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

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Clientelism is common in developing countries, and often detrimentally affects political accountability and public good provision. However, little is known empirically about how clientelistic ties can be broken, particularly because policy reforms that could reduce voter dependence on incumbents for special favors may also cause voters to reward the reform's architects. Exploiting Mexico's federal structure and changes in incumbency over time, we separate these countervailing effects in the context of a federal land titling program that reached nearly 2.16 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 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 the federal incumbent party's loss of clientelistic capacity is more than compensated for by the lasting increase in its 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 demonstrate that programmatic reforms can both reduce clientelism while also rewarding incumbents for their policies in office.

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1 Introduction

Clientelism, the exchange of personal favors for political support, is ubiquitous in many developing contexts (Finan and Schechter 2012; Schaffer 2007; Vicente and Wantchekon 2009). This practice has important, and often detrimental, implications for the provision of public goods and political accountability (e.g. Keefer 2007; Keefer and Vlaicu 2008). Moreover, a largely pessimistic literature suggests that entrenched clientelistic ties can only be broken down by long-term economic development (e.g. Kitschelt and Wilkinson 2007; Stokes et al. 2013), which is itself impeded by clientelistic practices (Robinson and Verdier 2013).

However, programmatic policy reforms that redefine voters' relationship with the state could undermine the ability of local patrons to selectively allocate protection from expropriation and public services. By recasting voters' dependence on the incumbent political parties that control access to such protections and services, programmatic reforms have the potential to substantially reduce the scope for politicians to engage in clientelistic exchanges.[1] This article examines whether a major urban titling program can break down clientelistic ties in Mexico, where weak property rights are often used to enforce clientelistic exchanges, and thereby reduce a key electoral advantage of incumbent political parties.

Existing studies have instead emphasized the electoral benefits to incumbents from implementing programmatic reforms in clientelistic settings. Most compellingly, a growing literature has exploited natural experiments to identify the effects of conditional cash transfer programs (CCTs). These programs, which spread across Latin America in the late 1990s and early 2000s, specify when poor voters can receive cash transfers in exchange for school

[1] The existing literature highlights a variety of reasons for engaging in clientelistic relationships, including the short-termism of clients living in poverty (Díaz-Cayeros, Estévez and Magaloni forthcoming; Magaloni 2006), greater distributional benefits of a electorally-viable subset of the population (Lizzeri and Persico 2001), and the inability of governments to commit to programmatic policies (Keefer and Vlaicu 2008; Robinson and Verdier 2013). However, relatively little is known about when voters exit clientelistic relationships.

attendance and regular medical checks. The clear rules governing such programs mark them apart from government transfers that are subject to clientelistic allocation. De La O (2013) and Díaz-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 significantly increases electoral support for the federal incumbent that implemented the policy. Following the retrospective voting literature (Ferejohn 1986; Rogoff 1990), Díaz-Cayeros, Estévez and Magaloni (forthcoming) and Manacorda, Miguel and Vigorito (2011) attribute these large effects to voters using prominent policies to update about their incumbent party's suitability for office. Casaburi and Troiano (forthcoming) similarly identify a significant increase in the re-election rates of municipal incumbent's that claimed credit for implementing Italy's Ghost Buildings program—a national program designed to reduce tax evasion.

By *increasing* incumbent support, these findings could be interpreted as implying that programmatic policy reforms are unable to undermine the conditions under which incumbent parties employ clientelistic exchanges to retain office. However, the results cannot preclude the possibility that clearly defined rules for providing goods like cash transfers simultaneously impede incumbent party attempts to tie other goods and services to electoral support. Furthermore, these impediments to clientelistic practices may principally impact local politicians with discretion for delivering goods and services on the ground. Conversely, the electoral rewards for implementing a major reform may instead be primarily assigned to the (typically federal) party responsible for the reform. Rather than demonstrate the inability of programmatic reforms to break down clientelism, the findings from CCT programs may then only reveal that the electoral benefits to the federal government of implementing a popular policy dominate any reduction in its capacity to engage in clientelistic transactions.

In this article, we exploit Mexico's federal structure and changes in incumbent partisanship across time to separate the effects of a major land titling program on clientelism from its effects on rewards for policy implementation. Through its Committee for the Regularization

of Land Ownership (*Comité para la Regularización de la Tenencia de la Tierra*, CORETT) program, established in 1973, the federal government has created property rights on communal lands and offered squatters the opportunity to buy those rights at highly subsidized prices. By its 35th anniversary in 2008, the program had reached 2.16 million households (SEDESOL 2011).

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

Leveraging the timing of land titling in urban settlements, we use a difference-in-differences design to identify the effect of land titling on the precinct-level vote share of municipal and federal incumbent parties. To avoid comparing locations containing squatters to those that never experienced squatting, we focus only on electoral precincts that experienced land titling at least once as part of the CORETT program between 1980 and 2013.[3] If the rewards

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

[3]We restrict our sample to precincts for which at least 10% of their population is part of an urban settlement affected by the CORETT titling program. Our results are robust to stricter sample restrictions.

from implementing the program primarily accrue to the federal party overseeing the titling, but the ability of local politicians to engage in clientelistic practices is reduced, we are able to disentangle rewards for the party executing the titling from changes in the clientelistic relationship between local incumbent parties and voters by examining the vote share of incumbent parties at different levels of government *and* support for the incumbent responsible for titling over time. Although individual incumbents cannot seek re-election, voters hold parties responsible for incumbent performance in office in Mexico's highly party-centric system (see Chong et al. 2015; Larreguy, Marshall and Snyder 2015*b*; Marshall 2015).[4]

We first estimate land titling's effect on clientelism by examining the municipal incumbent party's vote share in municipal elections, regardless of whether the municipal incumbent is aligned with the federal government overseeing the land titling. Consistent with our expectation that municipal incumbent parties are especially well-placed to exploit the dependence of squatters on the government, but unlikely to gain much credit for the program, we find that land titling significantly decreases the municipal incumbent party's vote share. The introduction of a land titling program with average exposure decreases the municipal incumbent party's vote share by 2.8 percentage points (or 6.8% of their vote tally). Exploiting the fact that the program was implemented over several years in almost half of precincts, we similarly find that a standard deviation increase in the stock of voters that received a land titling through the CORETT program reduces the municipal incumbent party's vote share by 1.8 percentage points (or 4.4% of their vote tally).

