

# BREAKING CLIENTELISM OR REWARDING INCUMBENTS? EVIDENCE FROM AN URBAN TITLING PROGRAM IN MEXICO\*

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Clientelism is common in developing countries, and often detrimentally affects political accountability and public good provision. However, little is known about how clientelistic ties can be broken because policy reforms that could reduce voter dependence on incumbents for special favors may also cause voters to reward the reform's architects. Exploiting Mexico's federal structure and changes in incumbency over time, we separate these countervailing effects in the context of a federal land titling program that reached nearly 2.2 million urban households over 35 years. Our results demonstrate that programmatic reforms can both reduce clientelism while also rewarding incumbents for their policies.

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# 1 Introduction

? uses Brazil's Bolsa Familia to show that redistributive policies that are shielded from the influence of political intermediaries can reduce incumbency advantage for mayors, increase both electoral competition and candidate quality, reduce support for clientelistic parties, and lead incumbents to increase redistributive spending. The paper exploits a nonparametric multivariate regression discontinuity design and employs a novel identification strategy for the variation in program coverage. The theory proposes that cash transfers, by reducing the vulnerability of poor voters, make clientelism a less attractive strategy to incumbent mayors. Consequently, incumbents reallocate effort away from the practice into public good distribution.

? shows that parties strategically target irrevocable durable benefits to opposition areas to weaken voters' dependence on opposition's machines.

? show that slum dwellers are more involved in clientelistic arrangements than other urban poor voters. Insecure tenure, lack of access to public resources, and location in areas exposed to environmental shocks increase the vulnerability of slum dwellers. This vulnerability is used by politicians and brokers, who politicize access to scarce resources, and thus make slum dweller more exposed to clientelism.

Clientelism, the exchange of personal favors for political support, is ubiquitous in many developing contexts (?????). This practice has important, and often detrimental, implications for the provision of public goods and political accountability (e.g. ???) and creates—and possibly reinforces—inequalities in access to valuable government programs. Moreover, a largely pessimistic literature suggests that entrenched clientelistic ties may only be broken down by long-term economic development (e.g. ??), which is itself impeded by distortionary clientelistic practices (?).

However, programmatic policy reforms that redefine voters' relationship with the state could undermine the ability of local patrons to selectively allocate public goods and services. In contrast with clientelistic government provision mechanisms relying on discretionary targeting conditional

on vote choices, programmatic allocations are instead determined by objective rule-based program eligibility criteria. By recasting voters' dependence on the incumbent political parties controlling access to those goods and services, programmatic reforms have the potential to substantially reduce the scope for politicians to engage in clientelistic exchanges.<sup>1</sup>

Assessing whether programmatic reforms can liberate voters from their clientelistic ties with local brokers and politicians faces major empirical challenges. While any such reform may affect a voter's electoral behavior by reducing the return of clientelistic transactions (e.g. by weakening a key source of broker leverage over voters), they might also change voters' evaluations of the incumbent party implementing the reform. Where programmatic reforms cause voters to update positively about the incumbent's suitability for office (e.g. ?), the effect of such evaluations may counteract any loss of electoral support induced by any loss of clientelistic capacity that disproportionately affects incumbent parties. Furthermore, while impediments to clientelistic practices may principally impact local politicians with greater initial discretion for delivering goods and services on the ground, the electoral rewards for program implementation may instead be primarily assigned to the federal party responsible for the reform.

In this article, we examine whether a major federal urban land titling program can break down clientelistic ties in Mexico, where weak property rights are often used to enforce clientelistic exchanges, and thereby reduce a key electoral advantage of local incumbent political parties. Through its Committee for the Regularization of Land Ownership (*Comité para la Regularización de la Tenencia de la Tierra*, CORETT) program, established in 1973, the federal government has created property rights on illegally occupied lands and offered squatters the opportunity to buy those rights at highly subsidized prices. By its 35th anniversary in 2008, the program had reached 2.2 million households (?).

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<sup>1</sup>The existing literature highlights a variety of reasons for engaging in clientelistic relationships, including the short-termism of clients living in poverty (??), greater distributional benefits of a electorally-viable subset of the population (?), and the inability of governments to commit to programmatic policies (??). However, relatively little is known about when voters exit clientelistic relationships.

There is a strong symbiotic relationship between the lack of property rights and clientelism in urban Mexico. Political brokers and municipal government officials often offer squatters protection against eviction and the basic infrastructure that informal communal settlements lack in exchange for political support for the municipal incumbent party. In addition, squatters' inability to provide proof of residence creates a host of other opportunities for political intermediation by brokers mobilizing support for federal and especially municipal incumbents. Consequently, the establishment of land property rights has the potential to substantially diminish the dependency of squatters upon incumbent political parties, particularly at the municipal level, and thus break down clientelistic ties.<sup>2</sup> However, if incumbent parties—principally the federal incumbent actually responsible for the program—are credited for the program's implementation, the land titling program may also increase political support for that incumbent among the program's beneficiaries.

To separate the CORETT program's effects on clientelism from its effects on rewards for policy implementation, we exploit Mexico's federal structure and changes in incumbent partisanship across time. Leveraging the timing of the issuance of land titles to urban squatter settlements on communal lands, we use a generalized difference-in-differences design to identify the effect of land titling on the precinct-level vote share of municipal and federal incumbent parties. We focus only on electoral precincts that experienced land titling at least once as part of the CORETT program between 1980 and 2013.<sup>3</sup> If the rewards from implementing the program primarily accrue to the federal party overseeing the titling, but the ability of local politicians to engage in clientelistic practices is reduced, we are able to disentangle rewards for executing the titling from the break

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<sup>2</sup>Recipients of land titles also experience increased access to public goods and a positive net wealth effect. Although the short-run wealth effect is negative due to the purchase, the cost is low, and access to subsidies are facilitated. Squatters can avoid the cost altogether by choosing not to enter the program, but rarely do so. However, our results indicate that voting behavior reflects clientelism and rewards for implementation, rather than support for parties more closely associated with wealthier voters.

<sup>3</sup>Since we have no data on precincts with squatters that never experience land titling, our main estimates avoid comparing locations containing squatters to those that may never have experienced squatting. This restriction also reduces the scope for strategic allocation of titling by the federal government that could violate our identifying parallel trends assumption. Comparisons with areas that did not receive land titling are used to rule out alternative mechanisms.

down of clientelistic ties by comparing the vote share of incumbent parties across federal and local levels of government *and* examining support for the incumbent party responsible for titling over time. Although individual incumbents cannot seek re-election, voters hold parties responsible for incumbent performance in office in Mexico's highly party-centric system (see ???).<sup>4</sup>

We first estimate land titling's effect on clientelism by examining the municipal incumbent party's vote share in municipal elections, regardless of whether the municipal incumbent is aligned with the federal government overseeing the land titling. Consistent with our expectation that municipal incumbent parties are especially well-placed to exploit the dependence of squatters on the government, but unlikely to gain much credit for the program, we find that land titling significantly decreases the municipal incumbent party's vote share. Specifically, a standard deviation increase in the stock of voters that received a land titling through the CORETT program reduces the municipal incumbent party's vote share by 1.5 percentage points (or 3.6% of their vote tally). Changes in turnout rates do not drive the estimates.

These findings are unlikely to reflect strategic targeting by the federal government incumbent since very few precincts within any given municipality were affected by each titling event.<sup>5</sup> However, to alleviate the concern that differential trends in incumbent party vote share in areas where the titling took place drive our findings, we validate our identifying parallel trends assumption in various ways. First, event study plots do not indicate the presence of pre-trends in electoral support for the municipal incumbent party in precincts where voters were about to receive land titles. Second, we formally confirm this by showing that leads of our treatment variables do not predict municipal incumbent electoral performance. Third, the results are robust to including linear municipality- and precinct-specific time trends, as well as further controlling for state-year fixed effects to capture any variation in governor- or state administration-specific effects over time.

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<sup>4</sup>For example, while virtually all voters can identify Mexico's main political parties, and their broad political positions, only 19% of voters can name their federal deputy (?).

<sup>5</sup>Appendix Table B1 reports no effect of the program on the identity of the municipal incumbent in future elections.

Furthermore, we also consider alternative interpretations by leveraging a variety of tests that provide little evidence to suggest that our findings are explained by: (i) wealth effects, improved economic prospects or an ideological shift toward right-wing parties; (ii) resistance to municipal taxation or the differential ability of municipal incumbents to deliver the public goods that they ought to provide once property rights are allocated; (iii) the possibility that voters with different political preferences migrate into precincts experiencing a land titling program; (iv) spillovers to neighboring voters, which could reflect learning about the CORETT program or strategic reallocations of electoral resources in response to the program.

In contrast with the negative effect of land titling on the municipal incumbent party's vote share in municipal elections, we find no significant average effect on the federal incumbent party's vote share in federal elections. This is consistent with the party of federal government both being rewarded by program implementation and seeing its capacity to engage in clientelism weakened by land titling. However, to further separate the effects of breaking down clientelism and incumbent rewards, we compare the effect of urban titling on the vote shares of incumbents that were and were not originally responsible for a precinct's titling.<sup>6</sup> While the ability to engage in clientelistic practices is reduced for all future incumbent parties, any reward for implementing the program is likely to accrue only to the party responsible for the titling, even after it leaves office. We find that voters indeed reward the responsible president's party, and to a lesser extent aligned municipal incumbents, for the implementation of the program. Consistent with the extant studies finding that federal incumbents are rewarded for policy reforms, urban titling almost entirely reverses the negative effects of land titling, producing a *net gain* for the federal incumbent responsible for titling a given precinct. In contrast, rewards for municipal incumbents aligned with the federal party responsible for the programmatic reform only partially offset the cost of breaking down clientelistic ties.

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<sup>6</sup>Given the limited scale of the program in any particular municipality, Appendix Table B1 unsurprisingly indicates no treatment effect on municipal level incumbent vote share or re-election prospects. It is implausible that the CORETT's programs slow rollout affected presidential elections.

Our results address a key empirical challenge in the literature: differentiating a program's impact on clientelism from its impact on voter appraisal of incumbent performance in office. In the Mexican context, we show that both forces apply, but principally act at different levels of government. While the CORETT land titling program primarily reduced the ability of municipal incumbents to engage in clientelism, the program's federal architects predominantly received the rewards for its implementation.

These findings contribute to various literatures. First, this article extends our understanding of the factors weakening clientelistic ties. A large extant literature has illuminated the mechanisms underpinning clientelistic exchanges in practice—whether brokers mobilize likely supporters through turnout buying (?) or induce individuals to change their vote by exploiting their reciprocity (?) or perceived failures of ballot secrecy (?),<sup>7</sup> or how parties provide incentives to brokers to mitigate moral hazard and adverse selection problems (???). However, far less is known about what factors weaken voter dependence on such relationships. In contrast to studies examining how institutional changes led to the demise of clientelism in the United Kingdom and United States (?????), we focus on a major developing context where clientelistic exchanges remain prevalent. Our findings thus demonstrate programmatic policy reforms can break down such ties in a contemporary setting without requiring major institutional reforms. Although some qualitative evidence has amassed in support of this argument (?), the only systematic work conducted in a similar context of which we are aware is by ?. They similarly find that a randomized intervention intended to limit voter vulnerability persistently reduced clientelism in Brazil, but cannot separate loss of clientelistic capacity from rewards for implementing programmatic policies.<sup>8</sup>

Second, in highlighting how programmatic reforms can reduce clientelistic dependencies, our findings naturally add to recent work examining politician incentives to permit squatting (?) or

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<sup>7</sup>? show that brokers learn this information about voters through their social networks.

<sup>8</sup>Recent work also analyzes the effect of interventions designed to mitigate the extent of vote-buying exchanges, whose comparatively ephemeral nature contrasts with that of long-lasting clientelistic exchanges (????).

engage in land redistribution (??). Indeed, our findings provide causal evidence rationalizing incumbents may elect to implement reforms that might impede their ability to engage in clientelistic exchanges (??). As in the case of Mexico's *Progresa* conditional cash transfer (CCT) program,<sup>9</sup> which was implemented in the late 1990s right before the Revolutionary Institutional Party (PRI) lost the presidency after seven decades in government, our results suggest that a historically clientelistic government may transition toward programmatic programs in an attempt to retain power at the national level.

Third, our findings also suggest a different take on recent work highlighting the positive effect of CCTs—portrayed as paragons of programmatic policies—on incumbent support. ? and ? document short-run increases in incumbent electoral support, and argue that these effects reflect voters updating about the incumbent's ability or willingness to deliver programmatic policies. ? further argues that the effect is short-lived and that programmatic policies are unlikely to induce substantial long-term voter realignment. Our distinctive empirical strategy, which leverages Mexico's federal structure and changes in incumbency over time to differentiate rewards for implementation from clientelistic capacity, also shows that federal incumbents implementing programmatic policies enjoy persistent electoral rewards. Our findings thus accord with a growing experimental literature similarly emphasizing the importance of indicators of incumbent competence in office (e.g. ??). However, we simultaneously provide evidence that the capacity to engage in clientelistic exchanges is severely curtailed for federal and especially municipal incumbents of all political stripes.

