Monitoring Political Brokers: Evidence from Clientelistic Networks in México *

Horacio A. Larreguy A.[†]

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Abstract

This paper studies how a political party uses electoral data to monitor and incentivize the political brokers who control its clientelistic networks. We study networks organized around rural communal lands in Mexico, which are largely controlled by the Institutional Revolutionary Party (PRI). We use the fact that the level at which brokers operate (the communal land) does not necessarily coincide with the level at which the electoral data is disclosed (the electoral section). Guided by a simple model, we compute a measure of how informative the available electoral data is about the performance of the PRI's political brokers, as a function of the degree of overlap between communal lands and electoral sections. We compare the vote share for the PRI in communal lands where the electoral data is more or less informative, both when the PRI does and does not have access to resources to fund and incentivize brokers. The results suggest that clientelistic networks contribute significantly to the enforcement of clientelistic transactions.

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[†]Department of Government, Harvard University, Cambridge, MA, 02138 (hlarreguy@fas.harvard.edu)

1 Introduction

Political clientelism –the distribution of benefits targeted to individuals or groups in exchange for electoral support– is widespread in the developing world.¹ Both the political science and economics literatures argue that clientelism undermines democracy and economic development: it weakens the ability of citizens to hold elected officials accountable, and it diverts public resources to fund clientelistic transactions.² While the secret ballot does represent an obstacle for clientelism, the literature argues that parties are able to circumvent it using local political brokers, who control networks of voters and deliver their votes.³ To mobilize these so called clientelistic networks, parties need to control resources to fund and incentivize brokers. Additionally, parties need to monitor the performance of their brokers to make sure they deliver the votes of their networks. While the literature has addressed the use of public resources for clientelistic purposes, we have a limited understanding as to how parties monitor their brokers.

In this paper, we study how a political party uses electoral data to monitor the brokers that control its clientelistic networks. We study the context of clientelistic networks on communal lands in México, which are largely controlled by the Institutional Revolutionary Party (PRI), a party that has traditionally relied on patronage and clientelistic practices for electoral gain. Communal lands, which were allocated through a land redistribution policy after the 1910 Mexican revolution, are tracts of land where property rights belong to communities as a whole, but each individual works on a specific plot and is entitled to its entire product. In each communal land there is an elected official that participates in the distribution of the government programs within the communal land. The literature and the fieldwork we conducted show that, in the states under the PRI's control, these officials operate as the PRI's political brokers, trading access to public programs for votes (Mackinlay Grohmann (2011)). This is an important phenomenon since communal lands represent 50% of agricultural land in México and, according to the Federal Electoral Institute (IFE), their peasants have the largest risk of being subject to clientelistic practices (IFE (2012)). 4

Our identification strategy exploits two sources of variation. First, we use whether the PRI controls the state government at the time of the election to measure whether the PRI controls the resources needed to fund and incentivize brokers. State governments control the implementation of the bulk of public programs at the local level and incumbency is necessary to manipulate government funds for clientelistic purposes (Beer (2007), Holzner (2010)).⁵ Second, to measure differences in the PRI's capacity to monitor its brokers, we

¹Among others, Kitschelt and Wilkinson (2007), and Schaffer (2007) document the prevalence of clientelism in the developing world.

²Hicken (2011) provides a comprehensive survey of the recent literature on clientelism.

 $^{^{3}}$ We later discuss different theories and supporting empirical evidence that Chandra (2004), Stokes (2005), Nichter (2008), Finan and Schechter (2012), and Lawson and Greene (2012) provide.

⁴Figure 1 illustrates the distribution of communal lands in México.

⁵According to the municipal and state public finance records, the annual expenditure of the state governments represents 80% of the joint expenditure of municipal and state governments.

exploit plausibly exogenous variation in overlap between the level at which brokers operate –communal lands– and the level at which the electoral data the PRI can use to monitor its brokers is disclosed –electoral sections.⁶ Figure 2 and Figure 3 shows some examples of the variation in this overlap.

The literature, the fieldwork experience and the popular press suggest that the PRI uses electoral data to monitor the votes they secured through clientelistic practices.⁷ In particular, Holzner (2003) suggests that the PRI monitors the electoral support from communal lands using electoral data and punishes the political brokers that fail to deliver the vote of their communities. During our fieldwork in the month prior to the 2012 federal election, several peasants, who were polling station officials representing the PRI in past elections, stated that the party watched electoral section level outcomes closely to make sure that the figures matched the expected support.

To guide our empirical analysis, we develop a simple model that characterizes the relationship between the PRI's monitoring capacity over its broker and the electoral support for the PRI in a communal land. In the model, the PRI and another party compete for votes offering a policy menu of public goods and transfers to voters. In addition, when the PRI is the incumbent party, it has access to resources to fund and incentivize a broker to mobilize its clientelistic networks. The PRI uses the available electoral section-level data to extract a signal about its broker's performance on which it conditions his funding. The overlap between the communal land and its overlapping electoral sections determines the precision of the signal, and therefore, the PRI's monitoring capacity. The model predicts that, when the PRI controls the government, communal lands where the electoral data allows high PRI monitoring ability should exhibit a larger electoral support for the PRI. The model predicts no difference when another party controls the government.

As a measure of the PRI's ability to monitor its brokers, we use what we denote as the *fit* of a communal land, which is the weighted average proportion of communal land voters in the electoral sections where they vote. For illustrative purposes, Figure 4 shows one case of large *fit* and one case of small *fit*. *Fit* is a measure of overlap between communal lands where brokers operate and electoral sections where the PRI observes the electoral results it can use to monitor them, and thus it naturally affects the PRI's monitoring ability. A larger *fit* improves this ability, since the electoral section-level data is more informative about the work of brokers.

The results of the empirical analysis support the predictions of the model. Communal lands with larger *fit* display a larger electoral support for the PRI. In addition, this difference in votes only happens when the PRI controls the state government. To address the concern that results might be driven by omitted unobservable variables that predict PRI's electoral support and correlate with *fit*, we conduct a placebo test, looking at incumbency at the

⁶Electoral sections are the smallest electoral demarcation in México.

⁷An illustrative example from the popular press comes from the state of Nuevo Leon, where the PRI candidate for the state governorship acknowledge that they had an army of 100 thousand individuals to monitor the election (of 2,677,343 registered voters) and that 30 thousand of those were trained to work as representatives at the polling stations. The National Action Party (PAN) contender argued that the goal of such an army was to monitor the votes they secured through clientelistic practices (Reyes and Romo (2003)).

municipal rather than at the state government. PRI's incumbency at the municipal level is correlated with PRI's electoral support but should not allow the PRI to mobilize its clientelistic networks on communal lands since municipalities have a very limited budget relative to state governments. Our placebo exercise indicates that there is no differential effect of *fit* on the electoral support for the PRI.

The estimated effect of the communal land *fit* is meaningful. A one standard deviation increase in *fit* corresponds to a 1.5 percentage points increase in the vote share for the PRI. Such an effect accounts for one fifth of the incumbency advantage that the PRI enjoys when it controls the state government.

We then provide evidence that suggests that clientelistic networks operating in communal lands have an aggregate effect on election and policy outcomes. We use a difference in differences strategy where we compare municipalities with different shares of communal lands while controlling for the share of agricultural land, which includes communal and privates lands. We show that, when the PRI controls the state government, municipalities with a larger share of communal lands exhibit an increased vote share for the PRI and a lower provision of public goods, measured by the number of schools and teachers per capita. These results are not driven by differential pretrends or differences in the economic development of communal and private lands. A similar placebo test as before indicates no differential effect of the share of communal lands on electoral and policy outcomes.

Our work is closely related to the literature on clientelistic networks.⁸ In seminal work, Stokes (2005) observes that machines use their deep insertion into voters' social networks to try to circumvent the secret ballot and infer the votes of individuals. Chandra (2004) advocates that clientelistic networks facilitate the monitoring of turnout, an idea later formalized and tested by Nichter (2008). Auyero (2000), Finan and Schechter (2012), and Lawson and Greene (2012) argue that clientelistic networks mitigate asymmetric information about voter's reciprocity, which allows parties to target benefits to individuals who are more likely to reciprocate with their vote.

Our work is also related to Robinson and Verdier (2013), Keefer (2006), and Keefer (2007), who argue that clientelism leads to an underprovision of public goods. We provide empirical evidence that supports their claim. To our knowledge, we are the first to provide empirical evidence that clientelism has a significant effect on aggregate electoral and policy outcomes. Finally, our work is also related to the literature that looks at the overlap between political markets and the level at which different types of information are disclosed. A prominent example is Snyder and Stromberg (2010), who look at the fit between political districts and newspaper markets.

Section 2 describes the historical development of clientelistic networks on communal lands in México. It also discusses the current clientelistic practices in these lands and reports the qualitative evidence that was collected during our fieldwork. To guide the empirical work, section 3 presents a model that captures the relationship between the PRI's monitoring

⁸Also see Hicken (2011), Kitschelt and Wilkinson (2007), Manzetti and Wilson (2007), and Schaffer (2007) for a discussion on the work that documents the presence and features of clientelistic practices in developing economies.

capacity over its political brokers and the electoral support for the PRI in communal lands. Section 4 presents the empirical strategy and data. The empirical tests of the predictions of the model are in section 5. In section 6, we provide empirical evidence that supports that clientelistic networks on communal lands have aggregate effects on election and policy outcomes. Section 7 concludes.

2 Background

In this section, we highlight the main features of the historical development of clientelistic networks on communal lands. We place particular emphasis on how the PRI captured the administrative office of each communal land. We then explain current clientelistic practices in communal lands. We stress the importance of the PRI's control of state government to mobilize its clientelistic networks and the inability of other parties to take over the PRI's networks in states lost by the PRI. We conclude by presenting supporting qualitative data we collected during fieldwork in twelve municipalities across four states. We complement this data with qualitative evidence from the Mexican press to give a broader view of these issues across the whole of México.

2.1 Historical Background

After the 1910 Mexican revolution, where the redistribution of land was the central demand of the rural insurgents, there was significant land redistribution (Knight (1986)). Article 27 of the 1917 Constitution established the distribution of land in the form of either agrarian communities or *ejidos*, to which we refer jointly as communal lands. ⁹ The 1917 Constitution established the office of the commissariat to administer each communal land. Commissariats are democratically elected officials that mediate between the peasants of the communal lands and the government. Among their many responsibilities, they are in charge of the access and distribution of the government programs for their communities.

