Breaking clientelism or rewarding incumbents? Evidence from an urban titling program in Mexico[*]

Horacio Larreguy[†]   John Marshall[‡]   Laura Trucco[§]

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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 equilibria break down, particularly because 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 2.16 million urban households over 35 years. We find that municipal incumbents, who were not responsible for the program's implementation but often rely on weak property rights to enforce clientelistic exchanges, experience a large and persistent decrease in their vote share in electoral precincts where the program was implemented. The clientelistic capacity of future federal incumbents is diminished to a lesser degree. However, we show that this loss is more than compensated for by the lasting increase in the implementing federal incumbent's vote share among the land titling program's beneficiaries. Aligned municipal incumbents also successfully claim credit, receiving a smaller boost that partially offsets their loss of clientelistic capacity. These results thus demonstrate that major programmatic reforms can both reduce clientelism while also rewarding incumbents for their policies in office.

[†]Assistant Professor, Department of Government, Harvard University, 1737 Cambridge St., Cambridge, MA 02138 (hlarreguy@fas.harvard.edu).

[‡]Ph.D. candidate, Department of Government, Harvard University, 1737 Cambridge St., Cambridge, MA 02138 (jlmarsh@fas.harvard.edu).

[§]Post-doctoral Fellow, NYU Development Research Institute (trucco@nyu.edu).

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1 Introduction

Clientelism, the exchange of personal favors for political support, is ubiquitous in many developing contexts (Kitschelt and Wilkinson 2007; Schaffer 2007). This practice has important, and often detrimental, implications for the provision of public goods and political accountability (Keefer 2007; Keefer and Vlaicu 2008). While a blossoming literature explains how clientelistic exchanges operate in practice—whether brokers mobilize likely supporters through turnout buying (Nichter 2008) or induce individuals to change their vote by exploiting their reciprocity (Finan and Schechter 2012; Lawson and Greene 2014), or how parties provide incentives to brokers to mitigate moral hazard and adverse selection problems (Larreguy 2013; Larreguy, Marshall and Querubín forthcoming; Stokes et al. 2013)—a lot less is known about what ultimately causes voters to enter clientelistic relationships, and especially the conditions under which voters escape such relationships.

Why might voters enter and remain in clientelistic relationships? One possibility is that the short-term return to voters from engaging in clientelistic exchanges with incumbent parties, who have greatest access to resources, is larger than the benefits associated with demanding greater public good provision. Since clients often live in poverty, the marginal return of immediate informal assistance from politicians may often exceed future benefits of public good provision (Diaz-Cayeros, Estévez and Magaloni forthcoming; Magaloni 2006). Even without relying on high discount rates, the ongoing distributional benefits of clientelism could be higher than even programmatic policies in the long-run for the subset of the population receiving such benefits (Lizzeri and Persico 2001). Alternatively, voters may be unaware of programmatic policies, and even if they are aware of such policies, promises of programmatic policies may not be regarded as credible. Many developing democracies struggle to escape equilibria where incumbent parties that (potentially) would like to provide programmatic policies cannot commit to such provision because short-term electoral

incentives lead them to break their promises in order to retain office (Keefer 2007; Keefer and Vlaicu 2008).

However, understanding why voters fall into and remain in clientelistic exchanges faces major empirical challenges. In particular, the impact of any reform that may alter the return of clientelistic transactions to voters, or provide voters with information about alternative political agendas like programmatic politics, might also independently affect a voter's electoral behavior by altering their appraisal of the government implementing the reform. This difficulty is exemplified in the growing literature exploiting natural experiments to identify the effects of conditional cash transfer programs (CCTs). By transparently conditioning cash transfers on school attendance and regular medical checks, these programs—which spread across Latin America in the late 1990s and early 2000s—reduce the scope for governments to engage in clientelistic transfers and increase the value of public goods to voters. De La O (2013) and Diaz-Cayeros, Estévez and Magaloni (forthcoming) in Mexico, Manacorda, Miguel and Vigorito (2011) in Uruguay, and Zucco (2013) in Brazil all find that enrollment in CCTs substantially increases electoral support for the federal incumbent that implemented the policy. These findings could be taken as evidence that CCTs are unable to undermine the conditions under which incumbent parties can employ clientelistic exchanges to retain office. However, such a conclusion ignores the possibility that voters may also use the outcomes of prominent policies to update about their incumbent party's suitability for office (Manacorda, Miguel and Vigorito 2011). Instead, these results could simply reveal that this positive effect on the federal incumbent's vote share dominates any negative effects on the incumbent's ability to engage in clientelistic transfers in the election immediately after the policy's implementation.

In this article, we exploit Mexico's federal structure and changes in incumbency across time to separate the effects of a major land titling program on clientelism from its effects on rewards for policy implementation. Since 1973, the federal government has created property

rights on communal lands and offered squatters the opportunity to buy those rights at highly subsidized prices. Over 35 years, the program has reached 2.16 million households. Like CCT programs, recipients of land titles experience increased access to public goods and a positive net wealth effect.[1]

There is a strong symbiotic relationship between the lack of property rights and clientelism in urban Mexico. Political brokers and local government officials often offer squatters protection against eviction 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 both municipal and federal incumbents. Consequently, the establishment of land property rights has the potential to substantially diminish the dependency of squatters upon the incumbent political parties, particularly at the municipal level, and thus break down clientelistic ties. However, identifying the effect of land titling on clientelism is vulnerable to the same empirical concerns as CCTs. If incumbent parties, and especially the federal incumbent responsible for the program, are credited for the program's implementation, then land titling reforms may also increase political support for that incumbent among the reform's beneficiaries.

Leveraging the timing of land titling of informal urban settlements owned by ejidos and agrarian communities, we use a difference-in-differences design to identify the effect of land titling on the vote share of municipal and federal incumbent partiess.[2] In order to avoid comparing locations containing squatters to those that never experienced squatters, we focus solely on electoral precincts that experienced land titling at least once as part of

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[1]Although the short-run wealth effect is negative due to the purchase, the cost was low, and access to subsidies were facilitated. Squatters can avoid the cost altogether by choosing not to enter the program, but rarely do so.

[2]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.

the Committee for the Regularization of Land Ownership (*Comité para la Regularización de la Tenencia de la Tierra*, CORETT) program between 1980 and 2013.[3] If the rewards from implementing the program primarily accrue to the federal party executing the titling, but the ability of municipal politicians to engage in clientelistic practices is reduced, by examining the vote share of incumbent parties at different levels of government over time we are able to disentangle rewards for the party executing the titling from changes in the clientelistic relationship between local incumbent parties and voters. Although incumbents cannot seek re-election, voters hold Mexico's strong parties responsible for incumbent performance in office (Chong et al. forthcoming; Larreguy, Marshall and Snyder 2015; Marshall 2015).

We focus on electoral results at the precinct level—the smallest geographical electoral unit for which voting data is available—and operationalize our treatment in two ways. First, we identify the effect of the introduction of the titling program in the precinct across all future elections. Second, we exploit the fact that the program was implemented over several years in almost half of precincts and look at the change in titling intensity within a given precinct over time.

We first estimate the effect on clientelism by examining the vote share of municipal incumbent parties, for whom the negative effect of titling on clientelism is expected to be largest. The ability of municipal incumbents to provide the basic infrastructure that irregular settlements lack and condition protection from eviction and access to public good on their electoral success places them in a particularly good position to exploit the dependence of squatters on the government. Conversely, the municipal government is unlikely to gain much credit for the reform, especially if the incumbent is not aligned with the government implementing the program.

The results show that land titling significantly decreases political support for municipal

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[3]We restrict our sample to precincts for which at least 10% of their population is part of the ejido or agrarian community that was affecting by titling by the CORETT. Our results are robust to stricter sample restrictions.

incumbent parties in municipal elections. The average land titling event in our sample decreases the vote share of municipal incumbents by 2.2 percentage points (or 5% of their vote tally). To alleviate the concern that these findings might be driven by differential trends in incumbent party support in areas where the titling took place, we demonstrate the validity of the identifying parallel trends assumption. First, neither changes in incumbent vote share nor changes in turnout over time predict the occurrence of land titling. Second, the inclusion of up to third-order lags of the corresponding treatment variable never significantly predict electoral performance. Third, the results are robust to including state-, municipality-, and ejido-specific time trends.

We also rule out a series of alternative interpretations for this finding. Examining the ideological leanings of municipal incumbents, we show that our findings are not explained by a shift in preferences toward more market-oriented parties (de Janvry, Gonzalez-Navarro and Sadoulet 2014). This result suggests that the findings are unlikely to be explained by a switch in political preference due to greater economic prospects (Di Tella, Galiani and Schargrodsky 2007), better labor market opportunities (de Janvry et al. forthcoming; Field 2007), or enhanced credit and investment opportunities (Field 2005; Field and Torero 2008) that could be associated with the program for its beneficiaries. We then show that the alignment of the municipal government with higher levels of government does not protect municipal incumbents from the negative electoral effect of the titling program. Given that such alignment increases the capacity of municipal governments to provide public goods, this result indicates that our findings are unlikely to reflect a lack of resources for municipal incumbents to deliver the public goods that they are obliged to provide after the allocation of property rights.

The federal government's capacity to engage in clientelism might also be slightly weakened by land titling, given that brokers can no longer promise federal services that would otherwise require a residential addresses. However, the incumbent at the time of titling may

be substantially rewarded for implementing the land titling program. Averaging across all future federal incumbents, these forces appear to balance out: in contrast with the results for municipal incumbent parties, land titling does not significantly affect the vote share of the incumbent president's party in federal elections. However, this approach cannot distinguish rewards for implementing and non-implementing federal incumbents, while it is also possible that neither force applies at federal elections.

To better distinguish the impacts of land titling on clientelism and incumbent rewards, we exploit changes in incumbency across time. We find that voters indeed reward municipal and especially federal incumbents for the implementation of the program, but only when the party in power is responsible for its implementation at the federal level. For such parties, these rewards partially offset the cost of breaking down clientelistic ties at the municipal level, and entail a net gain at the federal level.