Lastly, this paper builds on the literature examining the effects of political competition on public good provision (??), and the incumbency advantage more generally. Since clientelism contributes to the incumbency advantage limiting electoral accountability (??), a breakdown in clientelistic ties may—in addition to the direct addition of the programmatic policies that break clientelism down—further bolster public good provision via increased political competition and

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<sup>9</sup>The *Oportunidades* program, which has since been renamed *Prospera*, was based on *Progresa*.



the challenging of the privileged position enjoyed by incumbents.

The next section describes the use of clientelism in Mexico, its relationship with properties rights, and the CORETT land titling program. Section 3 describes our data and empirical strategy. Section 4 reports estimates of the impact of land titling on clientelism and incumbent party rewards, and the robustness checks that we perform. Section 5 concludes.

## 2 Land titling, clientelism, and policy rewards in Mexico

Until the 1990s, Mexican politics was dominated by the PRI (??). However, after winning congressional majorities in the 1990s, the PAN broke PRI hegemony by winning the presidency in 2000. The PAN narrowly retained the presidency in 2006 by beating the Party of the Democratic Revolution (PRD), but was replaced by a resurgent PRI in 2012. Although Mexico had three major parties and relatively competitive elections throughout this period, elections were still characterized by significant clientelism and vote buying (e.g. ??). Government resources often play a central role in such practices.

Mexico's government is divided between three administrative and elected layers: approximately 2,500 municipalities, 31 states (excluding the Federal District of Mexico City), and the federal government. The federal government, which is led by the president, plays the central role in providing social programs. However, major decentralization reforms in the 1990s mean that municipal mayors administer local public services such as sanitation, electricity, piped water, sewage, and roads. Municipal spending represents around 20% of total government spending. Until a constitutional reform first applying in 2018, politicians at each political level were elected to non-renewable terms. Given Mexico's strong political parties (????), this article paper examines how land titling impacts incumbent *parties*.

We focus on informal settlements located on communal urban land belonging to an ejido or

agrarian community in Mexico that have participated in the CORETT land titling program.<sup>10</sup> These settlements are scattered across 862 electoral precincts in 463 municipalities from all 31 Mexican states excluding the Federal District; Appendix Table A1 reports the distribution across states.<sup>11</sup> As our summary statistics in Table 1 indicate, the PRI is the most common municipal incumbent in our panel (holding the municipal mayorship in 59% of precinct-elections), followed by the PAN (27%), and then the PRD (11%). The distribution of municipal incumbents in this subsample resembles the distribution across all municipalities over the period.

This section first describes why such ejidos and agrarian communities are particularly vulnerable to clientelism. We then explain how land titling could break down clientelistic ties, but also generate electoral rewards for the incumbent party responsible for providing such land rights.

## 2.1 Clientelism in urban settlements without property rights

There is a strong symbiotic relationship between clientelism and the lack of property rights in parts of urban Mexico. First, the illegal occupation of urban land has historically been supported largely by politicians or brokers in order to establish and secure a captured base of clients.<sup>12</sup> Considerable evidence from focus groups that we conducted and press reports demonstrate that either politicians or brokers with political connections in the municipal government have encouraged individuals to illegally take possession of land or illegally purchase land while offering protection against

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<sup>10</sup>Ejidos consist of lands that were granted to communities of petitioners that never had land after the Mexican revolution. Agrarian communities instead represent the restitution of lands that were expropriated from communities of peasants during the rule of Porfirio Díaz between 1876 and 1910. Both ejidos and agrarian communities were initially granted as communal lands. However, the *Programa de Certificación de Derechos Ejidales y Titulación de Solares* (PROCEDE) that started in 1992 has allocated individual land certificates since.

<sup>11</sup>Electoral precincts are the smallest geographical electoral unit for which voting data is available, and contain around 1,500 voters. We exclude the Federal District from our sample since it contains no municipal governments, and the responsibilities of its local governing bodies differ from municipal governments.

<sup>12</sup>This situation is not unique to Mexico. For example, ? and ? provide evidence of similar situations in Sub-Saharan Africa, while ? offers similar accounts from the Greater Buenos Aires in Argentina.

Table 1: Summary statistics

Variable	Mean	Standard deviation	Observations
PRI municipal incumbent	0.592	0.492	22,165
PAN municipal incumbent	0.271	0.445	22,165
PRD municipal incumbent	0.108	0.311	22,165
Other municipal incumbent	0.029	0.167	22,165
Municipal vote share of municipal incumbent party	0.408	0.167	22,165
Municipal vote share of federal incumbent party	0.355	0.177	22,165
Municipal turnout	0.552	0.124	21,213
Federal vote share of federal incumbent party	0.363	0.164	28,592
Federal vote share of municipal incumbent party	0.413	0.151	26,904
Federal turnout	0.557	0.135	28,592
Share of voters that received a title	0.017	0.097	22,165
Stock of voters with a title	0.271	0.281	22,165
Share of voters first titled	0.279	0.643	22,165
Federal incumbent was federal incumbent at titling	0.353	0.444	22,165
Municipal incumbent was federal incumbent at titling	0.496	0.475	22,165
Ideology scale	0.145	0.615	22,165
Left party	0.127	0.333	22,165
Center party	0.601	0.490	22,165
Right party	0.272	0.445	22,165
Municipal taxes per capita	197	320	22,130
Aligned municipal and federal governments	0.411	0.492	22,165
Aligned municipal government and state governor	0.611	0.488	22,165
Change in the number of registered voters	202	405	17,270
Incumbent support relative to potential migrants	0.057	0.180	17,712

Notes: With the exception of the federal election data, observations are based on our precinct-level sample for municipal elections. Further differences in the number of observations reflect missing data.

municipal intervention.<sup>13</sup> In return for their protection, brokers sometimes charge minor fees.<sup>14</sup>

<sup>13</sup>For evidence from the press, see “Grandes asentamientos,” *El Universal*, July 19th 2000; “Habitan familias en riesgo total,” *El Sol de Puebla*, July 23rd 2009; “Vecinos trabajando,” *El Universal*, May 19th 2013. Participants in focus groups conducted in former squatter communities that benefited from titling by the CORETT often reported that the occupation of their lands was mediated by intermediaries with connections with the municipal government. Participants reported that such connections continued to intermediate between them and the municipal government, so that communities have access to property rights, public services and social programs.

<sup>14</sup>See “Grandes asentamientos,” *El Universal*, July 19th 2000.

However, the main political motive for encouraging squatting is to condition the permanence of squatters on their political support (??).<sup>15</sup> While in some cases there are direct threats of eviction by municipal incumbents or their intermediaries, in other cases squatters are indirectly threatened with the possibility of eviction if another party comes to power (?).<sup>16</sup>

Second, regardless of whether municipal incumbents or their intermediaries offer protection or threaten eviction in exchange for political support, the possibility of a legal land title is an important political asset. Municipal officials and local brokers often stress the importance of the continuity of the municipal incumbent for titling to occur (?). Some parties have gone even further by issuing certificates of possession free of charge to residents of several illegal settlements. Since these certificates were issued by specific political parties, squatters feared that they would be evicted if there was a change in power (see ? for an example from a PRI municipality). It is also common that public officials explicitly condition titling opportunities on electoral support, in some cases requesting the formal affiliation of community members to the party (?).<sup>17</sup>

Third, the illegal use of land in irregular urban settlements, together with the initial lack of provision of basic public services in such settlements, creates other opportunities for political intermediation (?).<sup>18</sup> Since the municipal government is not obliged to—and should not—provide public services when land is occupied illegally, squatters become easy prey for political clientelism (?).<sup>19</sup> Several accounts in the literature and interviews that we conducted depict municipal officials justifying the lack of public service provision in irregular settlements due to the lack of property

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<sup>15</sup>? also argues that often the lack of political support for the regularization of property rights originates from the fact that politicians did not want to lose their control over the voters in irregular settlements.

<sup>16</sup>Our focus groups highlighted several accounts of individuals that occupied illegal settlements and were themselves expelled, or that knew of other communities whose illegally-occupied land was expropriated by municipal governments. Moreover, CORETT beneficiaries often point out that, before receiving the deeds of the houses they occupied, they lived under a constant fear that they would be expelled.

<sup>17</sup>See “Solapa Gudiño asentamientos irregulares: PAN,” *Imagen del Golfo*, May 8th 2013.

<sup>18</sup>This is not unique to Mexico. ??, ?, ? and ? provide evidence that party officials intervene to direct public services to people in slums in Brazil, Ecuador, India and Peru respectively.

<sup>19</sup>See “Vecinos trabajando,” *El Universal*, May 19th 2013; “Piden reubicar a dos millones; familias viven en 500 mil casas de alto riesgo,” *Excelsior*, September 30th 2013.

rights (?).<sup>20</sup> Moreover, the popular press and various accounts from our fieldwork suggest that the inability to provide formal proof of residence has prevented squatters from accessing social programs from the federal government (?).<sup>21</sup> The inability of squatters to legally demand public services and social programs creates opportunities for political manipulation. Their precarious conditions make squatters highly dependent upon the municipal and federal government for social and unemployment plans and housing, which they cannot legally request because of their illegal residency (?).<sup>22</sup> This weak position is often exploited by local politicians and political brokers who assist squatters with their demands in exchange for their votes in elections.<sup>23</sup>

The political control that such linkages enable can take many forms. In some cases, leaders of irregular settlements are co-opted by municipal and federal incumbent parties, such that settlements are required to affiliate with the party in order to gain access to government benefits both for themselves and their communities (?). In other cases, the local government promotes the creation of community associations, or exploits existing ones by staffing their committees with individuals with close ties to the incumbent party or by directly appointing incumbent party officials (??). In the absence of community association leaders, intermediation is often undertaken by traditional brokers and party officials.<sup>24</sup>

Regardless of whether it is because of a threat of eviction, the offer of protection, the promise of

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<sup>20</sup>? mentions the interesting case of a public official that stated that they would not provide public services in no man's land. Municipal officials emphasized their inability to provide public services in illegal settlements, but stressed how the situation changes once the CORETT distributes property rights deeds.

<sup>21</sup>For evidence from the press, see "En la capital hay 8 mil familias en extrema pobreza," *La Jornada Aguascalientes*, August 2nd 2013. The municipal officials that we interviewed highlighted a host of federal social program that CORETT beneficiaries gain access to once they receive deeds of property rights, including credits and subsidies for house improvement.

<sup>22</sup>Paradoxically, but important for our research design, while squatters are not legally entitled to demand public services because of their illegal residency, they must register to vote using proof of such residency.

<sup>23</sup>This situation is well characterized by ? in the case of Pakistan. The CORETT beneficiaries that we interviewed often mention the role of intermediaries in gaining access to public services from the municipal government.

<sup>24</sup>We did not interview a single community of CORETT beneficiaries that did not mention the presence of community leaders or intermediaries that mediate with municipal and federal governments to gain access to public services and property rights, respectively.

land, or an exchange for public services, there is abundant evidence that people in irregular urban settlements are disproportionately subjected to political mobilization and illegal electoral practices (?). CORETT beneficiaries in our focus groups stated that, while municipal incumbents often promised access to property right and public services without delivering, they still gave them their vote given their precarious situation. There is also extensive evidence of squatters being mobilized to attend political rallies—often without knowing who they are mobilizing for.<sup>25</sup> Individuals living in such settlements are also subject to significant vote buying. For example, although *acarreo*—which involves transporting voters to polling stations—is illegal under Article 403 of the Mexican Federal Penal Code (?), there are abundant newspaper accounts documenting its extensive use in irregular settlements by hired coaches and especially groups of taxi drivers.<sup>26</sup> Common gifts that party representatives distribute around elections include cement bags and corrugated steel zinc planks, which are both essential materials for home improvements.

Such voter mobilization campaigns typically operate at the candidate level (?). Consequently, although there may be some spillovers across campaigns, clientelism facilitated by a lack of property rights is likely to play a greater role in municipal than federal elections due to the relatively greater ability of municipal incumbents to condition services on electoral support. This possibility is further strengthened by the fact that municipal and federal elections often do not overlap.

Together, this preliminary evidence suggests that the establishment of formal property rights could substantially break down clientelistic interactions facilitated by the existence of illegal urban settlements that induce voters to depend upon political parties at the federal and especially municipal level. Some accounts from the popular press and our focus groups indeed suggest that the land titling promoted by the CORETT ended the historical clientelistic business of parties.<sup>27</sup>

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<sup>25</sup>See “Vecinos trabajando,” *El Universal*, May 19th 2013; “Se manifiestan vecinos de Los Volcanes en Cabildo contra comerciantes y concejal,” *Sistema Radiofónico Informativo*, October 8th 2014.

<sup>26</sup>See “Cerraron gasolineras en Cancún para evitar acarreo,” *Cronica*, July 7th 2005; “Sustitutos de última hora en colonias irregulares,” *Por Esto Quintana Roo*, no date.

<sup>27</sup>For evidence from the press, see “La situación política económica y social del estado de Baja California Norte vista desde abajo y hacia la izquierda,” *Rincón Rupestre*, October 5th 2006. On several occasions during our focus groups, CORETT beneficiaries and officials mention that voter become much more electorally

## 2.2 The CORETT land titling program

Due to the large number of irregular settlements and increasing demand for land ownership, as well growing social discontent with the hegemonic PRI government (??), the administration of President Luis Echeverría created the CORETT program in 1973. Its purpose was to regularize the informal settlements located both on federal and communal property, by providing squatters with land deeds. Although it started with limited reach and resources, in the year after its inception the Committee was raised to the rank of Commission and endowed with greater resources and the power to expropriate land for subsequent titling. Since 1979, the Commission has restricted its work to the regularization of communal land in urban areas (??).