To alleviate the concern that these findings might be driven by differential trends in incumbent party vote share in areas where the titling took place, we support 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 inclu-

[4]For example, while virtually all voters can identify Mexico's main political parties, and their broad political positions, only 19% of voters can name their federal deputy (Larreguy, Marshall and Snyder 2015*a*).

sion of up to third-order lags of our treatment variables never significantly predict electoral performance. Third, the results are robust to including state-, municipality-, and settlement-specific time trends. Leveraging a variety of tests to evaluate alternative interpretations, we also show that our findings are unlikely to be explained by improved economic prospects, an ideological shift toward right-wing parties, the inability of municipal incumbents to deliver the public goods that they are obliged to provide after the allocation of property rights, or the possibility that voters from neighboring precincts with different political preferences migrate into precincts experiencing a land titling program.

The federal government's capacity to engage in clientelism may also be weakened by land titling, given that brokers can no longer promise federal services that would otherwise require a residential address. However, even after leaving office, the incumbent responsible for land titling in a given precinct may continue to receive electoral rewards. To separate the effects of breaking down clientelism and incumbent rewards, we compare the effect of urban titling on the vote shares of incumbents that were and were not originally responsible for a precinct's titling. While the ability to engage in clientelistic practices is reduced for all future incumbent parties, any reward for implementing the program is likely to accrue only to the party responsible for the titling, even after it leaves office. We find that voters indeed reward the president's party, and to a less extent aligned municipal incumbents, for the implementation of the program. Consistent with the extant studies finding that federal incumbents are rewarded for policy reforms, urban titling entails a net gain for the federal incumbent responsible for titling a given precinct.[5] However, rewards only partially offset the cost of breaking down clientelistic ties at the municipal level.

Our results address a key empirical challenge in the literature: differentiating a pro-

[5]Averaging across all future federal incumbents (i.e. both those responsible and those not responsible for a precinct's land titling), 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.

gram's impact on clientelism from its impact on voter appraisal of incumbent performance in office. In the Mexican context, we show that both forces apply, but principally act at different levels of government. While the CORETT land titling program primarily reduced the ability of municipal incumbents to engage in clientelism, the program's federal architects predominantly received the rewards for its implementation. These findings thus help explain the puzzle of why federal incumbents implement reforms that might impede their ability to engage in clientelistic exchanges (de Janvry, Gonzalez-Navarro and Sadoulet 2014). As in the case of Mexico's CCT program, *Progresa*, implemented in the late 1990s, our results suggest that a historically clientelistic government may transition toward programmatic programs in an attempt to retain power at the federal level.[6]

These findings contribute to various literatures. Most immediately, this paper extends our understanding of the factors supporting clientelistic ties. This existing literature principally focuses on explaining 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). However, little is known about what ultimately causes voters to escape such relationships. Building on studies examining how institutional changes led to the demise of clientelism in the United Kingdom and United States (Folke, Hirano and Snyder 2011; Stokes et al. 2013; Ujhelyi 2014*a*,*b*), we instead focus on a major developing context where clientelistic exchanges remain prevalent, and thus demonstrate how policy reforms can break down such ties in a contemporary setting.

In doing so, we reinterpret recent work highlighting the positive effect of programmatic policies on incumbent support. De La O (2013) and Manacorda, Miguel and Vigorito (2011)

[6]The *Opportunidades* program, which has since been renamed *Prospera*, was based on *Progresa*.

document short-run increases in incumbent electoral support, and argue that these effects reflect voters updating about the incumbent's ability or willingness to deliver programmatic policies. 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, which leverages Mexico's federal structure and changes in incumbency over time to differentiate rewards for implementation from clientelistic capacity, also shows that federal incumbents implementing programmatic policies enjoy persistent electoral rewards. Our findings thus accord with a growing experimental literature similarly emphasizing the importance of indicators of incumbent competence in office (e.g. Banerjee et al. 2011; Kendall, Nannicini and Trebbi 2015). However, we simultaneously provide evidence that the capacity to engage in clientelistic exchanges is severely curtailed for federal and especially municipal incumbents of all political stripes.

Lastly, our work relates to prior research investigating the effect of an agricultural land certification program on electoral behavior in rural Mexico (Castañeda Dower and Pfutze 2015; de Janvry, Gonzalez-Navarro and Sadoulet 2014). 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,[7] Castañeda Dower and Pfutze (2015) suggest that the program broke down clientelistic transactions. By focusing on the vote share of municipal *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.

[7]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.

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. Díaz-Cayeros, Estévez and Magaloni forthcoming; Larreguy, Marshall and Querubín forthcoming; Nichter and Palmer-Rubin 2014). Government resources often play a central role in such practices.

Mexico's government is divided between three administrative and elected layers: approximately 2,500 municipalities, 31 states (excluding the Federal District of Mexico City), and the federal government. The federal government, which is led by the president, plays the central role in providing social programs. However, major decentralization reforms in the 1990s mean that municipal mayors administer local public services such as sanitation, electricity, piped water, sewage, and roads. Municipal spending represents around 20% of total government spending. At each political level, politicians are elected to non-renewable terms.[8] Given Mexico's strong political parties, this paper examines on how land titling im-

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

pacts incumbent *parties* (Chong et al. 2015; Langston 2003; Larreguy, Marshall and Snyder 2015*a*,*b*; Marshall 2015).

We focus on informal settlements located on communal urban land belonging to an ejido or agrarian community in Mexico that participated in the the CORETT land titling program.[9] These settlements are distributed across 463 municipalities (19% of all municipalities in Mexico) from all 31 Mexican states excluding the Federal District (see Table A1 in the Online Appendix).[10] As our summary statistics in Table 1 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 events that could break those clientelistic ties. However, such land titling could also generate electoral rewards for the incumbent party.

[Table 1 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.[11]

[9]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. Electoral precincts are the smallest geographical electoral unit for which voting data is available.

[10]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.

[11]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.

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 offering protection against municipal intervention.[12] In return for their protection, brokers sometimes charge minor fees.[13] However, the main political motive for encouraging squatting is to condition the permanence of squatters on their political support (Díaz 2008; Flores Rodríguez 2008).[14] 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).[15]

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

[12]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.

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

[14]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.

[15]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.

the formal affiliation of community members to the party (Varley 1994).[16]

Third, the illegal use of land in irregular urban settlements, together with the initial lack of provision of basic public services in such settlements, creates other opportunities for political intermediation (Vite Pérez 2001).[17] 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).[18] 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).[19] 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).[20] 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.[21]

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

[17]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.

[18]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.

[19]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.

[20]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.

[21]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.

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 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.[22]

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 public services without delivering, they still gave them their vote given their precarious situation. There is also extensive evidence of squatters being mobilized to attend political rallies—often without knowing who they are mobilizing for.[23] 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.[24] Common gifts that party representatives distribute around elections include cement bags and corrugated steel zinc planks, which are both essential materials for home

[22]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.

