Poll Watchers, Polling Stations, and Electoral Manipulation[*]

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Abstract

How do parties respond to the electoral manipulation attempts of their competitors? To answer this question we study the allocation of party representatives or poll watchers to polling stations in an electoral environment in which fraud, clientelism, and other manipulation tactics are common. Using polling station data from the Mexican Chamber of Deputies elections, we find a robust positive correlation between the presence of party representatives and that party's vote share. We present further evidence that suggests that such correlation can be attributed to party representatives directly influencing the electoral results. We also formulate a game theoretic model of party representative allocation and structurally estimate its parameters. The results show that parties send their representatives where they expect their opponents to send their own as well as to more competitive districts and precincts within the district.

"A polling station without a representative is a stolen polling station" repeated presidential candidate Andrés Manuel López Obrador to numerous crowds of followers in cities and small towns across Mexico during the 2012 campaign. "We don't want to repeat 2006, when we were robbed because we didn't have representatives and many polling stations were not guarded," he insisted, alluding to the disputed 2006 election, in which he lost by 0.58% of the votes. The important role of party representatives emphasized by López Obrador is clear. Along with independent observers, party representatives maintain the transparency of the electoral process by preventing potential manipulation attempts. Paradoxically, the integrity of the election is often compromised by these same actors. Party representatives can use their privileged position to irregularly influence the vote count in favor of their parties, or to help control the electorate's behavior at the polls. What do representatives do to prevent malpractice or to irregularly favor their parties? How important is the presence of party representatives to electoral outcomes? What factors influence the allocation of representatives to different polling stations?

Although there is a growing interest in studying electoral malpractice, we still know little about how parties respond to the manipulation efforts of their opponents. The literature has made progress in understanding the interactions between voters and parties engaging in manipulation, but there are no empirical studies that systematically account for how competitors react to these irregular actions. This paper addresses this gap by studying the allocation of party representatives to polling stations using a rich dataset of representatives' locations and results from the Mexican Chamber of Deputies elections. Having representatives at the polls is one of the most important tools that parties use to protect themselves from ballot stuffing, miscounting, and many other election day irregularities. Moreover, unlike other actions taken by parties during the pre-election period, it is easily observed and verified, facilitating its study.

Understanding how parties react to their rivals' manipulation attempts can inform efforts to protect the integrity of elections. Political parties are the most interested in preventing actions that hurt their electoral prospects and, as such, are likely to use their

scarce resources optimally to this end. Other actors like domestic and international election monitors face a similar problem when they choose to allocate their delegates. Identifying what factors affect the allocation of party representatives and how important these actors are in influencing election results could bring new information to facilitate efforts to improve the quality of elections.

Our analysis begins by illustrating how party representatives influence electoral results. We find that, consistent with our interviews with activists, candidates, and party representatives, there is a robust positive correlation between the presence of party representatives and the vote shares of the party in the polling station. The presence of competitors' representatives is, on the other hand, negatively associated with the party's vote share and also weakens the positive effect of the party's own representatives.

Since it is possible that the observed patterns reflect that it is easier for a party to find representatives where the party is popular, we undertake a number of checks that suggest that the findings are in fact driven by the representatives' direct influence on electoral results. We first exploit the highly disaggregated nature of our data to estimate the effect of representatives on vote shares, controlling for polling station fixed effects. We find that the results are robust to this within polling station comparison. We also find that representatives increase turnout, but only when representatives of their competitors are not present. This is consistent with party representatives engaging in mobilization efforts that are prevented by their competitors' own representatives. Finally, we show that the effect of party representatives on vote shares depends on the fraction of poll-workers that are selected from the line of voters. In Mexico, poll-workers (i.e., president, secretary, and tellers) are chosen from the line of voters when previously assigned workers do not show up. Parties use this institutional feature to control the vote counts by placing their supporters first in line and paying officially assigned workers to stay at home. If party representatives do prevent or facilitate fraud, we should expect that their ability to do so depends on the fraction of workers from the line. This is what the data shows.

The second part of the paper deals with the decision of where to deploy party repre-

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sentatives. When choosing where to send their representatives, parties balance the resources needed to do so, electorate preferences, their own plans to irregularly influence the election results, and the expectations about competitors' actions that are, in turn, also determined by these same factors. We model these decisions using an incomplete information game of political competition and estimate its parameters. A methodological advantage of structurally estimating the model is that, unlike other reduced-form approaches, it accounts for the simultaneity of parties' actions and the fact that contextual factors affect choices directly and indirectly through the expected actions of other parties. The main finding is that the major parties in Mexico send their representatives where they expect their rivals to send theirs and to precincts where previous elections were competitive.

This paper is part of the growing literature that studies electoral malpractice. There have been important advances in identifying the determinants of manipulation. Poverty, uneducated citizens, inequality, rural environments, small electorates, and institutions that shape the nature of intra-party competition have been consistently linked to fraud, vote buying, and legal restrictions to free competition (Lehoucq and Molina 2002; Lehoucq 2003; Hicken 2007; Ziblatt 2009; Birch 2011; Stokes et al. 2013). There is less agreement regarding how the preferences of the electorate affect manipulation strategies and in particular, whether parties concentrate their efforts to influence the electoral results of swing or core constituencies (e.g. Calvo and Murillo 2004; Stokes 2005; Magaloni 2006; Nichter 2008; Calvo and Murillo 2013; Gans-Morse, Mazzuca and Nichter 2013; Stokes et al. 2013). Our paper focuses instead on how parties respond to manipulation attempts from their competitors. These strategic considerations have not been empirically studied, a gap that this paper fills. The focus on strategic behavior also separates our paper from theories of electoral manipulation that treat a party or political machine as the only actor engaging in irregular practices without explicit consideration of the reactions from their rivals.

Our paper is also related to the literature that explores the internal organization of clientelistic campaigns and the enforcement mechanisms of vote buying. This literature has explored the principal-agent problem between party bosses and activists who might engage

in shirking or misallocation of campaign resources (Szwarcberg 2012; Larreguy 2013; Stokes et al. 2013; Szwarcberg 2014; Larreguy, Marshall and Querubín 2014), and the commitment problems between bribed voters and brokers generated by the secret ballot (Stokes 2005; Smith and Bueno de Mesquita 2012; Gingerich and Medina 2013; Rueda 2015a,b). Our paper contributes to this literature by showing that party representatives in polling stations play two important and separate roles enforcing clientelistic transactions: the representatives transmit to party higher-ups whether brokers and activists are meeting their mobilization goals and also help brokers identify voters who are not complying with the brokers' and activists' instructions. To our knowledge, these key roles of party representatives ameliorating moral hazard and commitment problems in vote and turnout buying transactions have not been documented.