During its seven decades in power, the PRI established clientelistic networks on communal lands by controlling the commissariats through the state agrarian leagues of the National Peasant Confederation (CNC). The poor peasants living in communal lands, with no individual property rights, faced difficulties accessing private credit markets and relied on the government for access to agricultural inputs. This dependence, together with their internal legal organization, made communal lands the perfect ground for the development of clientelistic networks (Sabloff (1981)). Commissariats became the PRI's political brokers, trading

⁹Agrarian communities represented the restitution of lands that were expropriated from communities of peasants during the rule of Porfirio Díaz between 1876 and 1910. During this period, there was extensive illegal expropriation of lands from communities of small landholders by landlords that led to a dramatic land concentration. *Ejidos* consisted of land that was granted to communities of petitioners that never had land. The logic behind the communal property rights over the land was to avoid the illegal expropriation and land concentration that took place during the rule of Porfirio Díaz.

access to public programs for votes (Baños Ramírez (1988)), Mackinlay Grohmann (2011).¹⁰ In turn, commissariats enjoy the rents associated with their powerful position. Their discretionary control in the distribution of public programs to the interior of their communities facilitates the extraction of rents (González Martínez (1997), Sabloff (1981)).

2.2 Recent Changes

México underwent a profound democratic transition in the last two decades that paradoxically led to a strengthening of the clientelistic practices in rural México (Schedler (2004)). A series of political reforms, beginning with a constitutional reform approved in 1989 and led by the creation of the Federal Electoral Institute (IFE) in 1990, eliminated vote fraud practices (e.g., ballot stuffing, intimidation, manipulation of voter registration lists, issuing multiple voting credentials to PRI supporters, multiple voting by PRI supporters). The PRI's response to the loss of its traditional methods of controlling election results was to change its electoral strategy by shifting from vote fraud to clientelism and vote buying.

In the last two decades, the functioning of the CNC and the PRI's clientelistic networks on communal lands has heavily relied on the funds from the PRI's state governments.¹¹ Municipal governments are very weak and state governments are responsible for the execution of the bulk of public programs at the local level. The PRI's state governors took advantage of the fiscal decentralization that took place in the 1990's to make use of the federal funds for clientelistic exchanges and the strengthening of their clientelistic networks in rural areas (Cornelius (2002)). The role of the PRI's state governments in the endurance of the party at the local level became even more important after the PRI lost the federal government to the National Action Party (PAN) in the 2000 presidential election (Langston (2003)).

Despite the PRI's loss of several states, and the consequent weakening of the influence of the CNC in these states, other political parties have not been able to contest the power of the CNC and take over the PRI's political networks in communal lands. The main reason is that the PAN and the Party of the Democratic Revolution (PRD) were not able to create a structure of control of commissariats in communal lands like the PRI did with the CNC during its long tenure in power.¹² The PAN created the Rural Action Program (PAR) in 2004 to coordinate the PAN's rural supporters (Cortés (2004), Soto (2004)). However, the PAN's project was a total failure (Galicia (2012)). In 1988, dissidents of the PRI and the CNC founded the Cardenist Peasant Central (CCC) to support the main contender against the PRI's candidate for presidency and challenge the PRI and the CNC's hegemony in the rural sector. Despite the fact that affiliates of the CCC belong to several leftist parties,

 $^{^{10}}$ Often, the PRI operates through a local cacique instead, who in turn controls the commissariats. Caciques usually start as commissariats (González Martínez (1997)).

¹¹An illustrative example comes from the state of Tlaxcala, where the PRI lost the state government in 1991, and returned in 2011. When the PRI recovered the state governorship, the president of the CNC in this state acknowledged that the peasant organization had lost presence in the state as a result of the political rivalry with the past two state governments. However, he asserted that he trusted that the organization would be able to recover its strength with the return of the PRI to the state government (Osorno Xochipa (2011)).

¹²The PAN and the PRD are mostly urban parties with weaker presence in rural areas.

including the PRI, the CCC has been mostly associated with the various forms of the PRD. However, the weight of the CCC in the communal land sector is minimal relative to that of the CNC. The most conservative estimates indicate that the CCC's affiliates account for less than 3% of the CNC's.¹³

The CNC has no equal. It has 88 federal legislators in the Chamber of Deputies, which represent 18% of the total, and a comparable political strength in the states. Thus, in coordination with state government, the CNC plays a very important role in the allocation of resources at the local level (Galicia (2012)). The manipulation of social programs for electoral purposes in México is severe (Martínez (2010)). Alianza Cívica, the main NGO that monitors electoral practices in México, estimates that during the 2009 election 27% of citizens were subject to vote buying and the conditioning of social programs for their votes (Zermeño (2012)). There are no separate estimates for the individuals living in communal lands but, according to the figures of the CNC, its affiliates contribute more than 35% of the PRI's votes. After the PRI's loss in the 2000 presidential election, the federal legislators of the CNC claimed that they were the only PRI sector that fulfilled its vote quota, 6 million votes (Ramos (2000)). ¹⁴

2.3 Evidence from Fieldwork and the Popular Press

During the fieldwork we conducted in the month prior to the 2012 presidential election, we observed a strong presence of the PRI's clientelistic practices in communal lands in the states that have always been under PRI control. On the contrary, we did not observe such practices in communal lands in states that the PRI previously lost to other parties. We conducted fieldwork in twelve municipalities of four states of México, which present a range of political configurations that are particularly relevant for our analysis: México, Morelos, Puebla and Tlaxcala.¹⁵ The state of México is the PRI's largest stronghold in México; it has always controlled the state government and the majority of the municipal governments. Similarly, the PRI just lost the state of Puebla to the PAN in 2010. In contrast, in Morelos, the PRI lost the state government in 2000 to the PAN, which had control until 2012, when it lost to the PRD. Likewise, in Tlaxcala, the PRI just returned to state government in 2011 after two terms of non-PRI governors. During fieldwork we noted a strong prevalence of the PRI's

 $^{^{13}}$ According the CCC website, http://cccardenista.net/, it has one hundred thousand affiliates. According to Zermeño (2011), unofficial figures suggest that the CNC has 4.5 million affiliates.

¹⁴It is also worth a brief mention of México's communal land certification program, which started in 1992 with the reform of Article 27 of the Constitution. The so called PROCEDE (*Programa de Certificación de Derechos Ejidales y Titulación de Solares*) consists of two main stages. The first stage constitutes a certification process in which each communal land has its boundaries delineated, and its land is divided into land for common use and land for individual plots. Additionally, the plots designated for private use are demarcated and renting is permitted. In a second stage, if a super-majority of the communal land members agree, peasants have the option of registering their plots into the private domain and then their land enters the private market. While most communal land has gone through the first stage, less than 3% has entered the private domain. Consequently, the PROCEDE has had a modest impact on the socio-economic situation of communal lands.

¹⁵Please refer to Appendix 7 for detailed supporting anecdotal evidence.

clientelistic practices in communal lands in the state of México and important residuals of these in the state of Puebla. However, these practices appeared to be absent in the states of Morelos and Tlaxcala.

In the state of México, we found evidence that supports the presence of PRI clientelistic practices. We observed a close relationship between commissariats and the PRI's government: in all municipalities we visited, at least one commissariat or relative of the commissariat works in the government. Also, commissariats stated that the PRI's supporters in communal lands receive considerably more public assistance from the PRI's government. They also added that, for that to happen, it is crucial that commissariats are aligned with the party. In addition, we observed a conditioning of government support within communal lands by commissariats.

In the state of Puebla, we noticed that the PRI's clientelistic networks on communal lands are still present but they are weakening. The state of Puebla provides an interesting case study given the recent transition from the PRI to the PAN at the state government level. As in the state of México, we observed that most commissariats, which were elected under a PRI's governor, continue to support the PRI openly. Not surprisingly, the PRI's commissariats report a significant decrease in government aid with the recent party transition. Commissariats also mention a radical change in the conditioning of the state government assistance for electoral support. When asked about this matter, a commissariat explained, "when the PRI was in government, the conditioning was a serious problem. If we voted for the PRI, there was aid, if we did not, we were marginalized. With the change in government, everything is more flexible; people can vote for the party they want and the aid will still come."

The evidence from newspapers reflects that our observations from the states of México and Puebla are not unique to those states. Given the limited geographical coverage of our fieldwork, we complement it with qualitative data from the popular press. Qualitative evidence from newspapers suggests that, while the individuals from communal lands that support the PRI benefit the most when it comes to receiving aid, assistance to and within communal lands is conditioned on political support.

Further, in the states of México and Puebla, we observed that parties intervene in the political life of the communal lands to gain their political control. The PRI's control of the commissariats is a political asset since it is a necessary condition for the PRI to be able to mobilize its clients in the communal lands. Thus, candidates for commissariat often run representing a party, and vote buying and fraud characterize elections for commissariats. This situation is not unique to the states of our fieldwork. Many other cases show up in newspapers.

In the states of Morelos and Tlaxcala, we found limited evidence on clientelistic practices in communal lands. Commissariats stress that, while there was a conditioning of the assistance for electoral support in the times before the PRI lost the state government, that is no longer the case. Additionally, they mention that the rules of the programs of the state government are clear and these are not distributed to favor individuals associated to a given political party. It is worth noticing the relevance of these facts for the state of Tlaxcala, where the PRI returned to power two years ago. They suggest that, despite the return of the PRI to the state government, clientelistic exchanges are not as strong as before the PRI lost the state government.

Finally, the evidence we observed during fieldwork corroborates the mentioned role of the CNC. On the one hand, commissariats and peasants in the state of México report current support from the CNC. Evidence from newspapers also reveals that, in the states under the control of the PRI, the CNC conditions government assistance for electoral support to the PRI. On the other hand, commissariats and peasants of the states of Morelos, Puebla and Tlaxcala agree that the CNC disappeared together with the PRI when the PRI lost the state elections. However, commissariats in the state of Tlaxcala, where the PRI recovered the state government recently, indicated that there were several signs that the CNC was coming back to action. Additionally, we observed evidence that the PRI's clientelistic networks are latent and the return of the PRI to the state government, with the consequent strengthening of CNC, could reanimate the PRI's clientelistic practices in communal lands. A commissariat pointed out, "I do not support the PRI but, if the CNC returns, we will have to support the PRI so that we get government help."

3 Model

Our goal in this section is to develop a simple model to guide the empirical work. The model makes two contributions to our analysis. First, it characterizes the relationship between the PRI's capacity to monitor its political broker and the electoral support for the PRI in such a communal land. The model studies the case where the PRI controls the state government as well as the case where it does not. Second, the model links the PRI's monitoring capacity to the communal land *fit* we measure in the data. The main prediction of the model is that, when the PRI controls the state government, there should be a larger support for the PRI in communal lands where a large *fit* allows better PRI monitoring capacity. However, there should be no difference otherwise.

3.1 Setup

The model builds on a standard probabilistic voting model to which we add a standard principal-agent problem that incorporates the way the PRI monitors and provides incentives to its political broker so that he delivers the votes of its network. As the anecdotal evidence suggests (Holzner (2003)), the PRI faces an agency problem since, once the broker receives funds from the PRI, he has no incentives to exert any effort or to spend the funds to persuade voters to vote for the PRI. To address this problem, the PRI uses the available electoral data to extract a signal about the broker's performance on which it conditions funds to incentivize him.

Consider a communal land c inhabited by a population of peasants normalized to one. There are two political parties, the PRI and other party denoted by O that compete for the control of the government of state where the communal land is located. When in office, a party p uses the budget b^c , assigned to the communal land, to invest in a public good g_p^c , to make a transfer τ_p^c to individuals, and to potentially fund and incentivize a political broker, w_p , $(g_p^c + \tau_p^c + w_p \leq b^c)$.