[23]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.

[24]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.

improvements.

Such voter mobilization campaigns typically operate at the candidate level (Ugalde and 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. This possibility is further strengthened by the fact that municipal and federal elections often do not overlap.

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 political parties at the federal and especially municipal level. Some accounts from the popular press and our focus groups indeed suggest that the land titling promoted by the CORETT ended the historical clientelistic business of parties.[25]

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 on federal and social property, by providing squatters with land deeds. 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).

[25]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.

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 estimated that 8.64 million individuals, 11.5% of the Mexican urban population, benefited from the scheme. After 35 years of work, the CORETT contributed to the titling of around 150 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.[26] 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).[27] 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.[28] Lastly, the squatters have to formally request that

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

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

[28]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).

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.[29]

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.[30] Consistent with these claims, the results in Table 2 show that the likelihood of land titling occurring in the electoral precincts in our sample does not vary with municipal political competition, the identity of the municipal incumbent party, or its alignment with the president's party. Moreover, as we show later, Table 4 indicates that the past performance of municipal and federal incumbents, as well as turnout rates, are not associated with land titling.

[Table 2 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

[29]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).

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

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.[31] Moreover, it is often emphasized that access to formal property rights over their land will permit access to low-cost credit and social programs, which will contribute to the well-being of the beneficiaries.[32]

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 pro-

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

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

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

3 Data and empirical strategy

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 PROCEDE spatial database. To locate beneficiaries, we use data on the spatial location of rural localities and urban blocks, together with the population in each, from the *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).[33] For more details see the Online Appendix.

We use electoral returns from the IFE and State Electoral Institutes for every available precinct in each municipal and presidential election between 1994 and 2013.[34] We focus on precincts that were reached by the land titling program, which leaves us with the 4,277 unique precincts depicted in Figure 1.

[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. Municipal governments have the closest connections with the community, provide the public goods squatters most lack, and can condition the permanence of

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

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

the squatter in the lands they occupy and access to public services 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 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.[35]

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, our variable "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 a title by any post-program election in our sample.[36] This variable does, therefore, remains constant after the first titling event, even after a precinct experiences a subsequent round 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 more variation in the treatment because the land titling program was rolled out in many precincts before the start of our municipal election panels.[37]

We use a difference-in-differences design to identify the effect of the CORETT land titling

[35]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. Díaz-Cayeros, Estévez and Magaloni forthcoming; Garrido de Sierra 2013; Larreguy, Marshall and Querubín forthcoming).

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

[37]Only 9.5% of our precinct-year observations are coded as 0 by our first land titling measure.

program. Specifically, we exploit within-precinct variation in exposure to the program, and measure its impact on the municipal and federal incumbent's vote share. This strategy allows us to circumvent potential concerns about the correlation between unobservable precinct-level characteristics and the allocation of the program. We 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 standard 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 than our treatment of interest. The principal 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, 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.

To capture rewards for policy implementation, we could instead focus on estimating the effect of land titling on the vote share of the federal incumbent—the incumbent president's party—in presidential elections. As noted above, the federal incumbent is closely involved with the administration of the CORETT program, and actively seeks credit for its implementation. Conversely, because land titling predominantly impacts the ability of the municipal incumbent to condition non-eviction 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. However, simply estimating equation (1) using the president's party's vote share in presidential elections is unable to distinguish the possibility that these effects cancel out from the possibility that neither effect is in operation.

To differentiate between the clientelistic and reward effects, we leverage variation in incumbent party identity over time. Crucially, while any reward or punishment for implementing the program primarily affects the party responsible for the titling at the federal level, the ability to engage in clientelistic practices is reduced for all future incumbent parties. We can therefore separate the clientelistic and reward dimensions of land titling by exploiting variation in the extent to which the party responsible for past titling remains in office. Specifically, for each election and each electoral precinct, we compute I_{pt} as the share of years t when the program was executed that the current incumbent party was also the federal incumbent at the time of these titling events.[38] We thus estimate specifications of the following form:

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

where the coefficient on $L_{pt} \times I_{pt}$ captures the reward (or punishment) incurred by the incumbent party that implemented the titling program in the past. In our sample, the federal incumbent party has an average share of participation in previous titling of 35.5%. In the precincts where the current federal incumbent was also responsible for previous land titling, the average share of participation in previous titling is 87.6%.

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

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. However, municipal incumbent are less likely to be able to claim credit for land titling. Consequently, any change in the underlying costs and benefits of clientelism should principally be reflected in the vote share of municipal incumbents. Table 3 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 3 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. 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 exposure to the program following its introduction—i.e. affecting 25.6% of voters—the land titling program decreases the vote share of all future municipal incumbents by 2.8 percentage points. This represents approximately a 6.8% 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 is indistinguishable from the estimate in column (1) in each specification. Given that municipal incumbents may also be able to claim some credit for the program, such estimates are likely to represent lower bounds on the effect

magnitude. 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 events.[39]

We also find 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 a standard deviation increase in the stock of voters with a land title—an increase in the share of voters treated by the program of 24.9 percentage points—causes a 1.8 percentage points loss of vote share for municipal incumbents, or 4.4% 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. 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:

$$L_{pt,t+1} = \beta C_{pt} + \delta_t + \eta_p + \varepsilon_{pt} \tag{3}$$

[39]Similarly, Table B2 shows that federal incumbents are also relatively unaffected 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. 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 4 about here]

We find no evidence to suggest that land titling responds to electoral shifts. Each cell in Table 4 corresponds to a combination of the measures of electoral pre-trends and program allocation described above. Focusing on our main specifications in columns (1) and (5), electoral trends never significantly predict either the occurrence of any land titling or the share of voters within a precinct that received a title. In fact, the generally 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 3, 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 existing land titles. Table 5 reports the results of specifications including three lags, while Table B3 in the Online

Appendix reports results for one and two 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 vote 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.

[Table 5 about here]

4.1.2 Alternative interpretations

By not focusing on any particular party or set of parties, but rather on municipal incumbent parties in general, our results are unlikely to simply capture any shift in voters' electoral preferences toward a particular type of party. Nevertheless, the program's positive wealth effect could induce voters to support more right-wing parties like the PAN (de Janvry, Gonzalez-Navarro and Sadoulet 2014). This concern remains if, as suggested by Table 1, incumbents and more clientelistic parties in Mexico are disproportionately centrist. Furthermore, previous work suggests that the granting of property rights improves expectations over economic prospects and leads to better labor market, credit and investment opportunities (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 3 varies with the municipal incumbent party's ideology. We propose two approaches to test whether the electoral losses associated with the CORETT titling program are concentrated among left-wing incumbent parties.