Since its conception, the CORETT has played a major role in the regularization of urban land in Mexico. By 2008, the CORETT had provided property rights to 2.2 million households across Mexico. It is estimated that 8.6 million individuals, 11.5% of the Mexican urban population, benefited from the scheme. After 35 years of work, the CORETT contributed to the titling of around 150,000 hectares, which accounts for approximately 10% of urban land in Mexico (?).

Based on our interviews with CORETT officials, the program operates according to the following procedures. Either through intermediaries of the communities themselves, other levels of government, or other government agencies, the CORETT first identifies an urban settlement located on land belonging to an ejido or agrarian community. After an agreement is reached with the ejido or community members, their land is formally expropriated in exchange for economic compensation reflecting the land's commercial value.<sup>28</sup> Once the CORETT takes possession of the land, it conducts a census of the squatters, the plots they occupy, and their socioeconomic characteristics. This information then informs the (highly-subsidized) price offered to squatters to acquire formal property rights over the land they occupied. Given that the government absorbs independent from political brokers and candidates after titling, since voters no longer rely on their promises or protection against expropriation.

<sup>28</sup>CORETT officials highlight legal actions by ejido or agrarian communities as the main impediment to land regularization.

most of the cost associated with the titling process, our interviews suggest that CORETT beneficiaries pay between 500 and 1,000 Mexican pesos (approximately between 35 and 70 US dollars).<sup>29</sup> Moreover, squatters are informed about the federal social programs that they can potentially have access to if they purchase the land. While the CORETT does not supply these social programs itself, it can help channel the potential beneficiaries to the relevant institutions that provide these.<sup>30</sup> Lastly, the squatters have to formally request that their land be regularized, provide evidence that they indeed occupy their land, and make the necessary payments (??). CORETT officials indicate that the entire process takes between 6 and 8 months.<sup>31</sup>

While the CORETT program is often initiated by community representatives that may work for specific parties, other government levels, or other government agencies, CORETT officials emphasize that they treat all requests equally. The rules governing the operation of the CORETT limit the scope for discretion in the titling of land within or between squatter settlements. In addition, once the procedure has been initiated, both officials and beneficiaries note that citizens deal directly with the CORETT rather than working through intermediaries. Essential for our identification strategy, we later show in Table 3 and Appendix Table B8 that land titling is not associated with trends in the past performance of municipal or federal incumbents.

## 2.3 Credit claiming

Although the rules governing the program's implementation limit scope for discretion between squatter settlements, CORETT officials ensure that the party controlling the presidency receives

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<sup>29</sup>CORETT officials depict CORETT beneficiaries as incredulous when they are approached with such an offer of regularize their land.

<sup>30</sup>For example, since 2008 the Secretariat of Social Development (*Secretaría de Desarrollo Social*, SEDESOL) provides support to the squatters who are in extreme poverty through the Program to Support Settlers in Situations of Poverty to Regularize Irregular Human Settlements (*Programa de Apoyo a los AVECINDADOS EN CONDICIONES DE POBREZA PATRIMONIAL PARA REGULARIZAR ASENTAMIENTOS HUMANOS IRREGULARES*, PASPRAH).

<sup>31</sup>Provided that there are no problems, since the program relies on information from other government agencies (e.g. land registries, courts in case of trials).



still credit for titling events. Several accounts from CORETT officials indicate that the ceremonial handover of deeds is often coordinated with the Office of the President. In many cases, efforts to enable the president to present the transfer of rights in person have significantly delayed the granting of land title certificates (?). In the absence of the president, or a senior member of their party, the CORETT public officials in charge of distributing property rights repeatedly mention how instrumental the federal government was for the titling, as well as its sensitivity toward the needs of poorer voters and its willingness to engage in the efforts required to help those in greatest need.<sup>32</sup> Moreover, it is often emphasized that access to formal property rights over their land will permit access to low-cost credit and social programs, which will contribute to the well-being of the beneficiaries.<sup>33</sup>

Our focus groups suggest that voters may respond positively to the federal government. Many CORETT beneficiaries indicate that they remember and are grateful to the party of the president at the time when they were granted property rights over the land they occupied. Such beneficiaries argue that titlings signal that the party cares about them. In return, voters acknowledge that they continue to support the party since “that is the way politics work, you support who helps you.” Land title recipients also indicate that municipal governments attempt to claim credit for land titling, although voters often recognize that only the federal government is responsible for the program.

## **2.4 Access to services after titling**

Focus group interviews indicate that, after receiving their titles, communities of beneficiaries observe a substantial improvement in access to public services provided at the municipal level, such as electricity, water, and drainage. CORETT beneficiaries report that after experiencing titling they

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<sup>32</sup>See “Entregan Herrera Caldera y Corett títulos de propiedad a 110 familias,” *La Prensa*, November 6th 2013; “Ramírez Marín entrega más de 5 mil títulos de propiedad en Jalisco,” Secretaría de Desarrollo Agrario, Territorial y Urbano, February 25th 2014.

<sup>33</sup>See “Ramírez Marín entrega más de 5 mil títulos de propiedad en Jalisco,” Secretaría de Desarrollo Agrario, Territorial y Urbano, February 25th 2014.

got access to public services or started the process of accessing them, and some beneficiaries also point out that possessing copies of their deeds were instrumental in this process.

CORETT beneficiaries also report increased access to federally-implemented social programs upon receiving their land certificates. This is consistent with the accounts of CORETT officials, who mention that the Secretariat of Social Development often asks the CORETT to grant property right titles to communities where it wants to provide social programs. The beneficiaries we interviewed emphasized the importance of social programs allowing them to invest in improving their housing by supplementing the basic materials normally provided by the federal government. Such federal assistance thus complements the reduced fear of expropriation, which undermines incentives to invest in home improvements. Consequently, CORETT beneficiaries experienced significantly improved standards of living, particularly in terms of higher-quality floors, walls and ceilings, as well as additional rooms within their housing units.

### **3 Data and empirical strategy**

The differential incidence of the CORETT program on local and national incumbent parties, as well as how such incidence should vary over time when the incumbent at the time of the titling is no longer in power, provides a rare opportunity to distinguish the effects of an important programmatic reform on local clientelistic capacity from its capacity to generate support for the reform's author. This section describes the data and the identification strategies that we employ to estimate these effects.

#### **3.1 Data**

We obtained information about the CORETT program's incidence through several freedom of information requests. This yielded data on all the land owned by ejidos and agrarian communities where each CORETT titling occurred, the date when titling events started, and the number of

households that benefited in each case. We matched this to the Cadaster and History of Agrarian Nuclei (PHINA) of the National Agrarian Registry (RAN), which contains all the ejido and agrarian communities that were expropriated by the CORETT, including their unique RAN identifiers. For each ejido and agrarian community, we identified its geographical location using the PROCEDE spatial database. To locate beneficiaries, we use data on the spatial location of rural localities and urban blocks, together with the population in each, from the National Institute of Statistics and Geography (INEGI). Finally, to link this to the one or more electoral precincts that each titling event spanned, we intersected these localities and blocks with the location of Mexico's 67,000 electoral precincts using the electoral map of the Federal Election Institute (IFE).<sup>34</sup> Appendix A provides more detailed descriptions of these procedures.

Our analysis leverages precinct-level electoral returns from the IFE and Mexico's State Electoral Institutes for every available municipal and federal legislative election between 1994 and 2013.<sup>35</sup> Beyond being the closest geographical electoral unit to the level at which land titling is granted, precinct boundaries are very rarely changed over time and are the building blocks around which redistricting occurs (?). To minimize measurement error, we restrict our sample to precincts where at least 10% of the population is eventually affected by the CORETT land titling program,<sup>36</sup> which leaves us with the 4,277 unique precincts depicted in Figure 1.<sup>37</sup> Due to the small fraction of the electorate affected by the program in any given municipality, we do not consider municipal or district-level election outcomes in our baseline analysis.

There is substantial variation in the timing of the land titling, as depicted in Figure 2. More-

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<sup>34</sup>The IFE has since become the National Electoral Institute (INE).

<sup>35</sup>The federal legislative elections subsume 1994, 2000, 2006, and 2012 presidential elections. Municipal elections are typically not held concurrently, and follow three-year cycles. Not all Mexican State Electoral Institutes have kept precinct-level returns as far back as 1994.

<sup>36</sup>Our results are robust to stricter sample restrictions.

<sup>37</sup>We have been unable to locate data on squatter settlements also located in ejidos and agrarian communities but that never received a land title. Our empirical strategy thus leverages comparisons only among precincts where at least one land title has been conferred. Although an additional control group could increase our design's power, our approach increases the design's plausibility by increasing within-sample homogeneity while remaining relatively nationally representative.

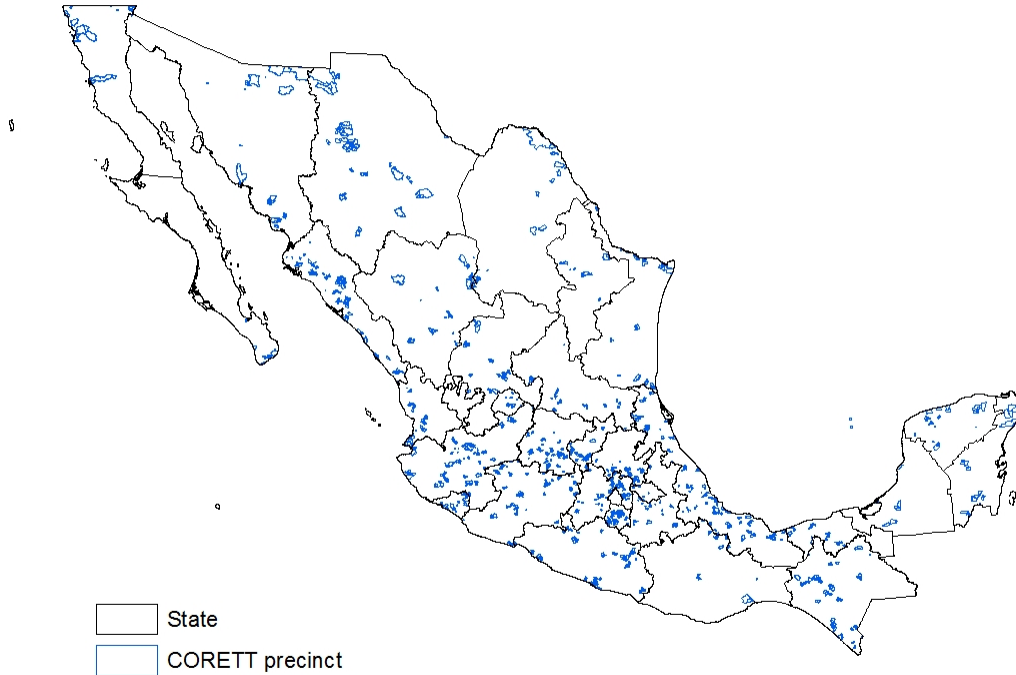


Figure 1: Electoral precincts included in our sample

over, there are two sources of variation in the intensity of precinct-level land titling. First, while precincts are the closest geographical electoral unit to ejidos or agrarian communities—the level at which land titling is assigned—they do not always fully coincide. An ejido can cover parts of several precincts, and precincts can intersect more than one ejido, which generates variation in the exposure—the proportion of voters affected—of each precinct to the titling program. Figure 3 shows the distribution of surface area that is covered by ejidos that were subject to land titling at some point. Second, precincts vary in the number of times that their residents received titles. Figure 4 shows that in almost half of the precincts that ever receive titles, the program was implemented over several, far from consecutive, years.

Our measure of precinct-level land titling is the stock of voters had received a title before a given election year. This definition captures both extensive and intensive margin variation in the

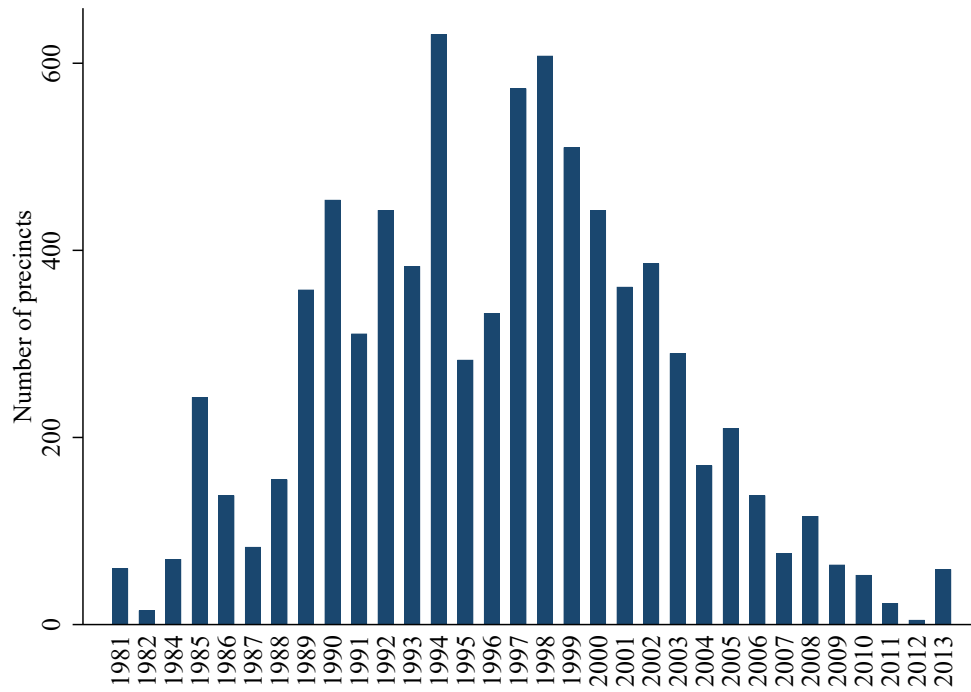


Figure 2: Distribution of land titling over time

Note: In 26 cases, there were two titlings in different ejidos in a given for precinct-year.