Elections in Mexico

Before proceeding with the analysis, we provide some relevant background on legislative elections in Mexico and rules regarding the functioning of polling stations.

The Chamber of Deputies is elected every three years through a mixed-member electoral system. Of the 500 deputies, 300 are elected in single-member districts by plurality rules, while the remaining 200 are elected by proportional representation through a system of closed lists. Electoral districts are divided into precincts which, according to Mexican electoral law, group voters into units of, at most, 1,500 people (COFIPE, Art. 155). Within each precinct there must be a polling station for every 750 voters. These voters are assigned to a particular polling station in alphabetical order on the basis of their last name (COFIPE, Art. 152). It should also be noted that the electoral law requires all polling stations in a precinct to be located in the same building or in adjacent locations (COFIPE, Art. 239).

The electoral law allows political parties to register up to two party representatives (plus a substitute) in each polling station. Party representatives are allowed to be in their respective polling stations from the moment they open and until after the vote count—

which takes place in the polling station. Their official responsibilities involve verifying that the electoral law is being followed and denouncing any irregular activities at any stage of the process (COFIPE, Arts. 245-251).

Each polling station is operated by a group of four registered voters, which we will call *poll-workers*. These are a president, a secretary, and two tellers. These poll-workers, as well as their three substitutes, are selected through a process that consists of sequentially and randomly restricting the universe of registered voters.[1] On election day, if any of the appointed poll-workers is missing, she will be replaced by one of the substitutes and the remaining poll workers will shift roles in order to preserve the hierarchy (president, secretary, teller 1, and teller 2). For example, If the secretary does not show up on election day, then teller 1 assumes the position of secretary, teller 2 assumes the role of teller 1, and the first substitute assumes that of teller 2. The process of filling vacancies continues iteratively until all four positions have been filled or there are not any appointed substitutes left. In the latter case, the missing positions will be filled by people from the line of voters of that particular polling station, according to their place in the line.

We focus our analysis on two of the three major Mexican political parties. The *Partido Revolucionario Institucional* (PRI-Institutional Revolutionary Party) which dominated Mexican politics for seventy-one years, and the *Partido Acción Nacional* (PAN-National Action Party), the long-standing opposition party during the PRI's autocratic regime and the incumbent party in the period covered by this study (2000-2012). The focus on these two parties is reasonable in light of recent research that suggests that, contrary to popular belief, the PAN and the PRI, but not the Partido de la Revolución Democrática (The Party of the Democratic Revolution)—the other major Mexican party at the national level–are the main beneficiaries of irregular practices such as turnout buying (Larreguy, Marshall and Querubín 2014).

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[1]The selection proceeds in three stages and involves the use of two different lotteries, so that only people 1) born in a certain month, 2) who came to a training session, and 3) whose last name starts with a particular letter are eligible to serve as poll workers.

How do representatives affect electoral outcomes?

Party representatives can influence the vote count in a variety of ways. First and foremost, they prevent the manipulation attempts of their competitors. A look at some published guidelines for representatives (and some videos) illustrate their most important duties in this regard.[2] First, party representatives are expected to be at the polling station by the time poll workers start preparing the material and the polls open. During the day, they report any irregularities to the president of the polling station and give a written notice describing any such incidents to the secretary. Then, after the polls close, they verify the counts, transmit the final counts to general representatives of their parties, ensure that they are published near the polling station; and go, along with the polling station's president to deliver all official documents (e.g., vote-count report, ballots) to the *Instituto Nacional Electoral* (INE-National Electoral Institute) office in the district.

Common incidents that the representatives seek to prevent are multiple votes by the same person, early closings of polling stations, and miscounting. The ways by which they do so vary. For example, although the voters' thumbs are supposed to be marked with indelible ink after they vote and voters have to show their thumbs before they are given a ballot, it is not unusual to find that the official ink is replaced with one that washes off easily. During the 2012 campaign, the *Movimiento de Regeneración Nacional* (MORENA-National Regeneration Movement) representatives were given small bottles with bleach to test whether the ink was, in fact, indelible. Flashlights and candles were also given to them to prevent early closings of the polling stations due to power outages.

A situation that parties especially want to avoid is having a polling station in which all poll-workers and representatives support the rival party, especially in contested areas. As Emmanuel, an activist with the PAN, explains, "if there is a polling station in which you know you might win and you don't send a representative, but there is only a representative

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[2]For an example of an instructional video made for representatives of the *Movimiento de Regeneración Nacional* (MORENA-National Regeneration Movement) see https://www.youtube.com/watch?v=BSKZabqmlm4 (accessed on 1/2/2016).

from the other party, the party that is tied with us... then, I would be worried."[3]

Parties try to gain control over the polling station by exploiting the institutional feature that allows voters to serve as poll-workers. To do this, first, previously appointed poll-workers are paid not to show up to the assigned polling station and then, party activists place supporters first in line to serve as their replacement. This however, is effective only as long as representatives from other parties are "neutralized." Although the lists of party representatives are not public, parties have denounced how municipal and state electoral councils filter this information allowing their opponents to try to bribe or threaten the representatives.[4] The fact that parties make efforts to obtain the lists of authorized representatives reflects the importance that parties give to these representatives in the electoral process.

Preventing manipulation is not the only way by which representatives affect electoral outcomes. They can play a critical role in mobilization efforts. As described by party activists from multiple parties, party representatives have lists of voters who are supposed to vote in the polling station for their own party. The list is given to them by party activists and vote brokers whose job is to identify those supporters in the weeks and months preceding the election. The party representatives, using their unique position within the polling station, verify whether those on the list have shown up to vote. They might also alert activists when the time for voting is running out and some of the voters in the list have still not cast their votes. José, a party activist from the PRI, describes the process,

> If in the list it turns out there are 100, and by 3:00pm only 30 of the 100 have voted, they [the representatives] tell the activist to keep working. [The representative tells the activist] Look, go find these 70. They said they were going to come to vote for the PRI.