A political broker that works for a given party p can exert an effort, a_p , to persuade voters to vote for party p. The effort is costly and a unit of effort a_p has a convex $\cot \frac{1}{2}a_p^2$. The effort a_p can potentially encompass the energy to investigate the voters with the largest reciprocity as well as the funds that the broker targets to these voters (Finan and Schechter (2012), and Lawson and Greene (2012)). It could also represent the use of resources to identify and mobilize unlikely-to-vote supporters of party p (Chandra (2004), Nichter (2008)).

Parties choose the level of public goods, transfers and funds for political brokers to maximize their vote share and peasants are assumed to vote sincerely. From the perspective of parties, the utility of peasants of the communal land over the public good, the transfer, and political broker's effort is

$$u_p^{i,c}\left(g_p^c, \tau_p^c, a_p\right) = -\exp\left(-\left(u^c\left(g_p^c\right) + \tau_p^c + a_p + \left(\eta^c + \varphi^{i,c}\right)I_{PRI}\right)\right),\tag{1}$$

where $u^c(\cdot)$ is increasing in its argument and strictly concave, I_{PRI} is an indicator for the PRI coming to the state office, $\varphi^{i,c}$ is an idiosyncratic ideology shock towards the PRI distributed uniformly on $\left[-\frac{1}{2}, \frac{1}{2}\right]$, and η^c is a normally distributed error that reflects the uncertainty about $u^c(\cdot)$, $\eta^c \sim \mathcal{N}(0, \sigma_c^2)$. We interpret σ_c^2 as the degree of aggregate uncertainty about the potential voting behavior of peasants of the communal land. Note that we take a reduced form approach and assume that the effort of the political broker a_p enters directly in the average voter's utility over party p's policies. This assumption reflects that the effort that the political broker exerts, a_p , is able to influence voters' utility for party p.

Given the setup, as in a standard probabilistic voting model, the vote share for the PRI is

$$\pi_{PRI}^{c} = \frac{1}{2} + \left(u^{c}\left(g_{PRI}^{c}\right) - u\left(g_{O}^{c}\right) + \tau_{PRI}^{c} - \tau_{O}^{c} + a_{PRI} - a_{O}\right) + \eta^{c},\tag{2}$$

where η^c represents the uncertainty about the potential voting behavior of peasants in communal land for a given policy vector $(g_{PRI}^c, \tau_{PRI}^c, a_{PRI}, g_O^c, \tau_O^c, a_O)$.

We assume that only the PRI has access to a political broker. This assumption mimics the evidence from the literature and our fieldwork, and the fact that the peasant organizations of other political parties are minimal relative to the PRI's CNC. Additionally, we assume that, only when the PRI controls the state government, is it able to use public resources to fund its political broker to mobilize its networks.¹⁶ Henceforth, since a_O and w_O are always zero, we drop the subscript in a_{PRI} and w_{PRI} .

When in control of the state government, the PRI offers a political broker operating in the communal land a linear contract $w = f + v \cdot s$, with $f, v \ge 0$, where $s = a + \varepsilon$ represents

¹⁶We could think of this game as the stage game of a dynamic game where current funds destined to mobilize political brokers and to fund clientelistic transactions were determined in the past election. Hence, when voters vote for the PRI, they are aware that a share of the future budget will be used for clientelistic purposes in future elections.

a noisy signal of a with $\varepsilon \sim \mathcal{N}(0, \sigma_{\varepsilon}^2)$, which we discuss in depth shortly.¹⁷ For simplicity we assume that the political broker has the following utility over a contract (f, v) of

$$E\left[u^{b}\left(f,v\right)\right] = E\left[-\exp\left(-\left(f+v\cdot s-\frac{1}{2}a^{2}\right)\right)\right].$$
(3)

Additionally, we assume that the political broker has an outside option of 0, and hence, a contract (f, v) has to be such that $E\left[u^{b}(f, v)\right] \geq 0.^{18}$

3.2 Timing

The timing of the model is as follows:

- 1. nature draws the incumbent party,
- 2. each party p announces (g_p^c, τ_p^c) ,
- 3. the PRI proposes contract (f, v) to its political broker and he accepts,
- 4. shocks $\{\varphi^{i,c}\}_{i\in c}$ and η^c are realized,
- 5. broker exerts effort a,
- 6. voters vote sincerely,
- 7. party p wins,
- 8. winner implements (g_p^c, τ_p^c) , and
- 9. The PRI extracts a signal s over the effort a and pays its political broker w according to (f, v),

where 3., 5. and 9. occur only if the PRI controls the state government.

3.3 Signal Extraction

To construct the signal s on which the PRI conditions funds to the broker, the PRI uses the election data available at the electoral section level as well as its imperfect knowledge about the potential voting behavior of individuals inside and outside communal lands.¹⁹ For exposition, we consider the case where the peasants of the communal land vote in a

 $^{^{17}}$ The restriction to linear contracts is common in the literature, justified by the work by Holmstrom and Milgrom (1987).

¹⁸In equation (3) we implicitly assume that the broker experiences no utility over g_p^c , τ_p^c , η^c and $\varphi^{i,c}$. This avoids considering the potential convoluted case where the broker ends up working for the PRI but voting for the other party.

¹⁹This knowledge about the potential voting behavior of individuals comes from the known part of their preferences and the promises over the public good and the transfer by parties.

single electoral section e. The electoral section has a share α of voters that come from the communal land and a share $1 - \alpha$ from outside the communal land. Note that α coincides with our definition of the communal land fit. Thus, the electoral support for the PRI of the voters from the electoral section e is

$$\pi_{PRI}^e = \alpha \pi_{PRI}^c + (1 - \alpha) \pi_{PRI}^{nc}, \tag{4}$$

where π_{PRI}^{c} , which is defined in equation (2), represents the electoral support for the PRI of the voters that belong to the communal land. π_{PRI}^{nc} is the analogous element for the voters outside the communal land but without a since we assume that no clientelistic networks operate in non-communal lands.²⁰

Recall that η^{c} and η^{nc} are independently normally distributed errors $-\eta^{c} \sim N(0, \sigma_{c}^{2})$ and $\eta^{nc} \sim N(0, \sigma_{nc}^2)$ - that reflect the uncertainty about π_{PRI}^c and π_{PRI}^{nc} , respectively. We assume that $\sigma_c^2 \leq \sigma_{nc}^2$ to replicate that political brokers and the PRI might have better information about the potential voting behavior of peasants in communal lands relative to the one of outsiders.

Using the expressions of π_{PRI}^e , π_{PRI}^c , and π_{PRI}^{nc} the PRI extracts the following signal about the effort of the broker a,

$$s = a + \varepsilon, \tag{5}$$

where $\varepsilon = \eta^c + \left(\frac{1-\alpha}{\alpha}\right) \eta^{nc}$ with $\sigma_{\varepsilon}^2 = \sigma_c^2 + \left(\frac{1-\alpha}{\alpha}\right)^2 \sigma_{nc}^2$.²¹ Note that the precision of the signal is increasing in the *fit* of the communal land,

$$\frac{\partial \sigma_{\varepsilon}^2}{\partial \alpha} = -2 \left(\frac{1-\alpha}{\alpha^3} \right) \sigma_{nc}^2 < 0.$$
(6)

This result is driven by two related elements. First, a larger communal land fit increases the signal to noise ratio. While the votes from communal land individuals are informative about the broker's performance, the votes from non-communal land individuals only provide noise. Thus, a larger fit makes electoral data more informative. Second, the assumption that $\sigma_c^2 \leq \sigma_{nc}^2$ implies that a larger fit might not only increase the signal to noise ratio but also reduce the variance of the noise. The uncertainty about the potential voting behavior of individuals is what prevents the PRI from being able to extract a noiseless signal about the broker's effort. Hence, if this uncertainly is smaller for the communal land voters, a larger fit reduces the overall uncertainty.

Characterization of the Case Without Clientelism 3.4

We start by characterizing the case when another party controls the state government at the time of the election. Since we only characterize the equilibrium from the communal land,

 $[\]frac{1}{2^{0}\pi_{PRI}^{nc}} = \frac{1}{2} + u^{nc}(g_{PRI}) - u^{nc}(g_{O}) + \tau_{PRI}^{nc} - \tau_{O}^{nc} + \eta^{nc}.$ ²¹Note that $s = \frac{1}{\alpha}\pi_{PRI}^{e} - \frac{1}{2\alpha} - [u^{c}(g_{PRI}) - u^{c}(g_{O}) + \tau_{PRI}^{c} - \tau_{O}^{c}] - (\frac{1-\alpha}{\alpha}) \cdot [u^{nc}(g_{PRI}) - u^{nc}(g_{O}) + \tau_{PRI}^{nc} - \tau_{O}^{nc}].$ In constructing the variance of signal for tractability we assume that η^c and η^{nc} are independent.

throughout the rest of our characterization we drop the superscript c. In this case there is no clientelism in equilibrium given that, since the PRI does not have access to resources to fund and incentivize its political broker, he exerts no effort to mobilize voters to vote for the PRI. Hence, PRI chooses (g_{PRI}, τ_{PRI}) to maximize its expected electoral support,

$$\max_{\{g,\tau\}} \{u(g) + \tau\}$$

$$s.t.$$

$$(7)$$

$$g + \tau \le b \tag{8}$$

$$g, \tau \ge 0, \tag{9}$$

where equation (7) is the part of the PRI's vote share in equation (2) that the PRI can influence, and equation (8) is the budget constraint. Thus, from the first order conditions of the maximization problem and the budget constraint, the PRI chooses $g_{PRI}^O = u'^{-1}(1)$ and $\tau_{PRI}^O = b - u'^{-1}(1)$. By symmetry, the other party chooses $g_O^O = u'^{-1}(1)$ and $\tau_O^O = b - u'^{-1}(1)$. Thus, in the case without clientelism, both parties offer the same public good and transfer. Consequently, using the expression of the PRI's vote share in equation (2) and $(g_{PRI}^O, \tau_{PRI}^O, g_O^O, \tau_O^O)$, the vote share for the PRI is

$$\pi_{PRI}^{O} = \frac{1}{2} + \eta \tag{10}$$

and there is Downsian convergence, i.e., there is an ex-ante equal vote share for both parties.