These results address a key empirical challenge in the literature: differentiating the impact of a program on clientelism from its impact on voter appraisal of the incumbent's policy performance. In the Mexican context, we show that both forces apply, but principally act at different levels of government. While the CORETT land titling program mainly reduced the ability of municipal incumbents to engage in clientelism, the program's federal architects were predominantly received rewards for its implementation. Our findings thus help explain the puzzle of why incumbent parties implement programs and reforms that might hurt their ability to engage in clientelistic exchanges (de Janvry, Gonzalez-Navarro and Sadoulet 2014). As in the case of Mexico's CCT program, Progresa, in the late 1990s, our results suggest that a historically clientelistic government may transition toward programmatic programs in an attempt to hold onto power at the federal level.

These findings contribute to various literatures. First, our paper is naturally related to the literature examining how institutional changes led to the demise of clientelism in the developed world. Stokes et al. (2013) study the collapse of machine politics in the United

Kingdom and the United States. Related, Folke, Hirano and Snyder (2011) and Ujhelyi (2014*a*,*b*) show how civil service reforms short-handed the ability of clientelistic parties to use government employment and resources to reward voters. We instead focus on a major developing context where clientelistic exchanges remain prevalent, and thus show how policy reforms can break down such ties in a contemporary setting.

We also reinterpret recent work highlighting the significant effect of programmatic policies on incumbent support (De La O 2013; Manacorda, Miguel and Vigorito 2011; Zucco 2013). De La O (2013) and Manacorda, Miguel and Vigorito (2011) document a short-run electoral effect, and argue that such an effect is consistent with voters updating about the incumbent's ability or willingness to deliver programmatic policies. Zucco (2013) 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 instead shows that federal incumbents implementing programmatic policies enjoy persistent electoral reward, but also provides evidence that the ability to engage in clientelistic exchanges is severely curtailed for federal and especially municipal incumbents of all stripes.

Lastly, our work relates to Castañeda Dower and Pfutze (2015) and de Janvry, Gonzalez-Navarro and Sadoulet (2014), who look at the effect of a agricultural land certification program on electoral behavior in rural Mexico. In contrast with this paper, both articles instead examine the PROCEDE program. They also focus on different outcome variables—the vote share of the right-wing National Action Party (PAN) and the clientelistic Institutional Revolutionary Party (PRI), respectively—and reach different conclusions. While de Janvry, Gonzalez-Navarro and Sadoulet (2014) argue that the wealth effect induced by the program led to a shift in votes towards the right,[4] Castañeda Dower and Pfutze (2015) suggest that the program broke down clientelistic transactions. By focusing on the vote share of municipal

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[4]These findings are also consistent with a breakdown of clientelistic transactions, since incumbents and more clientelistic parties in Mexico are located disproportional at the left and center.

and federal incumbent parties, and examining how these vary by ideological position, we are able to isolate the effect of property rights on clientelistic ties from the rewards associated with implementing a land titling program.

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 our results identifying 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 (e.g. Cornelius 1996; Greene 2007; Magaloni 2006). 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 the PRI in 2012. Although in the period that we consider the country has three major parties and regularly engages in relatively competitive elections, elections are still characterized by significant clientelism and vote buying (e.g. Diaz-Cayeros, Estévez and Magaloni forthcoming; Larreguy, Marshall and Querubín forthcoming; Nichter and Palmer-Rubin 2014). State 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. At each political level, politicians are elected to non-renewable terms.[5] Given Mexico's strong political parties, this paper examines on how land titling impacts incumbent *parties.*

We focus on informal settlements located on urban land belonging to an ejido or agrarian community in Mexico that participated in the the CORETT land titling program. These settlements are distributed across 463 municipalities (19% of all municipalities in Mexico) from all 31 Mexican states excluding the Federal District (Table 1).[6] As our summary statistics in Table 2 indicate, the PRI is the most common municipal incumbent in our panel (60% of precinct-elections), followed by PAN (26%), and then PRD (13%). The distribution of municipal incumbents in this subsample resembles the distribution across all municipalities over the period. Even though these areas are particularly vulnerable to clientelism, they have also experienced significant land titling reforms that could break those clientelistic ties. However, such land titling could also generate electoral rewards for the incumbent party.

[Tables 1 and 2 about here]

2.1 Clientelism in urban settlements without property rights

There is a strong symbiotic relationship between clientelism and the lack of property rights in 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.[7] Considerable evidence from the focus groups that we conducted and the press demonstrates 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

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[5]From 2018, re-election will become possible for some primarily non-executive offices.

[6]We exclude the Federal District from our sample since it contains no municipal governments, and the responsibilities of its local governing bodies differ substantially from municipal governments.

[7]This situation is not unique to Mexico. For example, Fox (2014) and Hansungule, Feeney and Palmer (1998) provide evidence of similar situations in Sub-Saharan Africa, while Clichevsky (2003) offers similar accounts from the Greater Buenos Aires in Argentina.

offering protection against municipal intervention.[8] In return for their protection, brokers sometimes charge minor fees.[9] However, the main political motive for encouraging squatting is to condition the permanence of squatters on their political support (Díaz 2008; Flores Rodríguez 2008).[10] 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 (Flores Rodríguez 2008).[11]

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 (Flores Rodríguez 2008). 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 Holzner 2004 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 (Varley 1994).[12]

Third, the illegal use of land in irregular urban settlements, together with the initial

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[8]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.

[9]See "Grandes asentamientos," *El Universal*, July 19th 2000.

[10]Díaz (2008) 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.

[11]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 their occupied, they lived under a constant fear that they would be expelled.

[12]See "Solapa Gudiñoo asentamientos irregulares: PAN," *Imagen del Golfo*, May 8th 2013.

lack of provision of basic public services in such settlements, creates other opportunities for political intermediation (Vite Pérez 2001).[13] 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 (Garcés Fierros 2009).[14] 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 rights (Varley 1994).[15] Moreover, the popular press and various accounts from our field work suggest that the inability to provide formal proof of residence has prevented squatters from accessing social programs from the federal government (Varley 1994).[16] 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 (Villalón 2003). 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.[17]

Political intermediation takes many forms. In some cases leaders of irregular settlements are co-opted by municipal and federal incumbent parties, such that settlements are required

[13]This is not unique to Mexico. Gay (1990, 1994), Burgwald (1996), Auerbach (Forthcoming) and Kuehl (2013) provide evidence that party officials intervene to direct public services to people in slums in Brazil, Ecuador, India and Peru respectively.

[14]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.

[15]Varley (1994) 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.

[16]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.

[17]This situation is well characterized by Shami and Majid (2014) 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.

to affiliate with the party in order to gain access to government benefits both for themselves and their communities (Holzner 2004). In other cases, the government promotes the creation of community associations, or exploits exiting ones by staffing their committees with individuals with close ties to the incumbent party or by directly appointing incumbent party officials (Trujeque Díaz 1997; Vite Pérez 2001). In the absence of community association leaders, intermediation is often undertaken by traditional brokers and party officials.[18]

Regardless of whether it is because of a threat of eviction, protection, promise of land, or in exchange of public services, there is abundant evidence that people in irregular urban settlements are disproportionally subjected to political mobilization and illegal electoral practices (Holzner 2004). CORETT beneficiaries in our focus groups stated that, while municipal incumbents often promised access to property right and pubic 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.[19] Individuals living in such settlements are also subject to significant turnout buying. For example, although *acarreo*—which involves transporting voters to polling stations—is illegal under Article 403 of the Mexican Federal Penal Code (Larreguy, Marshall and Querubín forthcoming), there are abundant newspaper accounts documenting its extensive use in irregular settlements by hired coaches and especially groups of taxi drivers.[20] 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 (Ugalde and

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[18]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.

[19]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.

[20]See "Cerraron gasolinerías en Cancún para evitar acarreos," *Cronica*, July 7th 2005; "Sustitutos de última hora en colonias irregulares," *Por Esto Quintana Roo*, no date.

Rivera Loret de Mola 2013). 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.

Combined, this 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 federal and especially local political parties. Some accounts from the popular press and our focus groups suggest that the land titling promoted by the CORETT ended the historical clientelistic business of parties.[21]

2.2 CORETT and credit claiming

Due to the large number of irregular settlements spread out over ejidos and agrarian communities, the administration of Luis Echeverría (1970-1976) decided to create the CORETT in 1973. Its purpose was to regularize the informal settlements located both in federal and social property. Although it started with limited reach and resources, in the year after its inception the Committee was advanced to the rank of Commission and endowed with greater resources and the power to expropriate land for subsequent tiling. Since 1979, the Commission has restricted its work to the regularization of social land in urban areas (Díaz 2008; Flores Rodríguez 2008; Varley 1994).

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 2.16 million households across Mexico. It is is estimated that 8.64 million individuals, 11.5% of the Mexican urban population, benefited from the scheme. In 35 years of work, the CORETT

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[21]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 independent from political brokers and candidates after titling, since voters no longer rely on their promises or protection against expropriation.

contributed to the titling of around 150 thousand hectares, which accounts for approximately 10% of urban land in Mexico (Carreras López 2008).

Based on our interviews with CORETT officials, the program operates as follows. 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.[22] 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 all the cost of the associated taxes, our interviews suggest that CORETT beneficiaries pay between 500 and 1,000 Mexican pesos (approximately between 35 and 70 US dollars).[23] 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 channel the potential beneficiaries to the relevant institutions that provide these.[24] 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 (Carreras López 2008; SEDESOL 2011). CORETT officials indicate that the entire process takes between 6 and 8 months.[25]

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[22]CORETT officials highlight legal actions by ejido or agrarian communities as the main impediment to land regularization.

[23]CORETT officials depict CORETT beneficiaries as incredulous when they are approached with such an offer of regularize their land.

[24]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).

[25]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).

Although the CORETT program is often initiated by community representatives that may work for specific parties, other government levels, and 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.[26] Consistent with these claims, the results in Table 3 show that the likelihood of land titling occurring in the electoral precincts in our sample varies with neither the identity of the municipal incumbent party nor its alignment with the president's party. Moreover, as we show later, Table 5 indicates that the past performance of municipal and federal incumbents, as well as turnout rates, are not associated with land titling.