The interviewees also mentioned that when all the voters in the supporters list had voted, the representatives would inform the activist outside the polling station so they could engage

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[3]Interview conducted by the authors, July 2015. All original audio recordings are available upon request.

[4]See "Filtran listas nominales de representantes de casilla del PAN" (PAN representatives lists are leaked) in *Durango al Día*. May 7, 2013.

in turnout suppression. Starting fights, planting firecrackers, or disseminating rumors about vandalism, theft and violence around the polling station, are common tactics.

It is important to highlight that party representatives play two separate and important roles enforcing clientelistic transactions: the representatives transmit to party higher-ups whether brokers and activists are responding quickly to the party's needs on election day while meeting their mobilization goals and also help brokers identify those voters that are not complying with the brokers' or activists' instructions.

Our conversations with party activists showed that the presence of party representatives is considered important by the parties, that the expected actions of their competitors are factored in when deciding where to allocate their own representatives, and that representatives not only guard against malpractice but, occasionally, engage in manipulation themselves. In the rest of the paper we examine what the electoral effects of these representatives are and we formulate and estimate a model of representative allocation.

Data

Our dataset has information on electoral results and the presence of party representatives in polling stations for the Chamber of Deputies' elections of 2000, 2003, 2006, 2009, and 2012.[5] The INE keeps records of all the information contained in official polling station reports, including whether or not vote totals were signed by the representative of each party. Therefore, our data reports the actual rather than planned presence of party representatives. The average number of precincts used in the analysis is $63,333$ with an average of $117,137$ polling stations per election.

For the analysis, we take vote shares and representatives of the PAN and the PRI to be those of the coalitions in which these parties were members. For example, in the year 2009 the PRI and the *Partido Verde Ecologista* (Ecologist Green Party) were part of the coalition *Primero México* (Mexico first) in the state of Guanajuato in the Uriangato district,

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[5]For the year 1997 we have information on electoral results but not on party representation. The 1997 data, however, will be used in estimations of dynamic panel models.

but in other districts in the state, the PRI competed against all other parties by itself. For the precincts located in that district we will consider the votes and the representatives of the PRI to be those of the *Primero México* coalition. For all other districts where there was no coalition between the PRI and other parties, we use the PRI's vote shares and number of representatives.

Figure 1: Parties' representation in polling stations
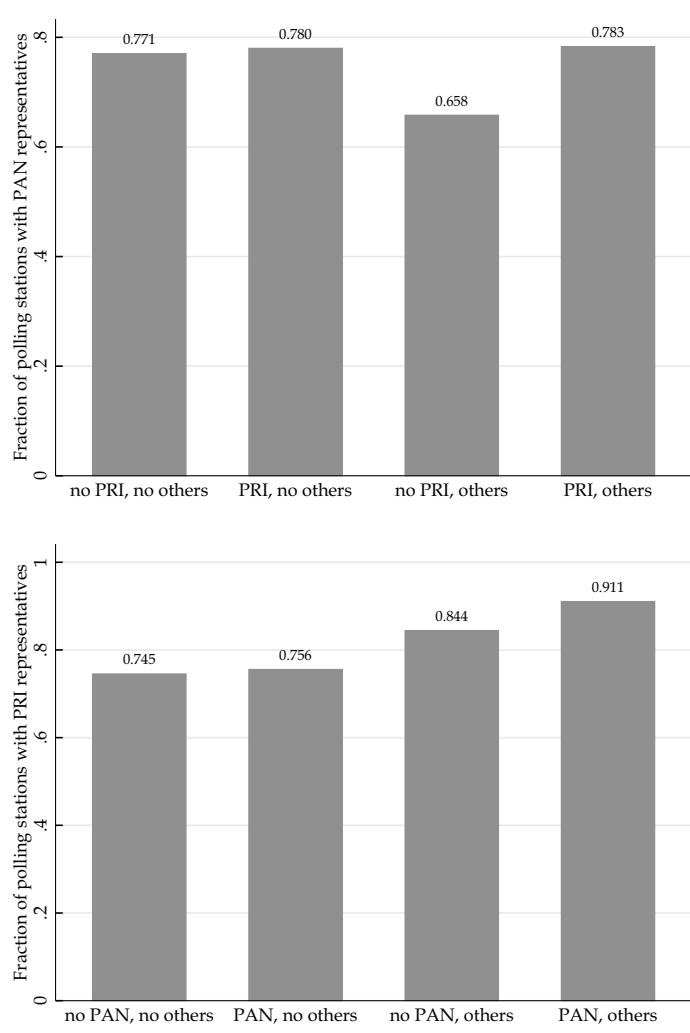
Figure 1 presents the fraction of polling stations with representatives of each of the two major parties conditional on whether other parties have representatives of their own.

Both parties have the highest probability of sending representatives to polling stations in which the other major party and at least one other party also have representatives (0.783 for the PAN and 0.911 for the PRI). We also see that both major parties slightly prefer to send representatives where the other major party sends theirs regardless of the presence of other parties' representatives. As for the differences across parties, the PAN is not very likely to send representatives to stations in which there are no PRI representatives, but where at least one other party has representation (the probability is 0.658). The PRI on the other hand, has a high probability of sending representatives to places in which the PAN is not represented, but where at least one of the smaller parties has a representative (0.844).

Since it is possible that the choice of polling station representation is not completely independent across polling stations within the same precinct, we also examine allocation at the precinct level. Descriptive statistics at the precinct level in the appendix show again that parties prefer to have higher representation in those precincts where its main competitor has chosen high representation. Nonetheless, a large fraction of precincts in which one of the main parties has low or no representation has high representation from its main competitor.

Party representatives and electoral outcomes

To look for evidence of party representatives influencing electoral outcomes, we estimate equations of the form

$$(1) \qquad v_{p,t}^i = r_{p,t}^i \ \gamma_i + r_{p,t}^{-i} \ \gamma_{-i} + r_{p,t}^{\text{others}} \ \gamma_{\text{others}} + \delta_p + \eta_t + \varepsilon_{p,t},$$

where $v_{p,t}^i$ is the vote share of party $i \in \{\text{PAN,PRI}\}$ in polling station p in election t, $r_{p,t}^i$ is a dummy indicating whether party i has a representative in that polling station, and $r_{p,t}^{\text{others}}$ is a dummy that indicates the presence of a representative from a party different from the PAN or the PRI. The major party whose vote share is not the dependent variable is denoted by $-i$. In addition, the δ_p's denote a full set of polling station effects and the η_t's capture

common shocks to all polling stations in a given election. The error term, $\varepsilon_{p,t}$, includes all other factors affecting electoral outcomes. We also estimate linear models where we allow for the effects of representatives to vary with the presence of representatives from a rival party.