First, we estimate 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).[40] Second, we separately estimate heterogeneous effects using indicators for left and right incumbent ideologies, where centrists are the excluded baseline comparison. Table B4 in the Online Appendix presents 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 suggest that the allocation of property rights hurt right-wing incumbent parties more than left-wing incumbent parties.

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 B5 in the Online Appendix reports the results of specifications interacting land titling with the alignment of municipal incumbents with the president's party. The negligible coefficient on the interaction provides no evidence that this competing explanation drives our results.[41]

[40] As Table 1 shows, only 3% of incumbents do not contain the PAN, PRD or PRI.

[41] State governors may also play an important role in distributing resources to municipalities. However, Table B6 in the Online Appendix similarly reports no difference in the effects of land titling by a municipalities

Rather than altering clientelistic ties to the municipal incumbent, another possibility is that the CORETT program induced an influx of voters with lower levels of incumbent support. This could occur if land title recipients immediately sold their land, or the area became more attractive to outsiders. To assess this alternative interpretation, we examine prior voting behavior in the precincts most likely to approximate the preferences of possible migrants to newly titled areas. Mexican experts indicate that voters are most likely to migrate from relatively more urban precincts to the periphery as urban areas expand. Consequently, the political preferences of voters that previously moved to the urban periphery should be indicative of the preferences of the voters likely to migrate to areas where the CORETT granted titles. Figure 5 provides an example from the municipality of Aguascalientes, where voters who recently move to precinct 86 should be similar to those likely to migrate to precinct 83 (where a land titling occurred).

We then calculate the difference in the municipal vote share at the previous election between the nearest precinct in an urban area that did not itself experience a land titling event and the precinct experiencing land titling.[42] If migration of this type is driving our findings, we would expect to find that nearby urban areas are more likely to oppose the incumbent and land titling's biggest effects would arise where candidate migrants are less favorable toward the incumbent. However, contrary to the concern that nearby urban precincts are more anti-incumbent, the average nearby urban precinct is 5.6 percentage points more favorable toward the incumbent. Furthermore, Table B7 in the Online Appendix shows that we do not find a significant interaction between our land titling variables and the difference in prior vote share. In sum, we find little evidence indicating that migration is explaining our findings.

[Figure 5 about here]

alignment with the state governor.

[42]In the cases where multiple precincts satisfy this criteria, we randomly selected a precinct. 95% of our matches are from the same municipality.

4.2 Rewarding incumbent parties for implementing land titling events

By focusing on the electoral fortunes of municipal incumbent parties, our estimates so far predominantly capture the effect of Mexico's land titling program on clientelism. However, as noted above, voters may also reward the parties directly involved in the land titling program. Because the CORETT program is administered at the federal level, this credit claiming channel is most likely to impact the electoral support of the federal incumbent party that administered the titling program.[43]

To examine the policy reward dimension, we first estimate equation (1) to identify the effect of land titling on the *current* incumbent president's party in presidential elections. The results in Table 6 show that, regardless of whether the incumbent president's party was responsible for the titling, the incumbent president's party is unaffected by land titling on average. 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 credit claiming story where the incumbent president's party is able to capture credit for previous urban titling events. This null finding could reflect the possibility that federal incumbents were in fact unaffected by Mexico's land titling program. Alternatively, the loss of clientelistic capacity may cancel out credit claiming benefits.

[Table 6 about here]

To separate rewards for the federal incumbent that implemented the program from loss of clientelistic capacity, we turn to our second empirical strategy exploiting differences in

[43]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.

incumbency across time. Table 7 presents the results of estimating equation (2), 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 municipal incumbents above. However, the significant positive interaction between land titling and federal incumbency of the titling party provides clear evidence that voters remember and persistently reward the party that provided them with property rights.

[Table 7 about here]

The estimates in column (1) indicate that, in a precinct with average exposure to the program following its introduction, the reward for a federal incumbent party with an average responsibility for past titling—conditional on being involved in a titling event—is approximately 3.1 percentage points, or a 7.5% increase in its vote share. As reported in column (5), a standard deviation increase in the stock of voters that received a land title through the CORETT program also entails a 3.1 percentage points, or a 7.5%, increase in the vote share for incumbents with average level of involvement in the program. Furthermore, the p-values at the foot of Table 7 confirm that the net effect of land titling for the federal incumbent that implemented the program, 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 urban titling program, these results suggest that the null effect reported in Table 6 reflects the balancing of these forces when different types of federal incumbent are pooled.

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

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, and imply that our estimates in Table 3 underestimate the extent of clientelistic breakdown. To assess this credit claiming channel, we use the same approach to examine how titling differentially affects the municipal incumbent's vote share in municipal elections when the municipal incumbent party was also the federal incumbent party at the time of the land titling.

The results in Table 8 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 for past titling experiences a 24.5% reduction in the negative impact of the program on its vote share.[44] 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 for past titling, the negative effect on vote share due to an increase in the intensity of the program is 49.1% 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 7. This comparison thus reinforces our previous findings and qualitative evidence that while municipal incumbents principally suffer from a loss of

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

clientelistic capacity, federal incumbents primarily benefit from claiming credit for a popular program.

[Table 8 about here]

Together, these findings highlight how land titling programs 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 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 breakdown 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 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: Electoral precincts included in our sample