[Table 3 about here]

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 credit for titling events. Several accounts from CORETT officials indicate that the ceremonial handover of deeds are 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 property right certificates (Varley 1994). 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 their willingness to engage in the efforts required to help those in greatest need.[27] Moreover, it is often emphasized that access to formal property rights over their land will

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[26]CORETT officials do recognize that historically the situation might have been different.

[27]See "Entregan Herrera Caldera y Corett ttulos de propiedad a 110 familias," *La Prensa*, November 6th 2013; "Ramírez Marín entrega más de 5 mil títulos de propiedad en Jalisco," Secretara de Desarrollo Agrario, Territorial y Urbano, February 25th 2014.

permit access to low-cost credit and social programs, which will contribute to the well-being of the beneficiaries.[28]

Our focus groups suggest that voters indeed 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 (maybe surprisingly) that only the federal government is responsible for the program.

2.3   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 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

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[28]See "Ramírez Marín entrega más de 5 mil títulos de propiedad en Jalisco," Secretara de Desarrollo Agrario, Territorial y Urbano, February 25th 2014.

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

3.1 Data

We obtained information about the CORETT 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 *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, including their unique RAN identifiers. For each ejido and agrarian community, we identified its geographical location using the spatial database of the *Programa de Certificación de Derechos Ejidales y Titulación de Solares* (PROCEDE). To locate beneficiaries, we use 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). Finally, to link this to electoral units, we intersected these localities and blocks with the location of Mexico's 67,000 electoral precincts using spatial data from the *Instituto Federal Electoral* (IFE).[29] For more details see the Online Appendix.

We use electoral returns from the IFE and State Electoral Institutes for every available

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[29]The IFE has since become the *Instituto Nacional Electoral*.

precinct in each municipal and presidential election between 1994 and 2013.[30] We focus on precincts that were reached by the land titling program, which leaves us with 4,277 unique precincts. Figure 1 shows the length of our panel for the precincts in our sample of municipal and federal elections.

[Figure 1 about here]

There is extensive variation in the timing of the land titling implementation, as depicted in Figure 2. Moreover, there are two sources of variation in treatment intensity. First, ejidos (or agrarian communities) and precincts do not 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 they received titles. Figure 4 shows that in almost half of the precincts, the program was implemented over several (far from consecutive) years.

[Figures 2-4 about here]

3.2   Empirical Strategy

Municipal incumbents are in a particularly good position to exploit the dependency of squatters upon the government, as they have the closest connections with the community, provide the public goods to squatters lack the most, and can condition the permanence of the squatter in the lands they occupy and public good access on their electoral success. At the same time, municipal incumbents are unlikely to receive much credit for the federal CORETT program. We thus assess the effect of property rights on clientelism by examining how the land

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[30]We use data from the 1994, 2000, 2006, and 2012 presidential elections. Municipal elections are typically not held concurrently, and follow three-year cycles.

titling program affects the vote share of *municipal* incumbent parties. Since we do not track one particular party, but hold for municipal incumbents regardless of their affiliation, our estimates are designed to capture changes in the clientelistic relationship between incumbent parties and voters, rather than shifts in voters' political preferences over parties.[31]

To capture rewards for policy implementation, we instead examine 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 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. To distinguish the possibility that these effects cancel out from the possibility that neither effect is in operation, we also exploit variation over time in incumbency status, and thus access to the tools of clientelism, as an alternative means of separating the effects of property rights on clientelism from policy rewards.

We use two precinct-level land titling measures. First, we consider the first time the program reached a precinct. To account for the fact that the program had different intensity in different precincts, "mean stock of voters with a title after first titling" takes the value 0 before the start of the program, and the average share of voters in the precinct that had received by any post-program election in our sample.[32] This variable does, therefore, remains constant after the first titling event, even after a precinct experiences a subsequent round

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[31]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. Greene 2007; Magaloni 2006). However, for our period of study, each of Mexico's major parties have been heavily linked with clientelistic activities (e.g. Diaz-Cayeros, Estévez and Magaloni forthcoming; Garrido de Sierra 2013; Larreguy, Marshall and Querubín forthcoming).

[32]We find similar results if we instead use a binary indicator for any level of past exposure to the program.

of land titling. Our second measure of land titling, "stock of voters with a title," captures the effect of an increase in the intensity of the program over time. In almost half of the precincts, the program was implemented over several (not necessarily consecutive) years. Our titling intensity measure is the share of voters that had received a title before a given election year. This allows us to exploit significantly more variation in the treatment as the land titling program was rolled out in many precincts before the start of our municipal election panels, and only 9.5% of our precinct-year observations are coded as 0 by the first land titling measure.

We use a difference-in-differences design to identify the effect of the land titling program. In particular, we exploit within-precinct variation in exposure to the program to measure its impact on the municipal and federal incumbent's vote share. This allows us to circumvent potential concerns about the correlation between unobservable precinct-level characteristics and the allocation of the program. We thus estimate the following regression using our two measures of land titling, L_{pt}:

$$Y_{pt} = \beta L_{pt} + \delta_t + \eta_p + \varepsilon_{pt}, \tag{1}$$

where Y_{pt} is the outcome of interest in precinct p at election year t, δ_t are election year fixed effects, and η_p are precinct fixed effects. The election year fixed effects control for common trends in our outcomes of interest. Throughout, we cluster errors by municipality.

This design relies on the "parallel trends" assumption that the timing of land titling events is not correlated with changes in incumbent electoral support for reasons other reason than our treatment of interest. The main threat to this identifying assumption is the strategic allocation of the program to areas where incumbent support is trending in a particular direction. Below, we support this assumption in several ways. First, we show no association between the program allocation and recent changes in incumbent electoral support. Second,

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we test for the significance of up to three lags of the corresponding treatment variables. Third, we also demonstrate the robustness of our results to the inclusion of state-, municipality-, and ejido-specific time trends.

4 Results

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. Consequently, any change in the underlying costs and benefits of clientelism should principally be reflected in the vote share of municipal incumbents. Table 4 assesses this claim by estimating equation (1), reporting the effect of both measures of land titling on the vote share of the municipal incumbent party in municipal elections.

[Table 4 about here]

Column (1) examines the effect of initial exposure to the program, adjusting for variation in the overall reach of the program in a given precinct, and presents clear evidence that land titling restricts the ability of municipal incumbents to win votes. In particular, we find that a unit increase in land titling reduces the municipal incumbent's vote share by around 10 percentage points. For a precinct with average initial exposure to the program—i.e. affecting 20.5% of voters—the land titling program decreases the vote share of all future municipal incumbents by 2.2 percentage points. This represents approximately a 5% decrease in the vote share of the average municipal incumbent. Columns (2), (3), and (4) respectively demonstrate the robustness of this result to the inclusion of unit-specific trends at the state, municipality, and ejido levels. The negative effect remains statistically significant despite the loss of precision, and indistinguishable from the estimate in column (1). Furthermore,

consistent with municipal incumbents facing the greatest obstacle to their clientelistic practices, Table B1 in the Online Appendix shows that municipal incumbents in federal elections are relatively unaffected by land titling reforms.[33]

We find similarly large effects when we also account for subsequent increases in CORETT land titling. Column (5) reports a slightly smaller, but nevertheless highly significant, decrease in the municipal incumbent's vote share associated with increasing the intensity of the program over time. The results imply that an average increase in land titling intensity—an increase in the share of voters treated by the program of 14.3 percentage points—and leads to an additional 0.93 percentage points loss of vote share for municipal incumbents, or 2.13% of their votes. As noted above, nearly half of precincts experienced multiple periods of titling. Columns (6), (7), and (8) again illustrate the robustness of this finding to the inclusion of state, municipality, or ejido trends are considered. In sum, and consistent with breaking down clientelistic ties, we find that the establishment of property rights on land substantially decreases the electoral support of future municipal incumbents.

4.1.1   Assessing the parallel trends assumption

Rather than break down clientelistic ties, a potential concern is that the decrease in the municipal incumbent party's vote share could simply reflect strategic allocation of the CORETT program to areas where support for the municipal incumbent is declining. If this were the case, our identifying assumption would be violated. To address this concern, we first test whether electoral trends at the precinct level predict the allocation of the program using the following specification:

$$L_{pt,t+1} = \beta C_{pt} + \delta_t + \eta_p + \varepsilon_{pt} \qquad (2)$$

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[33]Similarly, Table B2 shows that federal incumbents are also relatively less handicapped in municipal elections.

where C_{pt} is a measure of electoral trends between the previous election at time $t-1$ and the election at t in precinct p, and $L_{pt,t+1}$ is a measure of land titling allocations in precinct p for the subsequent period $(t, t+1]$. We employ four measures to capture electoral pre-trends: first, we use the change in the municipal incumbent party's vote share to assess whether the implementation of the program responds to municipal interests; second, we examine the change in the municipal turnout rate to test whether titling aims to (re)mobilize to voters; and finally, we similarly test whether the program responds to federal interests using changes in the federal incumbent party's vote share in federal elections and changes in the federal turnout rate. We examine the predictive power of these changes for two measures of program allocation: an indicator that captures whether land titles were distributed at all between t and $t+1$, and the share of voters that received a title between t and $t+1$.

[Table 5 about here]

We find no evidence to suggest that titling responds to electoral shifts. Each cell in Table 5 corresponds to a combination of the measures of electoral pre-trends and program allocation described above. Focusing on our main specification in columns (1) and (5), electoral trends never significantly either predict the occurrence of any land titling or the share of voters within a precinct that received a title. In fact, the generally positive positive coefficients stand in contrast with the argument that either municipal or federal incumbent parties engage in titling to offset electoral trends. In addition to supporting the parallel trends assumption, the lack of a significant positive effect also challenges the possibility that the municipal or federal government delivers future land titles as a reward for recent electoral support.