3.5 Characterization of the Case With Clientelism

When the PRI controls the state government, it has access to resources to fund and incentivize its political broker. The other party chooses $g_O^{PRI} = u'^{-1}(1)$ and $\tau_O^{PRI} = b - u'^{-1}(1)$ as in the no clientelism case. However, the PRI chooses $(g_{PRI}, \tau_{PRI}, f, v)$ to maximize its expected electoral support,

$$\max_{\{g,\tau,f,v\}} \{ u\left(g\right) + \tau + a \}$$
s.t.
$$(11)$$

$$g + \tau + f + v \cdot a \le b \tag{12}$$

$$g, \tau, f, v \ge 0, \tag{13}$$

$$a \in \arg\max_{a} \left\{ -\exp\left(-\left(f + v \cdot a - \frac{1}{2}v^{2}\sigma_{\varepsilon}^{2} - \frac{1}{2}a^{2} \right) \right) \right\}$$
(14)

$$f + v \cdot a - \frac{1}{2}v^2\sigma_{\varepsilon}^2 - \frac{1}{2}a^2 \ge 0 \tag{15}$$

where equation (11) is the part of the PRI's vote share in (2) that the PRI can influence, equation (12) reflects the expected budget constraint, equation (14) is the incentive compatibility constraint, which follows directly by using equation (3) and applying the moment generating function of a normal variable, and equation (15) is the individual rationality constraint. The incentive compatibility constraint makes sure that the political broker exerts the effort desired by the PRI, and the individual rationality constraint ensures that the broker accepts the contract (f, v).

Replacing equations (12), (14) and (15) into equation (11), we rewrite the problem as

$$\max_{v,\tau \ge 0} \left\{ u \left(b - \tau - \frac{1}{2} \left(1 + \sigma_{\varepsilon}^2 \right) v^2 \right) + \tau + v \right\}$$
(16)

where the first order conditions are given by

$$v: -u'\left(b - \frac{1}{2}\left(1 + \sigma_{\varepsilon}^{2}\right)v^{2}\right)\left(1 + \sigma_{\varepsilon}^{2}\right)v + 1 = 0,$$
(17)

$$\tau : -u' \left(b - \frac{1}{2} \left(1 + \sigma_{\varepsilon}^2 \right) v^2 \right) + 1 + \lambda_{\tau} = 0$$
(18)

To characterize the equilibrium outcome we can consider the case where $\tau \ge 0$ is not binding, which we denote as case A, and the case where $\tau \ge 0$ is binding, which we denote as case B.

3.5.1 Case A ($\tau \ge 0$ is not binding)

In the case where $\tau \geq 0$ is not binding, clientelism does not distort the allocation of the public good. The PRI's budget allocation to the public goods and transfer are $g_{PRI}^{PRI} = u'^{-1}(1)$ and $\tau_{PRI}^{PRI} = b - u'^{-1}(1) - \frac{1}{2(1+\sigma_{\varepsilon}^2)}$, respectively. Further, the PRI offers the broker a contract $(f, v) = \left(\frac{\sigma_{\varepsilon}^2 - 1}{2(1+\sigma_{\varepsilon}^2)^2}, \frac{1}{1+\sigma_{\varepsilon}^2}\right)$, where we assume that $\sigma_{\varepsilon}^2 > 1$, and the broker exerts an effort $a = \frac{1}{1+\sigma_{\varepsilon}^2}$.

Note that in this case clientelism does not alter the investment in the public good because of the assumption that the utility function of the voters is linear in the transfer. However, in the absence of this assumption, the conditioning of transfers for electoral support would alter the investment on the public good just as it does in the case where $\tau \geq 0$ is binding. Note from the expression of τ_{PRI}^{PRI} that the larger the precision of the signal, the more likely that $\tau \geq 0$ is binding, since more funds are crowded out from transfers to fund the broker.

Using the expression of the PRI's vote share in (2) and $(g_{PRI}^{PRI}, \tau_{PRI}^{PRI}, a, g_O^{PRI}, \tau_O^{PRI})$, the vote share for the PRI when it controls the state office at the time of the election is

$$\pi_{PRI}^{PRI} = \frac{1}{2} + \frac{1}{2\left(1 + \sigma_{\varepsilon}^2\right)} + \eta \tag{19}$$

3.5.2 Case B ($\tau \ge 0$ is binding)

In the case where $\tau \geq 0$ is binding, clientelism distorts the allocation of the public good since the funds destined to clientelistic exchanges crowd out the public good. The PRI's budget allocation to the public goods and transfer are $g_{PRI}^{PRI} = b - \frac{1}{2} (1 + \sigma_{\varepsilon}^2) v^2$ and $\tau_{PRI} = 0$,

respectively, where v is implicitly defined by equation (17). In addition, differentiating the first order condition equation (17), we show that the distortion on the public good is increasing in the precision of the signal, which, as we show below, captures the PRI's monitoring capacity.²²

In this case, the vote share for the PRI when it controls the state office at the time of the election, π_{PRI}^{PRI} , does not take a closed form solution.

3.6 Estimating the Return to Clientelism

The increase in the electoral support that the PRI achieves in communal lands through the performance of its political broker, which we denote as $\Delta \pi_{PRI}$, is the difference between the vote share for the PRI when it controls the state office at the time of the election, π_{PRI}^{PRI} , and the vote share for the PRI when it does not, π_{PRI}^{O} .

Note that, from the envelope condition of the PRI's maximization problem in (16), $\Delta \pi_{PRI}$ is increasing in the precision of the signal over the performance of the political broker, $\frac{\partial \Delta \pi_{c,s}^{PRI}}{\partial \sigma_{\epsilon}^2} < 0.^{23}$ The intuition is that, when the precision of the signal is large, the marginal cost for the PRI to incentivize the political broker to exert effort is small. Thus, the increase in the electoral support due to clientelistic practices is larger.

We now develop a strategy to bring this testable implication of the model to the data. For that note that we can rewrite $\Delta \pi_{PRI}$ as

$$\pi_{PRI} = \frac{1}{2} + I^{PRI} \cdot \Delta \pi_{c,s}^{PRI} + \eta \tag{20}$$

where I^{PRI} is an indicator variable for whether the PRI controls the state government at the time of the election. Linearizing (20) on the *fit* of the communal land,

$$\pi_{PRI} = \beta_0 + \beta_1 \cdot I^{PRI} + \beta_2 \cdot fit + \beta_3 \cdot I^{PRI} \cdot fit, \qquad (21)$$

where $\beta_2 = 0$ and $\beta_3 = \frac{\partial \Delta \pi_{c,s}^{PRI}}{\partial \sigma_{\varepsilon}^2} \frac{\partial \sigma_{\varepsilon}^2}{\partial \alpha} > 0$. $\beta_3 > 0$ since $\Delta \pi_{c,s}^{PRI}$ is increasing in the precision of the signal over the performance of the political broker, $\frac{\partial \Delta \pi_{c,s}^{PRI}}{\partial \sigma_{\varepsilon}^2} < 0$, and, from (6), the precision of the signal is increasing in the *fit* of the communal land, $\frac{\partial \sigma_{\varepsilon}^2}{\partial \alpha} < 0$. The intuition for $\beta_3 > 0$ is that a larger *fit* allows the PRI extracting a more precise signal about the performance of its broker. In turn, since the broker is risk-averse, a more precise signal facilitates the provision of incentives by the PRI, and therefore, delivers a larger electoral return to the funds allocated to the broker.

3.7 Predictions of the Model

The model first predicts that there should be a larger vote share for the PRI in communal lands with a larger *fit* when the PRI is in control of the state government. In these lands the

```
 \begin{array}{l} \frac{22 \, \partial g_{PRI}}{\partial \sigma_{\varepsilon}^2} = \frac{1}{\psi} \left( 1 + \gamma \psi \sigma_{\varepsilon}^2 \right) v \frac{-u^{\prime \prime}(g) \left( 1 + \psi \sigma_{\varepsilon}^2 \right) \gamma \psi v^3 + 2u^{\prime}(g) \psi^2 v}{-2u^{\prime \prime}(g) (1 + \psi \sigma_{\varepsilon}^2)^2 v^2 + 2u^{\prime}(g) \psi \left( 1 + \gamma \psi \sigma_{\eta}^2 \right)} > 0 \\ \frac{23 \, \partial \Delta \pi_{PRI}}{\partial \sigma_{\varepsilon}^2} = -\frac{1}{2} u^{\prime} \left( g \right) v^2 < 0. \text{ The same conclusion rises in case A.} \end{array}
```

PRI has better monitoring capacity, which facilitates the PRI's work at incentivizing them to exert more effort in persuading peasants to vote for the PRI

Second, the model predicts that the communal land *fit* should have no association with the vote share for the PRI when the it does not control the state government, since it has no resources to fund and incentivize its political broker, and consequently, its monitoring capacity is irrelevant.

Lastly, the model predicts that places with more clientelism should experience a lower public good provision since the resources to fund and incentivize the broker crowd out the budget that otherwise would be allocated to public goods. Note that, while this prediction is actually only for *Case B*, we have explained that this prediction is absent in *Case A* due to the artifice of linear utility in the transfer.

4 Empirical Strategy and Data

4.1 Empirical Strategy

In this section we develop the empirical strategy used to test the predictions of the model. Our empirical approach tests whether communal lands with a larger *fit* exhibit larger electoral support for the PRI when the state government is under the control of the PRI.

The variation in *fit* comes from the initial location of the communal lands and the subsequent drawing of the electoral sections. In 1994, the Federal Electoral Institute (IFE) designed the sections for electoral purposes so that each included a minimum of 50 and a maximum of 1500 voters. Additionally, each electoral section was conceived to fall fully within a single municipality and to avoid the partition of voters from the same locality.

The demarcation had no political considerations, which is essential for the validity of the identification strategy. When the IFE demarcated the electoral sections in 1994, it represented an autonomous institution administered by a body of councilors, who are citizens with no links to any party or state branch. To get a sense of the institutional strength of the IFE, note that the 1994 federal elections were the first conducted by the IFE, and it was the first time in Mexican history that elections were free from vote fraud (Schedler (2004)). Additionally, the electoral sections were demarcated inside already set municipalities and electoral districts. Hence, the political manipulation of electoral sections could not have allowed for the grouping of voters to win municipalities or electoral districts, a strategy commonly known as gerrymandering.

The variation in the PRI's control of the state government comes mostly from states switching from the PRI to another party. The PRI not only held México's presidency for 71 years, but for a long period it also controlled the politics of all states, many of which are still under the control of the PRI. In our period of analysis (1991 - 2010), out of 31 sates, 17 states experienced a change in party in the state government.²⁴ Additionally, out of these states, the PRI recently regained the state government in four.

 $^{^{24}13}$ out the other 14 states have always had a state governor of the PRI.