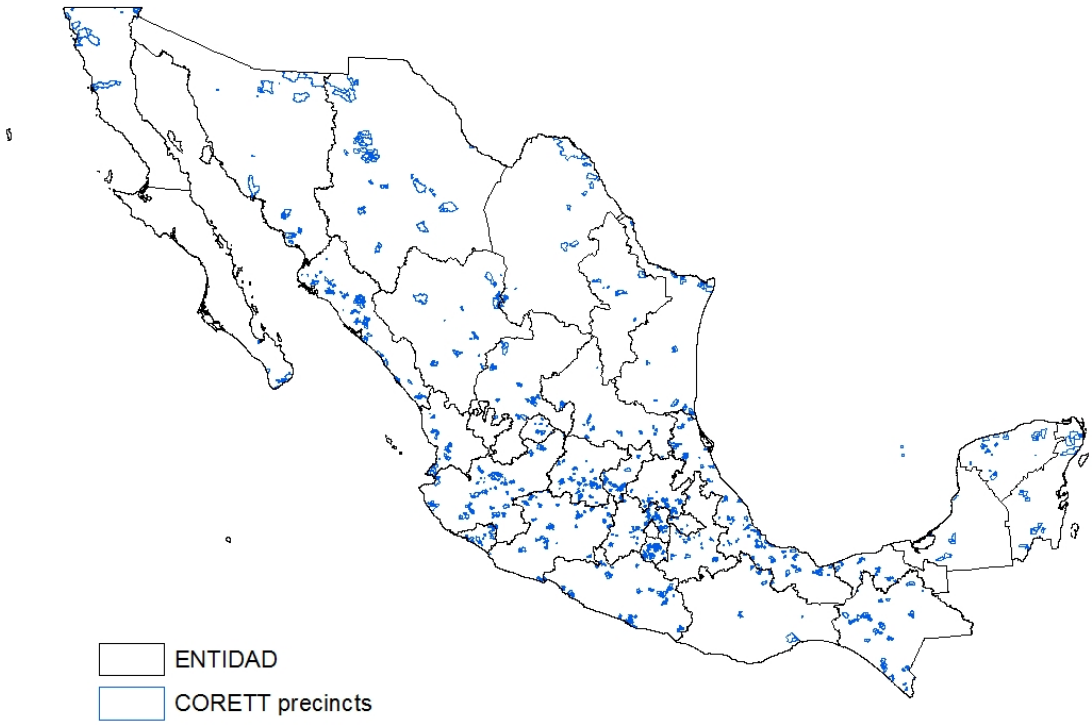

Figure 2: Distribution of land titling over time

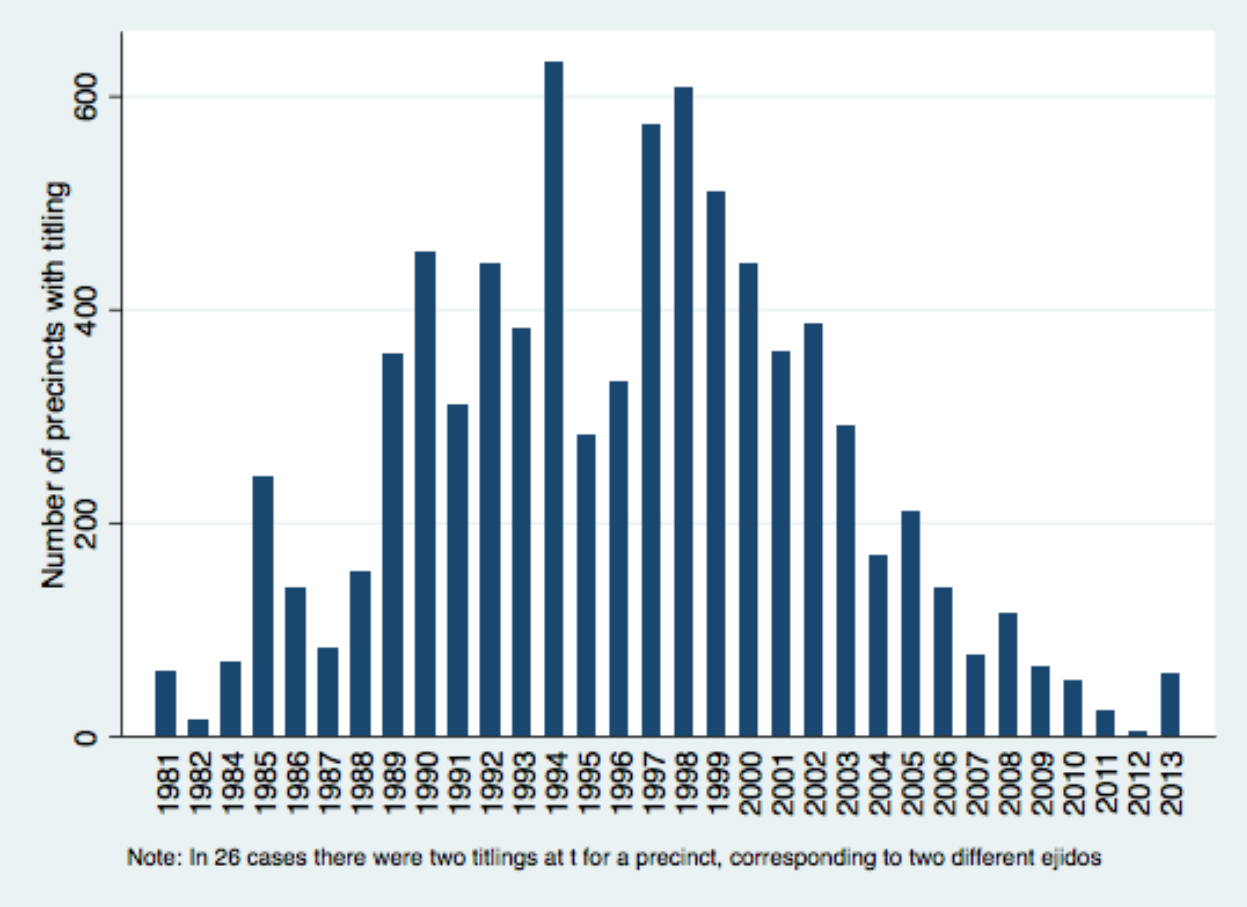

Figure 3: Share of precinct land affected by land titling

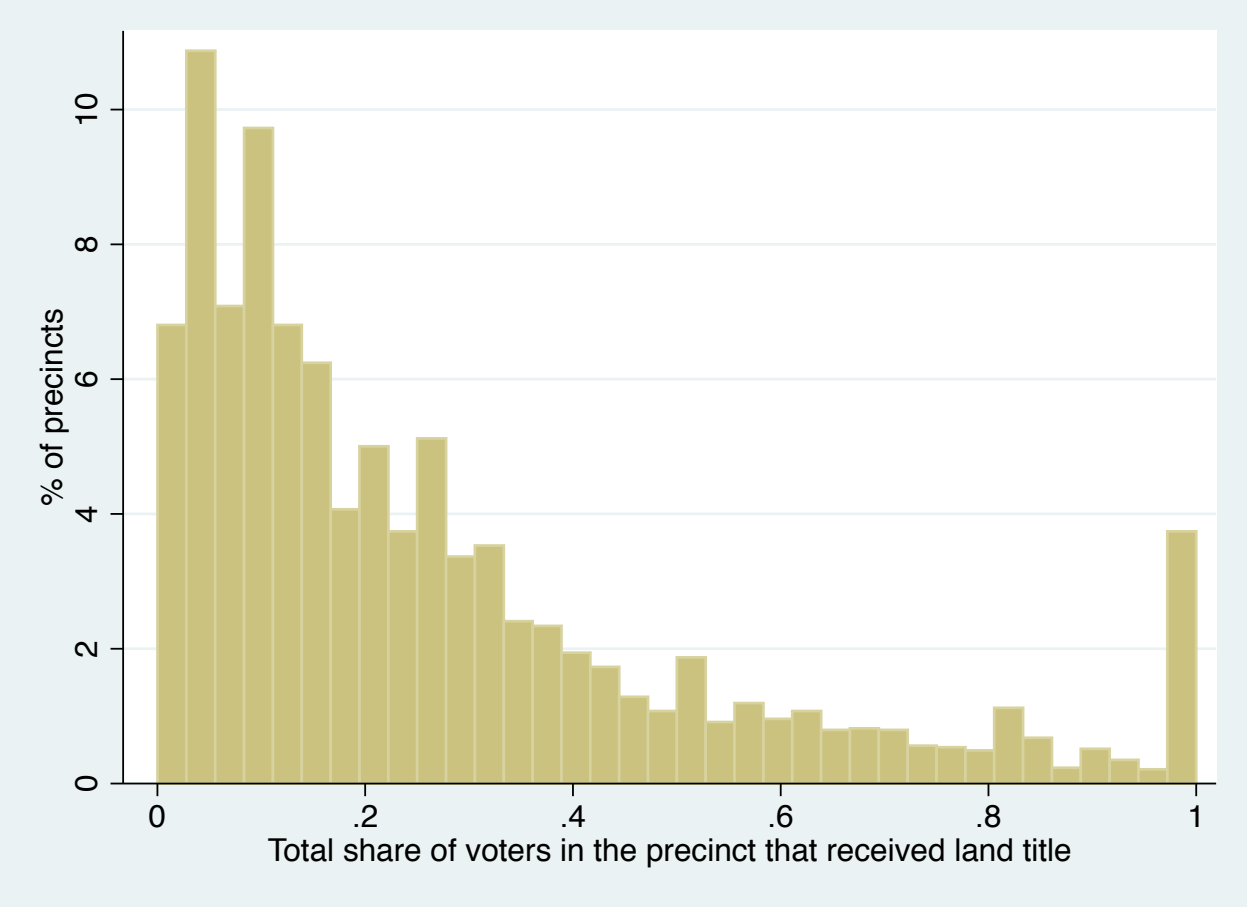

Figure 4: Number of times land titles distributed in a precinct