In addition to the unit-specific trends included in Table 4, we demonstrate that our results are robust to including lags of our treatment variables. Large effects of such lags would imply differential trends across precincts that vary in the number of voters with

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existing land titles. Tables 6 and 7 report the results of specifications including one, two and three lags. Across all specifications, the coefficients on the lags are small and almost-invariably statistically insignificant. Furthermore, the effect of the titling program on a municipal incumbent party's voter share remains stable and statistically indistinguishable from those obtained in our baseline estimations. Together with the trends included above, and the inability of prior election results to explain land titling, the lack of differential trends by prior titling intensity reinforces the robustness of our finding that land titling reduces the level of clientelism that municipal incumbent parties can effectively engage in.

[Tables 6 and 7 about here]

4.1.2 Alternative interpretations

Our empirical analysis focuses on the electoral outcomes of municipal incumbent parties, as opposed to particular (types of) parties to mitigate the concern that our results are confounded by a shift in voters preferences toward a particular type of party. In particular, the program's positive wealth effect could induce voters to support more right-wing parties like the PAN (de Janvry, Gonzalez-Navarro and Sadoulet 2014). This concern remains if, as suggested by Table 2, incumbents and more clientelistic parties in Mexico are disproportionately leftist or 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 (de Janvry et al. forthcoming; Di Tella, Galiani and Schargrodsky 2007; Field 2005, 2007; Field and Torero 2008). These insights were reiterated in the focus groups we conducted with the beneficiaries of the CORETT's titling program.

To address this alternative interpretation of our findings, we explore how the effect of land titling in our baseline specification in Table 4 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.

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First, we estimate these 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).[34] 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 in Table 8 present the corresponding results, which both offer little evidence to suggest that the effects of land titling are driven by a rightward shift in the preferences of the voters receiving property rights. If anything, the results in Panel B suggest that the allocation of property rights hurt right-wing incumbent parties more than left-wing incumbent parties.

[Table 8 about here]

An alternative concern is that our baseline results reflect the punishment of municipal incumbents for their inability to deliver the public goods 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 goods. 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 provides these goods, we leverage the fact that—under such explanation—municipal governments that are aligned with the president 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. Table 9 reports the results of specifications interacting land titling with the alignment of municipal incumbents with the president. The negligible coefficient on the interaction provides no evidence that

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[34] As Table 2 shows, only 3% of incumbents do not contain the PAN, PRD or PRI.

this competing explanation drives our results.[35]

<center>*[Table 9 about here]*</center>

4.2   Rewarding incumbent parties for implementing titling reforms

By focusing on the electoral fortunes of municipal incumbent parties, our estimates so far only capture the clientelistic dimension of Mexico's land titling program. However, voters may also reward the parties directly involved in the land titling program (De La O 2013; Manacorda, Miguel and Vigorito 2011; Zucco 2013). Because the CORETT program is administered at the federal level, this credit claiming channel is most likely to impact the electoral support of the federal incumbent party that administered the titling program.[36] As noted above, our qualitative evidence indicates that voters understand that the federal government leads the program. Furthermore, the federal government's clientelistic capacities may be relatively unaffected by the reform. To examine this policy reward dimension, we instead estimate equation (1) to identify the effect of land titling reforms on the incumbent president's party in presidential elections.

The results in Table 10 are inconclusive. The insignificant estimates in columns (1) and (5) are close to zero in magnitude, and thus indicate 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 pure credit claiming effect. 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 cancel out credit claiming benefits.

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[35]State governors may also play an important role in distributing resources to municipalities. However, Table B3 in the Online Appendix similarly reports no difference in the effects of land titling by a municipalities alignment with the state governor.

[36]To the extent that this also operates at the municipal level, it suggests that our current estimates understate the impact of land titling on the breakdown of clientelism.

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4.2.1 Variation in incumbency over time

To differentiate between the clientelistic and reward effects of land titling canceling out, and land titling not affecting federal incumbents, we exploit variation in incumbency 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 parties are responsible for past titling in different precincts. Specifically, for each election and each electoral precinct, we compute I_{pt} as the share of years when the program was executed that the current municipal incumbent party was also the federal incumbent at the time.[37] We thus estimate specifications of the following form:

$$Y_{pt} \ = \ \alpha L_{pt} + \beta I_{pt} + \gamma \Big(L_{pt} \times I_{pt} \Big) + \delta_t + \eta_p + \varepsilon_{pt}, \tag{3}$$

where the coefficient on $L_{pt} \times I_{pt}$ captures the reward or punishment incurred by the incumbent party that implemented a titling reform in the past. Among the precincts in our sample where federal incumbents engaged in titling, the federal incumbent party has an average share of participation in previous titling of 87.6%.

Table 11 presents the results, and suggests that the CORETT program both reduces clientelism and entails substantial rewards to the implementing federal incumbent party. Consistent with the impact on clientelism primarily affecting municipal incumbents, the negative coefficient on land titling among federal incumbent parties that did not themselves implement the titling remains negative but is far smaller in magnitude than we found for

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[37]We use an average to address the fact that some precincts experienced multiple periods of titling.

municipal incumbents above. However, the significant positive interaction between land titling and federal incumbency of the titling party provides clear evidence that voter remember and persistently reward the party that provided them with property rights. The estimates in column (1) indicate that, in a precinct with average exposure, the reward for a federal incumbent party with an average level of involvement in the program is approximately 2.5 percentage points, or a 5% increase in its vote share. As reported in column (5), an average increase in the share of voters that received a land title similarly entails an extra 2.2 percentage points or a 4.3% increase in the vote share for incumbents with average level of involvement in the program. Furthermore, the p-values at the foot of Table 11 confirm that the net effect of land titling for the federal incumbent that implemented the reform, i.e. the sum of the lower-order and interaction terms, is significantly positive. Columns (2)-(4), and (6)-(8) show that these estimates are again robust to the inclusion of various unit-specific time trends. By separating out the clientelistic and reward components of the land reform, these results suggest that null effect reported in Table 10 reflects the balancing of these forces when different types of federal incumbent are pooled.

[Table 11 about here]

Although federal incumbent parties work hard to claim credit for the CORETT program, municipal incumbents may also be able to capture some of the substantial benefits experienced by federal incumbents. Such benefits could at least partially offset the large electoral costs of losing clientelistic capacity. 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 it presided over past land titling.

The results in Table 12 indicate that voters indeed reward municipal incumbents in office when the titling program was implemented, but such rewards are small relative to the large losses attributed to reduced clientelistic capacity. The results in column (1) indicate that

a municipal incumbent with average responsibility over titling suffers a 24.4% reduction in the negative impact of the program on its vote share.[38] Even though voters reward incumbents in office when the program is implemented, the net effect of being exposed to the program continues to be negative for municipal incumbents (as indicated by the p-value of the test for the overall effect at the foot of the table). Controlling for state-, municipality-, or ejido-specific trends does not affect this conclusion. Column (5) reports broadly similar results for an increase in the share of voters that received a title: for a municipal incumbent with average responsibility over previous titling, the negative effect on vote share due to an increase in the intensity of the program is 48% lower. In this case of this larger offsetting effect, the net effect of an increase in the intensity of the program, while sill negative, is no longer quite statistically different from zero at the 95% confidence level. Nevertheless, the overall negative impact is substantially lower than the clear positive net effect experienced by federal incumbents in Table 11. 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.

[Table 12 about here]

Together, these findings highlight how land titling reforms produce two countervailing effects. In particular, 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 reinforce 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 and willingness to

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[38]The average share of previous titling that were responsibility of a municipal incumbent in our panel is also 0.86 (among those incumbents that participated at all).

implement programmatic policies. These findings thus help to explain why federal incumbent parties implement programs and reforms that might hurt their ability to enforce clientelistic exchanges (de Janvry, Gonzalez-Navarro and Sadoulet 2014).

5   Conclusion

In this paper, we show that programmatic policies can simultaneously break down clientelistic ties whilst 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 local government—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, we identify persistent losses among future municipal incumbents. Alongside the break down of clientelistic ties, we also find evidence of effective credit-claiming by the federal incumbent. While 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, we document clear evidence that the rewards for federal incumbent that implemented the program far outweigh the slight losses in clientelistic capacity that it is 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 explain why federal incumbents may wish to implement popular programmatic policies that nevertheless reduce their capacity to harvest votes by exploiting the dependence of voters on local government.

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Figure 1: Length of panel for precincts in our sample
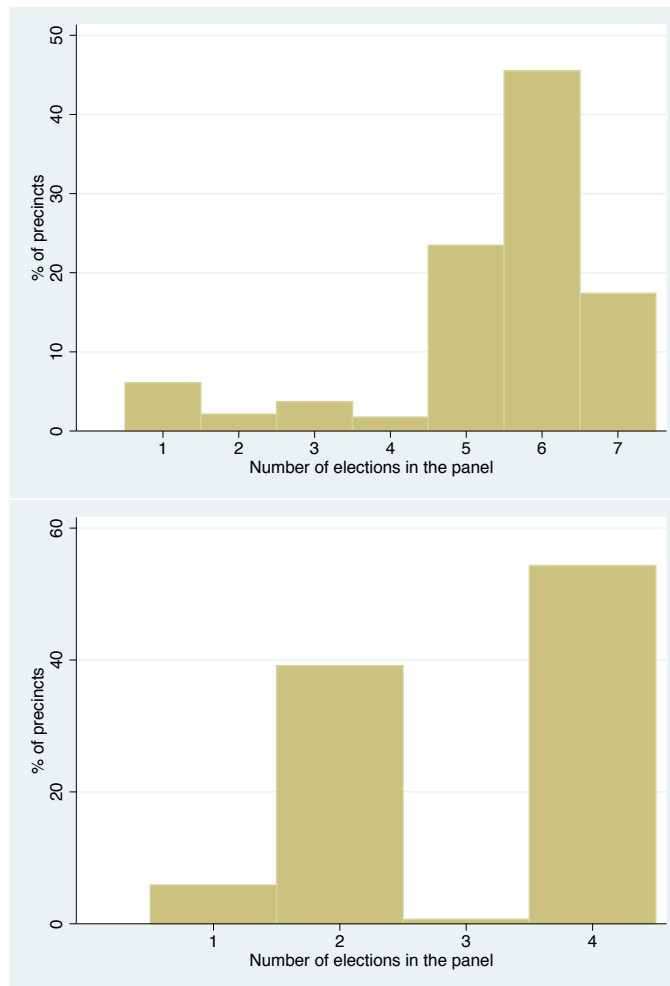
Note: The top and bottom figures refer to municipal and federal elections, respectively.