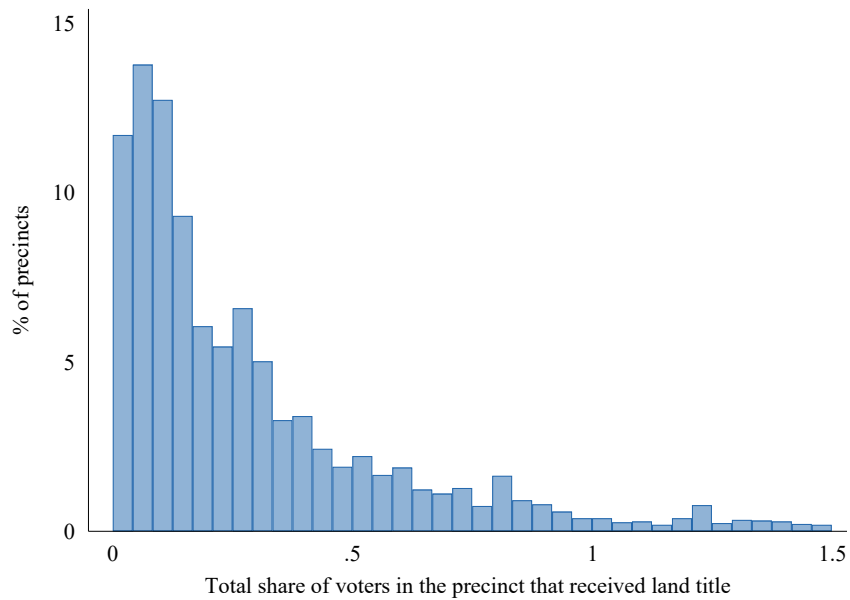


Figure 3: Share of precinct land affected by land titling

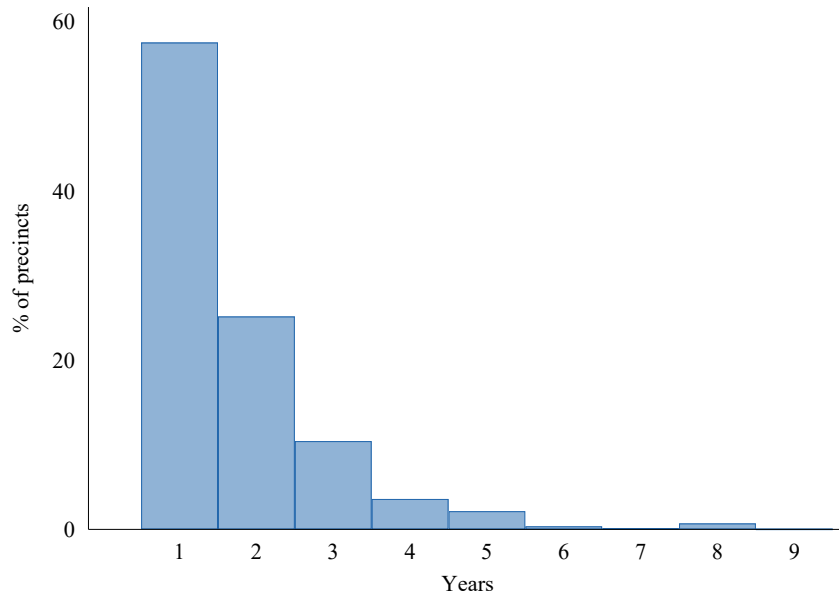


Figure 4: Number of times land titles distributed in a precinct

intensity of the program over time. This allows us to exploit more variation in the treatment than if we had focused exclusively on the extensive margin, because the land titling program was rolled out in 90.5% of precincts before the start of our panel dataset in 1993. As a robustness check, Appendix Tables B5 and B6 report qualitatively similar results using a lower-powered approach focusing on the first titling event experienced by a precinct.

## 3.2 Empirical strategy

### 3.2.1 Estimating the loss of local clientelistic capacity

Municipal incumbents are in a particularly good position to exploit the dependency of squatters upon the government. Municipal governments have the closest connections with the community, greatest capacity to monitor local brokers and provide the public goods squatters most lack, and can condition the permanence of the squatter on the lands they occupy and access to public services on their electoral success. Moreover, municipal incumbents are unlikely to receive much credit

for the federal CORETT program. We thus estimate the effect of property rights on clientelism by examining how the land titling program affects the vote share of *municipal* incumbent parties, under the assumption—that we assess empirically below—that the primary municipal-level impact of land titling is the incumbent’s loss of clientelistic capacity. If the clientelistic machinery of municipal incumbent parties is indeed harmed more than that of the federal incumbent party, we expect to observe larger reductions in support for municipal than federal incumbent parties. We do not track one particular party, but instead focus on incumbent parties regardless of their affiliation to capture structural changes in the clientelistic relationship between incumbent parties and voters.<sup>38</sup>

We use a generalized difference-in-differences design to identify the effect of the CORETT land titling program on the municipal and federal incumbent party’s vote share. Specifically, we exploit variation in exposure to the program over time within the set of precincts that every receive a land title. This strategy allows us to circumvent potential concerns about the correlation between unobservable precinct-level characteristics and the allocation of the program, while leveraging a plausible counterfactual set of precincts that were already titled or soon to be titled. We estimate the following regression:

$$Y_{pt} = \beta L_{pt} + \eta_p + \delta_t + \varepsilon_{pt}, \quad (1)$$

where  $Y_{pt}$  is the outcome of interest in electoral precinct  $p$  at election year  $t$ ,  $L_{pt}$  is our continuous measure of a precinct’s stock of land titles,  $\eta_p$  are precinct fixed effects, and  $\delta_t$  are election year fixed effects. The precinct fixed effects absorb all time-invariant differences across precincts that received titles, while the election year fixed effects remove all common trends in our outcomes of interest. Our quantity of interest,  $\beta$ , estimates the linearized effect of land titling. Throughout, we cluster standard errors by municipality.

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<sup>38</sup>The literature has generally characterized the PRI as the party most likely to engage in clientelism, particularly during its hegemonic hold on the presidency between 1929 and 2000 (e.g. ??). However, for our period of study, each of Mexico’s major parties have been heavily linked with clientelistic activities (??).

This identification strategy relies on the “parallel trends” assumption that precincts that experience an increase in the stock of their land titles before a given election follow similar trends to those that do not. The restriction of our sample to precincts ever deemed eligible to receive land titles is likely to enhance this assumption’s credibility by only constructing counterfactual trends from precincts with similar baseline socioeconomic characteristics, vulnerability to clientelism, and susceptibility to strategic targeting of the CORETT program. Nevertheless, although only a small number of precincts within a municipality are affected by title events, this assumption could still have been violated if titling was strategically allocated to areas where incumbent support was trending in a particular direction (?). Another possibility is that areas receiving more government attention, and thus a greater likelihood of land titles, may also be following different trajectories in incumbent support.

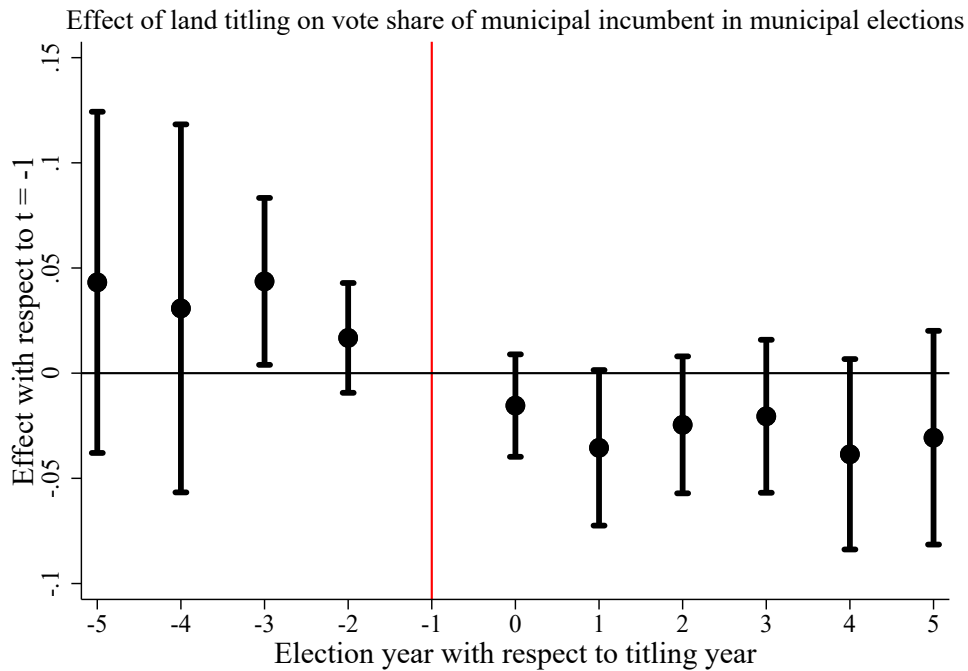


Figure 5: Lack of pre-trends in municipal incumbent party vote

A variety of tests support the parallel trends assumption. First, the event study-style plot in Figures 5 and B1 show that trends in municipal and federal incumbent party vote share, respectively,



were relatively flat across precincts that did and did not experience a titling event in advance elections, defined as at least once new title granted over the last electoral cycle.<sup>39</sup> This general check suggests that the CORETT program was not targeted at precincts where support was trending in favor of or against national or local incumbents. Second, using our continuous measure of titling stock intensity, we further demonstrate support for the parallel trends assumption by including first and second-order leads of our treatment variables. Contrary to the concern that the pre-trends drive the results, our leads specifications in Table 3 and Appendix B8 provide little evidence to suggest that future increases in the stock of titled land affect support for current federal or municipal incumbents.<sup>40</sup> Thirdly, we show that our results are robust to flexibly controlling including linear municipality- and precinct-specific time trends as well as state-year fixed effects. We do not include municipality-year fixed effects because there is often only a single *ejido* or agrarian community in a given municipality. Including such fixed effects would thus effectively drop a large fraction of our sample where there is no within-municipality-year variation. The trends control for the possibility of differential trajectories across locations, while the state-year fixed effects fully absorb any state-level factors, such as concurrent governor races or differences in state administration, present during a particular election period.

### **3.2.2 Estimating the rewards for implementing programmatic policies**

To capture rewards for policy implementation, we could instead focus on estimating the effect of land titling on the vote share of the federal incumbent—the incumbent president’s party—in presidential elections. As noted above, the federal incumbent is closely involved with the administration of the CORETT program, and actively seeks credit for its implementation. Conversely, because land titling predominantly impacts the ability of the municipal incumbent to condition non-eviction

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<sup>39</sup>Such trends cannot be compared with “control” precincts because all precincts receive treatment at different times.

<sup>40</sup>In the case of support for federal incumbent, this clearly holds once linear municipality- or precinct-specific time trends are included.

and local public goods on electoral support, land titling is less likely to affect the federal incumbent’s clientelistic capacity. Nevertheless, federal incumbents may lose some clientelistic capacity, while municipal incumbents may be able to claim some policy credit. Simply estimating equation (1) using the president’s party’s vote share in the triennial federal legislative elections is unable to distinguish the possibility that these effects cancel out from the possibility that neither effect is in operation.

To more formally differentiate between the clientelistic and reward effects, we leverage changes in incumbent party identity over time. Crucially, while any reward or punishment for implementing the program primarily affects the party responsible for the titling at the federal level, the ability to engage in clientelistic practices is reduced for all future incumbent parties. We can therefore separate the clientelistic and reward dimensions of land titling by exploiting variation in the extent to which the party responsible for past titling remains in office.<sup>41</sup> Specifically, for each election and each electoral precinct, we compute  $I_{pt}$  as the share of titling events affecting a precinct in which the current incumbent party was also the federal incumbent when the title was bestowed.<sup>42</sup> We thus build on equation (1) to estimate specifications of the following form:

$$Y_{pt} = \alpha L_{pt} + \beta I_{pt} + \gamma(L_{pt} \times I_{pt}) + \eta_p + \delta_t + \varepsilon_{pt}, \quad (2)$$

where the coefficient  $\gamma$  captures the reward (or punishment) incurred by the incumbent party that implemented the titling program in the past. In our sample, the federal incumbent party at election  $t$  has an average share of participation in previous titlings of 35.5%. In the precincts where the current federal incumbent was also responsible for previous land titling, the average share of participation in previous titling is 87.6%.