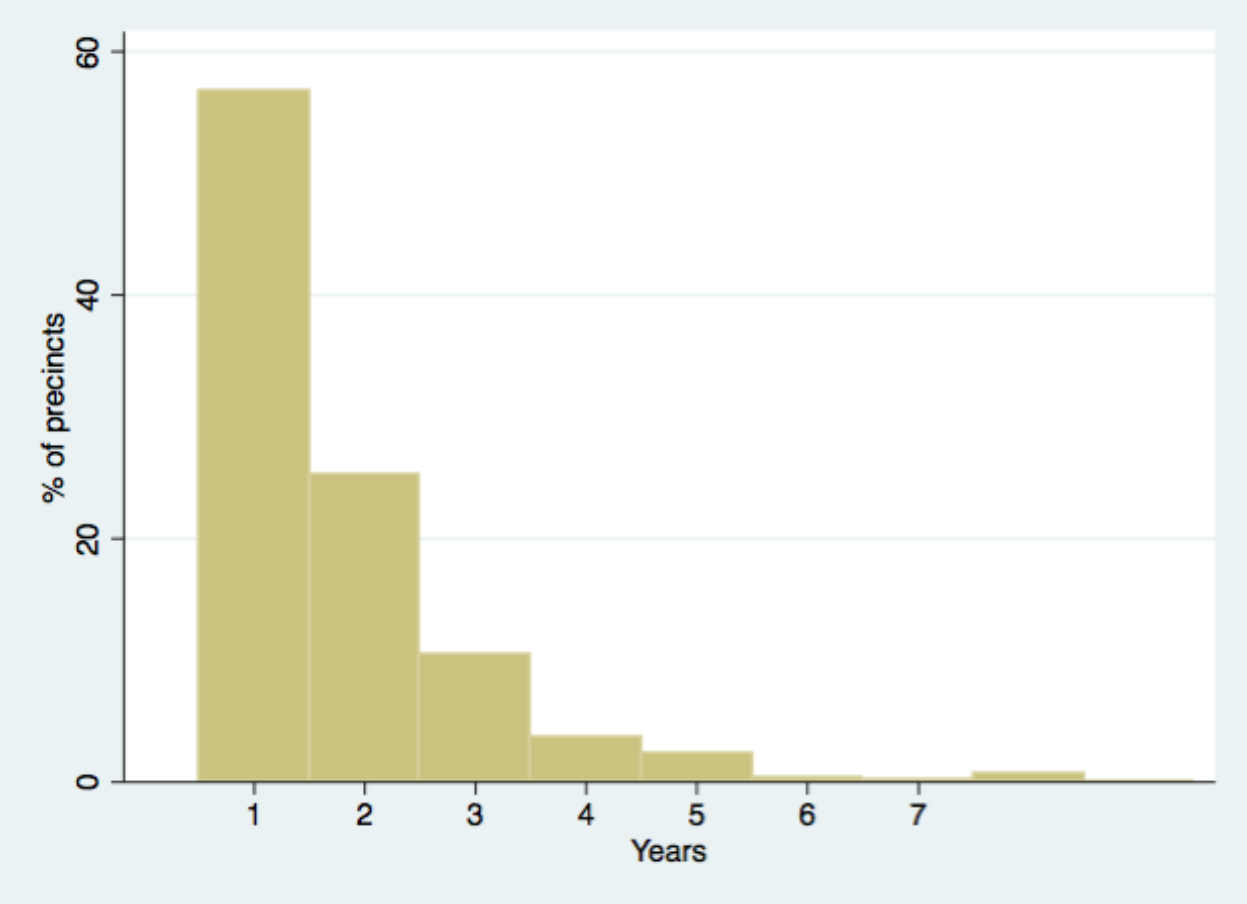

Figure 5: Example of a nearby precinct without a land titling event where voters who recently moved to (precinct 86) should be similar to those likely to migrate to the precinct where a land titling occurred (precinct 83)