We expect to find a positive effect of having a representative of party i on i's vote share and a negative effect on the other parties' share. Table 1 presents the results. All standard errors are clustered at the precinct level. Columns 1, 2, 4, and 5 report pooled OLS estimated coefficients. In columns 1 and 4 we see that having a party representative in a polling station is positively associated with the vote share of that party. In particular, the PAN's vote share in a polling station where PAN representatives are present is, on average, 11.2% larger. The coefficient on PRI representatives in the PRI's vote share model is smaller but still has a considerable magnitude. We also see that while PRI representatives are negatively associated with the PAN vote shares, the PAN's representatives have a positive, but smaller effect on PRI shares. As expected, for both the PRI and the PAN, the presence of third parties representatives is negatively associated with their vote shares.

Models 2 and 5 add an interaction term between the representatives of the PAN and the PRI to the previous models. If there are two representatives from different parties, it is possible that they would try to stop any action against their own party taken by the rival's representative. Take for example the common practice of monitoring the lists of supporters who have voted in a polling station. If one representative notices that all its rival's supporters have already voted in the polling station and there is still plenty of time before the polls close, she could warn her party's own activist of the possibility of turnout suppression tactics from their rival. Consistent with this, or similar mechanisms, we see that the coefficient on this interaction term is negative.

Table 1: Party Representatives in Polling Stations and Electoral Results

Dependent Variable:	PAN's vote share			PRI's vote share			Turnout	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PAN representatives	0.112	0.123	0.033	0.019	0.039	-0.004	0.003	0.01
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
PRI representatives	-0.051	-0.043	-0.007	0.055	0.071	0.013	0.004	0.009
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
PAN representatives × PRI representatives		-0.012	-0.001		-0.023	-0.021		-0.008
		(0.002)	(0.001)		(0.002)	(0.001)		(0.001)
Others' representatives	-0.078	-0.077	-0.021	-0.038	-0.037	-0.014	-0.011	-0.011
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
Polling station fixed effects	no	no	yes	no	no	yes	yes	yes
Precincts	66,847	66,847	66,847	66,847	66,847	66,847	66,841	66,841
Observations	600,992	600,992	600,992	600,992	600,992	600,992	600,369	600,369

All models include election year dummies as controls. Standard errors clustered at the precinct level are in parentheses.

Although these results are consistent with party representatives influencing electoral results, they could also be explained by omitted factors like partisan preferences. In particular, in an area where a party expects to do well, it is easier for that party to find supporters who are willing to serve as representatives. To address such a concern, we add polling station fixed effects to the previous specification. This identification strategy exploits the highly disaggregated nature of our data and controls for all unobserved confounders at the polling station level that are constant over time. If the group of voters who vote in a particular polling station have relatively stable political preferences, the fixed effects estimates would more closely capture the direct influence of representatives on electoral outcomes.

It is important to note that, given the rules determining the sizes of polling stations, it is possible that small changes in the number of registered voters from year to year can induce large changes in the allocation of voters to polling stations within a precinct. This would invalidate our identification assumption of having roughly invariant political preferences among the people within a given polling station. To illustrate the problem suppose that a precinct had 750 registered voters in 2000, 730 voters in 2003, and 800 in 2006. According to the rules governing the sizes of polling stations, in 2000, such a precinct would have one polling station with 750 registered voters. This same polling station would have 730 registered voters in 2003, but in 2006, there will be two polling stations, each with 400 voters. It is likely that most of the voters in the precinct and voting in the only polling station in 2000 and 2003 are the same, but in 2006, given that half of them were assigned to the new polling station, the aggregate preferences in the original polling station might change more drastically. To account for this in our estimations, we treat one in which there was a change in size induced by the rules as a different polling station.

The results of the polling station fixed effects models—that use our labeling of polling stations—show that the previous patterns still hold.[6] The magnitudes of the effects have decreased but are still important. PAN representatives increase the PAN's vote share by 3.3% when they are in a polling station with no representatives from the PRI. The effect of

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[6]Substantive findings do not change if we use the IFE polling station identifiers. Results are available upon request.

PRI representatives on PRI's vote share is smaller. Again, we see that these effect are offset by the presence of a representative from the main competitor.

Even though the effects of party representatives on vote shares seem to be small, it should be noted that in all five elections considered here, the margin of victory has been less than two percentage points in at least 20 races, and less than three percentage points in at least 30. In some districts, elections are so competitive that it is common to find elections decided by just a few hundred votes or less. This is remarkable considering that the average number of valid votes in a district is well above 100,000.

Columns 7 and 8 present turnout models. These models give information about the ways through which representatives are influencing the results and support our interpretation of the previous findings. In column 7, we see that the estimated coefficients on representatives are positive, but very small. In column 8, however, after adding the interaction term between the PAN and PRI representatives, we find that the presence of one party's representatives where its main competitor is not represented boosts turnout by approximately 1%. Importantly, we see that the effect of a representative of one party is completely offset by the presence of a representative of the other party. If our previous findings were only explained by the fact that in places where people are more likely to vote on election day it is easier to find people willing to be representatives, we should not expect to see a significant negative coefficient on this interaction term. On the other hand, finding a significant negative coefficient is consistent with the representatives taking measures to prevent turnout-enhancing actions taken by their rivals.

Robustness

As a robustness check, we also consider dynamic panel models. The previous findings relied on the assumption that the political preferences of those voting in each polling station stay relatively constant for the years in which there were no changes in the polling station size induced by the institutional rule (on average this is 2.9 elections). Given the stability of the party system in Mexico, and the fact that most of the voters in a polling station are the

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same as those who had voted there in recent previous elections, we believe this assumption is sensible. Nonetheless, we include previous electoral results of the same polling station as controls. The idea behind such an approach is that past electoral results could serve as a proxy for the potentially non-stable partisan preferences of the same group of voters. The results are still in line with what we have seen before.