Figure 2: Distribution of land titling over time

Note: In 26 cases there were two titlings at t for a precinct, corresponding to two different ejidos
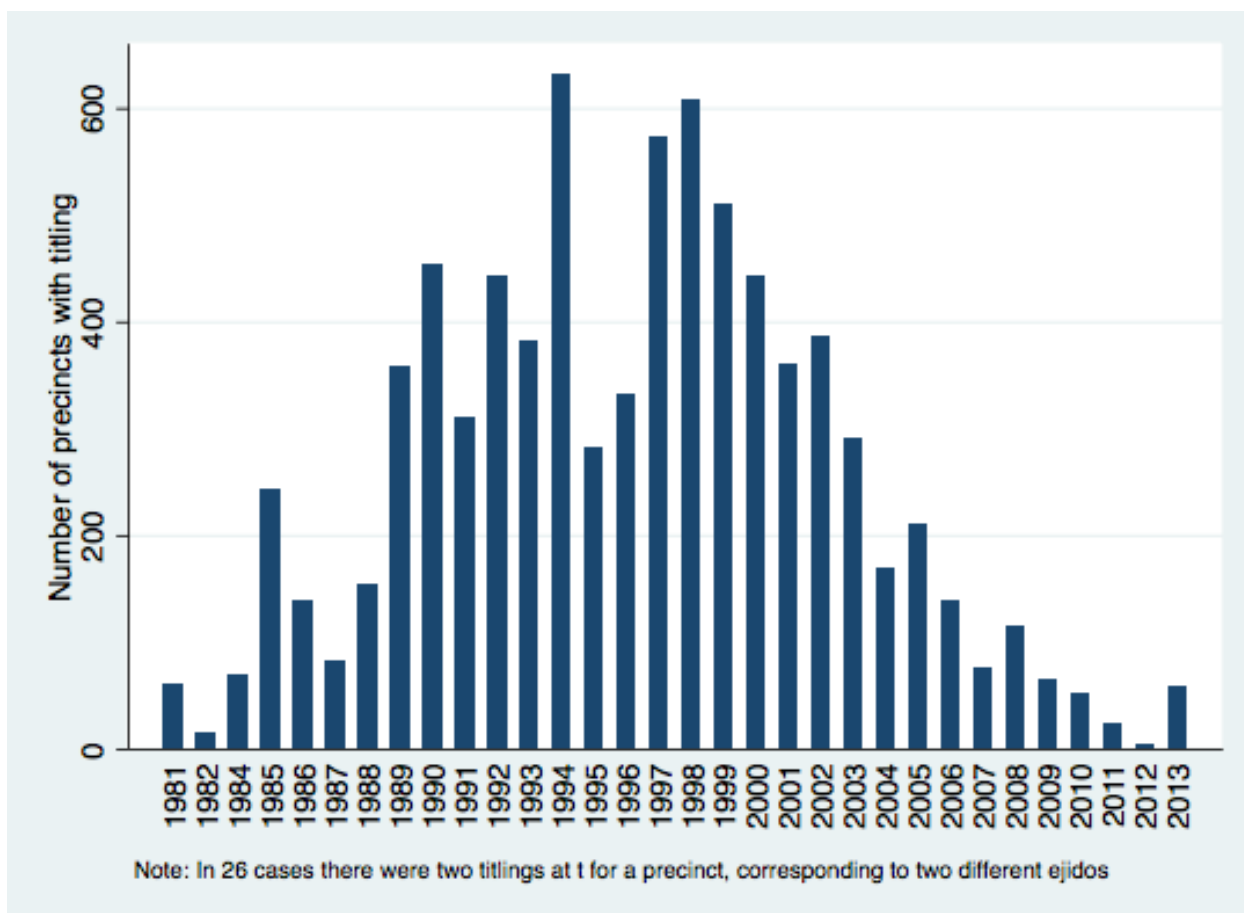
Figure 3: Share of precinct land affected by land titling
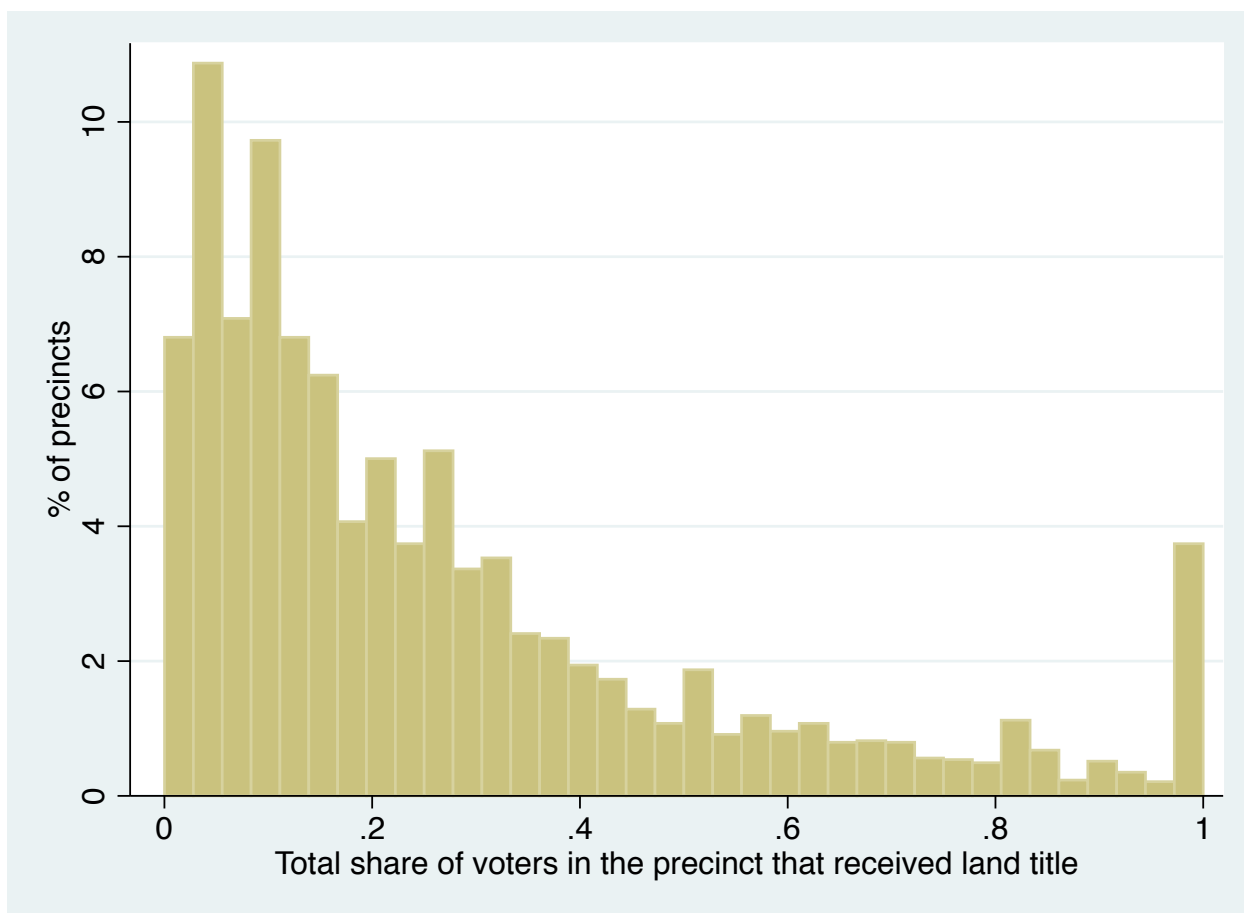
Figure 4: Number of times land titles distributed in a precinct
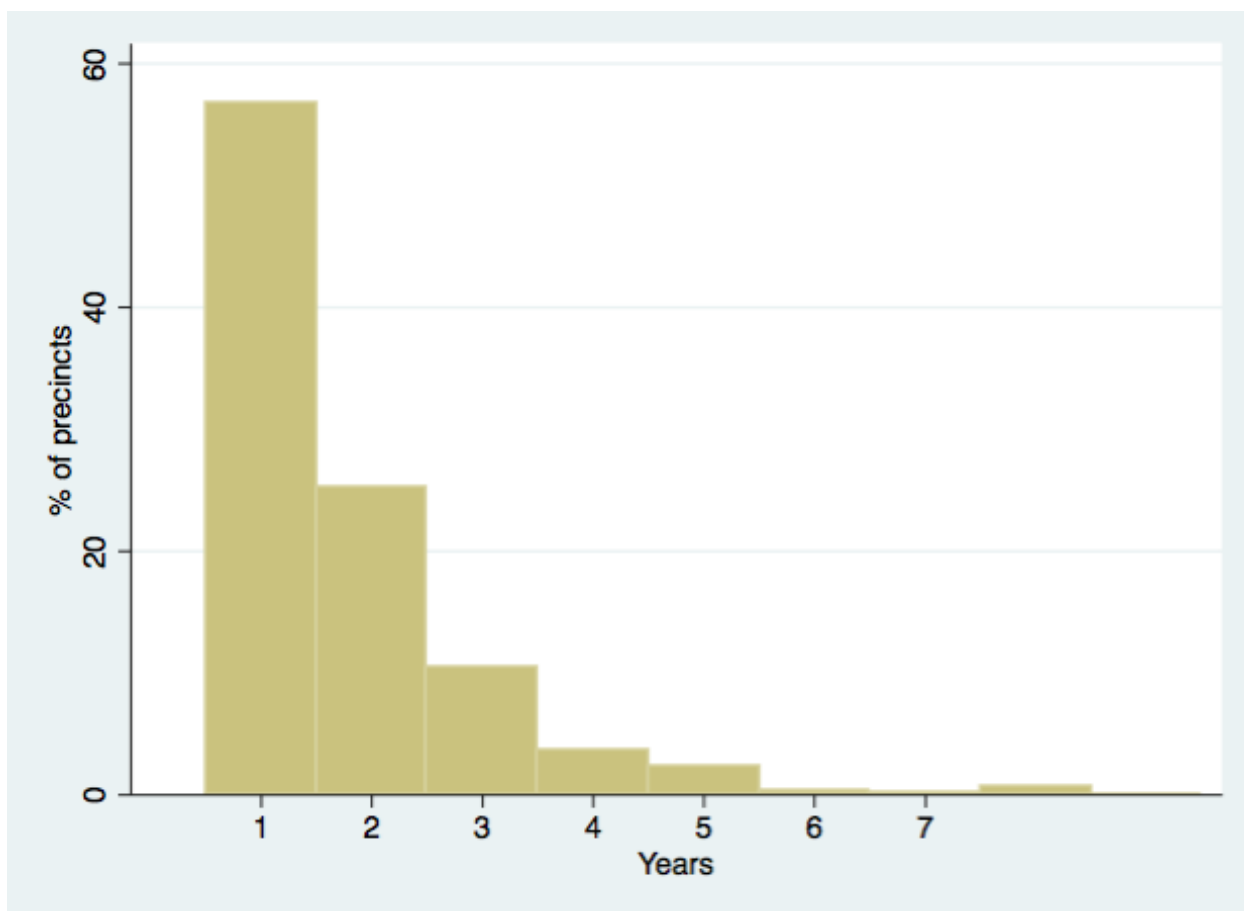
Table 1: Distribution of municipalities in our sample