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<sup>41</sup>At no point in time was the roll out of the CORETT program large enough to plausibly affect the election outcome either at the federal or municipal level. While obvious for federal elections, Table B1 confirms that land titling had no effect on the likelihood of future incumbency of the municipal incumbent party at titling.

<sup>42</sup>We use a share because some precincts experienced multiple periods of titling.

Table 2: Effect of land titling on the municipal vote share of municipal incumbent party

	Municipal vote share of municipal incumbent party					
	(1)	(2)	(3)	(4)	(5)	(6)
Stock of voters with a title	-0.058** (0.023)	-0.044* (0.023)	-0.058 (0.041)	-0.045** (0.022)	-0.040* (0.024)	-0.050 (0.042)
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X
Observations	22,165	22,165	22,165	22,165	22,165	22,165
$R^2$	0.382	0.505	0.548	0.476	0.570	0.609

*Notes:* All specifications include precinct and year fixed effects. “Stock of voters with a title” is the share of voters in precinct  $p$  that received titles before  $t$ . Standard errors are clustered by municipality.

## 4 Results

We now present our findings. Overall, the results first show that access to land titles through the programmatic CORETT policy has reduced incumbent party clientelistic capacity, particularly at the municipal level. However, in contrast with the net losses experienced by municipal incumbents, we then demonstrate that the small loss of clientelistic capacity experienced by federal incumbents is at least offset by rewards for the program’s implementation.

### 4.1 Land titling and clientelistic breakdown

As argued above, the benefits from clientelistic practices that rely on weak property rights primarily accrue to municipal incumbents. Moreover, municipal incumbents are less likely to be able to claim credit for land titling. Consequently, any change in the underlying costs and benefits of clientelism should principally be reflected in the vote share of municipal incumbents. Table 2 assesses this claim by estimating equation (1), reporting the effect of increasing the stock of voters with a land title on their precinct’s vote share for the municipal incumbent party in municipal elections.

The results provide clear evidence that land titling restricts the ability of future municipal in-

cumbents to win votes. Our baseline specification in column (1) reports that a unit increase in the stock of land titles, i.e. moving from 0% to 100% of the precinct receiving a title, reduces the municipal incumbent's vote share by approximately 6 percentage points ( $p < 0.01$ ). This estimate implies that a standard deviation increase in the stock of voters with a land title—an increase in the share of voters treated by the program of 24.8 percentage points—causes a 1.5 percentage points loss of vote share for municipal incumbents, or 3.6 % of their votes. Appendix Table B2 reports no robust effect of land titling on turnout, suggesting that it either discourages turnout among voters previously vulnerable to clientelism and increases turnout among other groups in the precinct, or more likely that many newly-titled voters start voting for parties other than the incumbent.

Given that municipal incumbents may also be able to claim some credit for the program, as we later demonstrate, our estimate is likely to represent a lower bound on the effect magnitude. Furthermore, consistent with municipal incumbents facing the greatest obstacle to their clientelistic practices, Appendix Table B3 shows that municipal incumbents in federal elections are relatively unaffected by land titling events.<sup>43</sup> Consistent with breaking down clientelistic ties, we thus find that the establishment of property rights on land substantially decreases the electoral support of future municipal incumbents.

Columns (2)-(6) illustrate the robustness of this finding to controlling flexibly for time trends. Columns (2) and (3) respectively introduce linear municipality- and precinct-specific time trends to account for possible differential trends in support for the municipal incumbent party. Columns (4)-(6) show that the baseline specification, as well as those that add time trends, are robust to including state-year fixed effects. The stability of the point estimates across these specifications suggests that different trends across precincts receiving different levels of land titling are unlikely to drive the results, while only the most demanding specification in column (6) decreases the precision of estimates to the point of becoming statistically significant beyond the  $p < 0.1$  level. The precinct-level trends present a particularly powerful check, by allowing each precinct to follow

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<sup>43</sup>Similarly, Table B4 shows that federal incumbents are also relatively unaffected in municipal elections.

a different linear trend.

Table 3: Effect of future land titling on the municipal vote share of municipal incumbent party, robustness to including one and two leads

	Municipal vote share of municipal incumbent party					
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A: Robustness to including one lead</b>						
Stock of voters with a title	-0.041 (0.026)	-0.045* (0.027)	-0.062 (0.042)	-0.038 (0.025)	-0.040 (0.027)	-0.054 (0.043)
Stock of voters with a title ( $t + 1$ )	-0.005 (0.040)	0.010 (0.040)	-0.020 (0.051)	0.006 (0.033)	0.006 (0.037)	-0.024 (0.049)
Observations	18,280	18,280	18,280	18,280	18,280	18,280
$R^2$	0.399	0.542	0.590	0.486	0.598	0.644
<b>Panel B: Robustness to including two leads</b>						
Stock of voters with a title	-0.045* (0.026)	-0.039 (0.031)	-0.059 (0.058)	-0.036 (0.026)	-0.036 (0.030)	-0.068 (0.059)
Stock of voters with a title ( $t + 1$ )	-0.001 (0.041)	-0.006 (0.043)	-0.026 (0.064)	-0.010 (0.039)	-0.017 (0.041)	-0.053 (0.061)
Stock of voters with a title ( $t + 2$ )	-0.020 (0.059)	0.014 (0.058)	-0.026 (0.098)	0.036 (0.049)	0.003 (0.059)	-0.064 (0.096)
Observations	14,391	14,391	14,391	14,391	14,391	14,391
$R^2$	0.460	0.594	0.651	0.533	0.646	0.703
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X

*Notes:* All specifications include precinct and year fixed effects. To accommodate the leads, panel A drops the last observation for each precinct, while panel B drops that last two observations for each precinct. “Stock of voters with a title” is the share of voters in precinct  $p$  that received titles before  $t$ . Standard errors are clustered by municipality.

In addition to the various controls used to capture differential local trends included in Table 2, we further support the validity of the identifying “parallel trends” assumption by including one and two leads of our treatment variable. Large effects of such leads would imply differential trends across precincts that vary in the number of voters with future land titles. Table 3 reports the results of specifications including one and two leads, which respectively require dropping the last and last two observations per precinct (for which future data are unavailable). Across all

specifications, the coefficients on the leads are small and statistically insignificant. Furthermore, the effect of the land titling program on a municipal incumbent party's vote share remains stable and statistically indistinguishable from those obtained in our baseline estimations. Together with the trends included above, and the event study plots in Figure 5 and Appendix Figure B1, the lack of differential trends by prior titling intensity reinforces the robustness of our conclusion that land titling reduces the capacity of municipal incumbent parties to engage in clientelism.

We also find similar results at the extensive margin, where we define our land titling variable to capture precincts titled for the first time. With the caveat that less than 10% of precincts received their first titles after our panel begins, we re-estimate equation (1) where  $L_{pt}$  is instead a dummy for a precinct ever having been titled. Panel A of Appendix Table B5 reports a 1-2 percentage point reduction in the municipal incumbent party's municipal vote share *on average*.<sup>44</sup> Although this estimate is small and ceases to be statistically significant at conventional levels once trends are included, panel B shows a large and robust negative interaction with the share of voters first titled. This heterogeneous effect indicates that, once the many cases where the first titling event involved only a small number of voters are accounted for, the municipal incumbent vote share declined by around 10 percentage points where all voters received a title at once. This estimate implies that a standard deviation increase in the stock of voters first titled—an increase in the share of voters receiving the program of 20.9 percentage points—caused a 2 percentage points loss of vote share for municipal incumbents, or 5.1% of their votes.

## 4.2 Alternative interpretations

The preceding analysis provides robust evidence consistent with land titling reducing the clientelistic capacity of municipal governments. Nevertheless, mechanisms other than clientelism could also explain a reduction in municipal incumbent vote share. To support our clientelistic interpretation, we next demonstrate that plausible alternative interpretations are inconsistent with our findings,

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<sup>44</sup>Appendix Table B6 shows the analogous results for the federal incumbent party's federal vote share.

before leveraging variation over time in incumbency to illustrate the trade-off between clientelistic capacity and credit for implementing a programmatic reform.

#### **4.2.1 Wealth effects and changes in ideology**

By not focusing on any particular party or set of parties, but rather on municipal incumbent parties in general, our results are unlikely to simply capture any shift in voters' electoral preferences toward a particular type of party. Nevertheless, the program's positive wealth effect could induce voters to persistently support more right-wing parties like the PAN (??). This concern remains if, as is generally believed in this context, incumbents and more clientelistic parties in Mexico are disproportionately centrist. Furthermore, previous work suggests that the granting of property rights improves expectations over economic prospects and leads to better labor market, credit, and investment opportunities (????). These insights were reiterated in the focus groups that we conducted with CORETT beneficiaries.

To address this alternative interpretation of our findings, we explore how the effect of land titling in our baseline specification in Table 2 varies with the municipal incumbent party's ideology. We propose two approaches to test whether the electoral losses associated with the CORETT titling program are concentrated among left-wing incumbent parties. First, we estimate heterogeneous effects using a linear measure of ideology that takes value  $-1$  if the incumbent is a left-wing party (mainly the PRD, the Labor Party or PT, and the Citizen Movement Party or MC),  $0$  if it is a centrist party (mainly the PRI, the Mexican Green Party or PVEM, and the New Alliance Party or PANAL), and  $1$  if it is a right-wing party (mainly the PAN).<sup>45</sup> Second, we separately estimate heterogeneous effects using indicators for left and right incumbent ideologies, where centrists are the excluded baseline comparison. Panels A and B of Table 4 present the corresponding results, which both offer little evidence to suggest that the effects of land titling are driven by a rightward

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<sup>45</sup>As Table 1 shows, only 3% of incumbents were not elected as representatives of, or in coalition with, the PAN, PRD, or PRI.

Table 4: Heterogeneous effect of land titling, by ideology of municipal incumbent party

	Municipal vote share of municipal incumbent party					
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A: Effect of land titling interacted with ideology scale</b>						
Stock of voters with a title	-0.058*** (0.022)	-0.037* (0.022)	-0.048 (0.040)	-0.041** (0.020)	-0.032 (0.023)	-0.038 (0.042)
Stock of voters with a title $\times$ Ideology scale	-0.021 (0.022)	-0.028 (0.020)	-0.038* (0.021)	-0.030* (0.017)	-0.028* (0.016)	-0.032 (0.020)
Observations	21,615	21,615	21,615	21,615	21,615	21,615
$R^2$	0.383	0.507	0.550	0.479	0.573	0.612
<b>Panel B: Effect of land titling interacted with indicators for left-wing and right-wing party</b>						
Stock of voters with a title	-0.044* (0.025)	-0.026 (0.022)	-0.041 (0.039)	-0.031 (0.023)	-0.023 (0.022)	-0.032 (0.039)
Stock of voters with a title $\times$ Right party	-0.057** (0.024)	-0.061** (0.026)	-0.068** (0.029)	-0.057*** (0.022)	-0.055** (0.023)	-0.055** (0.028)
Stock of voters with a title $\times$ Left party	-0.010 (0.032)	-0.009 (0.030)	0.008 (0.031)	0.003 (0.029)	-0.001 (0.025)	0.007 (0.030)
Observations	21,615	21,615	21,615	21,615	21,615	21,615
$R^2$	0.404	0.515	0.559	0.495	0.581	0.620
Test: sum of base and 1st interaction coeff. ( $p$ value)	0.001	0.002	0.011	0.002	0.004	0.038
Test: sum of base and 2nd interaction coeff. ( $p$ value)	0.107	0.298	0.482	0.362	0.448	0.610
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X

*Notes:* All specifications include precinct and year fixed effects. “Stock of voters with a title” is the share of voters in precinct  $p$  that received titles before  $t$ . “Ideology” is a three-point variable coded -1 for left-wing parties, 0 for centrist parties, and 1 for right-wing parties (see main text for further details). Standard errors are clustered by municipality.



shift in the preferences of the voters receiving property rights. If anything, the results suggest that the allocation of property rights hurt right-wing incumbent parties more than left-wing incumbent parties.

#### **4.2.2 Aversion to taxation**

A related concern is that the experience of becoming a taxpayer—via any tax collected by the municipal government—could systematically shift electoral behavior. The finding above that land titling did not reduce incumbent support most in municipalities with left-wing incumbents suggests that becoming a taxpayer has little impact on aggregate partisan preferences. However, starting to pay municipal property tax could also reduce support for any type of incumbent overseeing levels of such taxation perceived to be high. We test this possibility by interacting the stock of land titles with per capita municipal tax revenues. In contrast with newly-taxed voters sanctioning the incumbents in high-tax municipalities, panel A of Table 5 shows that the change in vote choice is not significantly different where the likelihood of facing a higher per capita municipal tax is greater.

#### **4.2.3 Inability to deliver the public services**

An alternative concern is that our baseline results reflect voter sanctioning of municipal incumbents for their inability to deliver the public services that they are obliged to provide after the allocation of property rights. As noted above, in the absence of property rights, municipal incumbents can neglect communities of squatters on the grounds that their illegal occupation prevents them from being entitled to public services. However, this ceases to be the case after the CORETT's program reaches those communities.