An additional robustness check examines the previous results using a different level of aggregation. It is possible that the actions of representatives in one polling station can also affect electoral outcomes in a different one given the proximity of the polling stations within a precinct. Without assumptions on how the presence of one representative in a polling station affects whether others are placed in other stations in the precinct, it is hard to assess how the previous results are affected by such dependence. To examine this, in the appendix, we present estimations at the precinct level. The explanatory variables in these models are the fraction of polling stations in the precinct with party representatives from each party. The findings are qualitatively the same.
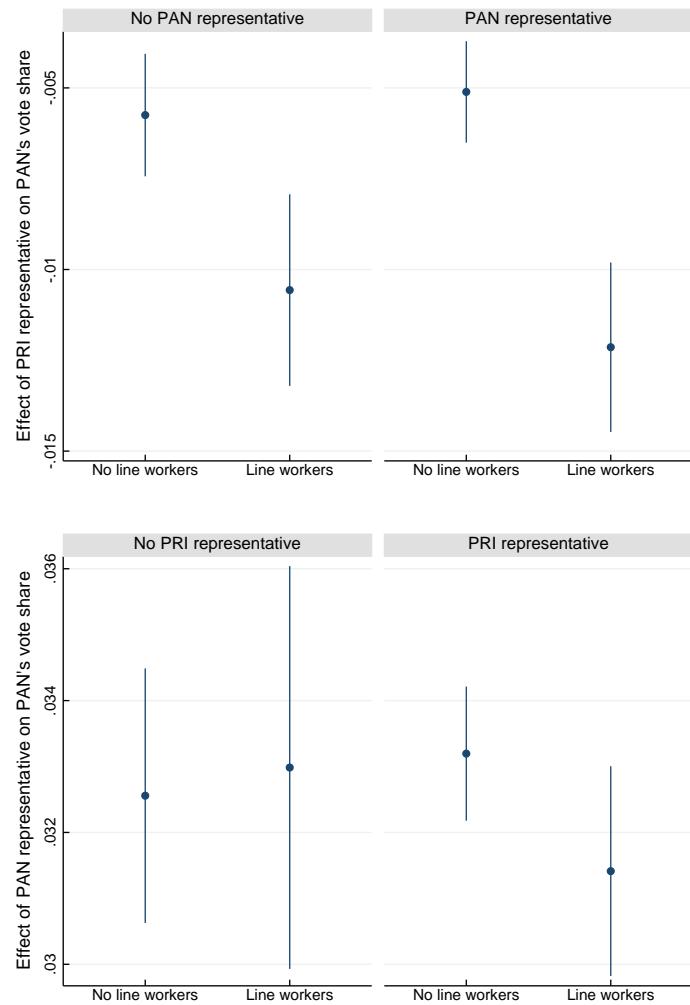
We can look for further evidence that the representatives have a direct effect on the electoral results by examining whether their effect on vote shares is independent from the presence of poll workers that came from the line of voters. Since party representatives are not working alone at a polling station, their influence over the results should depend on whether other personnel in the station, like poll-workers, cooperate or hinder their efforts. To explore these issues, we estimate a model where we allow the coefficients on the representatives of the PRI, PAN, and their interaction to vary with the presence of poll workers from the line. Figure 4 presents the marginal effects of both parties' representatives on the PAN's vote shares.[7] The graph on the top shows that the negative effect of the PRI representative on the PAN vote shares is strengthened by the presence of poll workers from the line. On the other hand, in the bottom graph we see that the positive effect of PAN representatives on the PAN's vote share is weakly decreased by the presence of poll workers from the line when there are PRI representatives in the polling station. When looking at the PRI's vote share

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[7]The model also includes polling station fixed effects and year effects.

model we also see suggestive evidence of a complementarity between PRI representatives and poll workers from the line. The negative effect of PAN representatives on PRI's vote shares is significantly weakened only when there are poll workers from the line and PRI representatives (see the appendix).

Figure 2: Poll-workers from the line and party representatives' effects on PAN's vote shares

These findings suggest that the PRI is more effective at filling the positions of poll workers with their supporters, which facilitates their representatives' actions. On the other hand, it is not clear why we would see that the presence of poll-workers from the line

strengthes the effect of PRI's representatives, but not the effect of the PAN's if the association between vote shares and representatives seen before is driven by unobserved partisan preferences.

Allocation of polling station representatives

We now turn to the analysis of how parties allocate their representatives. For this, we formulate and estimate a model that allows us to assess the relevance of different theoretical mechanisms that account for representation choices. As the interviews revealed, it is important for the parties to avoid having polling stations where there are only representatives from its main competitor. The key motivation for doing so is to prevent irregular actions in which these representatives might engage. This suggests that parties will try to imitate the representative allocations of their rivals. However, sending representatives to a polling station that is not guarded by the competition might facilitate the parties' own mobilization efforts and could prevent other forms of malpractice not carried out by the competitors' representatives. Which of these logics dominates the allocation of representatives? What are the contextual variables that moderate allocation choices of parties?

Strategic model and estimation

Suppose that the PRI and the PAN compete in a district that contains S electoral precincts. We continue indexing parties by i, and precincts by $s = 1, \ldots, S$. For simplicity, we first describe the parties' interaction in one precinct and, in the appendix, we generalize the model to include data from different precincts. Parties decide what fraction of polling stations within a precinct to which they want to send representatives. We assume that parties take one of three actions: low representation (L), medium representation (M), and high representation (H). We say that a party has low representation if its representatives cover less than 20% of the precinct's polling stations. A party has medium representation if the share of polling stations with representatives from the party is greater or equal than

20% or less than 80%, and finally, it has high representation if the party has 80% or more polling stations covered by its representatives.[8] We further assume that at the time these actions are taken, parties do not know the choices of their competitors. The action taken by party i will be denoted by a_i.

Parties maximize precinct-level payoffs by choosing their poll-watchers' representation level. The payoffs of party i are given by

$$\pi_i(a_i = k, a_{-i}, x_i, \epsilon_i) = g_{i,k}(a_{-i}, x_i) + \epsilon_i(k),$$

with $k \in \{L, M, H\}$.

These payoffs capture the votes received by the party as well as the costs of running a campaign in that area. The vector x_i describes exogenous characteristics of the party and the region where the precinct is located. Additionally, there are shocks to the payoffs, $\epsilon_i(k)$, for each of the actions available. We assume these shocks are private information and are also not observed by us (the researchers). Furthermore, they are i.i.d. across parties and across actions and drawn from a Type I Extreme Value distribution, f. We can think of these shocks as all factors that make the party more (or less) likely to succeed in its efforts to influence the results when using a given representation level.