The main outcome of our empirical analysis is the vote share for the PRI in municipal elections. Since municipal and state government elections are commonly staggered, the electoral support for the PRI in interim municipal elections represents a signal to the PRI about the good performance of its political brokers in mobilizing its networks. Hence, if the PRI is able to successfully mobilize its clientelistic networks when it controls the state government, this should be reflected in its electoral support in municipal elections. In addition, municipal elections also have the advantage that they take place every three years, which provides a large sample size and allows us to analyze pretrends.²⁵

Our analysis is at the electoral section level and our estimation equation follows directly from aggregating (21) to the electoral section level,²⁶

$$\pi_{emst} = \beta_0 + \beta_1 \cdot I_{st}^{PRI} + \beta_2 \cdot fit_{ems} + \beta_3 \cdot I_{st}^{PRI} \cdot fit_{ems}$$
(22)

$$+\Gamma' X_{emst} + \Delta' G_{ems} + \eta_{ms} + \phi_y + \varepsilon_{emst}$$
⁽²³⁾

where π_{emst} is the vote share for the PRI in electoral section e in municipality m in state s in year t, I_{st}^{PRI} is an indicator of whether the PRI controls the state government at the time of the election, and fit_{ems} is the communal land fit aggregated at the electoral section level,²⁷ η_{ms} are municipality fixed effects, which control for municipality characteristics that are invariant over time. A more robust specification includes electoral section fixed effects η_{ems} , and therefore, identification only comes from communal lands that experienced a change in the party that controls the state government. ϕ_t are year dummies that control for national level trends. A more robust specification includes state-year dummies, $\phi_{s,t}$, which control for state-level trends. Standard errors are clustered at the state level.

Recall that the model from Section 3 predicts that $\beta_2 = 0$ and $\beta_3 > 0$. In words, communal lands with larger fit should exhibit a larger support for the PRI but only when the PRI controls the state government.

 X_{emst} includes controls for area, number of registered voters and communal land share, and the interaction of these variables with I_{st}^{PRI} . X_{emst} addresses the concern that fit may pick differences in these variables, which might be associated with other correlates of electoral support for the PRI. G_{ems} includes a series of flexible polynomials of latitude and longitude of the centroid of each communal land interacted with state dummies. G_{ems} addresses the

²⁵The available state election data provides little variation to empirically test the implications of the model. State government elections take place every six years and the data at the section and municipal level is not available for many states for the first half of the period of analysis. This lack of data constitutes a serious problem since identification comes from states that switch from the PRI to another party. Many states have missing state government election data under the PRI, which removes them from the sample of identifying observations.

 $^{^{26}}$ For details on the derivation of the estimation equation, please see Appendix 7.

 $^{{}^{27}}fit_{e,m,s} = \alpha_{e,m,s} \cdot \sum_{i} \rho_{c_i,e,m,s} \cdot fit_{c_i,m,s} \text{ where } \alpha_{e,m,s} \text{ is the share of voters from communal lands in the electoral section, } \rho_{c_i,e,m,s} \text{ is the share of voters from communal lands in the electoral section that come from communal land <math>c_i$, and $fit_{c_i,m,s}$ is the fit of communal land c_i . To construct $fit_{e,m,s}$ we approximate $\alpha_{e,m,s}, \rho_{c_i,e,m,s}, \text{ and } fit_{c_i,m,s} \text{ using area shares: } \alpha_{e,m,s} = \frac{area_{c_i,m,s} \cap area_{e,m,s}}{area_{e,m,s}}, \rho_{c_i,e,m,s} = \frac{area_{c_i,m,s} \cap area_{e,m,s}}{area_{e,m,s}}, \alpha_{c_i,e,m,s} = \sum_{e \in E_{c_i,m,s}} \frac{area_{c_i,m,s} \cap area_{e,m,s}}{area_{c_i,m,s}} \frac{area_{c_i,m,s} \cap area_{e,m,s}}{area_{e,m,s}}.$

concern that the spatial distribution of *fit* is correlated with the electoral support for the PRI.

The identification assumption is that fit is plausibly exogenous, and consequently, uncorrelated with omitted unobservable variables that correlate with PRI's electoral support. The prediction of the model that $\beta_2 = 0$ helps us to address the validity of the identification assumption. If $\beta_2 > 0$, it would cast doubt about the plausible exogeneity of fit. Additionally, we conduct a placebo analysis, which we describe later in detail, that supports the validity of the identification.

4.2 Data

We use election data at the electoral section and the municipal level for all municipal elections from 1994 to 2010 for which data is available as our main outcome variable.²⁸ Prior to 1994, electoral figures were directly manipulated by the PRI through vote fraud practices. The election data at the section level comes from the state electoral institutes, which are responsible for conducting municipal and state governor elections. The election data at the municipal level comes from several sources: the Alain de Remes' 1980-1990 electoral data base, the BANAMEX-CIDAC's 1985-2010 electoral data base, and different state electoral institutes.

To compute the measure of *fit* used in our empirical analysis, we use geospatial data on the location of the communal lands and the electoral sections in México. The electoral section data is from the Federal Electoral Institute (IFE). The communal land data comes from the Agrarian National Registry (RAN), which collected the data during the rollout of México's land certification program –the PROCEDE. The RAN facilitated the spatial location of all communal lands that completed the certification stage of the program or were in the process of certification by the end of 2006. The sample includes more than 95% of the communal lands in México.

To construct an indicator of whether the PRI controls the state government at the time of the election, we used electoral data at the state level for all state gubernatorial elections from 1985 to 2010. The source of this data is the BANAMEX-CIDAC's 1985-2010 electoral data base.

Finally, the data on other regressors of interest and policy outcomes come from the 2007 Agricultural Census, several Population Censuses (1990 to 2010), and the State and Municipal Data Base System (1994-2010). The source of all these data sets is the Mexican National Institute of Statistics and Geography (INEGI).

 $^{^{28}\}mathrm{The}$ data at the municipality level is available for all elections.

5 Results

5.1 Preview of Results

Figure 5 show that communal lands with a larger *fit* exhibit a larger PRI vote share only when the PRI controls the state government. Figure 5 shows two plots that illustrate the relationship between the vote share for the PRI and communal land *fit*. The plot on the left indicates the cases when the PRI controls the state government and the plot on the right depicts the cases when it does not. As predicted by the model, the left plot shows that communal lands with a larger *fit* exhibit a larger electoral support for the PRI when it controls the state government. Additionally, the right plots suggests that *fit* presents no clear association with the electoral support for the PRI when another party is the incumbent.

Figure 6 illustrates the evolution of the vote share for the PRI over time for the states that experience a change in state government control from the PRI to another party. The data is divided into communal lands above and below the median level of *fit*. As predicted, *Figure 5* indicates that communal lands with a larger *fit* exhibit a larger electoral support for the PRI only when it controls the state government. Additionally, there are no differential trends in electoral support for the PRI in communal lands with different *fit*. Hence, we could interpret our estimation equation as a difference in differences where the changes in the party that controls the state government are plausibly exogenous.

5.2 Results

Table 1 reports the results of our empirical specification that tests whether communal lands with a larger *fit* exhibit a larger PRI vote share when the PRI controls the state government. Column (1) presents the baseline specification in equation (22), column (2) includes spatial controls for the location of communal lands within each state, column (3) introduces electoral section fixed effects, and column (4) adds state-year fixed effects.

As predicted, all columns in Table 1 indicate that fit has a significant positive effect on the PRI's vote share when the PRI controls the state government. As also predicted by the model, columns (1) and (2) indicate that the effect of fit is indistinguishable from zero when another party controls the state government. The results in column (4) suggest that, when the PRI is the incumbent party at the state government level, a one standard deviation increase in fit corresponds to a 1.5 percentage points (pp) increase in the vote share for the PRI. To interpret the importance of the coefficient, note that 1.5 pp account for 19% of the 8 pp of incumbency advantage that the PRI enjoys when it controls the state government. In addition, in 11% of municipal elections, the winning margin is less than 1.5 pp.

The predictions of the model are supported by the results. While a larger *fit* leads to a larger PRI vote share, the effect is only evident when the PRI controls the state government.

5.3 Placebo

We conduct a placebo exercise to address any concerns that results might be driven by omitted unobservable variables that correlate with PRI's electoral support. In our placebo exercise, instead of considering the incumbency of the PRI in the state office, we use its incumbency in the municipal office. PRI's control of the municipal government is correlated with PRI's electoral support but should not allow the PRI to mobilize its clientelistic networks on communal lands. Commissariats have weak links with municipal authorities (Hevia de la Jara (2010)) and municipal governments are very weak relative to the state governments, which are responsible for the execution of the bulk of public programs at the local level. Hence, if *fit* captures the variation in omitted unobservable variables that are correlated with the PRI's electoral support, our placebo estimates should also be significantly positive. However, if our identification assumption is valid, estimates should be zero.

Table 2 replicates columns (1) to (4) in Table 1 and looks at the effect of *fit* when the PRI controls the municipal government. Results support the validity of our identification strategy. They indicate that a larger *fit* does not contribute to the electoral support for the PRI when the PRI controls the municipal government at the time of the election.

6 Aggregate Effects of Clientelism

We now turn to the aggregate effects of clientelism on electoral and policy outcomes. Our goal in this section is twofold. First, we want to show that the presence of clientelistic networks on communal lands has an aggregate effect on election outcomes. This is particularly relevant since, e.g., a priori there could be a general equilibrium interaction across places, and therefore, aggregate effects aren't just the aggregation of the communal land-level results.²⁹ Additionally, note that the effect we estimate might not solely reflect the PRI's monitoring over its political brokers.³⁰

To identify the aggregate effect of clientelism on election outcomes, we look at municipality level outcomes and exploit a difference in differences strategy where we use private lands as a control group for communal lands. In doing this, we use the fact that there is a larger presence of clientelistic networks operating in communal lands than in private ones. Consequently, communal lands should exhibit a larger electoral support for the PRI relative to private lands when the PRI controls the state government.

Our second goal is to see whether the presence of clientelistic networks on communal lands has aggregate effects on policy outcomes. In the model in *Section 3* we show that communal lands where clientelistic networks operate more extensively have lower investments in public goods when the PRI controls the state government. The intuition is that funding a political broker has a larger electoral return in communal lands and, consequently, it crowds out the provision of public goods.

²⁹We are currently exploring this theoretical possibility.

 $^{^{30}}$ Unfortunately, we cannot look at the interaction of the share of communal land with aggregate *fit* since we do not have enough variation in *fit* at the municipal level.

To estimate the effect of clientelism on policy outcomes, we look at schooling outcomes and use an identification strategy analogous to the one we use for the case of the election outcomes. Schooling outcomes are an appropriate measure of public good provision for two reasons. First, since the 1992 National Agreement for the Modernization of Basic Education, states have been responsible for the administration of basic education at the local level in México (Helper et al. (2006), Santibañez et al. (2005)).³¹ Second, they represent an appropriate measure of public goods, since exclusion is hard. Figure 7 illustrates that it is hard to exclude students from a communal land or those close to a communal land from attending a nearby school.

6.1 Empirical strategy

Our baseline specification to test the aggregate effect of the presence of clientelistic networks on communal lands on election and policy outcomes is the following:

$$y_{msy} = \beta_0 + \beta_1 \cdot I_{sy}^{PRI} + \beta_2 \cdot I_{sy}^{PRI} \cdot cl_{ms} + \beta_3 \cdot I_{sy}^{PRI} \cdot al_{ms} +$$
(24)

$$\beta_4 \cdot v_{sy} + \beta_5 \cdot cl_{ms} \cdot v_{sy} + \beta_6 \cdot al_{ms} \cdot v_{sy} + \eta_m + \phi_{sy} + \varepsilon_{msy} \tag{25}$$

where y_{msy} is an outcome of interest in municipality m in state s in year y, I_{sy}^{PRI} is an indicator of whether the PRI controls the state government at the time of the election, cl_{ms} is the share of communal land area over the total area of a given municipality, al_{ms} is the share of total agricultural land over the total area of a given municipality, and v_{sy} is the vote share that the PRI obtained in the last state government election by the year y. η_m are municipality fixed effects, and hence, identification comes from within variation in municipalities that experienced a change in the party that controls the state government.³² ϕ_{sy} are either year dummies or state-year dummies that control for national-level or state-level trends.³³ Standard errors are clustered at the state level.