State	Full Sample Number of municipalities	Our sample Number of municipalities	% over total
Aguascalientes	11	7	63.6%
Baja California	5	4	80.0%
Baja California Sur	5	2	40.0%
Campeche	11	5	45.5%
Chiapas	118	19	16.1%
Chihuahua	67	16	23.9%
Coahuila	38	13	34.2%
Colima	10	7	70.0%
Durango	39	14	35.9%
Guanajuato	46	21	45.7%
Guerrero	81	19	23.5%
Hidalgo	84	20	23.8%
Jalisco	125	35	28.0%
México	125	29	23.2%
Michoacán	113	34	30.1%
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	14	19.4%
Tabasco	17	5	29.4%
Tamaulipas	43	11	25.6%
Tlaxcala	60	5	8.3%
Veracruz	212	58	27.4%
Yucatán	106	13	12.3%
Zacatecas	58	9	15.5%
Total	2441	463	19.0%

Table 2: Summary statistics

Variable	Mean	Standard deviation	Observations
PRI municipal incumbent	0.595	0.491	22,477
PAN municipal incumbent	0.270	0.444	22,477
PRD municipal incumbent	0.107	0.309	22,477
Other municipal incumbent	0.029	0.166	22,477
Municipal vote share of municipal incumbent party	0.408	0.167	22,477
Municipal vote share of federal incumbent party	0.356	0.177	22,477
Municipal turnout	0.548	0.121	21,177
Federal vote share of municipal incumbent party	0.430	0.160	12,602
Federal vote share of federal incumbent party	0.409	0.168	12,602
Federal turnout	0.624	0.110	12,602
Number of titlings at time t	1.442	1.054	22,477
Indicator of new titling	0.116	0.320	22,477
Share of voters that received a title	0.014	0.067	22,477
Mean stock of voters with a title after first titling	0.244	0.244	22,477
Stock of voters with a title	0.244	0.249	22,477
Municipal incumbent was federal incumbent at titling	0.499	0.474	22,477
Federal incumbent was federal incumbent at titling	0.355	0.444	22,477
Aligned municipal and federal governments	0.414	0.493	22,477
Ideology Scale	0.145	0.613	22,477
Left party	0.126	0.332	22,477
Center party	0.604	0.489	22,477
Right party	0.271	0.444	22,477

Table 3: Land titling, by party identity of municipal incumbent

	Indicator of new titling				Share of voters that received a title			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PRI municipal incumbent	-0.0023	-0.0032	0.0063	0.0119	0.0019	0.0007	0.0016	0.0018
	(0.0122)	(0.0111)	(0.0144)	(0.0140)	(0.0017)	(0.0017)	(0.0019)	(0.0020)
PAN municipal incumbent	-0.0078	-0.0058	0.0049	0.0114	0.0016	0.0009	0.0018	0.0019
	(0.0139)	(0.0117)	(0.0144)	(0.0146)	(0.0026)	(0.0024)	(0.0028)	(0.0028)
PRD municipal incumbent	0.0044	0.0061	0.0130	0.0149	-0.0004	-0.0004	-0.0001	0.0001
	(0.0102)	(0.0113)	(0.0140)	(0.0142)	(0.0014)	(0.0018)	(0.0022)	(0.0023)
Aligned municipal and federal governments	0.0005	0.0018	0.0024	0.0012	-0.0006	-0.0003	-0.0001	0.0000
	(0.0059)	(0.0058)	(0.0059)	(0.0066)	(0.0019)	(0.0019)	(0.0019)	(0.0019)
State trends		X				X		
Municipality trends			X				X	
Ejido trends				X				X
Observations	140,119	140,119	140,119	140,119	140,119	140,119	140,119	140,119
R-squared	0.0776	0.0871	0.1200	0.1633	0.0757	0.0790	0.0959	0.1169
Number of precincts	4,540	4,540	4,540	4,540	4,540	4,540	4,540	4,540

Notes: All regressions include precinct-fixed effects. Errors are clustered by municipality. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

Table 4: Effect of land titling on municipal vote share of municipal incumbent party

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Municipal vote share of municipal incumbent party				
Mean stock of voters with a title after first titling	-0.1077*** (0.0267)	-0.0843*** (0.0267)	-0.0739** (0.0301)	-0.0707* (0.0373)				
Stock of voters with a title					-0.0717*** (0.0240)	-0.0617*** (0.0237)	-0.0535** (0.0240)	-0.0597* (0.0315)
State trends		X				X		
Municipality trends			X				X	
Ejido trends				X				X
Observations	22,477	22,477	22,477	22,477	22,477	22,477	22,477	22,477
R-squared	0.0446	0.0892	0.2333	0.2487	0.0436	0.0888	0.2331	0.2487
Number of precincts	4,202	4,202	4,202	4,202	4,202	4,202	4,202	4,202

Notes: All regressions include precinct-fixed effects. "Mean stock of voters with a title after first titling" takes value 0 if voters in the precinct had not received any land titles before t, or the mean number of voters affected by the program at election time, where the mean is taken over all elections for which the program had already reached the precinct. "Stock of voters with a title" is the share of voters in the precinct that received titles before t. Errors are clustered by municipality. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

Table 5: Predicting land titling events

	Indicator of new titling $(t, t+1)$				Stock of voters reached by new titling $(t, t+1)$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A								
Δ municipal vote share of municipal incumbent party	0.0722	0.0783	0.0344	0.0373	0.0068	0.0074*	0.0063	0.0059
	(0.0591)	(0.0509)	(0.0450)	(0.0461)	(0.0042)	(0.0044)	(0.0050)	(0.0052)
Observations	18,063	18,063	18,063	18,063	18,063	18,063	18,063	18,063
R-squared	0.1316	0.1776	0.3208	0.3986	0.0692	0.0836	0.2097	0.3130
Number of precincts	4,016	4,016	4,016	4,016	4,016	4,016	4,016	4,016
Panel B								
Δ municipal turnout rate (municipal elections)	0.0077	0.0448	0.0562	0.0480	0.0044	0.0052	0.0071	0.0059
	(0.0427)	(0.0434)	(0.0478)	(0.0484)	(0.0057)	(0.0053)	(0.0053)	(0.0054)
Observations	17,387	17,387	17,387	17,387	17,387	17,387	17,387	17,387
R-squared	0.1071	0.1518	0.3238	0.4098	0.0622	0.0745	0.2286	0.3347
Number of precincts	4,016	4,016	4,016	4,016	4,016	4,016	4,016	4,016
Panel C								
Δ federal vote share of federal incumbent party (federal elections)	0.1867	0.0417	-0.0768	-0.0841	-0.0108	0.0050	-0.0045	0.0002
	(0.1972)	(0.1209)	(0.0914)	(0.0955)	(0.0136)	(0.0142)	(0.0164)	(0.0162)
Observations	8,449	8,449	8,449	8,449	8,449	8,449	8,449	8,449
R-squared	0.2267	0.2996	0.5005	0.6539	0.0983	0.1807	0.3993	0.5643
Number of precincts	3,909	3,909	3,909	3,909	3,909	3,909	3,909	3,909
Panel D								
Δ precinct turnout rate (federal elections)	0.2140	0.1996	0.1691	0.1707*	-0.0030	-0.0025	0.0014	0.0119
	(0.1511)	(0.1373)	(0.1142)	(0.0960)	(0.0230)	(0.0121)	(0.0109)	(0.0103)
Observations	8,449	8,449	8,449	8,449	8,449	8,449	8,449	8,449
R-squared	0.2252	0.3016	0.5014	0.6547	0.0979	0.1807	0.3993	0.5645
Number of precincts	3,909	3,909	3,909	3,909	3,909	3,909	3,909	3,909
State trends		X				X		
Municipality trends			X				X	
Ejido trends				X				X

Notes: All regressions include precinct-fixed effects. "Δ municipal vote share of municipal incumbent party" is the change in vote share between $t-1$ and t for the party that is the municipal incumbent at t. "Δ federal vote share of federal incumbent party" is defined in the same way but for federal incumbent and in federal elections. "Δ precinct turnout rate" is the change in turnout between $t-1$ and t for the precinct. "Indicator new titling" takes value 1 if land titles were allocated between t (not included) and $t+1$ (included), and 0 otherwise. "Stock of voters reached by new titling" is the share of voters in the precinct that received a title. Errors are clustered by municipality. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

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Table 6: Robustness check: Effect of land titling on municipal vote share of municipal incumbent party, up to 3 lags