We opt for a linear specification of the function $g_{i,k}$

$$g_{i,k}(a_{-i}, x_i) = x' \beta_{i,k} + 1\{a_{-i} = L\} \alpha_{i,k,L} + 1\{a_{-i} = H\} \alpha_{i,k,H},$$

where $1\{.\}$ is an indicator function. Note that we have chosen to allow the payoffs function's parameters to be player and action specific. This allow us to test for differences across players in their best response functions.

The previous assumptions make this a game of incomplete information with simultaneous moves and the equilibrium concept that we use is Bayesian Nash Equilibrium. A strategy in this game is a function, r_i, that gives the level of representation of the party for a

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[8]These thresholds are chosen given the observed distribution of the fraction of polling stations with representatives shown in the appendix.

given set of payoff-relevant characteristics (captured by x_i), and private shocks (ϵ_i). In this way, in equilibrium, the probability that one party chooses action k is

$$p_i(a_i = k|x_i) = \int 1\{r_i(x_i, \epsilon_i(k)) = k\} f(\epsilon_i(k)) d\epsilon_i(k).$$

The expected payoffs are then

$$\widetilde{\pi}_i(a_i = k, x_i, \epsilon_i, p_{-i}) = \sum_{a_{-i} \in \{L,M,H\}} g_{i,k}(a_{-i}, x_i) p_{-i}(a_{-i}|x_i) + \epsilon_i(k).$$

Here, $p_{-i}(a_{-i}|x_i)$ gives the other party's equilibrium probability of taking a given action. We denote the vector of equilibrium probabilities of both parties by $\boldsymbol{p} = (p_{\text{PAN}}, p_{\text{PRI}})$.

In equilibrium, parties will choose the action that maximizes their payoffs and so

(2) $$p_i(a_i \mid x_i) = Pr\left\{\widetilde{\pi}_i(a_i, x_i, \epsilon_i, p_{-i}) \geq \widetilde{\pi}_i(a'_i, x_i, \epsilon, p_{-i}) \text{ for all } a'_i \neq a_i\right\}.$$

Letting $\boldsymbol{\theta}$ be a vector that contains the βs and αs of both players and $\boldsymbol{x} = (x_{\text{PAN}}, x_{\text{PRI}})$, we can write this system of equations more compactly as

(3) $$\boldsymbol{p} = \Psi(\boldsymbol{p}, \boldsymbol{x}, \boldsymbol{\theta}).$$

Depending on the values of $\boldsymbol{x}$, multiple solutions of this system can exist.

We can use expression (2) and the known distribution of the private shocks to write the likelihood function of the model. To estimate $\boldsymbol{\theta}$, we follow an approach that draws on a methodology proposed by Hotz and Miller (1993) for dynamic discrete choice games. It consists of estimating in a first stage the action probabilities $\widehat{\boldsymbol{p}}$, and substituting them in the likelihood function. Then, in a second stage, we estimate the structural parameters by maximizing the likelihood. Consistency of the structural estimates requires that only one equilibrium is played in the data. That is, that given the same set of observables in

two electoral precincts, parties would play the same equilibrium in both of them. This assumption is more likely to apply in settings in which the same players interact with each other in similar environments over time with the same set of rules.[9]

Among the variables included in x_i is the distance from the polling station to the nearest party headquarter or *Comité Directivo Municipal*. As shown in Bajari et al. (2010), when estimating static models of incomplete information, exclusion restrictions need to be satisfied to separately identify the effects of expectations of other players' actions and state variables on observed players' choices. In particular, we need to include in x_i a continuous variable that affects each parties' payoffs directly without entering the payoffs' equation of their rival. We believe that the distance from each party's office to the precinct satisfies this requirement. More distant precincts impose greater logistical challenges on the campaign staff, which include a greater difficulty in finding party representatives. The costs of finding representatives, after we have controlled for demographics, should only indirectly impact the payoffs of the other party through equilibrium actions. Given that the distance is computed using the location of party offices operating in early 2015, we choose to include in our estimation only the most recent elections in our sample, the 2009 and 2012 elections.[10]

Finally, to account for the uncertainty introduced in the first stage in the computation of our standard errors, we bootstrap across precincts.

Strategic model results

The set of explanatory variables includes characteristics of the electoral environment in the previous election, demographic indicators of the municipality where the precinct is located, and the distance from the precinct to the closest party's office. In the first group of variables we have the vote share difference between the party that won the majority seat and the second party with the most votes in the district, the vote share difference between

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[9]As a robustness check, we allow for one equilibrium to be played in each state. Ideally, we would like to allow for one equilibrium to be played in each precinct but this is not feasible as our data only covers five elections.

[10]Substantive results are robust to using only the 2012 election.

the PRI and the PAN in the precinct, the fraction of polling station workers in the precinct that came from the line of voters, and a dummy variable that takes the value of one if third parties had representatives in the precinct. We also include the average number of years in school for those 15 years and older and the municipality's logged population size.

Table 2: Party Representatives in Polling Stations and Electoral Results

Dependent Variable:	PAN's choice		PRI's choice	
Representation:	Medium	High	Medium	High
Rival's medium representation	2.573	-8.041	5.884	5.859
	(0.887)	(0.966)	(0.476)	(0.476)
Rival's high representation	4.946	3.26	2.421	5.637
	(0.34)	(0.335)	(0.175)	(0.148)
Others' representatives	-0.276	-0.301	0.125	0.343
	(0.02)	(0.023)	(0.032)	(0.03)
Precinct's difference PAN-PRI	-0.21	-0.545	-0.466	0.127
	(0.074)	(0.078)	(0.134)	(0.122)
Margin	0.556	0.483	-0.44	-0.897
	(0.11)	(0.119)	(0.19)	(0.161)
Poll-workers from line	0.094	-0.836	1.335	1.745
	(0.101)	(0.11)	(0.213)	(0.205)
Schooling	0.243	0.221	-0.191	-0.391
	(0.014)	(0.013)	(0.024)	(0.022)
ln(Population)	-0.066	-0.163	0.163	0.133
	(0.012)	(0.013)	(0.017)	(0.016)
ln(Distance to party's district office)	-0.123	-0.048	-0.185	-0.208
	(0.009)	(0.008)	(0.015)	(0.014)
Constant	-5.297	-0.311	-2	0.395
	(0.32)	(0.325)	(0.282)	(0.238)

Bootstrapped standard errors are in parentheses.