 β_2 captures the effect of the PRI's control of the state government on municipalities with a larger share of communal lands. We expect $\beta_2 > 0$ when the outcome variable is a measure of the PRI's electoral support, and $\beta_2 < 0$ when the outcome variable is a measure of schooling supply.

There is a concern that, in the case of the electoral outcomes, β_2 might be capturing reverse causality, i.e., that differential trends in the electoral support for the PRI in communal

 $^{^{31}}$ The majority of the financial resources still comes from the Federal Subsecretary of Basic Education (Subsecretaría de Educación Básica - SEP). However, states do raise their own funds to invest in new teachers or schools.

With respect to other potential outcomes for public goods, conversely, the public health system is mostly administered by the federal government. Between the Mexican Social Security Institute (Instituto Mexicano del Seguro Social - IMSS) and the Institute for Social Security and Services for State Workers (Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado - ISSSTE), the federal government provides health care coverage to most individuals. The IMSS and the ISSSTE are federal government organizations that provide health care to workers in the private sector and federal employees, respectively.

 $^{^{32}\}eta_m$ control for municipality characteristics that are invariant over time, including the levels of cl_{ms} and al_{ms} .

³³When ϕ_{sy} are state-year dummies, I_{sy}^{PRI} and v_{sy} are absorbed.

lands drive party changes in the state government. This concern is mitigated in the most robust specification that includes control for state-level trends. This specification accounts for any differential trend in the electoral support for the PRI in communal lands that is correlated with state-level trends. In addition, in all specifications we control for the interaction between the state vote share that the PRI obtained in the last state gubernatorial election and the municipal shares of both communal and agricultural land. Further, we conduct a placebo analysis as we did above.

6.2 Preview of Results on Election Outcomes

For a preview of the results, Figure 8 illustrates the vote share for the PRI over time for the states that experience a change in state government control from the PRI to another party. The data is divided into municipalities above and below median level of communal land in the municipality. Figure 8 indicates no presence of differential pretends between municipalities above and below the median municipal level of communal land under PRI's state governments. Additionally, Figure 8 shows that municipalities above the median municipal level of communal land exhibit a larger voter share for the PRI when the PRI controls the state government. However, such a difference disappears the moment the PRI loses the state government.

6.3 Results on Election Outcomes

Table 3 reports the results of our empirical specification on election outcomes. Columns (1) and (3) present the baseline specification as characterized in equation (24), and columns (2) and (4) add state-year dummies. Columns (3) and (4) add controls that capture municipal economic development.

As predicted, all columns in Table 3 indicate that a larger share of communal lands has a significant positive effect on the PRI's vote share when the PRI controls the state government. Results in column (2) indicate that the baseline result is robust to the introduction of state-year fixed effects, which suggests that state-level trends in support for the PRI are not driving the results. To interpret the importance of the coefficients, the specification in column (4) suggests that, when the PRI controls the state government, a one standard deviation increase in the share of communal lands corresponds to a 2.6 pp increase in the vote share for the PRI in municipal elections. Note that 2.6 pp account for 30% of the 8 pp of incumbency advantage that the PRI enjoys when it controls the state government. In addition, in 18% of municipal elections the winning margin is less than 2.6 pp.

To deal with the concern that communal lands are not only capturing the presence of clientelistic networks but also potential differences in economic development that correlate with electoral support for the PRI, columns (3) and (4) include a series of controls that account for these potential differences. These consist of the share of households with access to electricity, piped water and connection to drainage, which are the measures of economic development that are consistently captured in all censuses in México. Results from columns (3) and (4) indicate that our findings are robust. We should note a caveat on the estimates we present in columns (3) and (4). The model suggests that clientelism might result in a lower provision of public goods. Consequently, when we include controls that capture economic development, we control for outcome variables, which is a strategy that delivers unidentified estimates (Angrist and Pischke (2009)). Thus, we provide estimates in columns (3) and (4) for robustness but do not consider them the most preferred specification.

Table 4 replicates the estimates from Table 3 using an indicator of PRI winning the municipal election as an outcome instead, and has similar implications. Overall, the findings in Table 3 and Table 4 support that municipalities with a larger share of communal lands exhibit larger electoral support for the PRI when the PRI controls the state government.

To address the reverse causality concern, we conduct a placebo test using the incumbency of the PRI in the municipal office instead of its incumbency in the state office. Results in Table 5 indicate that municipalities with a larger share of communal lands do not present differential electoral support for the PRI when the PRI controls the municipal government.

Note that municipalities with a larger share of agricultural lands, which include both communal and private lands, exhibit a lower vote share for the PRI when the PRI controls the municipal government. This phenomenon simply reflects the downward trend we observe in Figure 8. During the period we study, there is a significant decrease in the support for the PRI. The reason this decrease is larger for municipalities with a larger share of agricultural lands is that urban areas were the first ones to turn against the PRI in the late 1980s and early 1990s.

6.4 Results on Policy Outcomes

Table 6 reports the results on schooling supply outcomes. Odd columns present the baseline specification, as characterized in equation (24), and even columns add state-year dummies. In the first two columns, the outcome is the number of primary and secondary schools per 1,000 inhabitants. The outcome in columns (3) and (4) is the number of primary and secondary teachers per 1,000 inhabitants. In the last two columns, the outcome is the number of students that attend primary and secondary schools per 1,000 inhabitants.³⁴

Overall, the estimates in Table 6 suggest that municipalities that have a larger share of communal lands have a significantly lower educational supply when the PRI is the party in the state government. Results in column (2) indicate that, when the PRI is the incumbent party, a one standard deviation increase in the share of communal lands corresponds to a 3.93 percentage drop in the number of primary and secondary schools relative to the sample mean. The third column shows that one standard deviation more in the share of communal lands is associated with a 3.09 percentage decrease in the number of primary and secondary schools relative to the sample mean, if the PRI is in power. Estimates in column (5) imply that, when the PRI controls the state government, a one standard deviation increase in the

³⁴The number of students is not necessarily indicative of the quality of the education supply. However, a lower number of students enrolled per capita confirms the effect of a worse schooling supply measured by the two other outcome variables. The results do not change when primary and secondary education are consider separately.

share of communal lands denotes a 2.24 percentage drop in the number of students enrolled in primary and secondary schools relative to the sample mean. These results are robust to introducing state-year fixed effects.

To address the worry that communal lands are not only capturing the presence of clientelistic networks but also differences in economic development, Table 7 controls for the economic development of the municipalities. Results are robust to adding these controls.

Overall, the findings in Table 6 and Table 7 support that municipalities with a larger share of communal lands exhibit a reduced provision of public goods - measured by schooling supply - when the PRI controls the state government.

Finally, our placebo estimates in Table 8 indicate that municipalities with a larger share of communal lands do not present differences in schooling outcomes when the PRI is in office at the municipal level.

7 Conclusion

In this paper, we make two contributions to our understanding of how clientelistic transactions prevail in a secret ballot context, and the effect of clientelism on electoral and policy outcomes. Our main contribution is to provide empirical evidence that suggests that the PRI uses electoral results to monitor political brokers to make sure they deliver the votes of its clientelistic networks.

Exploiting plausibly exogenous differences in the *fit* between communal lands and electoral sections that facilitate the PRI's supervision of its brokers, we show that communal lands with a larger *fit*, which enable better PRI's monitoring capacity, exhibit a larger electoral support for the PRI. This phenomenon only happens when the PRI controls the state government, and consequently, the resources necessary to fund and incentivize its brokers. While the direct evidence on the monitoring of brokers by the PRI is from the field work, the empirical findings are consistent with these observations. There seems to be no other explanations that would account for these empirical findings.

Second, we show that, when the PRI controls the state government, municipalities with a larger share of communal lands exhibit an increased vote share for the PRI and a lower provision of public goods, measured by schooling supply. We use a difference in differences strategy where we compare municipalities with different shares of communal lands while controlling for the share of agricultural land, which includes communal and privates lands. Results are not driven by differential pretrends or difference in the economic development of communal and private lands. Our second contribution provides empirical support to the literature that argues that clientelism undermines democracy and economic development (Keefer 2007, Kitschelt and Wilkinson 2007, Lyne 2007).

These results have several policy implications. Naturally, there is the need to clarify and strengthen the operation rules of social programs. The lack of transparency of the rules contributes significantly to the manipulation of programs for clientelistic purposes in México (Martínez 2010). Out of the federal and state programs registered in the Initiative for the Strengthening of the Institutionalization of the Social Programs in México (IPRO), 21% lack

operation rules, 27% have no beneficiary list, 40% have a beneficiary list but it is not public, 27% have no criteria to select beneficiaries, and 32% have no evaluation mechanisms.³⁵ Additionally, there might be scope for a demarcation of electoral sections that minimizes the capacity of parties to monitor its political brokers. Further, in case such a demarcation was not possible, since our findings identify the locations where clientelistic exchanges are more likely to prevail, they can be used to target the areas where to focus to crack down on clientelistic practices.

In future work, to provide further evidence of the effect of the monitoring of brokers by the PRI on election and policy outcomes, we will look at the effect of *fit* on turnout at the electoral section level, and the allocation of social programs and schooling supply at the communal land level. We have already requested turnout data to the IFE, data on allocation of social programs to the Secretariat of Social Development, and data on the location and opening date of all primary and secondary schools in the whole of México to the Secretariat of Public Education.

 $^{^{35}\}mathrm{IPRO}$ is a website where federal and state governments can voluntarily register the social programs they are executing. http://www.programassociales.org.mx/

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Appendix A: Fieldwork and Popular Press Evidence

I conducted fieldwork in June 2012, the month prior to the presidential election, in twelve municipalities of four Mexican states: México, Morelos, Puebla and Tlaxcala. On average I interviewed three commissariats or former commissariats (in case of short tenure of the current one) and two peasants in each municipality. In addition, I complemented the fieldwork evidence with qualitative evidence from the Mexican press to give a broader view of these issues across the whole of México.

Here there are some anecdotal evidence excerpts from the fieldwork and the popular press, which provide supporting evidence on the presence of the PRI's clientelistic practices in communal lands in the states under PRI control.

On the importance of the alignment of communal lands and commissariats to the PRI to receive assistance from PRI state governments:

In the state of México, a commissariat stated, "the PRI government listens to everybody equally but, logically, it does not give the same support to everybody; it supports its people more."

In the state of México, another commissariat affirmed, "it is easier for a commissariat to get support from people from his own party since, if they are not from his party, they put a series of obstacles in his way."