To examine the possibility that voters are punishing incumbents that fail to provide these services, we use two sources of variation. First, we leverage the likelihood that municipalities with a higher tax base can better afford to provide public services in newly titled areas. The insignificant

Table 5: Heterogeneous effect of land titling by per capita municipal taxes and alignment with federal government party or state governor

	Municipal vote share of municipal incumbent party					
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A: Heterogeneous effect of land titling by municipal taxes per capita</b>						
Stock of voters with a title	-0.060*** (0.022)	-0.041* (0.021)	-0.052 (0.043)	-0.045** (0.021)	-0.037 (0.022)	-0.052 (0.043)
Stock of voters with a title × Municipal taxes per capita	0.008 (0.013)	0.000 (0.012)	0.000 (0.024)	-0.006 (0.014)	-0.001 (0.009)	-0.018 (0.019)
Observations	21,580	21,580	21,580	21,580	21,580	21,580
$R^2$	0.383	0.506	0.549	0.478	0.572	0.611
Test: sum of coefficients ( $p$ value)	0.051	0.087	0.364	0.044	0.089	0.176
<b>Panel B: Heterogeneous effects of land titling by alignment with federal government party</b>						
Stock of voters with a title	-0.059*** (0.023)	-0.037* (0.022)	-0.041 (0.040)	-0.045** (0.021)	-0.031 (0.023)	-0.032 (0.042)
Stock of voters with a title × Aligned municipal and federal governments	-0.002 (0.018)	-0.005 (0.021)	-0.018 (0.025)	-0.001 (0.015)	-0.011 (0.015)	-0.020 (0.019)
Observations	21,615	21,615	21,615	21,615	21,615	21,615
$R^2$	0.383	0.511	0.554	0.479	0.575	0.614
Test: sum of coefficients ( $p$ value)	0.017	0.108	0.175	0.054	0.099	0.244
<b>Panel C: Heterogeneous effect of land titling by alignment with state governor</b>						
Stock of voters with a title	-0.067*** (0.024)	-0.051** (0.024)	-0.069 (0.043)	-0.055** (0.024)	-0.042* (0.024)	-0.052 (0.044)
Stock of voters with a title × Aligned mun. government and state governor	0.009 (0.016)	0.011 (0.016)	0.017 (0.019)	0.012 (0.016)	0.005 (0.015)	0.009 (0.018)
Observations	21,615	21,615	21,615	21,615	21,615	21,615
$R^2$	0.402	0.515	0.559	0.493	0.582	0.621
Test: sum of coefficients ( $p$ value)	0.014	0.071	0.205	0.055	0.111	0.302
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X

*Notes:* All specifications include precinct and year fixed effects. “Stock of voters with a title” is the share of voters in precinct  $p$  that received titles before  $t$ . “Municipal taxes per capita” is a standardized variable of municipal taxes per capita. “Aligned municipal and federal governments” is an indicator coded 1 when the same party is the municipal and federal incumbent. “Aligned municipal government and state governor” is an indicator for when the municipal incumbent party is aligned with the state governor. Standard errors are clustered by municipality.

differential effects across places with a varying tax base in panel A of Table 5 do not support this alternative explanation. Second, we exploit the likelihood that municipal governments that are aligned with the federal or state government enjoy greater access to higher-level resources, and therefore should not suffer from a lack of capacity to deliver goods associated with the allocation of property rights. Panels B and C of Table 5 report the results of specifications interacting land titling with the alignment of municipal incumbents with the federal and state government parties, respectively. The negligible coefficient on the interaction provides no evidence to suggest that this competing explanation drives our results.

#### **4.2.4 Migration into titled areas**

Rather than altering clientelistic ties to the municipal incumbent, another possibility is that the CORETT program induced voters with lower levels of incumbent support to flow into affected precincts. This could occur if land title recipients immediately sold their land, or the area became more attractive to outsiders. To assess this alternative interpretation, we first examine heterogeneous effects by the potential vote change due to migration. We leverage the idea that prior voting behavior in nearby precincts that are closer to the urban center approximate the preferences of possible migrants to newly titled areas. This expectation is based on Mexican migration experts, who argue that voters are most likely to migrate from relatively more urban precincts to the periphery as urban areas expand. Consequently, the political preferences of voters slightly further inside the urban periphery should be indicative of the preferences of the voters likely to migrate to areas where the CORETT granted titles. Figure 6 provides an example from the municipality of Aguascalientes, where voters in precinct 86 should be similar to those likely to migrate to precinct 83 after land titling occurred in precinct 83.

To implement this test, we calculate the difference in the municipal vote share at the previous election between the nearest precinct closer to the urban center in an urban area that did not itself

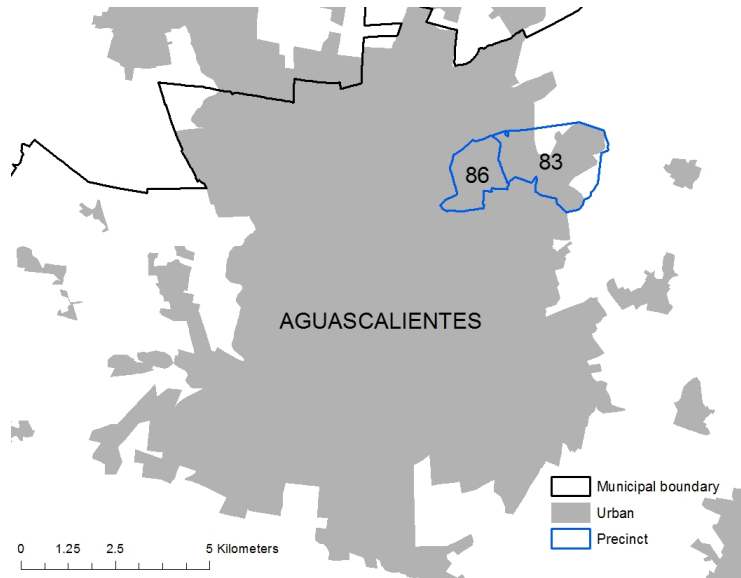


Figure 6: Example of a nearby precinct without a land titling event where voters who recently moved to (precinct 86) should be similar to those likely to migrate to the precinct where a land titling occurred (precinct 83)

experience a land titling event and the precinct experiencing land titling.<sup>46</sup> If migration of this type is driving our findings, we would expect to find that nearby urban areas are more likely to oppose the incumbent and land titling's biggest effects would occur where candidate migrants are less favorable toward the incumbent. However, contrary to the concern that nearby urban precincts are more anti-incumbent, the average nearby urban precinct is 5.6 percentage points more favorable toward the incumbent. Furthermore, panel A in Table 6 shows that we do not find a significant interaction between our land titling variables and the difference in prior vote share.

Second, we test for an increase in net migration as a result of land titling by looking at its effect on the change in the number of registered voters, which is the highest frequency population measure available at the precinct level. Panels B-D in Table 6 respectively show no statistically significant effects at conventional levels in our baseline specification, or when we add a lag or two lags of land titling exposure. The inclusion of lags enables us to dismiss large immediate effects of

<sup>46</sup>In the cases where multiple precincts satisfy this criterion, we randomly selected a precinct; 95% of our matches are from the same municipality.

Table 6: Heterogeneous effects of land titling by potential vote change due to migration on the municipal vote share and number of registered voters

	Municipal vote share of municipal incumbent party					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Effect of land titling on mun. vote share, by potential vote change due to migration						
Stock of voters with a title	-0.069** (0.033)	-0.052** (0.026)	-0.093* (0.048)	-0.041 (0.030)	-0.049 (0.030)	-0.088 (0.055)
Stock of voters with a title $\times$ Incumbent support relative to potential migrants	0.057 (0.042)	0.041 (0.042)	0.042 (0.051)	0.053 (0.035)	0.034 (0.032)	0.033 (0.039)
Observations	17,114	17,114	17,114	17,114	17,114	17,114
$R^2$	0.429	0.593	0.649	0.513	0.646	0.701
	Proportional change in the number of registered voters					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel B: Effect of land titling on the change in the number of registered voters						
Stock of voters with a title	-0.032 (0.043)	-0.044 (0.053)	0.017 (0.064)	-0.041 (0.046)	-0.044 (0.052)	0.017 (0.061)
Municipality trends	16,749	16,749	16,749	16,749	16,749	16,749
$R^2$	0.431	0.477	0.645	0.461	0.501	0.669
Panel C: Effect of land titling on the change in the number of registered voters with one lag						
Stock of voters with a title	0.000 (0.049)	-0.014 (0.050)	0.011 (0.060)	-0.004 (0.042)	-0.012 (0.049)	0.011 (0.058)
Stock of voters with a title ( $t - 1$ )	-0.053 (0.056)	-0.075 (0.073)	-0.053 (0.066)	-0.060 (0.051)	-0.076 (0.065)	-0.057 (0.053)
Municipality trends	16,749	16,749	16,749	16,749	16,749	16,749
$R^2$	0.431	0.478	0.645	0.462	0.501	0.669
Panel D: Effect of land titling on the change in the number of registered voters with two lags						
Stock of voters with a title	0.000 (0.049)	-0.015 (0.050)	0.006 (0.069)	-0.004 (0.043)	-0.012 (0.049)	0.019 (0.072)
Stock of voters with a title ( $t - 1$ )	-0.049 (0.059)	-0.066 (0.072)	-0.054 (0.065)	-0.062 (0.058)	-0.073 (0.066)	-0.054 (0.048)
Stock of voters with a title ( $t - 2$ )	-0.008 (0.023)	-0.024 (0.023)	-0.009 (0.040)	0.004 (0.027)	-0.009 (0.023)	0.015 (0.050)
Observations	16,749	16,749	16,749	16,749	16,749	16,749
$R^2$	0.431	0.478	0.645	0.462	0.501	0.669
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X

Notes: All specifications include precinct and year fixed effects. “Stock of voters with a title” is the share of voters in precinct  $p$  that received titles before  $t$ . “Incumbent support relative to potential migrants” is the difference in lagged incumbent vote shares between the closest precinct in an urban area and the precinct experiencing a titling. “Proportional change in the number of registered voters” is the change in registered voters between  $t$  and  $t - 1$  divided by the registered voters at  $t - 1$ . The loss of observations in panel A is due to the fact that many precincts do not have a closest precinct in an urban area that is unaffected by the titling. The loss in observations in panels B-D are due to missing data for the number of registered voters and that we lose one year of observations when focusing on the change. Relative to panel B, there is no further loss of observations in panels C and D, since we focus on lags of a program that started well before the date at which election data at the precinct level data is available. Standard errors are clustered by municipality.

land titling on net migration as well as effects that take longer to germinate. In sum, we find little evidence indicating that migration drives our findings.

#### **4.2.5 Spillovers to indirectly affected neighboring voters**

A final alternative interpretation regards the extent to which the changes in observed electoral behavior reflect belief updating about the incumbent party among voters in affected precincts that were not themselves squatters directly affected by the titling event or voters in control precincts that did not experience additional titles under the incumbent municipal government. Rather than reducing clientelistic leverage over directly affected land title beneficiaries, belief updating among unaffected voters could explain our results if such voters in affected precincts updated negatively about the incumbent, or if voters in unaffected precincts that had already received titles or would later receive titles updated positively about the incumbent. Effects in the opposite directions would imply that our estimates underestimate the clientelistic effect.

Since our precinct-level data cannot distinguish voters that did and did not receive titles within a precinct, we assess whether spillovers through either mechanism could account for our results by leveraging neighboring precincts that never receive land titles. Such neighboring precincts represent an informative test because both updating interpretations rely on voters learning that land titling occurred, which spatial proximity is likely to facilitate. These voters could update positively about the incumbent party if they support programmatic reforms more generally, believe that the CORETT program indicates incumbent competence to implement other projects, or benefited from the reallocation of clientelistic resources away from titled voters.

In practice, precincts that benefit from land titling rarely neighbor other precincts that also benefit from the CORETT program—in many municipalities, only one communal area is ever titled. Moreover, Table B1 demonstrates that land titling does not influence electoral outcomes in the municipality more broadly. Consequently, our primary concern is whether land titling in neighboring precincts increases incumbent party vote share. However, Appendix Table B7 reports no evidence

Table 7: Effect of land titling on the federal vote share of the federal incumbent party

	Federal vote share of federal incumbent party					
	(1)	(2)	(3)	(4)	(5)	(6)
Stock of voters with a title	-0.034 (0.023)	-0.022 (0.015)	0.016 (0.024)	-0.037** (0.017)	-0.029** (0.013)	0.007 (0.019)
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X
Observations	27,863	27,863	27,863	27,863	27,863	27,863
$R^2$	0.515	0.636	0.708	0.664	0.726	0.794

*Notes:* All specifications include precinct and year fixed effects. “Stock of voters with a title” is the share of voters in precinct  $p$  that received titles before  $t$ . Standard errors are clustered by municipality.

of increased support for the municipal incumbent in neighboring precincts, thereby providing little support for the primary spillover concern that non-beneficiaries in affected precincts sanctioned incumbents in response. Rather, the negative and usually insignificant coefficients are consistent with a lower return to clientelistic efforts in areas around the previously-untitled land discouraging clientelism in both the affected precinct and its vicinity.