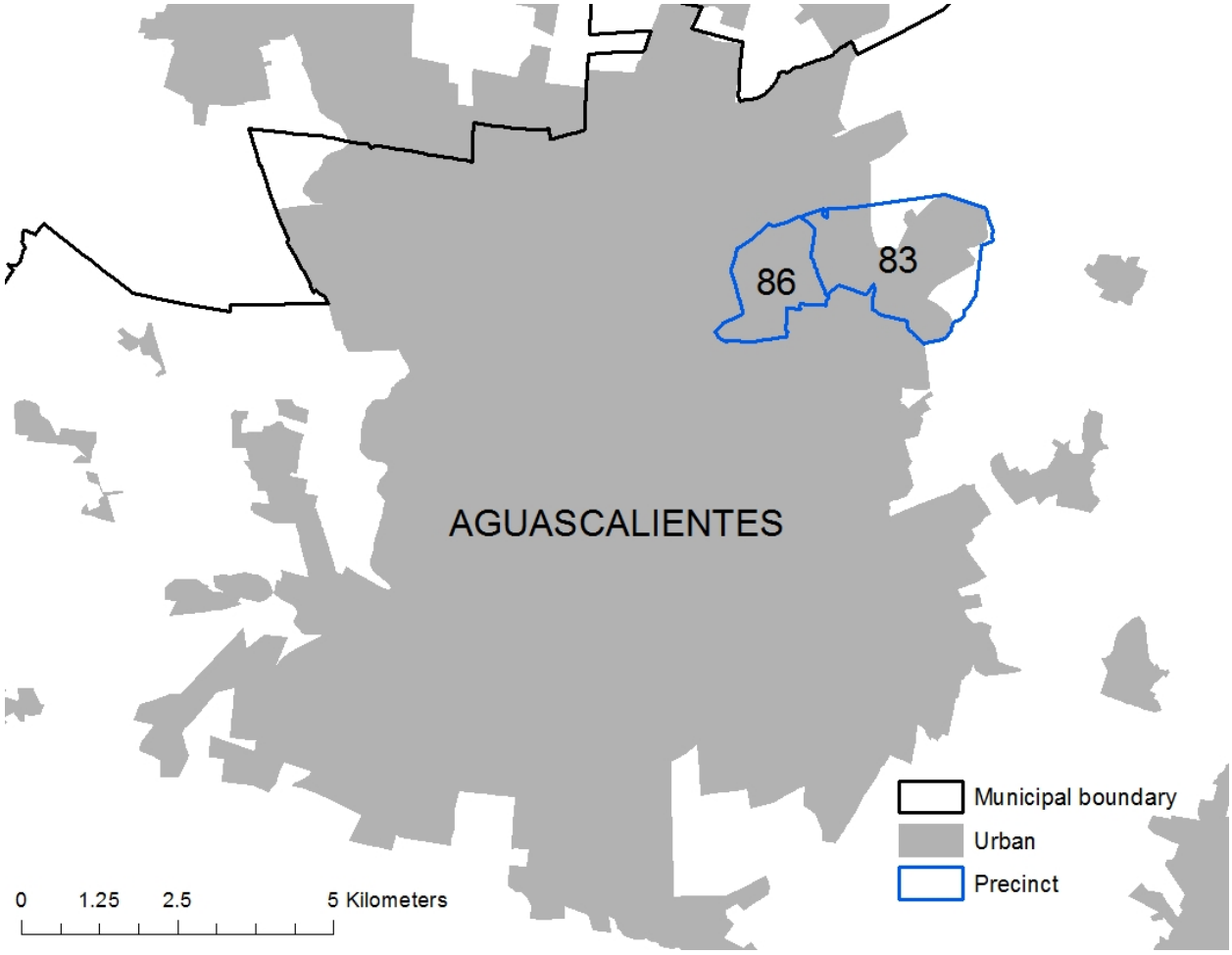

Table 1: Summary statistics

Variable	Mean	Standard deviation	Observations
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
Δ municipal vote share of municipal incumbent party	-0.076	0.170	18,063
Δ municipal turnout	0.003	0.113	16,918
Δ federal vote share of federal incumbent party	-0.082	0.144	8,449
Δ federal turnout	-0.045	0.108	8,449
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
Federal incumbent was federal incumbent at titling	0.355	0.444	22,477
Municipal incumbent was federal incumbent at titling	0.499	0.474	22,477
5% winning margin	0.231	0.422	22,440
5-10% winning margin	0.210	0.407	22,440
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
Aligned municipal and federal governments	0.414	0.493	22,477
Aligned municipal government and state governor	0.611	0.488	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
Incumbent support relative to potential migrants	0.056	0.180	17,807

Table 2: Land titling, by party identity and alignment of municipal incumbent

	Indicator of new titling				Share of voters that received a title			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
5% winning margin	0.0084	0.0067	0.0093	0.0094	0.0017	0.0014	0.0019	0.0019
	(0.0086)	(0.0083)	(0.0092)	(0.0092)	(0.0012)	(0.0012)	(0.0014)	(0.0014)
5-10% winning margin	-0.0092	-0.0087	-0.0090	-0.0089	-0.0009	-0.0013	-0.0013	-0.0013
	(0.0089)	(0.0077)	(0.0077)	(0.0077)	(0.0013)	(0.0013)	(0.0015)	(0.0015)
PRI municipal incumbent	-0.0096	-0.0089	-0.0156	-0.0158	0.0007	0.0028	0.0011	0.0011
	(0.0182)	(0.0180)	(0.0214)	(0.0215)	(0.0017)	(0.0018)	(0.0023)	(0.0023)
PAN municipal incumbent	-0.0083	-0.0085	-0.0162	-0.0164	-0.0003	0.0014	-0.0002	-0.0002
	(0.0166)	(0.0172)	(0.0204)	(0.0205)	(0.0020)	(0.0020)	(0.0024)	(0.0024)
PRD municipal incumbent	0.0040	0.0047	-0.0020	-0.0022	-0.0002	0.0013	-0.0001	-0.0001
	(0.0170)	(0.0170)	(0.0212)	(0.0213)	(0.0018)	(0.0020)	(0.0024)	(0.0024)
Aligned municipal and federal governments	0.0003	-0.0004	-0.0010	-0.0009	0.0008	0.0009	0.0006	0.0006
	(0.0070)	(0.0072)	(0.0079)	(0.0079)	(0.0015)	(0.0015)	(0.0015)	(0.0015)
State trends		X				X		
Municipality trends			X				X	
Ejido trends				X				X
Observations	73,618	73,618	73,618	73,618	73,618	73,618	73,618	73,618
R-squared	0.0335	0.0377	0.0585	0.0741	0.0206	0.0249	0.0475	0.0626

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 3: Effect of land titling on municipal vote share of municipal incumbent party

	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	-0.1077***	-0.0843***	-0.0739**	-0.0707*				
	(0.0267)	(0.0267)	(0.0301)	(0.0373)				
Stock of voters with a title					-0.0717***	-0.0617***	-0.0535**	-0.0597*
					(0.0240)	(0.0237)	(0.0240)	(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

