-0.0004
	(0.0045)	(0.0027)	(0.0025)	(0.0032)
Split × Distance squared	-0.0001	-0.0015**	0.0003	-0.0005
	(0.0014)	(0.0006)	(0.0006)	(0.0009)
Observations	20,788	20,788	20,788	20,788

Notes: All specifications include district-year fixed effects, and are estimated with OLS. All results are for a 20 voter bandwidth. Block-bootstrapped standard errors are clustered by district. Locality-weighted distance to the polling station was unavailable for a small number of electoral precincts. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

Table 8: Heterogeneous effects of splitting polling stations on PRI vote share, condition upon distance and controlling for alternative interactions

	(1) PRI vote share (lag)	(2) PAN vote share (lag)	(3) PRD vote share (lag)	(4) Area (log)	(5) Voter density	(6) Share economically active	(7) Share employed	(8) Share medical insurance
Split × Distance	0.0033	0.0057*	0.0064*	0.0067	0.0103**	0.0096***	0.0112***	0.0113***
	(0.0025)	(0.0034)	(0.0034)	(0.0050)	(0.0047)	(0.0033)	(0.0040)	(0.0038)
Split × Distance sq.	-0.0013**	-0.0019*	-0.0019*	-0.0022*	-0.0028**	-0.0027**	-0.0031**	0.0030**
	(0.0005)	(0.0010)	(0.0011)	(0.0013)	(0.0015)	(0.0010)	(0.0013)	(0.0012)
Observations	22,450	22,450	22,450	24,355	24,355	27,404	27,404	27,404
	(9) Share illiterate	(10) Incomplete primary school	(11) Complete primary school	(12) Incomplete secondary school	(13) Complete secondary school	(14) Share owns house	(15) Share basic amenities	(16) Share with radio
Split × Distance	0.0116***	0.0105***	0.0107***	0.0105***	0.0103***	0.0106***	0.0086**	0.0096***
	(0.0037)	(0.0035)	(0.0038)	(0.0037)	(0.0035)	(0.0036)	(0.0037)	(0.0039)
Split × Distance sq.	-0.0028**	-0.0027**	-0.0030**	-0.0030**	-0.0030**	-0.0030**	-0.0025**	-0.0028**
	(0.0012)	(0.0011)	(0.0013)	(0.0013)	(0.0012)	(0.0013)	(0.0011)	(0.0014)
Observations	27,404	27,404	27,404	27,404	27,404	27,409	27,409	27,409
	(17) Share with TV	(18) Share with fridge	(19) Share washing machine	(20) Share with car	(21) Share with telephone	(22) Share with cell phone	(23) Share with internet	(24) District-year-discontinuity fixed effects
Split × Distance	0.0104***	0.0100***	0.0093***	0.0104***	0.0082**	0.0085**	0.0094**	0.115**
	(0.0038)	(0.0038)	(0.0036)	(0.0035)	(0.0035)	(0.0034)	(0.0037)	(0.0048)
Split × Distance sq.	-0.0028**	-0.0028**	-0.0026**	-0.0028**	-0.0025**	-0.0024**	-0.0026**	-0.0031*
	(0.0012)	(0.0012)	(0.0012)	(0.0012)	(0.0012)	(0.0010)	(0.0012)	(0.0016)
Observations	27,409	27,409	27,409	27,409	27,409	27,409	27,409	26,697

Notes: Each specification is estimated separately using OLS and including district-year fixed effects, in addition to quadratic interactions of the variable listed at the top of each column with the split indicator (with the exception of column (24) which includes district-year-discontinuity fixed effects). All results are for a 20 voter bandwidth.Block-bootstrapped standard errors are clustered by district. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

Table 9: Controlling for district-year-discontinuity fixed effects

	Turnout (1)	PRI vote share (2)	PAN vote share (3)	PRD vote share (4)
Distance	-0.0071	0.0065*	-0.0102***	-0.0017
	(0.0052)	(0.0037)	(0.0038)	(0.0024)
Distance squared	-0.0003	-0.0006	0.0004	0.0001
	(0.0007)	(0.0009)	(0.0006)	(0.0004)
Split × Distance	0.0034	0.0115**	-0.0016	-0.0004
	(0.0061)	(0.0048)	(0.0041)	(0.0041)
Split × Distance squared	-0.0013	-0.0031**	0.0008	-0.0006
	(0.0017)	(0.0016)	(0.0008)	(0.0008)
Observations	26,701	26,701	26,701	26,701

Notes: All specifications include district-year-discontinuity fixed effects (and thus the lower-order split term is omitted), and are estimated with OLS. All results are for a 20 voter bandwidth. Block-bootstrapped standard errors are clustered by district. Locality-weighted distance to the polling station was unavailable for a small number of electoral precincts. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

polling station. It is thus unsurprising to find a slight decrease in coefficient magnitude and loss of precision for these interactions. Finally, Table 9 shows that the results are robust to the inclusion of district-year-discontinuity fixed effects.