### 4.3 Rewarding incumbent parties for implementing land titling events

By focusing on the electoral fortunes of municipal incumbent parties, our estimates so far predominantly capture the effect of Mexico’s land titling program on clientelism. However, as noted above, voters may also reward the parties directly involved in the land titling program. Because the CORETT program is administered at the federal level, this credit claiming channel is most likely to affect the electoral support of the federal incumbent party that administered the titling program.

To examine the policy reward dimension, we first estimate equation (1) to identify the net effect of land titling on the *current* incumbent president’s party in federal legislative elections.<sup>47</sup>

<sup>47</sup>Due to the high correlation ( $\rho > 0.9$ ) between vote shares in presidential and concurrent federal legislative elections, using presidential election results provides very similar results.

The estimate in column (1) of Table 7 shows that, regardless of whether the incumbent president's party was responsible for the titling, their party is unaffected by land titling on average. Although the negative coefficient is statistically significant ( $p < 0.1$ ) in our baseline specifications, the point estimate shifts toward zero in our more robust specifications—in columns (2)-(6)—that control more flexibly for time trends.<sup>48</sup> This suggests that land titling neither reduces the vote share of the federal incumbent party—as was the case with the municipal incumbent party—nor substantially increases it, as suggested by a credit claiming story where the incumbent president's party is able to capture credit for previous urban titling events. This null finding could reflect the possibility that federal incumbents were in fact unaffected by Mexico's land titling program. Alternatively, the loss of clientelistic capacity may roughly cancel out credit claiming benefits.

To separate rewards for the federal incumbent that implemented the program from loss of clientelistic capacity, we turn to our second empirical strategy exploiting changes in the federal incumbency of the incumbent responsible for titling across time. Table 8 presents the results of estimating equation (2) and suggests that the CORETT program both reduced clientelism and significantly rewarded the implementing federal incumbent party. Suggesting that the impact on clientelism also affects federal incumbents, the negative lower-order coefficients on land titling among federal incumbent parties that did not themselves implement the titling are generally statistically significant across columns (1)-(6). However, consistent with the impact on clientelism primarily affecting municipal incumbents, this effect of land titling is far smaller in magnitude the comparable estimate for municipal incumbents that we next report.

In contrast, the significant positive coefficients on the interaction between land titling and federal incumbency of the titling party provide clear evidence that voters remember and persistently reward the federal party that provided them with property rights. For example, the estimates in

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<sup>48</sup>Appendix Table B8 includes one or two leads and reports largely statistically insignificant effects on such leads. This lends further credibility to the “parallel-trends” assumption identifying these estimates. Appendix Tables B4 and B9 respectively show that the municipal vote share of the federal incumbent party is unaffected by land titling and that federal turnout is also not affected by land titling.



Table 8: Heterogeneous effect of land titling, by federal alignment with the federal incumbent party at time of titling

	Federal vote share of federal incumbent party					
	(1)	(2)	(3)	(4)	(5)	(6)
Stock of voters with a title	-0.050*	-0.048***	-0.049	-0.057***	-0.052***	-0.052*
	(0.027)	(0.017)	(0.037)	(0.021)	(0.015)	(0.028)
Stock of people with a title × Fed. incumbent was fed. incumbent at titling	0.081***	0.072***	0.109***	0.074***	0.057***	0.086***
	(0.020)	(0.017)	(0.030)	(0.018)	(0.014)	(0.021)
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X
Observations	27,863	27,863	27,863	27,863	27,863	27,863
$R^2$	0.518	0.638	0.711	0.666	0.727	0.796
Test: sum of coefficients ( $p$ value)	0.185	0.210	0.032	0.354	0.753	0.117

*Notes:* All specifications include precinct and year fixed effects. “Stock of voters with a title” is the share of voters in precinct  $p$  that received titles before  $t$ . “Federal incumbent was federal incumbent at titling” is a variable coded 0 if the current federal incumbent party was not the federal incumbent at the time of any titling, or the proportion of titling events where the current federal incumbent party was also the federal incumbent party. Standard errors are clustered by municipality.

column (1) indicate that a standard deviation increase in the stock of voters that received a land title through the CORETT program entails a 1 percentage point, or a 2.5%, increase in the vote share for the incumbent party responsible for delivering CORETT titles in that precinct. Furthermore, the  $p$ -values at the foot of Table 8 suggest that the net effect of land titling—i.e. the sum of the baseline and interaction effect where the current federal incumbent was the only incumbent responsible for land titling in a precinct—on the federal incumbent party’s vote share consistently positive and statistically significant in some specifications. The net effect is especially large in our more demanding specifications including municipality- and precinct-specific time trends. Regardless of whether the net effect is statistically significant at conventional levels, by separating out the clientelistic and reward components of the urban titling program, these results suggest that the null effect reported in Table 7 reflects the balancing of these forces when different types of federal incumbent are pooled.

Although federal incumbent parties work hard to claim credit for the CORETT program, mu-

municipal incumbents may also be able to capture some of the credit received by federal incumbents. Such benefits could at least partially offset the large electoral costs of losing clientelistic capacity, and imply that our estimates in Table 2 underestimate the extent of clientelistic breakdown. To assess this credit claiming channel, we use the same approach to examine how titling differentially affects the municipal incumbent's vote share in municipal elections when the municipal incumbent party was also the federal incumbent party at the time of the land titling.

The results in Table 9 indicate that voters indeed reward municipal incumbents in office when the titling program was implemented, but highlight that such rewards are small relative to the large losses attributed to reduced clientelistic capacity. The estimates in column (1) indicate that, for a municipal incumbent responsible for past titling, the negative effect on vote share due to an increase in the intensity of the program is more than double the gain associated with being incumbent at the time of titling. As the coefficients at the foot of the table show, the negative net effect of an increase in the intensity of the program is not quite statistically different from zero when including municipal and precinct-specific time trends. Nevertheless, the net negative impact is substantially lower than the positive net effect experienced by federal incumbents in Table 8. This comparison thus reinforces our previous findings and qualitative evidence that, while municipal incumbents principally suffer from a loss of clientelistic capacity, federal incumbents primarily benefit from claiming credit for a popular program.

Together, these findings highlight how land titling programs produce two countervailing effects. On the one hand, we demonstrated above that land titling reduces the capacity for incumbents to leverage insecure property to enforce clientelistic relationships. On the other, we find that voters reward municipal and especially federal incumbent parties involved in the land titling program. While these rewards surpass the loss of clientelistic capacity at the federal level, they do not offset the large negative effect of breaking down clientelistic ties at the municipal level. The result thus reinforces the importance of disentangling the effect of programmatic policies on parties' ability to enforce clientelistic exchanges from their effect on voters' perceptions about parties' ability

Table 9: Heterogeneous effect of land titling, by municipal alignment with the federal incumbent party at time of titling

	Municipal vote share of municipal incumbent party					
	(1)	(2)	(3)	(4)	(5)	(6)
Stock of voters with a title	-0.111*** (0.023)	-0.075*** (0.023)	-0.091** (0.042)	-0.089*** (0.022)	-0.070*** (0.024)	-0.082* (0.042)
Stock of voters with a title $\times$ Mun. incumbent was fed. inc. at titling	0.064*** (0.020)	0.054*** (0.017)	0.057*** (0.021)	0.055*** (0.019)	0.055*** (0.017)	0.058*** (0.020)
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X
Observations	21,615	21,615	21,615	21,615	21,615	21,615
$R^2$	0.396	0.511	0.555	0.489	0.577	0.617
Test: sum of coefficients ( $p$ value)	0.095	0.399	0.450	0.164	0.539	0.573

*Notes:* All specifications include precinct and year fixed effects. “Stock of voters with a title” is the share of voters in precinct  $p$  that received titles before  $t$ . “Municipal incumbent was federal incumbent at titling” is a variable coded 0 if the current municipal incumbent party was not the federal incumbent at the time of any titling, or the proportion of titling events where the current municipal incumbent party was also the federal incumbent party. Standard errors are clustered by municipality.

and willingness to implement programmatic policies. These findings thus help to explain why federal incumbent parties, and especially those with limited concern about local political control, implement programs and reforms that might hurt their ability to enforce clientelistic exchanges may find it strategically sensible to do so (??).

## 5 Conclusion

In this article, we show that programmatic policies can simultaneously break down clientelistic ties while also generating rewards for the party responsible for implementing the policy. In contrast with previous studies focusing on a single level of government, our analysis across municipal governments—where clientelistic relationship can be most easily sustained—and the federal government—which was primarily responsible for the implementation of the program—is able to differentiate clientelistic from credit claiming forces associated with a major land titling program.

In particular, while we identify persistent losses among future municipal incumbents as a result of the breakdown of clientelistic ties, we also find evidence of effective credit-claiming by the federal incumbent. The losses associated with a decline in clientelistic capacity of a municipal incumbent are partially offset by alignment with the federal incumbent at the time of titling. However, we document the first systematic evidence that the rewards for the federal incumbents that implemented the program outweigh the small losses in clientelistic capacity that federal incumbent parties also appears to suffer.

In addition to showing how the provision of property rights can break down clientelistic ties, which represent a major challenge to democratic and economic development across the developing world, our findings also highlight the trade off that federal incumbents face when deciding whether to implement popular programmatic policies. While the implementation of these policies might lead to electoral rewards for implementation, they nevertheless substantially reduce the capacity of locally aligned politicians to harvest votes by exploiting the dependence of voters on the local governments under their control. Whether programmatic policies are implemented by federal incumbents is thus likely to depend on whether the benefits outweigh the costs given the political context that federal governments face. It is then not surprising that federal governments implement this programs when they risk losing power, as was the case when the PRI implemented *Progres*a in the late 1990s. Conversely, when the federal incumbent retains stable national control, it is less likely that they will be willing to implement programmatic reforms that undermine the clientelistic ability of aligned local politicians and relinquish incumbency advantages.

## A Data construction

We first retrieved from the following variables from the CORETT data: the ejidos or agrarian communities where each CORETT titling event took place, the date when those events started, as well the number of households that benefited in each case. To identify the spatial location of the beneficiaries of each titling, we used two data sources. First, matching on name of the ejidos or agrarian communities and event date, we took from the *Padrón e Historial de Núcleos Agrarios* (PHINA) of the *Registro Agrario Nacional* (RAN), which contains all the ejido and agrarian communities that were expropriated by the CORETT, the unique RAN identifiers for each of the communal lands.<sup>49</sup> Second, using the unique RAN identifiers for each ejido and agrarian community, we identified their geographical location in the spatial database of the *Programa de Certificación de Derechos Ejidales y Titulación de Solares* (PROCEDE).

To determine the share of voters in each precinct that benefited in each case of CORETT titling, we exploited two spatial databases. First, we used data on the spatial location of rural localities and urban blocks, together with the population in each, from the *Instituto Nacional de Estadística y Geografía* (INEGI). Second, we combined this with data on the spatial location of the Mexican precincts from the *Instituto Federal Electoral* (IFE). We first intersected these two spatial databases to assign each rural locality and urban block to a precinct.<sup>50</sup> We then assigned each rural locality and urban block to an ejido or agrarian community. Using these two assignments, we distributed the number of households that benefited in each CORETT titling event across the precincts following population shares of each ejido and agrarian community across the precincts they overlap with. Lastly, we computed the share of voters in each precinct that benefited from each CORETT titling. Table A1 shows the distribution of municipalities in our sample by state.

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<sup>49</sup>The data was scrapped from <http://phina.ran.gob.mx/phina2/> by Melissa Dell, who generously shared it with us.

<sup>50</sup>At the end of this procedure, we only keep precincts where at least 10% of their population is part of the ejido or agrarian community that was affected by titling by the CORETT. Our results are robust to stricter sample restrictions.

Table A1: Distribution of municipalities in our sample

State	Full Sample	Our sample	% over total
	Number of municipalities	Number of municipalities	
Aguascalientes	11	7	63.6%
Baja California	5	4	80.0%
Baja California Sur	5	2	40.0%
Campeche	11	5	45.5%
Chiapas	122	18	14.8%
Chihuahua	67	16	23.9%
Coahuila	38	12	31.6%
Colima	10	7	70.0%
Durango	39	14	35.9%
Guanajuato	46	21	45.7%
Guerrero	81	19	23.5%
Hidalgo	84	19	22.6%
Jalisco	125	35	28.0%
México	125	29	23.2%
Michoacán	113	33	29.2%
Morelos	33	19	57.6%
Nayarit	20	7	35.0%
Nuevo León	51	6	11.8%
Oaxaca	570	11	1.9%
Puebla	217	18	8.3%
Querétaro	18	10	55.6%
Quintana Roo	10	5	50.0%
San Luis Potosí	58	12	20.7%
Sinaloa	18	15	83.3%
Sonora	72	13	18.1%
Tabasco	17	5	29.4%
Tamaulipas	43	10	23.3%
Tlaxcala	60	5	8.3%
Veracruz	212	57	26.9%
Yucatán	106	11	10.4%
Zacatecas	58	9	15.5%
Total	2,445	463	18.9%

## **B Additional robustness checks**

Figure B1 shows that the trends in the federal incumbent party vote share were relatively flat in advance of land titling events. Table B1 shows that land titling did not affect the likelihood of future incumbency of the municipal incumbent party at titling. Table B2 shows no robust effect of land titling on turnout. Tables B3 and B4 respectively show that the effects of land titling events on the municipal incumbent party's vote share in federal elections or the federal incumbent party's vote share in municipal elections. In contrast with the large and significant negative effects of land titling on the municipal incumbent party's vote share in municipal elections (see Table 2), these effects are comparatively small, and never statistically significant. This also conforms with the candidate-specific nature of Mexican election campaigns (i.e. relatively minimal cross-race spillovers). Table B5 shows a significant effect of the first land titling on the municipal vote share of the municipal incumbent party, and Table B6 no effect on the federal vote share of the federal incumbent party. Table B7 shows no evidence of increased support for the municipal incumbent in neighboring precincts. Table B8 shows the inclusion of one and two largely statistically insignificant leads, which supports the "parallel-trends" assumption identifying these estimates. Lastly, Table B9 shows that federal turnout is not affected by land titling.