Table 2 presents the results. Both parties are more likely to choose medium and high representation than low representation where they expect their rival to have high levels of representation. However, we see that the PAN is less likely to have a high level of represen-

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tation in a precinct where it is expected that the PRI will only have medium representation. That is, the PAN is only willing to bear the costs of covering most polling stations in a precinct when it expects the PRI to do the same. For other cases, medium representation is its most likely choice. The PRI on the other hand, possibly because it has a more established network of activist and brokers, tries to have complete coverage when it expects medium representation from the PAN.

We also see that the PAN is less likely to send representatives where, in the previous election, third parties had representatives. This could indicate that the PAN relies on third parties to play the watchdog role in precincts where it is difficult to send its own. The PRI, on the other hand, is more likely to send its presentatives where third parties send theirs in the previous election. Again, this could reflect the PRI's superior organizational capacity.

As expected after our interviews, we see that parties have representatives in precincts where there was a smaller difference in votes between the PRI and the PAN. Although for the PRI, this variable is not significant in the high representation equation. Moreover, and in contrast to the PAN, the PRI is more likely to send its representatives to precincts located in districts where the previous elections was more competitive and where more voters from the line served as poll workers. This is consistent with the previous findings in which we saw a complementarity between PRI representatives and poll-workers from the line.

Finally, we see that the PRI is more likely to have representatives in more populated areas while the opposite is true for the PAN. Given that we are controlling for schooling, this may indicate a desire to guard stations in areas where the rival has an advantage. The coefficient on schooling suggest that parties have representation in their natural constituencies (higher income, educated voters traditionally support the PAN). As expected, when precincts are farther away from a party office, it is less likely that they have representation.

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Appendix

Section level analysis

The distribution of the share of polling stations in a precinct with representatives shown in Figure 3 indicates that parties either cover all polling stations or none, and that there are relatively few cases where they have representation only in some polling stations in the same precinct. This observation justifies our decision to discretize the choice of representation when studying the allocation of the representatives at the precinct level.

Figure 3: Parties' representation in precincts
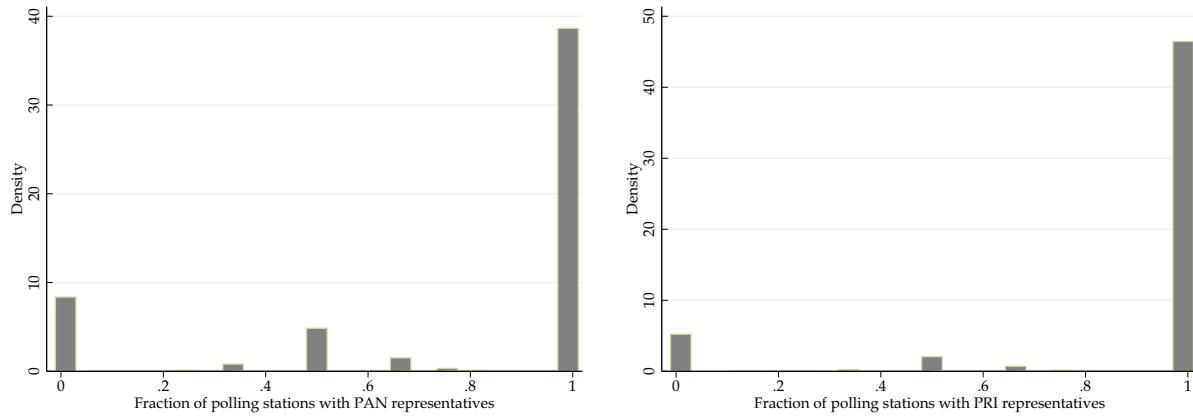
Table 3 is a frequency table of the precincts in which the PAN and the PRI select low, medium, and high representation (as defined in the model section). We again see that parties prefer to have higher representation in those precincts where its main competitor has chosen high representation. Nonetheless, a large fraction of precincts in which one of the main parties has low or medium representation has high representation from its main competitor. This suggest that parties do find it advantageous to place their representatives where the competition has not deemed important—or where it has not been possible—to place theirs.

Table 3: Representation choices

PAN's representation	PRI's representation		
	Low	Medium	High
Low	5,890	3,754	38,562
	(12.22)	(7.79)	(79.99)
	[19.6]	[20.11]	[14.4]
Medium	4,455	6,773	34,091
	(9.83)	(14.95)	(75.22)
	[14.83]	[36.28]	[12.73]
High	19,702	8,141	19,5178
	(8.83)	(3.65)	(87.52)
	[65.57]	[43.61]	[72.87]

Row percentages in parentheses. Column percentages in square brackets.
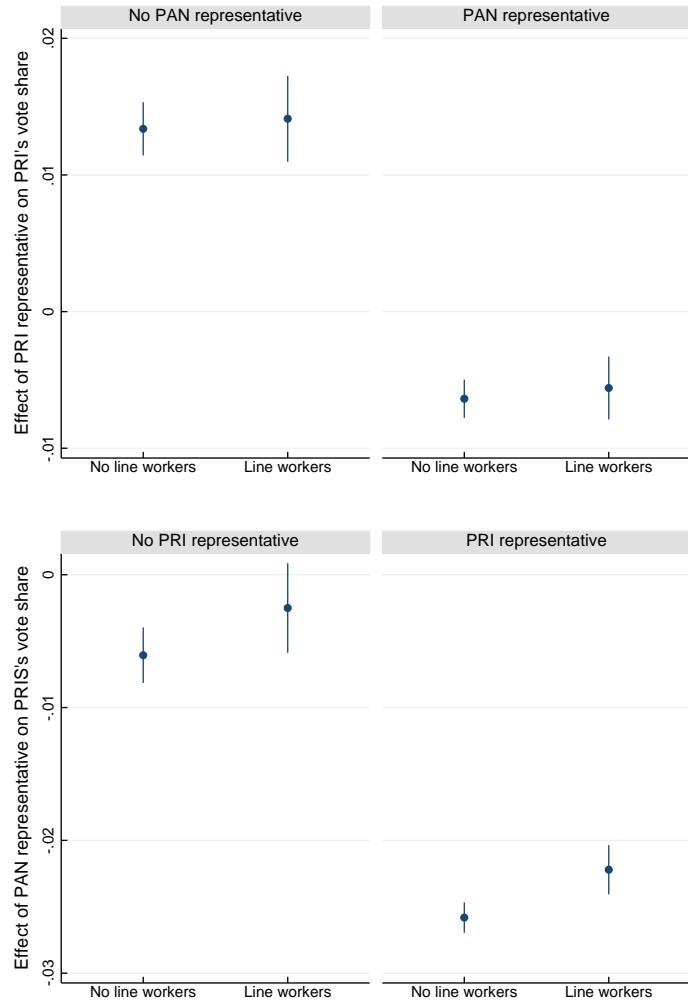
Table 4: Party representatives and electoral outcomes