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Municipal vote share of municipal incumbent party					
Panel A: One lag								
Mean stock of voters with a title after first titling	-0.0930***	-0.0736**	-0.0720**	-0.0679*				
	(0.0282)	(0.0293)	(0.0323)	(0.0383)				
Mean stock of voters with a title after first titling ($t-1$)	-0.0246	-0.0183	-0.0051	-0.0110				
	(0.0235)	(0.0231)	(0.0246)	(0.0277)				
Stock of voters with a title					-0.0654***	-0.0517**	-0.0497*	-0.0547*
					(0.0245)	(0.0259)	(0.0264)	(0.0320)
Stock of voters with a title ($t-1$)					-0.0100	-0.0162	-0.0083	-0.0169
					(0.0246)	(0.0238)	(0.0245)	(0.0281)
Observations	22,477	22,477	22,477	22,477	22,477	22,477	22,477	22,477
R-squared	0.0448	0.0893	0.2333	0.2487	0.0436	0.0888	0.2331	0.2487
Number of precincts	4,202	4,202	4,202	4,202	4,202	4,202	4,202	4,202
Panel B: Two lags								
Mean stock of voters with a title after first titling	-0.0895***	-0.0708**	-0.0674**	-0.0632*				
	(0.0286)	(0.0294)	(0.0319)	(0.0379)				
Mean stock of voters with a title after first titling ($t-1$)	-0.0397*	-0.0308	-0.0146	-0.0163				
	(0.0235)	(0.0235)	(0.0260)	(0.0283)				
Mean stock of voters with a title after first titling ($t-2$)	0.0262	0.0228	0.0246	0.0198				
	(0.0207)	(0.0207)	(0.0217)	(0.0242)				
Stock of voters with a title (t)					-0.0632***	-0.0502*	-0.0476*	-0.0514
					(0.0244)	(0.0257)	(0.0260)	(0.0313)
Stock of voters with a title ($t-1$)					-0.0357	-0.0373	-0.0236	-0.0251
					(0.0239)	(0.0241)	(0.0267)	(0.0293)
Stock of voters with a title ($t-2$)					0.0434*	0.0370	0.0346	0.0261
					(0.0256)	(0.0263)	(0.0250)	(0.0275)
Observations	22,477	22,477	22,477	22,477	22,477	22,477	22,477	22,477
R-squared	0.0451	0.0895	0.2336	0.2489	0.0445	0.0894	0.2336	0.2490
Number of precincts	4,202	4,202	4,202	4,202	4,202	4,202	4,202	4,202
State trends		X				X		
Municipality trends			X				X	
Ejido trends				X				X

Notes: All regressions include precinct-fixed effects. "Mean stock of voters with a title after first titling" takes value 0 if voters in the precinct had not received any land titles before t, or the mean number of voters affected by the program at election time, where the mean is taken over all elections for which the program had already reached the precinct. "Stock of voters with a title" is the share of voters in the precinct that received titles before t. Errors are clustered by municipality. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

Table 7: Robustness check: Effect of land titling on municipal vote share of municipal incumbent party, up to 3 lags (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Municipal vote share of municipal incumbent party							
Panel C: Three lags								
Mean stock of voters with a title after first titling	-0.0833***	-0.0668**	-0.0640**	-0.0613				
	(0.0292)	(0.0296)	(0.0316)	(0.0373)				
Mean stock of voters with a title after first titling ($t-1$)	-0.0347	-0.0274	-0.0115	-0.0144				
	(0.0234)	(0.0234)	(0.0257)	(0.0281)				
Mean stock of voters with a title after first titling ($t-2$)	0.0077	0.0108	0.0185	0.0176				
	(0.0214)	(0.0213)	(0.0239)	(0.0257)				
Mean stock of voters with a title after first titling ($t-3$)	0.0363*	0.0252	0.0175	0.0093				
	(0.0220)	(0.0233)	(0.0192)	(0.0218)				
Stock of voters with a title					-0.0612**	-0.0493*	-0.0472*	-0.0508
					(0.0245)	(0.0257)	(0.0259)	(0.0311)
Stock of voters with a title ($t-1$)					-0.0341	-0.0365	-0.0225	-0.0235
					(0.0237)	(0.0239)	(0.0264)	(0.0289)
Stock of voters with a title ($t-2$)					0.0224	0.0258	0.0251	0.0209
					(0.0270)	(0.0278)	(0.0281)	(0.0295)
Stock of voters with a title ($t-3$)					0.0363	0.0203	0.0222	0.0176
					(0.0252)	(0.0240)	(0.0212)	(0.0229)
State trends		X				X		
Municipality trends			X				X	
Ejido trends				X				X
Observations	22,477	22,477	22,477	22,477	22,477	22,477	22,477	22,477
R-squared	0.0461	0.0900	0.2337	0.2489	0.0452	0.0896	0.2338	0.2491
Number of precincts	4,202	4,202	4,202	4,202	4,202	4,202	4,202	4,202

Notes: All regressions include precinct-fixed effects. "Mean stock of voters with a title after first titling" takes value 0 if voters in the precinct had not received any land titles before t, or the mean number of voters affected by the program at election time, where the mean is taken over all elections for which the program had already reached the precinct. "Stock of voters with a title" is the share of voters in the precinct that received titles before t. Errors are clustered by municipality. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

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Table 8: Heterogeneous effect of land titling, by ideology of municipal incumbent party

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Municipal vote share of municipal incumbent party				
Panel A								
Mean stock of voters with a title after first titling	-0.1060***	-0.0821***	-0.0716**	-0.0681*				
	(0.0263)	(0.0264)	(0.0302)	(0.0375)				
Mean stock of voters with a title after first titling ×Ideology	-0.0089	-0.0185	-0.0175	-0.0184				
	(0.0247)	(0.0233)	(0.0222)	(0.0236)				
Stock of voters with a title					-0.0706***	-0.0593**	-0.0510**	-0.0571*
					(0.0238)	(0.0236)	(0.0241)	(0.0316)
Stock of voters with a title ×Ideology					-0.0115	-0.0216	-0.0194	-0.0200
					(0.0241)	(0.0228)	(0.0214)	(0.0227)
R-squared	0.0456	0.0902	0.2338	0.2492	0.0449	0.0901	0.2337	0.2493
Panel B								
Mean stock of voters with a title after first titling	-0.1009***	-0.0750**	-0.0634*	-0.0609				
	(0.0294)	(0.0295)	(0.0325)	(0.0388)				
Mean stock of voters with a title after first titling ×Right	-0.0438	-0.0535**	-0.0511*	-0.0520*				
	(0.0275)	(0.0261)	(0.0285)	(0.0308)				
Mean stock of voters with a title after first titling ×Left	-0.0237	-0.0209	-0.0228	-0.0216				
	(0.0379)	(0.0373)	(0.0355)	(0.0367)				
Stock of voters with a title					-0.0569**	-0.0472*	-0.0385	-0.0445
					(0.0267)	(0.0264)	(0.0267)	(0.0334)
Stock of voters with a title ×Right					-0.0478*	-0.0561**	-0.0543**	-0.0551*
					(0.0267)	(0.0252)	(0.0272)	(0.0292)
Stock of voters with a title×Left					-0.0247	-0.0203	-0.0261	-0.0256
					(0.0377)	(0.0375)	(0.0352)	(0.0365)
R-squared	0.0783	0.1151	0.2467	0.2621	0.0772	0.1146	0.2466	0.2622
State trends		X				X		
Municipality trends			X				X	
Ejido trends				X				X
Observations	22,477	22,477	22,477	22,477	22,477	22,477	22,477	22,477
Number of precincts	4,202	4,202	4,202	4,202	4,202	4,202	4,202	4,202

Notes: All regressions include precinct-fixed effects. "Mean stock of voters with a title after first titling" takes value 0 if voters in the precinct had not received any land titles before t, or the mean number of voters affected by the program at election time, where the mean is taken over all elections for which the program had already reached the precinct. "Stock of voters with a title" is the share of voters in the precinct 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). Errors are clustered by municipality. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

Table 9: Heterogeneous effects of land titling, by alignment with federal government party

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Municipal vote share of municipal incumbent party							
Mean stock of voters with a title after first titling	-0.1065***	-0.0893***	-0.0682**	-0.0613				
	(0.0274)	(0.0272)	(0.0310)	(0.0382)				
Mean stock of voters with a title after first titling ×Aligned municipal and federal governments	0.0027	0.0172	-0.0049	-0.0123				
	(0.0193)	(0.0203)	(0.0226)	(0.0248)				
Stock of voters with a title					-0.0702***	-0.0645***	-0.0477*	-0.0507
					(0.0246)	(0.0241)	(0.0247)	(0.0322)
Stock of voters with a title ×Aligned municipal and federal governments					-0.0015	0.0122	-0.0071	-0.0137
					(0.0206)	(0.0216)	(0.0235)	(0.0257)
State trends		X				X		
Municipality trends			X				X	
Ejido trends				X				X
Observations	22,477	22,477	22,477	22,477	22,477	22,477	22,477	22,477
R-squared	0.0458	0.0916	0.2403	0.2558	0.0449	0.0912	0.2401	0.2557
Number of precincts	4,202	4,202	4,202	4,202	4,202	4,202	4,202	4,202

Notes: All regressions include precinct-fixed effects. "Mean stock of voters with a title after first titling" takes value 0 if voters in the precinct had not received any land titles before t, or the mean number of voters affected by the program at election time, where the mean is taken over all elections for which the program had already reached the precinct. "Stock of voters with a title" is the share of voters in the precinct that received titles before t. Errors are clustered by municipality. "Aligned municipal and federal governments" is an indicator coded 1 when the same party is the municipal and federal incumbent. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

Table 10: 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)	(7)	(8)
Mean stock of voters with a title after first titling	-0.0200	-0.0134	-0.0244	0.0129				
	(0.0349)	(0.0322)	(0.0364)	(0.0471)				
Stock of voters with a title					0.0113	0.0092	0.0102	0.0577
					(0.0365)	(0.0363)	(0.0422)	(0.0559)
State trends				X				X
Municipality trends		X				X		
Ejido trends			X				X	
Observations	12,602	12,602	12,602	12,602	12,602	12,602	12,602	12,602
R-squared	0.4413	0.5236	0.6091	0.6292	0.4412	0.5235	0.6090	0.6298
Number of Precincts	4,153	4,153	4,153	4,153	4,153	4,153	4,153	4,153