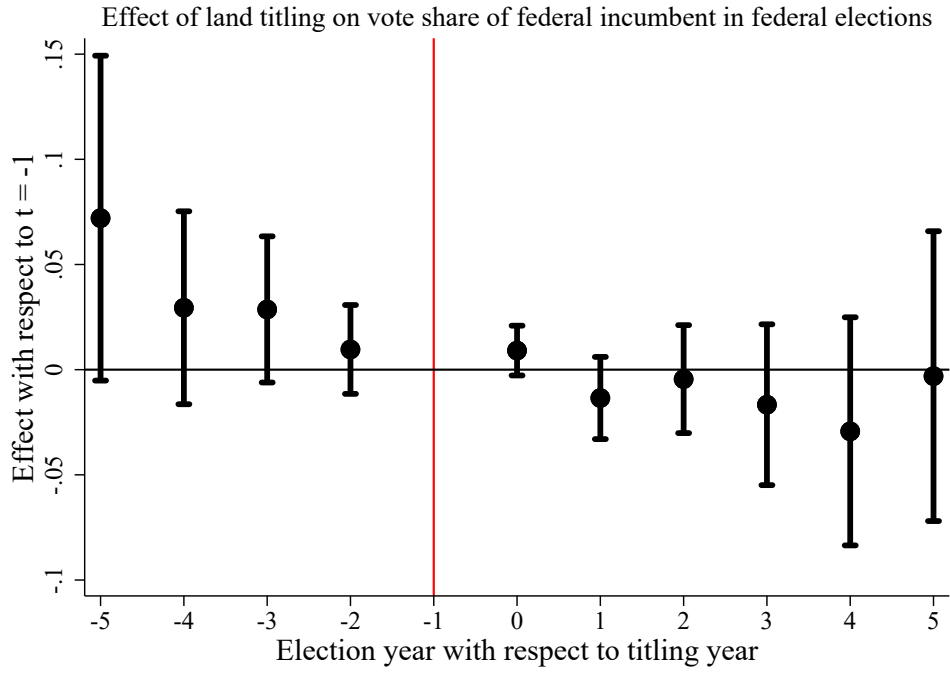


Figure B1: Lack of pre-trends in federal incumbent party vote



Table B1: Effect of land titling on the likelihood of future incumbency of the municipal incumbent party at titling (at the municipality level)

	Future election of municipal incumbent party at titling	
	(1)	(2)
Flow of voters with a title	0.017* (0.009)	0.017** (0.008)
Mean of Dependent Variable	0.040	0.040
State-year fixed effects		X
Observations	7,252	7,252
$R^2$	0.064	0.142

*Notes:* All specifications include year fixed effects. “Stock of voters with a title” is the share of voters in the municipality that received titles before  $t$ . Standard errors are clustered by municipality.

Table B2: Effect of land titling on turnout in municipal elections

	Turnout in municipal elections					
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A: Main effect</b>						
Stock of voters with a title	-0.008 (0.015)	-0.005 (0.012)	0.004 (0.019)	-0.016 (0.010)	-0.015* (0.009)	-0.013 (0.012)
Observations	20,687	20,687	20,687	20,687	20,687	20,687
$R^2$	0.711	0.778	0.810	0.822	0.851	0.882
<b>Panel B: Heterogeneous effect by municipal alignment with the federal incumbent party at time of titling</b>						
Stock of voters with a title	-0.007 (0.015)	-0.006 (0.012)	-0.000 (0.019)	-0.011 (0.010)	-0.015 (0.009)	-0.013 (0.012)
Stock of voters with a title $\times$ Mun. incumbent was fed. inc. at titling	-0.018* (0.010)	-0.012 (0.009)	-0.016 (0.011)	-0.011 (0.007)	-0.001 (0.006)	-0.003 (0.007)
Observations	20,687	20,687	20,687	20,687	20,687	20,687
$R^2$	0.713	0.779	0.811	0.822	0.851	0.882
Test: sum of coefficients ( $p$ value)	0.125	0.164	0.467	0.049	0.075	0.216
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X

*Notes:* All specifications include precinct and year fixed effects. “Stock of voters with a title” is the share of voters in precinct  $p$  that received titles before  $t$ . “Municipal incumbent was federal incumbent at titling” is a variable coded 0 if the current municipal incumbent party was not the federal incumbent at the time of any titling, or the proportion of titling events where the current municipal incumbent party was also the federal incumbent party. Standard errors are clustered by municipality.

Table B3: Effect of land titling on the federal vote share of municipal incumbent party

	Federal vote share of municipal incumbent party					
	(1)	(2)	(3)	(4)	(5)	(6)
Stock of voters with a title	-0.007 (0.017)	0.006 (0.016)	0.022 (0.027)	-0.013 (0.015)	-0.003 (0.013)	0.006 (0.023)
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X
Observations	26,209	26,209	26,209	26,209	26,209	26,209
$R^2$	0.387	0.478	0.521	0.495	0.561	0.600

*Notes:* All specifications include precinct and year fixed effects. “Stock of voters with a title” is the share of voters in precinct  $p$  that received titles before  $t$ . Standard errors are clustered by municipality.

Table B4: Effect of land titling on the municipal vote share of federal incumbent party

	Municipal vote share of federal incumbent party					
	(1)	(2)	(3)	(4)	(5)	(6)
Stock of voters with a title	-0.025 (0.024)	-0.033 (0.021)	-0.008 (0.040)	-0.027 (0.021)	-0.040** (0.020)	-0.020 (0.037)
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X
Observations	22,171	22,171	22,171	22,171	22,171	22,171
$R^2$	0.471	0.577	0.623	0.580	0.644	0.689

*Notes:* All specifications include precinct and year fixed effects. “Stock of voters with a title” is the share of voters in precinct  $p$  that received titles before  $t$ . Standard errors are clustered by municipality.

Table B5: Effect of the first land titling on the municipal vote share of municipal incumbent party

	Municipal vote share of municipal incumbent party					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Main effect						
Ever titled	-0.022*	-0.012	-0.016	-0.011	-0.013	-0.015
	(0.012)	(0.015)	(0.022)	(0.011)	(0.014)	(0.021)
Observations	21,615	21,615	21,615	21,615	21,615	21,615
$R^2$	0.382	0.506	0.550	0.478	0.573	0.611
Panel B: Heterogeneous effect by share of voters first titled						
Ever titled	-0.004	0.000	-0.005	0.005	0.001	0.001
	(0.016)	(0.019)	(0.029)	(0.015)	(0.017)	(0.027)
First titling $\times$ Share of voters first titled	-0.089**	-0.065*	-0.060	-0.081**	-0.073**	-0.079
	(0.035)	(0.035)	(0.064)	(0.033)	(0.036)	(0.066)
Observations	21,615	21,615	21,615	21,615	21,615	21,615
$R^2$	0.383	0.506	0.550	0.479	0.573	0.612
Test: sum of coefficients ( $p$ value)	0.000	0.013	0.174	0.003	0.012	0.125
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X

*Notes:* All specifications include precinct and year fixed effects. “Ever titled” is an indicator that voters in the precinct were ever titled. “Share of voters first titled” is the share of voters in the precinct that received titles at the time of the first titling. Standard errors are clustered by municipality.

Table B6: Effect of the first land titling on the federal vote share of federal incumbent party

	Federal vote share of federal incumbent party					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Main effect						
Ever titled	-0.014 (0.011)	-0.006 (0.008)	-0.001 (0.010)	-0.014 (0.009)	-0.006 (0.006)	0.001 (0.007)
Observations	27,863	27,863	27,863	27,863	27,863	27,863
$R^2$	0.515	0.636	0.708	0.664	0.726	0.794
Panel B: Heterogeneous effect by share of voters first titled						
Ever titled	-0.008 (0.012)	-0.002 (0.008)	-0.007 (0.011)	-0.006 (0.010)	0.000 (0.006)	-0.003 (0.008)
First titling $\times$ Share of voters first titled	-0.025 (0.031)	-0.021 (0.020)	0.026 (0.031)	-0.036 (0.023)	-0.029* (0.017)	0.016 (0.025)
Observations	27,863	27,863	27,863	27,863	27,863	27,863
$R^2$	0.515	0.636	0.708	0.664	0.726	0.794
Test: sum of coefficients ( $p$ value)	0.235	0.215	0.484	0.041	0.067	0.559
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X

*Notes:* All specifications include precinct and year fixed effects. “Ever titled” is an indicator that voters in the precinct were ever titled. “Share of voters first titled” is the share of voters in the precinct that received titles at the time of the first titling. Standard errors are clustered by municipality.

Table B7: Effect of land titling on the municipal vote share of municipal incumbent party in neighboring precincts

	Municipal vote share of municipal incumbent party					
	(1)	(2)	(3)	(4)	(5)	(6)
Stock of voters with a title	-0.027 (0.020)	-0.024 (0.022)	-0.040 (0.039)	-0.007 (0.018)	-0.020 (0.020)	-0.035 (0.036)
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X
Observations	40,042	40,042	40,042	40,042	40,042	40,042
$R^2$	0.366	0.475	0.531	0.446	0.527	0.582

*Notes:* All specifications include precinct and year fixed effects. “Stock of voters with a title” is the share of voters in precinct  $p$  that received titles before  $t$ . Standard errors are clustered by municipality.

Table B8: Effect of future land titling on the federal vote share of federal incumbent party, robustness to including one and two leads

	Federal vote share of federal incumbent party					
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A: Robustness to including one lead</b>						
Stock of voters with a title	-0.007 (0.019)	-0.009 (0.016)	0.021 (0.027)	-0.020 (0.016)	-0.022* (0.013)	0.009 (0.021)
Stock of voters with a title ( $t + 1$ )	-0.054** (0.021)	-0.052*** (0.020)	-0.030 (0.028)	-0.030* (0.016)	-0.029* (0.017)	0.000 (0.022)
Observations	23,561	23,561	23,561	23,561	23,561	23,561
$R^2$	0.494	0.641	0.719	0.650	0.730	0.808
<b>Panel B: Robustness to including two leads</b>						
Stock of voters with a title	-0.015 (0.020)	-0.004 (0.017)	0.062** (0.028)	-0.025 (0.017)	-0.021* (0.013)	0.037* (0.021)
Stock of voters with a title ( $t + 1$ )	-0.038* (0.021)	-0.028 (0.022)	0.031 (0.034)	-0.021 (0.016)	-0.002 (0.018)	0.051** (0.025)
Stock of voters with a title ( $t + 2$ )	-0.069** (0.032)	-0.029 (0.034)	0.061 (0.052)	-0.043* (0.025)	-0.061** (0.026)	0.015 (0.037)
Observations	19,417	19,417	19,417	19,417	19,417	19,417
$R^2$	0.486	0.650	0.734	0.654	0.745	0.829
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X

*Notes:* All specifications include precinct and year fixed effects. “Stock of voters with a title” is the share of voters in precinct  $p$  that received titles before  $t$ . Standard errors are clustered by municipality.



Table B9: Effect of land titling on turnout in federal elections

	Turnout in federal elections					
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A: Main effect</b>						
Stock of voters with a title	0.003 (0.011)	-0.003 (0.007)	-0.000 (0.010)	-0.002 (0.006)	-0.001 (0.006)	0.004 (0.008)
Observations	27,868	27,868	27,868	27,868	27,868	27,868
$R^2$	0.797	0.839	0.859	0.864	0.884	0.905
<b>Panel B: Heterogeneous effect by federal incumbent party at time of titling</b>						
Stock of voters with a title	-0.013 (0.012)	-0.006 (0.008)	-0.002 (0.016)	-0.006 (0.008)	-0.004 (0.007)	0.004 (0.012)
Stock of voters with a title $\times$ Fed. incumbent was fed. inc. at titling	0.009 (0.012)	0.000 (0.007)	-0.006 (0.013)	-0.007 (0.008)	-0.001 (0.006)	-0.011 (0.010)
Observations	27,868	27,868	27,868	27,868	27,868	27,868
$R^2$	0.797	0.839	0.859	0.864	0.884	0.905
Test: sum of coefficients ( $p$ value)	0.758	0.487	0.508	0.082	0.486	0.529
Municipality trends		X			X	
Precinct trends			X			X
State-year fixed effects				X	X	X

*Notes:* All specifications include precinct and year fixed effects. “Stock of voters with a title” is the share of voters in precinct  $p$  that received titles before  $t$ . “Federal incumbent was federal incumbent at titling” is a variable coded 0 if the current federal incumbent party was not the federal incumbent at the time of any titling, or the proportion of titling events where the current federal incumbent party was also the federal incumbent party. Standard errors are clustered by municipality.