Dep. Variable:	PAN's vote share				PRI's vote share			
	OLS		FE	AB	OLS		FE	AB
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PAN representatives	0.147***	0.159***	0.056***	0.057***	0.021***	0.056***	-0.010***	0.057***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)	(0.001)
PRI representatives	-0.067***	-0.057***	-0.005***	0.026***	0.075***	0.105***	0.021***	0.026***
	(0.001)	(0.002)	(0.001)	(0.005)	(0.001)	(0.002)	(0.001)	(0.005)
PAN representatives ×		-0.014***	-0.005***	-0.040***		-0.041***	-0.026***	-0.040***
PRI representatives		(0.002)	(0.001)	(0.005)		(0.003)	(0.002)	(0.005)
Others representatives	-0.095***	-0.095***	-0.033***	-0.023***	-0.057***	-0.056***	-0.018***	-0.023***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
R-squared	0.175	0.175	0.127		0.083	0.084	0.170	
Precincts	66,847	66,847	66,847	61,853	66,847	66847	66,847	61,853
Observations	316,521	316,521	316,521	177,485	316,521	316,521	316,521	177,485

All models include election year dummies as controls. Standard errors clustered at the precinct level are in parentheses. AB denotes results of second order autoregressive models using Arellano Bond estimator treating all reported variables as predetermined with a full matrix of lagged level instruments. $***$ Significance at the 1% level. $**$ Significance at the 5% level. $*$ Significance at the 10% level.

Other figures and tables

Figure 4: Poll-workers from the line and party representatives' effects on PRI's vote shares

Model estimation

We start by generalizing the model to different precincts. Let $\boldsymbol{p}^s = (p_{\mathrm{PAN}}^s, p_{\mathrm{PRI}}^s)$ be the equilibrium probabilities used in electoral precinct s. Similarly, let $\boldsymbol{x}^s = (x_{\mathrm{PAN}}^s, x_{\mathrm{PRI}}^s)$ represent the observed parties' and region characteristics of precinct s. We assume that the

vector of structural parameters, $\boldsymbol{\theta}$, is the same across precincts, but that parties' actions are independent across precincts. Expression (3) needs to be satisfied in each precinct and so

$$(4) \qquad \boldsymbol{p}^s = \Psi(\boldsymbol{p}^s, \boldsymbol{x}^s, \boldsymbol{\theta}) \text{ for } s = 1, \ldots S.$$

Given f, we can write the right hand side of (2) as

$$(5) \quad \psi_i^s(a_i^s = k | p_{-i}^s, x_i^s, \boldsymbol{\theta}) = \frac{\exp(x_i^s \beta_{i,k} + p_{-i}^s(L|x_{-i}^s)\alpha_{i,k,L} + p_{-i}^s(H|x_{-i}^s)\alpha_{i,k,H})}{\sum_{k' \in \{L,M,H\}} \exp(x_i^s \beta_{i,k'} + p_{-i}^s(L|x_{-i}^s)\alpha_{i,k',L} + p_{-i}(H|x_{-i}^s)\alpha_{i,k',H})}.$$

Then the log-likelihood is

$$L(\boldsymbol{\theta} \mid \boldsymbol{X}, \boldsymbol{P}) = \sum_{s=1}^S \sum_{i=1}^2 \sum_{k \in \{L,M,H\}} \delta_i^s(k) \ln\left(\psi_i^s(a_i^s = k | p_{-i}^s, x_i^s, \theta)\right)$$

subject to (4), with

$$\delta_i^s(k) = \begin{cases} 1 & \text{if } a_i^s = k \\ 0 & \text{if } a_i^s \neq k, \end{cases}$$

and $\boldsymbol{P} = (\boldsymbol{p}^s)_{s=1}^S$ and $\boldsymbol{X} = (\boldsymbol{x}^s)_{s=1}^S$.

There are several approaches to estimate the parameters in $\boldsymbol{\theta}$. One of them is the Nested Fixed Point Algorithm that requires solving the system (4) for each candidate $\boldsymbol{\theta}$ before evaluating the likelihood (5).[11] Such an approach requires either that the equilibrium of the game is unique or solving for all equilibria and specifying a selection mechanism among them. An alternative approach, which is the one we adopt here, involves a two-step estimation. In the first step, we estimate the beliefs of each party regarding their opponent's actions. Having these estimates, we use them in the second step to find the parameters of interest that correspond to those beliefs. Consistency of the structural estimates requires

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[11]This is the static game equivalent of the methodology introduced in Rust (1993).

that only one equilibrium is played in the data and that we obtain consistent estimates of action probabilities in the first stage. As a robustness check, we estimated beliefs in the first stage state by state to ensure that multiple equilibria will not affect our results. The results were very similar. The first stage was estimated using a multinomial model using a flexible specification that included square terms and pairwise interactions of all state variables.

Identification

We will assume that the expected payoffs of choosing the low level of representation in a precinct are zero. That is, $g_{i,L}(a_{-i}, x_i) = 0$. This is a similar normalization as the one used in multinomial models. We are also required to impose an exclusion restriction to identify the deterministic part of the payoff functions. Note that, in equilibrium, x_i^s determines the beliefs of i about her opponent taking a given action. At the same time, x_i^s directly affects the payoffs of i through the term $x_i^s \beta_{i,k}$. An identification strategy to address this issue is to include in x_i^s continuous variables that affect the payoffs of i, but that do not directly affect the payoffs of the other party.[12] We choose the distance from the precinct to the closest party headquarters in the district to satisfy this requirement.

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[12]For a general discussion about identification of parameters in empirical static models of strategic interactions see Bajari et al. (2010).