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 4: Predicting land titling events

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

Table 5: Robustness check: Effect of land titling on municipal vote share of municipal incumbent party, 3 lags

	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	-0.0833***	-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

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 6: 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

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

	Federal vote share of federal incumbent party							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
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	0.1389***	0.1274***	0.1082***	0.1158**				
× Fed. incumbent was fed. incumbent at titling	(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					0.1431***	0.1318***	0.1144**	0.1186*
×Fed. incumbent was fed. incumbent at titling					(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
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. "Federal incumbent was federal incumbent at titling" is a variable coded 0 if the current federal incumbent party was not the federal incumbent at the 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 8: Heterogeneous effect of land titling, by municipal alignment with the federal incumbent party at time of titling

	Municipal vote share of municipal incumbent party							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
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	0.0542**	0.0485**	0.0477**	0.0500**				
×Mun. incumbent was fed. inc. at titling	(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					0.0710***	0.0607***	0.0572***	0.0588***
× Mun. incumbent was fed. inc. at titling					(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
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. "Municipal incumbent was federal incumbent at titling" is a variable coded 0 if the current municipal incumbent party was not the federal incumbent at the 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: the ejidos or agrarian communities where each CORETT titling event took place, the date when those events started, as well the number of households that benefited in each case. To identify the spatial location of the beneficiaries of each titling, we used two data sources. First, matching on name of the ejidos or agrarian communities and event date, we took from the *Padrón e Historial de Núcleos Agrarios* (PHINA) of the *Registro Agrario Nacional* (RAN), which contains all the ejido and agrarian communities that were expropriated by the CORETT, the unique RAN identifiers for each of the communal lands.[45] 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.[46] We then assigned each rural locality and urban block to an ejido or agrarian community. Using these two assignments, we distributed the number of households that benefited in each CORETT titling event across the precincts following population shares of each ejido and agrarian community across the precincts they overlap with. Lastly, we

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

[46] 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. Table A1 shows the distribution of municipalities in our sample by state.

Table A1: 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%

B Additional robustness checks

Tables B1 and B2 respectively show that the effect of land titling events 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 in municipal elections (see Table 3), 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).

In addition to the three lags reported in Table 5 of the main paper, Table B3 shows that our results are also robust to including one and two lags.

Table B4 shows the heterogeneous effects by ideology described in the main text. Contrary to the concern that our findings are driven by wealth effects, we find no evidence to suggest that voters are shifting toward more right-wing parties.

To demonstrate the robustness of our claim that the results are not simply picking up an inability to deliver public services, Tables B5 and B6 respectively show that alignment between the municipal incumbent party and the federal governing party and party of the state governor do not impact the relationship between land titling and municipal incumbent vote share. We thus find no evidence to suggest that greater access to potential sources of help with service provision moderate land titling's electoral effects.

To assess the migration concern, Table B7 reports the interaction between our land titling measure and the difference in lagged incumbent vote shares between the closest precinct in an urban area and the precinct experiencing a titling. As noted in the main paper, we do not find a significant interaction, which would suggest that migration is driving our results. Although the point estimate is positive, it is both insignificant and small in magnitude.

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

	Federal vote share of municipal incumbent party							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mean stock of voters with a title after first titling	-0.0350	-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

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

	Municipal 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	-0.0456	-0.0477	-0.0478				
	(0.0331)	(0.0295)	(0.0290)	(0.0347)				
Stock of voters with a title					-0.0215	-0.0190	-0.0279	-0.0223
					(0.0301)	(0.0260)	(0.0254)	(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

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: Robustness check: Effect of land titling on municipal vote share of municipal incumbent party, 1 or 2 lags

	Municipal vote share of municipal incumbent party							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
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
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					-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
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 B4: Heterogeneous effect of land titling, by ideology of municipal incumbent party

	Municipal vote share of municipal incumbent party							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
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	-0.0089	-0.0185	-0.0175	-0.0184				
× Ideology scale	(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 scale					-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
Observations	22,477	22,477	22,477	22,477	22,477	22,477	22,477	22,477
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	-0.0438	-0.0535**	-0.0511*	-0.0520*				
× Right party	(0.0275)	(0.0261)	(0.0285)	(0.0308)				
Mean stock of voters with a title after first titling	-0.0237	-0.0209	-0.0228	-0.0216				
× Left party	(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 party					-0.0478*	-0.0561**	-0.0543**	-0.0551*
					(0.0267)	(0.0252)	(0.0272)	(0.0292)
Stock of voters with a title × Left party					-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
Observations	22,477	22,477	22,477	22,477	22,477	22,477	22,477	22,477
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. "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 B5: Heterogeneous effects of land titling, by alignment with federal government party

	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	-0.1065***	-0.0893***	-0.0682**	-0.0613				
	(0.0274)	(0.0272)	(0.0310)	(0.0382)				
Mean stock of voters with a title after first titling	0.0027	0.0172	-0.0049	-0.0123				
×Aligned municipal and federal governments	(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					-0.0015	0.0122	-0.0071	-0.0137
×Aligned municipal and federal governments					(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

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 B6: 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	0.0164	0.0252	0.0205	0.0241				
×Aligned mun. government and state governor	(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					0.0147	0.0227	0.0195	0.0238
×Aligned mun.l government and state governor					(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

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 government and state 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 $p < 0.01$.

Table B7: Heterogeneous effects of land titling, by potential vote change due to migration

	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	-0.1131***	-0.0709*	-0.1008**	-0.1200**				
	(0.0384)	(0.0377)	(0.0396)	(0.0502)				
Mean stock of voters with a title after first titling	0.0613	0.0552	0.0294	0.0251				
× Incumbent support relative to potential migrants	(0.0500)	(0.0461)	(0.0536)	(0.0565)				
Stock of voters with a title					-0.0891**	-0.0660**	-0.0619**	-0.0818**
					(0.0362)	(0.0319)	(0.0303)	(0.0408)
Stock of voters with a title					0.0551	0.0531	0.0395	0.0352
× Incumbent support relative to potential migrants					(0.0486)	(0.0446)	(0.0499)	(0.0526)
State trends		X				X		
Municipality trends			X				X	
Ejido trends				X				X
Observations	17,807	17,807	17,807	17,807	17,807	17,807	17,807	17,807
R-squared	0.0708	0.1177	0.3359	0.3592	0.0706	0.1178	0.3356	0.3589

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. "Incumbent support relative to potential migrants" is the difference in lagged incumbent vote shares between the closest precinct in an urban area and the precinct experiencing a titling. * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$.