After a flood in the state of Tabasco, the PRI's state government delivered aid to its supporters in communal lands under the threat that they would no longer get any help if they did not attend rallies and vote for the PRI's candidate in the upcoming election. The community from the *ejido* Las Coloradas in the municipality of Cárdenas, also affected by floods, did not receive any aid since it had historically voted for the PRD (Reforma (2000)).

A commissariat explained, "when the PRI was in government, the conditioning was a serious problem. If we voted for the PRI, there was aid, if we did not, we were marginalized. With the change in government, everything is more flexible; people can vote for the party they want and the aid will still come."

On the conditioning of aid within communal lands by commissariats in PRI states:

When asked about the distribution of the resources that come to the *ejido*, a commissariat mentioned, "most people support the PRI, those that do not vote for the PRI are excluded; they clearly know they cannot get anything from me."

Several peasants hinted that government aid only makes it to the party supporters within the *ejido*.

After a flood in the state of Tabasco, a peasant from the *ejido* Rafael Martínez de Escobar in the municipality of Huimanguillo complained that the government promised him relief but that the commissariat informed him that "by the instruction of the state government, assistance is only given to PRI's supporters" (Marí (2001)).

On the PRI's work to control commissariats:

In the last election for commissariat in largest *ejido* in the state of Puebla, the exiting commissariat and the PRI's municipal president were charged with fraud to facilitate a win by the PRI candidate. Witnesses argue that the commissariat, illegally assisted by the

municipal president, issued a number of permits to represent absent peasants that exceeded the number agreed upon by the candidates before the election. The municipal president also contributed to the issuing of such permits even though by regulation the commissariat is the only one entitled to do so. Also, in the course of the election they allowed peasants that did not belong to the *ejido* to vote. Dead people also appeared on the list of voters of the election. The tenure of the elected commissariat is about to end and the decision of the agrarian tribunal that has to rule on the validity of the election is still pending. Copies of the witnesses declaration to the agrarian tribunal are available upon request.

The former commissariat of the *ejido* El Quemado in the municipality of Gómez Palacio in the state of Durango was accused of vote buying and other irregularities in the elections to pick his successor. He, also a state legislator of the PRI, was alleged to have paid 3,000 pesos (\$230) for each vote and to allow peasants that were not part of the *ejido* to vote (Acosta 2009).

On the CNC:

Commissariats and peasant in the state of México report assistance from the CNC.

Peasants from communal lands in the states of Michoacán and Nayarit acknowledge that the PRI and the CNC use them for electoral purposes but claim that it is the only way they can get some support when they are in power (Reforma (2005)).

On the eve of the gubernatorial elections in the state of Oaxaca, it was reported that the PRI distributed 50 tons of fertilizers to the peasants of the *ejido* 20 de Noviembre that were affiliated with the CNC (García et al. 2004).

A commissariat in the state of Puebla mentioned, "the CNC was here when the PRI was in the government. With the change in government, it is no longer present."

A commissariat from the state of Morelos pointed out, "the CNC fell with the PRI government because the assistance is ultimately from programs that belong to the state and federal governments."

When the PRI recovered the state governorship in 2011 in the state of Tlaxcala, the president of the CNC in this state acknowledged that the peasant organization had lost presence in the state as a result of the political rivalry with the past two state governments. However, he asserted that he trusted that the organization would be able to recover its strength with the return of the PRI to the state government (Osorno Xochipa (2011)).

A commissariate of the state of Tlaxcala indicated, "the CNC has disappeared for a long time but it is now coming back with the return of the PRI to the state government."

Another commissariat from the state of Tlaxcala stated "I do not support the PRI but, if the CNC returns, we will have to support the PRI so that we get help."

Appendix B: Derivation of Estimation Equation

The vote share for the PRI in electoral section e in municipality m in state s in year t can be decomposed as follows

$$\pi_{e,m,s,t} = \alpha_{e,m,s} \cdot \pi_{c,e,m,s,t} + (1 - \alpha_{e,m,s}) \cdot \pi_{nc,e,m,s,t}$$

$$(26)$$

where $\alpha_{e,m,s}$ is the share of voters from communal lands in the electoral section, and $\pi_{c,e,m,s,t}$ and $\pi_{nc,e,m,s,t}$ are the vote shares for the PRI of the communal land voters and the noncommunal land voters, respectively. In turn,

$$\pi_{c,e,m,s,t} = \sum_{i} \rho_{c_i,e,m,s} \cdot \pi_{c_i,m,s,t}$$
(27)

where $\rho_{c_i,e,m,s}$ is the share of voters from communal lands in the electoral section that come from communal land c_i and $\pi_{c_i,m,s,t}$ is the vote share for the PRI of the voters that come from communal land c_i . Replacing $\pi_{c_i,m,s,t}$ with (21), and $\pi_{nc,e,m,s,t}$ with

$$\pi_{nc,e,m,s,t} = \beta_0 + \beta_{1,nc} \cdot I_{s,t}^{PRI} + \eta_{nc} + \varepsilon_{nc,e,m,s,t}$$
(28)

it follows that

$$\pi_{e,m,s,t} = \beta_0 + \beta_1 \cdot I_{s,t}^{PRI} + \beta_2 \cdot fit_{e,m,s} + \beta_3 \cdot fit_{e,m,s} \cdot I_{s,t}^{PRI} + \eta_{e,m,s} + \varepsilon_{e,m,s,t}$$
(29)

where $fit_{e,m,s} = \alpha_{e,m,s} \cdot \sum_{i} \rho_{c_i,e,m,s} \cdot fit_{c_i,m,s}$.

Appendix C: Figures and Tables



Figure 1: Distribution of communal lands in México

Note: State boundaries are in black, communal lands in green, and non-communal land areas in white.



(b) Del Nayar in Nayarit state

Figure 2: Examples of the variation in the correspondence between communal lands and electoral sections from Coahuila and Nayarit states

Note: The figures illustrate the variation in the correspondence between communal lands and electoral sections. Municipal boundaries are in black, electoral sections in dotted blue, communal lands in green, and non-communal land areas in green.



(a) Concepcion del Oro Mazapil, and Melchor Ocampo in Zacatecas state



(b) Tierra Blanca in Veracruz state

Figure 3: Examples of the variation in the correspondence between communal lands and electoral sections from Veracruz and Zacatecas states

Note: The figures illustrate the variation in the correspondence between communal lands and electoral sections. Municipal boundaries are in black, electoral sections in dotted blue, communal lands in green, and non-communal land areas in green.



Figure 4: Examples of communal land fit

Note: The *fit* of a communal land is the weighted average proportion of communal land voters in the electoral sections where they vote. In *Case a* almost exclusively peasants of the communal land vote in the electoral section overlapping with the communal land, and hence, the communal land has a large *fit*. In *Case b* communal land peasants vote together with a significant amount of individuals from outside the communal land, and therefore, the communal land has a small *fit*.



Figure 5: The relationship between communal land fit and the PRI's vote share under PRI and non-PRI governors

Note: The PRI's vote share in municipal elections is on the y-axis and the communal land fit on the x-axis. The left figure indicates the case when the PRI controls the state government and the right figure when it does not.



Figure 6: The effect of high and low fit on the PRI's vote share under PRI and non-PRI governors

Note: The PRI's vote share in municipal elections is on the y-axis and the election since the change from the PRI in state government is on the x-axis. The data is divided into communal lands above and below the median level of *fit*. The year when the change took place is normalized to zero and indicated with a red vertical line. Thus, elections during the PRI's state governments take negative values and elections during state governments of other parties take positive values. By construction, only municipalities that experienced a change in party at the state government level are included in the plot.



Figure 7: Example of the location of schools

Note: The figure illustrates that primary schools are non-excludable. Municipal boundaries are in black, electoral sections in dotted blue, communal lands in green, non-communal land areas are in white, and primary schools yellow squares.



Figure 8: The effect of high and low communal land on the PRI's vote share under PRI and non-PRI governors

Note: The PRI's vote share in municipal elections is on the y axis and the election since the change from the PRI in state government is on the x axis. The data is divided into municipalities above and below median level of communal land in the municipality. The year when the change took place is normalized to zero and indicated with a red vertical line. Thus, elections during the PRI's state governments take negative values and elections during state governments of other parties take positive values. By construction, only municipalities that experienced a change in party at the state government level are included in the plot.

	(1)	(2)	(3)	(4)
PRI's Governor	.1214***	.1259***	.1723***	
	[.0422]	[.0423]	[.0556]	
Fit	-0.0047	-0.0067		
	[.0229]	[.0243]		
PRI's Governor * Fit	.0808***	.0859***	.1249**	0.0717^{*}
	[.0289]	[.0291]	[.0486]	[.0426]
Effect (pp)	1.71	1.82	2.64	1.52
Municipality Fixed Effects	Yes	Yes		
Electoral Section Fixed Effects			Yes	Yes
Spatial controls		Yes		
State - Year Fixed Effects				Yes
Mean Outcome	0.5045	0.5045	0.5045	0.5045
Mean Fit	0.4235	0.4235	0.4235	0.4235
Standard Deviation Fit	0.2115	0.2115	0.2115	0.2115
Observations	133943	133943	133943	133943
R-squared	0.2808	0.2883	0.5062	0.567

Table 1: The effect of fit on the PRI's vote share in municipal elections

Note: In all specifications, the unit of observation is the electoral section, we include year fixed effects, and we cluster standard errors at the state level. Also we control for the area, number of registered voters and communal land share, and their interactions with PRI's Governor. Fit is the area weighted average of the communal land fit of the communal lands that overlap with the electoral section, times the share of the electoral section that overlaps with communal lands. The communal land fit captures the area weighted average share of each section that overlaps with the communal land. Spatial controls include flexible polynomials of latitude and longitude of the centroid of each electoral section interacted with state dummies. Effect is the impact of a one standard deviation increase in fit. pp indicates percentage points. * p<.1, ** p<.05, *** p<.01.

	(1)	(2)	(3)	(4)
PRI's Mayor	0.0142	0.0115	.0546**	.0461**
	[.0238]	[.0241]	[.0199]	[.0202]
Fit	0.0018	0.0047		
	[.0175]	[.0175]		
PRI's Mayor * Fit	0.0104	0.009	0.0149	0.0139
	[.0165]	[.0163]	[.0125]	[.013]
Effect (pp)	0.22	0.19	0.32	0.29
Municipality fixed effects	Yes	Yes		
Electoral fixed effects			Yes	Yes
Spatial controls		Yes		
State - Year Fixed Effects				Yes
Mean Outcome	0.5044	0.5044	0.5044	0.5044
Mean Fit	0.4236	0.4236	0.4236	0.4236
Standard Deviation Fit	0.2115	0.2115	0.2115	0.2115
Observations	133730	133730	133730	133730
R-squared	0.2824	0.2893	0.2813	0.3467

Table 2: Placebo on the effect of fit on the PRI's vote share in municipal elections

Note: In all specifications, the unit of observation is the electoral section, we include year fixed effects, and we cluster standard errors at the state level. Also we control for the area, number of registered voters and communal land share, and their interactions with PRI's Mayor. Fit is the area weighted average of the communal land fit of the communal lands that overlap with the electoral section, times the share of the electoral section that overlaps with communal lands. The communal land fit captures the area weighted average share of each section that overlaps with the communal land. Spatial controls include flexible polynomials of latitude and longitude of the centroid of each electoral section interacted with state dummies. Effect is the impact of a one standard deviation increase in fit. pp indicates percentage points. * p<.1, ** p<.05, *** p<.01.