Notes: All regressions include precinct-fixed effects. "Mean stock of voters with a title after first titling" takes value 0 if voters in the precinct had not received any land titles before t, or the mean number of voters affected by the program at election time, where the mean is taken over all elections for which the program had already reached the precinct. "Stock of voters with a title" is the share of voters in the precinct that received titles before t. Errors are clustered by municipality. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

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Table 11: Heterogeneous effect of land titling, by federal alignment with the federal incumbent party at time of titling

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Vote share of federal incumbent in federal elections				
Mean stock of voters with a title after first titling	-0.0721*	-0.0481	-0.0468	-0.0143				
	(0.0408)	(0.0317)	(0.0319)	(0.0529)				
Mean stock of voters with a title after first titling × Fed. incumbent was fed. incumbent at titling	0.1389***	0.1274***	0.1082***	0.1158**				
	(0.0376)	(0.0327)	(0.0413)	(0.0585)				
Stock of people with a title					-0.0357	-0.0279	-0.0178	0.0256
					(0.0369)	(0.0297)	(0.0289)	(0.0415)
Stock of people with a title ×Fed. incumbent was fed. incumbent at titling					0.1431***	0.1318***	0.1144**	0.1186*
					(0.0414)	(0.0364)	(0.0464)	(0.0612)
State trends		X				X		
Municipality trends			X				X	
Ejido trends				X				X
Observations	12,602	12,602	12,602	12,602	12,602	12,602	12,602	12,602
R-squared	0.4492	0.5307	0.6134	0.6334	0.4503	0.5317	0.6143	0.6349
Number of Precincts	4,153	4,153	4,153	4,153	4,153	4,153	4,153	4,153
F-statistic	3.666	6.976	4.099	7.969	7.427	6.857	3.980	6.715
P-value	0.0561	0.00854	0.0435	0.00496	0.00667	0.00912	0.0466	0.00987

Notes: All regressions include precinct-fixed effects. "Mean stock of voters with a title after first titling" takes value 0 if voters in the precinct had not received any land titles before t, or the mean number of voters affected by the program at election time, where the mean is taken over all elections for which the program had already reached the precinct. "Stock of voters with a title" is the share of voters in the precinct that received titles before t. "Fed. incumbent was fed. incumbent at titling" is a variable coded 0 if the current federal incumbent party was not the federal incumbent at the timing of titling, or the proportion of titling events where the current federal incumbent party was also the federal incumbent party. Errors are clustered by municipality. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

Table 12: Heterogeneous effect of land titling, by municipal alignment with the federal incumbent party at time of titling

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Vote share of municipal incumbent in municipal elections							
Mean stock of voters with a title after first titling	-0.1903***	-0.1576***	-0.1257***	-0.1237***				
	(0.0278)	(0.0267)	(0.0300)	(0.0380)				
Mean stock of voters with a title after first titling ×Mun. incumbent was fed. incumbent at titling	0.0542**	0.0485**	0.0477**	0.0500**				
	(0.0225)	(0.0224)	(0.0196)	(0.0202)				
Stock of voters with a title					-0.1243***	-0.1085***	-0.0897***	-0.0994**
					(0.0266)	(0.0258)	(0.0252)	(0.0326)
Stock of voters with a title × Mun. incumbent was fed. incumbent at titling					0.0710***	0.0607***	0.0572***	0.0588***
					(0.0229)	(0.0226)	(0.0201)	(0.0211)
State trends				X				X
Municipality trends		X				X		
Ejido trends			X				X	
Observations	22,477	22,477	22,477	22,477	22,429	22,429	22,429	22,429
R-squared	0.0679	0.1080	0.2416	0.2576	0.0654	0.1066	0.2413	0.2576
Number of precincts	4,202	4,202	4,202	4,202	4,202	4,202	4,202	4,202
F-statistic	18.66	12.09	5.824	3.367	3.219	2.603	1.264	1.173
P-value	1.91e-05	0.000556	0.0162	0.0671	0.0734	0.107	0.261	0.279

Notes: All regressions include precinct-fixed effects. "Mean stock of voters with a title after first titling" takes value 0 if voters in the precinct had not received any land titles before t, or the mean number of voters affected by the program at election time, where the mean is taken over all elections for which the program had already reached the precinct. "Stock of voters with a title" is the share of voters in the precinct that received titles before t. "Mun. incumbent was fed. incumbent at titling" is a variable coded 0 if the current municipal incumbent party was not the federal incumbent at the timing of titling, or the proportion of titling events where the current municipal incumbent party was also the federal incumbent party. Errors are clustered by municipality. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

A   Data construction

We first retrieved from the following variables from the CORETT data on the ejidos and 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, 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, and the unique RAN identifiers for each of these.[39] 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.[40] 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, assuming that every household that benefited in each CORETT titling had two registered voters, we

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[39]The data was scrapped from http://phina.ran.gob.mx/phina2/ by Melissa Dell, who generously shared it with us.

[40]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 effected by titling by the CORETT. Our results are robust to stricter sample restrictions.

computed the share of voters in each precinct that benefited from each CORETT titling.

B   Additional robustness checks

Tables B1 and B2 respectively show that the effect of land titling reforms on reducing clientelistic capacity are greatest among municipal incumbent parties. In contrast with the large and significant negative effects of land titling on the municipal incumbent party's vote share (see Table 4), these results indicate that the effect of land titling on the municipal incumbent party's vote share in federal elections or the federal incumbent party's vote share in municipal elections 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).

To demonstrate the robustness of our claim that the results are not simply picking up an inability to deliver public services, Table B3 shows that alignment between the municipal incumbent party and the state governor party does not impact the relationship between land titling and municipal incumbent vote share. In line with the federal alignment interaction results in Table 9, we thus find no evidence to suggest that greater access to potential sources of help with service provision moderate land titling's electoral effects.

Table B1: Effect of land titling on federal vote share of municipal incumbent party

				Municipal vote share for municipal incumbent party				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mean stock of voters with a title after first titling	-0.0350	-0.0335	-0.0399	-0.0530				
	(0.0262)	(0.0296)	(0.0355)	(0.0476)				
Stock of voters with a title					0.0099	0.0174	0.0065	0.0111
					(0.0302)	(0.0303)	(0.0372)	(0.0501)
State trends		X				X		
Municipality trends			X				X	
Ejido trends				X				X
Observations	12,602	12,602	12,602	12,602	12,602	12,602	12,602	12,602
R-squared	0.1623	0.1960	0.4094	0.4282	0.1618	0.1957	0.4090	0.4277
Number of Precincts	4,153	4,153	4,153	4,153	4,153	4,153	4,153	4,153

Notes: All regressions include precinct-fixed effects. "Mean stock of voters with a title after first titling" takes value 0 if voters in the precinct had not received any land titles before t, or the mean number of voters affected by the program at election time, where the mean is taken over all elections for which the program had already reached the precinct. "Stock of voters with a title" is the share of voters in the precinct that received titles before t. Errors are clustered by municipality. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

Table B2: Effect of land titling on municipal vote share of federal incumbent party

	Federal vote share of federal incumbent party							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mean stock of voters with a title after first titling	-0.0530 (0.0331)	-0.0456 (0.0295)	-0.0477 (0.0290)	-0.0478 (0.0347)				
Stock of voters with a title					-0.0215 (0.0301)	-0.0190 (0.0260)	-0.0279 (0.0254)	-0.0223 (0.0316)
State trends		X				X		
Municipality trends			X				X	
Ejido trends				X				X
Observations	23,117	23,117	23,117	23,117	23,117	23,117	23,117	23,117
R-squared	0.2521	0.3091	0.4010	0.4151	0.2518	0.3088	0.4009	0.4149
Number of precincts	4,277	4,277	4,277	4,277	4,277	4,277	4,277	4,277

Notes: All regressions include precinct-fixed effects. "Mean stock of voters with a title after first titling" takes value 0 if voters in the precinct had not received any land titles before t, or the mean number of voters affected by the program at election time, where the mean is taken over all elections for which the program had already reached the precinct. "Stock of voters with a title" is the share of voters in the precinct that received titles before t. Errors are clustered by municipality. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.

Table B3: Heterogeneous effect of land titling, by alignment with state governor

	Municipal vote share of municipal incumbent party							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mean stock of voters with a title after first titling	-0.1218***	-0.1026***	-0.0886***	-0.0879**				
	(0.0288)	(0.03)	(0.0321)	(0.0391)				
Mean stock of voters with a title after first titling ×Aligned municipal and governor	0.0164	0.0252	0.0205	0.0241				
	(0.0192)	(0.0199)	(0.0185)	(0.0188)				
Stock of voters with a title					-0.0826***	-0.0796***	-0.0698***	-0.0801**
					(0.0265)	(0.0265)	(0.0267)	(0.0346)
Stock of voters with a title ×Aligned municipal and governor					0.0147	0.0227	0.0195	0.0238
					(0.0192)	(0.0201)	(0.0186)	(0.0190)
State trends		X				X		
Municipality trends			X				X	
Ejido trends				X				X
Observations	22,477	22,477	22,477	22,477	22,477	22,477	22,477	22,477
R-squared	0.0760	0.1117	0.2478	0.2632	0.0748	0.1113	0.2477	0.2633
Number of precincts	4,202	4,202	4,202	4,202	4,202	4,202	4,202	4,202

Notes: All regressions include precinct-fixed effects. "Mean stock of voters with a title after first titling" takes value 0 if voters in the precinct had not received any land titles before t, or the mean number of voters affected by the program at election time, where the mean is taken over all elections for which the program had already reached the precinct. "Stock of voters with a title" is the share of voters in the precinct that received titles before t. "Aligned municipal and governor" is an indicator for when the municipal incumbent party is aligned with the state governor. Errors are clustered by municipality. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.