	(1)	(2)	(3)	(4)
PRI's Governor	-0.0214		0.0369	
	[.0264]		[.1576]	
Communal Land * PRI's Governor	.1565**	.1409***	.1507**	.1405***
	[.061]	[.0376]	[.0616]	[.0459]
Agricultural Land * PRI's Governor	-0.0067	-0.0473	-0.0053	-0.0425
	[.0462]	[.0466]	[.0416]	[.0412]
Effect (pp)	5.34	4.81	5.14	4.80
State - Year Fixed Effects		Yes		Yes
Controls for Economic Development			Yes	Yes
Mean of Ouctome	0.541	0.541	0.5408	0.5408
Mean of Communal Land	0.2333	0.2333	0.2332	0.2332
Standard Deviation of Communal Land	0.1847	0.1847	0.1846	0.1846
Mean of Agricultural Land	0.5249	0.5249	0.5252	0.5252
Standard Deviation of Agricultural Land	0.2837	0.2837	0.2837	0.2837
Observations	13902	13902	13855	13855
R - squared	0.5603	0.6577	0.5709	0.6641

Table 3: Difference in differences estimates of the effect of a PRI governor on the PRI's vote share in municipal elections

Note: In all specifications, the unit of observation is a municipality, we include municipality and year fixed effects and we cluster standard errors at the state level. Controls for economic development include the share of households with access to electricity, piped water and connection to drainage, and their interaction with a dummy that indicates a PRI governor at the time of the election. Effect is the impact of a one standard deviation increase in share of communal land. pp indicates percentage points. * p<.1, ** p<.05, *** p<.01.

	(1)	(3)	(2)	(4)
PRI's Governor	-0.0811		-0.1106	
	[.1195]		[.5689]	
Communal Land * PRI's Governor	.4844*	.3658*	.4436*	.392*
	[.246]	[.2053]	[.2467]	[.2272]
Agricultural Land * PRI's Governor	-0.0025	-0.1809	-0.0058	-0.1926
	[.1214]	[.1592]	[.1237]	[.1754]
Effect (pp)	15.54	11.73	14.23	12.57
State - Year Fixed Effects		Yes		Yes
Controls for Economic Development			Yes	Yes
Mean of Ouctome	0.5759	0.5759	0.5756	0.5756
Mean of Communal Land	0.2333	0.2333	0.2332	0.2332
Standard Deviation of Communal Land	0.1847	0.1847	0.1846	0.1846
Mean of Agricultural Land	0.5249	0.5249	0.5252	0.5252
Standard Deviation of Agricultural Land	0.2837	0.2837	0.2837	0.2837
Observations	13902	13902	13855	13855
R - squared	0.3481	0.4661	0.3539	0.4692

Table 4: Difference in differences estimates of the effect of a PRI governor on whether the PRI wins in municipal elections

Note: In all specifications, the unit of observation is a municipality, we include municipality and year fixed effects and we cluster standard errors at the state level. Controls for economic development include the share of households with access to electricity, piped water and connection to drainage, and their interaction with a dummy that indicates a PRI governor at the time of the election. Effect is the impact of a one standard deviation increase in share of communal land. pp indicates percentage points. * p<.1, ** p<.05, *** p<.01.

	(1)	(2)	(3)	(4)
PRI's Mayor	0.006		0.0142	
	[.0215]		[.1156]	
Communal Land * PRI's Mayor	-0.0076	-0.0064	-0.0137	-0.0301
	[.0328]	[.0227]	[.0288]	[.0229]
Agricultural Land * PRI's Mayor	0584*	0462***	0608**	0733***
	[.0298]	[.0125]	[.0283]	[.0182]
Effect (pp)	-0.14	-0.12	-0.25	-0.56
State - Year Fixed Effects		Yes		Yes
Controls for Economic Development			Yes	Yes
Mean of Ouctome	0.5409	0.5409	0.5407	0.5407
Mean of Communal Land	0.2333	0.2333	0.2331	0.2331
Standard Deviation of Communal Land	0.1846	0.1846	0.1846	0.1846
Mean of Agricultural Land	0.5248	0.5248	0.525	0.525
Standard Deviation of Agricultural Land	0.2837	0.2837	0.2837	0.2837
Observations	13822	13822	13779	13779
R - squared	0.5648	0.6608	0.5728	0.6674

Table 5: Difference in differences estimates of the effect a PRI mayor on the PRI's vote share in municipal elections

Note: In all specifications, the unit of observation is a municipality, we include municipality and year fixed effects and we cluster standard errors at the state level. Controls for economic development include the share of households with access to electricity, piped water and connection to drainage, and their interaction with a dummy that indicates a PRI governor at the time of the election. Effect is the impact of a one standard deviation increase in share of communal land. pp indicates percentage points. * p<.1, ** p<.05, *** p<.01.

utcomes	Schools	Schools	Teachers	Teachers	Students	Students
	(1)	(2)	(3)	(4)	(5)	(9)
RI's Governor	0.0195		$.4327^{**}$		7.904	
	[.0236]		[.1937]		[6.497]	
ommunal Land * PRI's Gov.	2649***	2857***	-1.362^{***}	9697***	-32.78***	-25.08***
	[.0569]	[.0741]	[.3992]	[.3555]	[11.8]	[9.673]
gricultural Land * PRI's Gov.	0.0222	0.0821	-0.1248	0.2694	2.821	14.18
	[.0416]	[0000]	[.2827]	[.3395]	[9.317]	[9.215]
Fect $(\%)$	3.93	4.24	3.09	2.20	3.24	2.48
ate - Year Fixed Effects		Yes		Yes		Yes
ean Ouctome	1.276	1.276	8.343	8.343	191.6	191.6
ean Communal Land	0.234	0.234	0.2339	0.2339	0.2334	0.2334
andard Deviation Com. Land	0.1894	0.1894	0.1892	0.1892	0.1891	0.1891
ean Agricultural Land	0.5272	0.5272	0.5272	0.5272	0.5264	0.5264
andard Deviation Agr. Land	0.2861	0.2861	0.2857	0.2857	0.2862	0.2862
bservations	32663	32663	32781	32781	33015	33015
- squared	0.9807	0.9828	0.9111	0.9346	0.8018	0.832

admetional onteomes 20 estimates of the effect of a PRI movemor Table 6. Difference in differences

rols ster and their interaction with a dummy that indicates a PRI governor at the time of the election. Effect is the impact of a one for economic development include the share of households with access to electricity, piped water and connection to drainage, standard deviation increase in share of communal land over the mean of the outcome variable. * p<.1, ** p<.05, *** p<.01. Note: stand

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Outcomes	Schools	Schools	Teachers	Teachers	Students	Students
	(1)	(2)	(3)	(4)	(5)	(9)
PRI Governor	-0.3929		-1.743		-55.87**	
	[.4829]		[1.106]		[23.77]	
Communal Land * PRI's Gov.	1648***	2195***	-1.204^{***}	8139**	-30.32***	-21.29^{**}
	[.0533]	[.0713]	[.3827]	[.3512]	[11.01]	[9.46]
Agricultural Land * PRI's Gov.	-0.001	0.0483	-0.1899	0.1254	0.8899	9.231
	[.0402]	[.0572]	[.2803]	[.3431]	[9.294]	[9.294]
Effect (%)	2.45	3.26	2.73	1.85	2.99	2.10
State - Year Fixed Effects		Yes		$\mathbf{Y}_{\mathbf{es}}$		Yes
Controls for Economic Dev.	Yes	Yes	Yes	\mathbf{Yes}	\mathbf{Yes}	Yes
Mean Ouctome	1.276	1.276	8.343	8.343	191.6	191.6
Mean Communal Land	0.234	0.234	0.2339	0.2339	0.2334	0.2334
Standard Deviation Com. Land	0.1894	0.1894	0.1892	0.1892	0.1891	0.1891
Mean Agricultural Land	0.5272	0.5272	0.5272	0.5272	0.5265	0.5265
Standard Deviation Agr. Land	0.2861	0.2861	0.2857	0.2857	0.2862	0.2862
Observations	32619	32619	32737	32737	32972	32972
R - squared	0.9809	0.9829	0.9114	0.9349	0.803	0.8331

cluster standard errors at the municipal level. Schools, Teachers and Students are per 1,000 inhabitants. Controls for economic Note: In all specifications, the unit of observation is a municipality, we include municipality and year fixed effects and we development include the share of households with access to electricity, piped water and connection to drainage, and their interaction with a dummy that indicates a PRI governor at the time of the election. Effect is the impact of a one standard deviation increase in share of communal land over the mean of the outcome variable. * p<.1, ** p<.05, *** p<.01.

Outcomes	Schools	Schools	Teachers	Teachers	Students	Students
	(1)	(2)	(3)	(4)	(5)	(9)
Communal Land * PRI Mayor	0.0013	-0.0046	-0.0941	-0.1239	-2.564	-3.928
	[.0377]	[.0371]	[.2112]	[.2086]	[5.266]	[5.258]
Agricultural Land * PRI Mayor	0.0245	0.0294	0.1381	0.1206	3.251	2.962
	[.0216]	[.0252]	[.121]	[.1362]	[2.957]	[3.252]
Effect (%)	0.02	-0.07	-0.21	-0.27	-0.25	-0.38
State - Year Fixed Effects	\mathbf{Yes}	\mathbf{Yes}	Yes	Yes	Yes	Yes
Controls for Economic Development		Yes		Yes		Yes
Mean Ouctome	1.267	1.266	8.321	8.322	191.3	191.3
Mean Communal Land	0.2342	0.2342	0.2342	0.2341	0.2337	0.2336
Standard Deviation Communal Land	0.1843	0.1843	0.1842	0.1841	0.1841	0.1841
Mean Agricultural Land	0.5283	0.5284	0.5283	0.5284	0.5275	0.5276
Standard Deviation Land	0.2829	0.2829	0.2825	0.2826	0.2831	0.2831
Observations	30013	29964	30130	30081	30364	30315
R - squared	0.9826	0.9831	0.9334	0.9349	0.8287	0.8303

Table 8: Difference in differences estimates of the effect of a PRI mayor on educational outcomes

nd we cluster standard errors at the municipal level. Schools, Teachers and Students are per 1,000 inhabitants. Controls for economic development include the share of households with access to electricity, piped water and connection to drainage, and their interaction with PRI mayor. Effect is the impact of a one standard deviation increase in share of communal land over the mean of the outcome variable. * p<.1, ** p<.05, *** p<.01. Note: