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Subnational democratization and the onset of the Mexican drug war

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Abstract: The Mexican drug war escalated dramatically since 2007. However, its origin is in the 1990s turf wars involving the main drug trafficking organisations operating in the country. In this study we seek to examine the main cause of turf wars at the municipal level between 1995-2006. In particular, we highlight the significant role of a large-scale land titling reform (PROCEDE) that secured property rights for the electorate, previously controlled by the state party (PRI) for seven decades. Our results indicate that political change at the municipality level after the rollout of PROCEDE is a significant determinant of organised crime deaths (OCDs). We further provide evidence that the effect is exacerbated when municipal political change is combined with a change at the gubernational level. We also show that increased intercartel violence is inextricably linked to the geographic expansion of cartel operations. Overall, the fall of the PRI at the subnational level after the rollout of PROCEDE - to signify its strong local roots - broke the equilibrium between corrupted local officials and local drug cartels making the latter more vulnerable to expansion operations of rival cartels resulting in more OCDs.

JEL classification: D72; K42; O54; Q15

Keywords: land reform; PROCEDE; PRI; democratisation; organised crime deaths

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1. Introduction

High levels of drug trade-related violence pose a significant challenge for the interior stability of many countries in the developing world. The escalation of violence in Mexico between 2007-2012 that claimed over 70,000 lives is by far the most daunting example of such violence (see Shirk and Wallman, 2015), attracting scholarly research in an attempt to decode its development (see, e.g., Dell, 2015; Dube et al., 2016).¹ Evidence seems to suggest that the death toll since 2007 has its origins in the 1990s turf wars involving the main drug trafficking organisations operating in the country. For instance, according to Dell (2015) the escalation of violence after 2007 is concentrated in municipalities with an above average pre-period homicide rate. Therefore, the present study seeks to examine the main mechanism of the spread of turf wars at the municipal level between 1995-2006 – that seems to be associated with the escalation observed after 2007.²

According to a strand of the literature, a significant determinant of the pre-period drug trade-related violence was the breakdown of informal networks of protection between the state and cartels due to the subnational democratisation process (Dube et al., 2013; Trejo and Ley, 2018). In particular, the Institutional Revolutionary Party (PRI) dominated the political landscape in Mexico for seven decades both nationally and subnationally. During the hegemony of the PRI, the power structure was extremely centralized and violence remained relatively low for decades, due to the consolidated relationships between drug traffickers and corrupted local officials.³ However, the rise of subnational democratic pluralism during the 1990s that eventually reached the national level in 2000 with the

¹ Additional negative consequences of this escalation include, among others, deterred economic growth (Enamorado et al., 2014), reduced labour force participation (Velasquez, 2019), decreased birth weight (Brown, 2018), as well as school completion rates (Brown and Velasquez, 2017).

² Actually, according to our data, in municipalities that had at least one drug related death until 2006, the rate of drug related killings after 2007 is 258 percent higher. This observation applies also when we split the sample between the north, the centre and the south of Mexico, with higher pre and post period deviations observed in the centre and the south.

³ It should be noted that PRI attempted with administrative reforms to reduce corruption among state officials (e.g., mass firings, rotation of police officers and civilian officials), though without any success (see, Snyder and Durán-Martínez, 2009).

electoral win of the National Action Party (PAN), undermined the long-standing implicit agreements causing turf wars between cartels and an increase in drug trade-related deaths.

A parallel strand of the literature attempts to explain what caused the break of PRI hegemony. For decades, the PRI established local clientelistic associations with the electorate through the institution of ejido (de Janvry et al., 2014; Castaneda Dower and Pfutze, 2015). Ejidos consist of mostly household-farm units, around a rural locality to which land has been granted by the government. This institution was established as a result of popular demand from landless peasants and former estate workers after the Mexican revolution in 1917. However, the PRI primarily used it for clientelistic purposes in rural areas of the country. That was achieved through the legal restrictions imposed to ejido members (called ejidatarios) – the most important of which was the discretion of the state party to revoke land rights (Sabloff, 1981; Mackinlay, 2011; Larreguy, 2013). In the beginning of the 1990s the Carlos Salinas administration, headed by technocrats inside the PRI, attempted to increase the competitiveness and growth prospects of ejidos by providing land tenure to ejidatarios. This land certification programme, whose rollout lasted between 1993-2007, limited significantly the clientelistic penetration of the state party in rural areas leading to the gradual subnational democratisation in municipalities and states first, eventually reaching the national level in 2000 with the election of PAN (see, de Janvry et al., 2014; Castaneda Dower and Pfutze, 2015).⁴

Taking into account the link between the rollout of PROCEDE and subnational democratisation, and the latter with the onset of the Mexican drug war during the 1990s we contribute to the literature by examining whether mayorship and gubernatorial turnovers from PRI after the implementation of PROCEDE is associated with the spread of turf wars between cartels within the Mexican territory between 1995-2006. In particular, using the Criminal Violence in Mexico (CVM)

⁴ The architects of the reform did not seem to have taken into account the potential negative electoral effects for the ruling party. In contrast, they may have hoped that peasants would reward the PRI at the ballot box for a popular reform that would enhance the growth prospects of ejidatarios (see, de Janvry et al., 2014).

dataset of Trejo and Ley (2018) that records drug trade-related deaths at the municipal level, our results indicate that political change at the municipality level to a non-PRI mayor, after the rollout of PROCEDE, is a significant determinant of organised crime deaths (OCDs). The magnitude of the effect is economically significant. In particular, in a municipality that the PRI rule breaks, after the rollout of PROCEDE, we have an increase in the probability of OCDs by around 1.9 percent. Given that the mean value of the dependent variable is 2.3 per cent this is a substantial effect. Moreover, we provide evidence that a municipal change when combined with a change at the gubernational level is even more detrimental. This is because state officials are higher in the ranking and cover wider geographical areas within the Mexican territory (see Trejo and Ley, 2018), thus a simultaneous change augment the extent of disruption of government protection towards cartels causing even higher instability and more OCDs. Furthermore, using the novel dataset constructed by Coscia and Rios (2012) that track the presence of ten criminal organizations at the municipality level, we provide evidence that increased intercartel violence is inextricably linked to the geographic expansion of cartel operations. Overall, the fall of the PRI at the subnational level after the rollout of PROCEDE - to signify its strong local roots - broke the equilibrium between corrupted local officials and local drug cartels making the latter more vulnerable to expansion operations of rival cartels resulting in more OCDs.

A number of specification checks lend support to this interpretation of the findings. First, we attempt to rule out the possibility that confounders are driving the results. In particular, the provision of property rights could be associated with a loss of social control by local authorities, resulting in an increase in the cultivation of illicit crops (due to the titling programme) that in turn can raise drug trade-related deaths. Second, following relevant studies we employ an instrumental variable (IV) approach to mitigate endogeneity concerns of the rollout of PROCEDE (see, de Janvry et al., 2014; Castaneda Dower and Pfütze, 2015). Third, we break our sample before and after 2000 – the point at which the PAN came in power- to support our argument that we capture the effect of democratisation

at the local level, rather than the effect of a national shock due to the election of PAN. Fourth, we break the sample into the three major areas of Mexico (north, centre, and south) to test if our results are driven by the more violent municipalities in the north. In all cases, our empirical findings are robust to these alternative specifications.

Our paper contributes to the literature that explores the implications of subnational democratic pluralism on OCDs prior to escalation of violence in 2007 (see, e.g., O’Neil, 2009; Snyder and Durán-Martínez, 2009). According to Dube et al. (2013), access to guns from the United States increased the homicide rate along the border between 2002-2006. The authors also provide evidence that political competition in municipal elections played a mediating role between guns and violence because it contributed to the destabilization of criminal organisations. Moreover, Trejo and Ley (2018) contribute to the literature recording in the CVM dataset drug trade-related violence at the municipal level between 1995-2006, providing evidence that their local increase is positively correlated with gubernational power alteration. We complement these studies, attempting to provide causal evidence of the effect of the subnational democratisation wave on turf wars between cartels that in turn increase OCDs.

This paper contributes also to a broader literature that explores the determinants of the Mexican drug war. Dube et al. (2016) show that exogenous movements in the Mexican maize price stemming from weather conditions in US maize-growing regions, cause changes in marijuana and opium cultivation and drug trade-related violence within the Mexican territory between 1990-2010. Moreover, Rios (2015) shows that an increase in the number of localities where different parties controlled different levels of government between 1990-2010, makes more likely drug traffickers to violate the long-standing informal prohibition on selling cocaine within the country. Furthermore, Osorio (2012) using a machine-generated database of daily event data at the municipal level in Mexico between 2000-2010, shows that rising subnational electoral competition that undermines peaceful configurations between authorities and criminals cause an increase in violence. According to the

author, an increase in the effective number of parties and divided governments is associated with the intensification of local law enforcement. Related to that, Dell (2015) examines the role of enforcement policy, and the launch of the campaign of war on drugs by the administration of the leader of PAN Felipe Calderon while in office (2006-2012), to show that drug-trade violence rises substantially between 2006-2010 in municipalities after the close election of mayors from the PAN political party. Finally, Dell et al. (2019) provide evidence that trade-induced manufacturing job losses in urban areas increase drug trade-related homicides between 2007-2010 in municipalities that criminal organisations are present.

The rest of the paper is organized as follows. Section 2 provides a description of the Mexican context and the mechanisms that link PROCEDE and the wave of subnational democratisation with OCDs. Section 3 describes the main variables and the empirical strategy. Section 4 presents the main econometric results and robustness checks. Finally, Section 5 offers some concluding remarks.

2. The Mexican context

2.1 Ejidos and the downfall of PRI

2.1.1 Ejidos

According to Article 27 of the 1917 constitution established after the Mexican revolution, land was provided in the form of ejidos as a popular demand mostly of landless peasants and those who used to work in haciendas - large landholdings controlled by one family part of the elite in power (see, Sabloff, 1981; de Janvry et al., 1997). The importance of the ejido institution can be seen in its coverage of roughly 32,000 ejidos equivalent to almost half the country's territory (Deininger and Bresciani, 2001; de Janvry et al., 2001).⁵ Each ejido represents a community, consisting of mostly household-farm units, around a rural locality to which land has been granted by the government. A notable characteristic of this type of communal property was its legal restrictions imposed on the members of each ejido

⁵ Around 2,000 of these refer to pre-colonial indigenous communities with a slightly different regime.

(ejidatarios). In particular, ejidatarios had to work their land directly, they were not allowed to hire external workers, and they were not permitted to rent or sell the land. Moreover, absences for more than two years could lead to the loss of land rights, whereas ejidatarios could just transfer their land plots to one unique heir to prevent the atomisation of the ejido.⁶

The internal structure of ejidos consisted of: (i) the general assembly, the highest authority inside it, formed by all ejido members; (ii) the executive board (comisariado ejidal), made of six elected ejidatarios under the leadership of a president; and (iii) the oversight council also composed of six elected members in charge of checking the performance of the assembly and the executive boards (see, e.g., Baitenmann, 1998). Political connections to access public goods and services were so important that the president of the executive board was actually a local power broker of the PRI party (de Janvry et al., 2001; Holzner, 2003). Overall, for decades the PRI gained an economic monopoly through the intense legal regulation of ejidos, and a political monopoly over these lands through the legal attributions of the president of Mexico as the sole authority in charge of the land granting process (see, e.g., Castaneda Dower and Pfutze, 2015).⁷

2.1.2 Ejidos and clientelism

According to the literature, clientelism is an asymmetric political exchange formed between a patron and a client, where the former supplies goods in exchange for loyalty from the latter (Kitschelt and Wilkinson, 2007; Stokes, 2008; Hicken, 2011). In Mexico, this network was formed by the power vested to local ejido leaders who were actually the local strongmen (caciques) of the PRI party, and

⁶ On top of that, the federal government was in charge, among other things, of legal arbitration inside ejidos and among ejidatarios, and especially giving collective credit and insurance for specific crops through a state-owned agricultural bank and insurance company, in which all ejidatarios were co-liaible (de Janvry et al., 2001; Johnson, 2001; Albertus et al., 2015).

⁷ To mitigate imposed restrictions, ejidatarios started to participate in secondary markets. More specifically, those secondary markets were based on illegal land transactions, informal settlements on ejido lands of more than one heir and the clandestine hiring of workers to help with the cultivation operations (Gordillo de Anda et al., 1994; Murphy and Rossi, 2016). However, those secondary markets were insufficient to compensate for the economic inefficiencies of the ejido.

the ejidatarios who were the “clients” (Lawson, 2000; Villareal, 2002; Magaloni, 2006; Albertus et al., 2012; Castaneda Dower and Pfitze, 2015). These caciques were given discretionary power to control the exchange and access of goods, services, sources of credit and commercialisation through their allegiance to the PRI. In that way they were in position to reward loyal ejidatarios and punish those who did not pledge allegiance to the party (Sabloff, 1981; Mackinlay, 2011; Larreguy, 2013). In turn, caciques were enjoying the rents associated with their powerful position. There is evidence, for instance, that caciques were able to redistribute land in their favor (Martínez-Vázquez, 1980). Moreover, their better local knowledge of political conditions allowed them to monitor more closely the rural farmer's electoral support for the state party (Villareal, 2002). In ejidos, voting behaviour was easy to supervise since being small rural communities allowed the PRI successfully to apply a clientelistic scheme (Larreguy, 2013).

In that regard, Johnson (2001) argued that ejidos was the preferred political instrument of the PRI to control elections. The reason behind this was related to the fact that those lands represented a visible sign of the government's commitment to the Mexican revolution's main demands, including giving land to the landless. The ejido was a key element in this system by allowing the party to control rural votes and aiding the PRI to win elections by extensive margins. These electoral victories were essential to legitimise the regime and to demonstrate a generalised support for the PRI rule (Klesner et al., 2001; Larreguy, 2013).

2.1.3 The rollout of PROCEDE

In the beginning of the 1990s the Carlos Salinas administration, headed by technocrats inside the PRI, attempted to increase the competitiveness of ejidos. The primary strategy followed was to end legal restrictions on ejidatarios (e.g., renting lands or hiring external labour). This was achieved through the amendment of Article 27 of the Mexican constitution that opened the possibility of ejido privatisation. This new bill was presented in 1991 and soon was approved by the Mexican Congress and state legislatures in 1992. With this reform, the aim of technocrats was to recapitalize the sector and increase

its export potential in the context of the just negotiated North American Free Trade Agreement (NAFTA). According to de Janvry et al. (2014) there is no evidence that the reform's architects took into account the potential negative effects on the ruling party's clientelistic scheme established for decades with the local societies. On top of that, the government may have hoped that ejidatarios would actually reward the PRI at the ballot box for a reform that would enhance the growth prospects of ejidos. Ejidatarios have been consistently plagued by low productivity and high poverty (Cornelius and Myhre, 1998).

The implementation of this reform was made through the scheme of PROCEDE (Programa de Certificación de Derechos Ejidales y Titulación de Solares Urbanos). The programme's aim was the establishment of boundaries for the ejido as a whole and for individual land plots within the ejido, providing land tenure and certificates of property rights to ejidatarios (World Bank, 2001). Participation in PROCEDE was voluntary, and ejidos could freely apply to participate in the certification process. The process was initiated by an informational meeting in the ejido between the officials and the ejido members.⁸ If there was an interest, an assembly was summoned (Asamblea de Información y Anuencia) and if the majority of the ejidatarios voted in favour, they were allowing authorities to measure the ejido and create a contour map with subdivisions. Once disputes between ejidatarios over land were resolved and all the requirements of the programme had been met, a final assembly was summoned to vote the agreed partition of land (Asamblea de Delimitación, Destino y Asignación de Tierras). Following this meeting, ejidatarios received certificates of ownership, and the possession of their land could not be contested (de Janvry et al., 1997; Johnson, 2001). Contrary to expectations, the implementation of the programme took much longer than expected. In particular, it

⁸ It should be noted that these assembly informational meetings followed a sequential approach indirectly creating a spatial pattern (see, Castaneda Dower and Pfitze, 2015). In particular, the government officials started these meetings in ejidos with greater accessibility. Normally, these ejidos were close to the capitals of each of the states or close to large cities. Subsequently, the agents would then go to the more remote ejidos to continue this process.

took approximately 15 years to complete, ending in 2007, covering more than 90% of ejidos within the Mexican territory.

2.1.4 PROCEDE and subnational democratisation

The state party Institutional Revolutionary Party (PRI) dominated the political landscape in Mexico for seven decades both nationally and subnationally. At the subnational level, the PRI had won every gubernatorial election in Mexico's 31 states up until 1988, until the first loss in 1989 in the state Baja California. At the municipal level, in 1990 less than 10% of municipalities ever have been governed by some party other than the PRI (see Castaneda Dower and Pfutze, 2015). However, up until 2006, the center-right National Action Party (PAN) obtained 10 governorships, the center-left PRD won six, and around two-thirds of Mexican municipalities were run by parties other than the PRI. According to studies, PROCEDE broke the local clientelistic penetration of the state party leading to the gradual subnational democratisation in municipalities and states first, eventually reaching the national level with the victory of the main opposition party, PAN, in 2000. de Janvry et al. (2014) show that granting property rights induced a conservative shift toward the right-wing party PAN in federal elections between 1994-2009, consistent with the investor class theory. Moreover, Castaneda Dower and Pfutze (2015) analysed information from 10,000 local elections held in Mexico between 1990 and 2010 showing that land certification raised significantly the number of votes for the main opposition parties in municipal elections and that this effect disappears once the PRI has already lost at least one mayoral election. The main conclusion of this paper is that issuing of land titles increased the cost of maintaining the clientelistic scheme weakening the party's local roots.

Along the same lines, Larreguy (2013) provides evidence of how local PRI party brokers mobilize voters for local elections in Mexico – whereas Larreguy et al. (2015) found that a land titling federal program - Committee for the Regularisation of Land Ownership (CORETT) - that reached nearly 2.16 million urban households over a period of 35 years helped federal officials who were credited with the reform but harmed local officials because it weakened their clientelistic association

with the electorate. Finally, Albertus et al. (2015) provide evidence that the institution of ejidos served the PRI to retain political power in rural Mexico, despite the gradual modernisation of the economy. Using data at the state level from 1917 to 1992, the authors found that ejidos were more likely to be established during election years where rural unrest was more prone to happen. In addition, PRI's electoral support eroded less in states where more ejidos were established. This result signifies once again the importance of ejidos for the PRI to retain voters.

2.2 The Mexican drug war

The war on drugs in Mexico that escalated dramatically between 2007-2010, has its origins in the 1990s turf wars involving the main drug trafficking organisations of the time operating in the country (Dell, 2015; Osorio, 2016; Trejo and Ley, 2018). In particular, during PAN's leader Felipe Calderon's term in office (2006-2012) and his campaign of war on drugs, Mexico witnessed more than 70,000 organised crime deaths (OCDs) (Shirk and Wallman, 2015). Related to that, according to Dell (2015) between 2007-2010 drug-trade violence rose substantially in municipalities following electoral victories by the incumbent PAN. This is attributed to drug cartels contesting areas in which traffickers have become weaker after close election of PAN mayors who implement locally the campaign of war on drugs (see, also, Osorio, 2015). Moreover, according to this study this escalation is concentrated in municipalities with an above average pre-period homicide rate. In other words, violence that was already present locally but on a much lower scale years before, is a key element in understanding its subsequent escalation.⁹

⁹ As an example of this phenomenon, despite the constant war between the Tijuana and the Arellano-Felix criminal organisations for the control of the main access point to the California market, the violence grew to new levels after 2007 when the Calderon government deployed the army to fight these organization (See Madrazo and Guerrero, 2012). Another example of the increase in violence is the case of Apatzingán in the state of Michoacan. A previous turf war had been initiated between the Gulf Cartel and its private army, the Zetas, against the Valencia brothers' organization, previously protected by the PRI local authorities, in 2002. Nevertheless, after the military intervention in 2006, the violence level sharply increased (Maldonado, 2012; Trejo and Ley, 2016).

According to the literature, a significant determinant of drug trade-related violence prior to the escalation was the breakdown of informal networks of protection between the state and cartels due to the subnational democratisation process at the municipality and state levels (Astorga, 2005; O’Neill, 2009; Snyder and Durán-Martínez, 2009; Osorio, 2016). During the hegemony of the PRI nationally and subnationally, the power structure was extremely centralized and violence remained relatively low for decades, due to the consolidated relationships between drug traffickers and corrupted state officials.¹⁰ The subnational democratic pluralism during the 1990s – and before the federal government launch the war on drugs - destabilized this equilibrium. In particular, municipal and gubernational electoral victories of opposition (non-PRI) parties undermined the long-standing implicit agreements between corrupted local officials and criminal organisations, weakening the latter and causing turf wars between rivals and an increase in drug trade-related violence.

Consistent with this, empirical evidence has been provided for the detrimental effect of gubernational and municipal level changes of authorities on drug trade-related violence. Regarding gubernational changes, Trejo and Ley (2018) demonstrated that their spread within the Mexican territory was strongly associated with a rise in violence between 1995 and 2006. According to the authors, state-level political alternations that broke long-standing informal networks of protection incentivised drug lords to create private militias to defend themselves from the expansion of other drug cartels.¹¹ Fundamentally, Trejo and Ley (2018) suggest that political alternation signals the weakness of local criminal groups, attracting the attention of rivals causing turf wars and an increase in OCDs.

¹⁰ These informal networks of protection can be created through the penetration of state officials by cartels with bribes and coercion (Snyder and Durán-Martínez, 2009), or through corrupted state officials that may seek to regulate illicit profitable activities in exchange for rents (Astorga, 2005).

¹¹ According to Trejo and Ley (2018), during the 1980s the PRI's intelligence agency, the federal security directorate (DFS) led by military personnel, regulated the criminal underworld. Drug trafficking was on the rise at that time, and it was at that moment when protection networks between the PRI regime and the criminal groups were mainly established. Nevertheless, corruption and political repression related cases compelled the Mexican government to disband the agency, resulting in many of the agents to migrate at the state level. The political transition in the 1990s disturbed those networks

However, there is also evidence that municipal level changes matter as well. Specifically, according to Dube et al. (2013), the 2004 expiration of the U.S. Federal Assault Weapons Ban had a spillover on gun supply in Mexican municipalities resulting in differential increases in homicides close to the non-California border states between 2002-2006. The authors also provide evidence that political competition in municipal elections played a mediating role between guns and violence because it contributed to the destabilization of criminal organisations. According to the authors, many municipalities that experienced turnover in PRI mayorships, which undermined informal sanctions, witnessed an increase in violence. Along the same lines, Rios (2015) provide evidence that when the number of localities where different parties controlled different levels of government increase between 1990-2010, makes more likely drug traffickers to violate the long-standing informal prohibition on selling cocaine within the country setting the conditions for a violent war between drug cartels to erupt.¹²

Taking into account the link between the rollout of PROCEDE and subnational democratisation, and the latter with the onset of the Mexican drug war during the 1990s, we expect that subnational democratisation at the municipal level after the implementation of PROCEDE to increase OCDs. This is because the fall of the PRI at the subnational level after the rollout of PROCEDE - to signify its strong local roots - broke the equilibrium between corrupted local officials and local drug cartels making the latter more vulnerable to expansion operations of rival cartels resulting in more OCDs. Moreover, we would expect even higher instability if a municipal change was combined with a change at the gubernational level. This is because state officials are higher in the ranking and cover wider

when the newly elected governments replaced those security officials with new personnel unaware of previous protection pacts.

¹² To safeguard their operations from government attacks and against rivals, the main drug trafficking organisations in Mexico like the Sinaloa cartel started to create private militias. This operation was done mainly by recruiting defectors from the state judicial police, the army and other security corporations. Despite being used first as a mean of defence, the cartels started to use those armies to conquer rival territories causing the majority of drug trade-related deaths in the mid 1990s and early 2000s in Mexico (O'Neil, 2009; Trejo and Ley, 2020).

geographical areas within the Mexican territory, thus a simultaneous change could augment the extent of disruption of government protection towards cartels. As a result, we would expect a simultaneous political change at the municipal and state levels after the implementation of PROCEDE to cause an even higher increase of OCDs.

3. Data and empirical strategy

3.1 Data and main variables

Our data about OCDs are retrieved from the Criminal Violence in Mexico (CVM) dataset. CVM data is constructed by Trejo and Ley (2018) and is available for the 1995-2006 period, recording drug trade-related violence at the municipal level. Our dependent variable takes the value one if there is an *OCD*, and zero otherwise.¹³ An advantage of the CMV is that it considers only murders that can be attributed directly to drug cartels violence. This information has been put together from the three most widely circulated daily newspapers in Mexico: *El Universal* (1995-2006), *Reforma* (1995-2006), and *El Financiero* (1997-2006).¹⁴ When news reports did not include the name of the criminal organisations involved, Trejo and Ley (2018) relied on three indicators to decide whether to include a murder in the data set: the use of assault weapons, signs of torture and brutal violence, and written messages left on the bodies.¹⁵ Figure 1 maps areas affected by OCDs at the municipality level between 1995-2006.

Insert Figure 1 here

¹³ However, later in the analysis we also experiment with a continuous dependent variable.

¹⁴ Specifically, *Reforma* is the most specialised source of drug trafficking news in Mexico (Shirk and Wallman, 2015). More concretely, *El Universal* covers the Pacific and Gulf coasts regions as well as the centre of Mexico, whereas *El Financiero* mainly covers the centre of the country. Nonetheless, the three publications adequately cover the southern region of the nation.

¹⁵ Since there are no credible sources for information on cartel violence prior to 1995, the research is limited to events that occurred after that year. One reason of this lack of information is that *Reforma* newspaper did not start publishing this sort of information until 1995, when it became a major source (Trejo and Ley, 2018).

Regarding the land reform PROCEDURE, the National Agrarian Registry (Registro Agrario Nacional, RAN) provides the exact dates land titles were issued for each ejido. Using the ArcGIS software we match this information with a shapefile that contains polygons of these ejidos to calculate the variable *PROCEDURE* between 1993-2007, as the percentage of certified ejido area in each municipality, to the total ejido area of the municipality.

Regarding political variables, data are retrieved by Trejo and Ley (2018) whose primary source is Centro de Investigación para el Desarrollo, A.C. (CIDAC). The CIDAC data are publicly accessible and contain electoral results in Mexico since 1980. In Mexico, gubernational and local elections take place every six and three years, respectively, but the precise years are staggered across states.¹⁶ To examine the effect of mayorship turnovers we construct the variable *PRI municipio break* that takes the value of one after the win of a non-PRI party in local elections. Moreover, to quantify the effect of a municipal change that has also reached the state we construct the variable *PRI break* that takes values ranging from zero to two: (i) no alteration in a municipality or gubernatorial office takes the value zero; (ii) municipalities with a mayor from an opposition party (as above) take the value of one; (iii) municipalities with a break in power both at the municipal and gubernational levels take the value of two.

Overall, our dataset is comprised of 1,850 municipalities over the period of analysis. Our sample excludes municipalities not yet formed in 1990, and those that opted for a non-party based local administration based on traditional institutions (*usos y costumbres*) (see, e.g., Castaneda Dower and Pfitze, 2015; Trejo and Ley, 2018; Trejo and Ley, 2021). Also, following Dube et al., (2016), we exclude close to 90 urban municipalities as ejido land coverage is predominantly a rural phenomenon that affected the welfare of the rural population. In addition, their inclusion may lead us to overestimate

¹⁶ Municipal elections are managed at the state level, with only slight variations in how each jurisdiction conducts them - with the exception of areas that use indigenous customary voting methods. Voters cast a single ballot for a political party or coalition, and the party that receives more votes gains the mayor's office. The same applies for gubernational elections and the elected governor face a single-term limit.

the impact on drug-related homicides. This is because densely populated areas with significantly lower ejido land coverage witnessed a sharper increase in violence in the second half of our sample during the rollout of PROCEDE.

3.2 Empirical specification

To examine if the break of PRI rule at the subnational level after the rollout of PROCEDE is a significant determinant of the spread of turf wars at the municipal level between 1995-2006 we estimate the following regression model (see Castaneda Dower and Pfutze, 2015; Castaneda Dower and Pfutze, 2020):

$$OCD_{it} = \alpha + \beta_1 PROCEDE_{it} + \beta_2 political\ break_{it} + \beta_3 PROCEDE_{it} * political\ break_{it} + \gamma X_i * \varphi_y + \theta_i + \theta_t + \varepsilon_{it} \quad (1)$$

where OCD_{it} denotes our binary indicator of organised crime deaths in municipality i and year t . Also, $PROCEDE_{it}$ is the ratio of certified ejido area to total ejido area in municipality i and year t , whereas $political\ break_{it}$ stands for the variables *PRI municipio break* and *PRI break* as described in section 3.1 (capturing the effect of democratic transition at the municipal and municipal-state levels, respectively). The key explanatory variable of interest is $PROCEDE_{it} * political\ break_{it}$. The parameter of interest in Equation (1) is thus β_3 that captures the effect of a break in PRI rule after the rollout of PROCEDE on OCDs. Moreover, X_i denotes a set of predetermined municipal characteristics measured before the beginning of our sample in order to reduce endogeneity concerns (see, e.g., Bahar et al., 2021). Interactions of these variables and year dummies (φ_y) aim to account flexibly for potential differential non-parametric trends on a number of municipal characteristics. In particular, to control for municipal socioeconomic characteristics that can affect OCDs we include the following variables: (i) *Log population 90*; (ii) *Young males' ratio 90*; (iii) *Adult females' ratio 90*; (iv) *Access to electricity 90*; (v) *Indigenous ratio 90*. Furthermore, to account for the effect of state presence on OCDs we include: (vi) *Log homicides 90-92*; (vii) *Log distance to border*; (viii) *Log distance to nearest police*

station; (ix) *Log distance to nearest military region*; (x) *Log distance to nearest air force base*. A plausible argument on their use is that in places with a weak state, criminal groups are more prone to resort to violence to settle conflicts over the control of local drug markets, resulting in an increase in drug-related mortality (see Skaperdas, 2001). Lastly, we also included two variables to capture the effect of crop suitability on OCDs. In particular, we include: (xi) *Log Maize suitability* and (xii) *Log drug crop suitability*. The former aims to control for the effect of shocks in the production of maize that in turn can affect the production of illicit crops and cartel activity (see Dube et al., 2016). Moreover, the variable *Log drug crop suitability* aims to directly proxy for illicit crop suitability that in turn can affect cartel activity.¹⁷ Explicit definitions, descriptive statistics and sources of the variables employed throughout the analysis, are provided in Table A1 in the Appendix. The model also includes municipality, θ_i , and year fixed-effects, ϑ_t , to control for time-invariant municipality characteristics and shocks common to all municipalities. Finally, ε_{it} is the error term clustered at the prefecture i level.

Can our findings for the key variable of interest be interpreted as causal? As already mentioned, the rollout of PROCEDE was carried out mostly by state authorities, with teams working from the state capitals moving from one ejido to the next, possibly creating a spatial pattern (Castaneda Dower and Pfutze, 2015; 2020). Apart from distance, other important determinants seemed to be flat topography, and shared boundaries with other ejidos that had already been certified. Moreover, according to Castaneda Dower and Pfutze (2020) the rollout of PROCEDE was largely uncorrelated with a large set of municipal characteristics, supporting further the quasi-random nature of each implementation. On top of that, according to de Janvry et al. (2014) the PROCEDE program was orthogonal to prior trends in electoral support. Specifically, since the procedure was largely a top-down Federal programme, the authors argued that ejidatarios had a limited intervention in the

¹⁷ In particular, following Dube et al. (2016) we use average marijuana and poppy eradication between 1990-1992 (i.e., before the implementation of PROCEDE and the start of our sample) as a proxy for drug crop suitability.

program's rollout dynamics. Despite this, among the robustness checks we perform a number of additional analyses that support a causal interpretation. In particular, we attempt to rule out that confounders associated with increased cultivation of illicit crops due to the rollout of PROCEDE are driving the results. Moreover, we adopt a two-stage-least-square (2SLS) approach, using the first informational meeting as an instrument for the rollout of PROCEDE (see, Castaneda Dower and Pfutze, 2015). Furthermore, we conduct a falsification test using deaths associated with accidents and suicides as dependent variable. Finally, we add municipality time trends in Equation (1) that indicate our main findings do not suffer from omitted variable bias.

4. Empirical Analysis

4.1 Main results

Our baseline results are reported in Table 1. Columns (1) and (2) report results when *PRI municipio break* is the political variable of the estimated equation, whereas in columns (3) and (4) it is replaced with the variable *PRI break* that captures municipal and combined municipal and state level democratic transition. Moreover, odd-numbered columns report results with municipal and year fixed-effects, whereas even-numbered columns add the predetermined municipal characteristics. As can be seen, the coefficient of the variable *PROCEDE* is negative and statistically significant in column (2) at the 10% level – though this result does not appear robust throughout the analysis. Therefore, despite the implementation of PROCEDE, in municipalities without political change where implicit agreements are not disrupted inter-cartel violence does not seem to be affected. Moreover, in columns (1) and (2), the variable *PRI municipio break* has a negative and statistically significant effect on OCDs. This result indicates that political change in municipalities without the implementation of PROCEDE, where the clientelistic roots of PRI are probably weaker and informal networks of protection more difficult to establish and maintain attract less cartel activity and result in less cartel deaths. More importantly, consistent with expectations the interaction term in columns (1) and (2) is positive and statistically significant at the 1% level. Also, according to panel (a) of Figure 2 the effect of PROCEDE on

municipalities that we observe a break in PRI hegemony ($PRI\ mun.\ break=1$), is positive and statistically significant. This is because political change after the implementation of *PROCEDE* signifies the strong local roots of the PRI that get disrupted along with the established agreements with drug cartels. This disruption makes cartels more vulnerable to expansion operations of rivals resulting in an increase of inter-cartel violence. According to the estimates in column (2), the interaction between *PROCEDE* and *PRI municipio* increases the probability of OCDs by around 1.9 percent. Given that the mean value of the dependent variable is 2.3 per cent this is a substantial effect. Results in columns (3) and (4) support further this finding. As can be seen, the interaction term that takes into account political breaks at the municipal level ($=1$) and changes at the municipal and state levels ($=2$), is once again positive and statistically significant at the 1% level. Moreover, as shown in panel (b) of Figure 2 the effect of simultaneous break at the municipal and state levels after the implementation of *PROCEDE* reinforces the positive effect on OCDs. This is consistent with Trejo and Ley (2018) who argue that the effect of political change at the state level is essential for informal networks of protection that when disrupted fuel inter-cartel violence.

[Insert Table 1, here]

[Insert Figure 2, here]

In Table A2 of the Appendix we present our first robustness checks of our findings. In particular, in columns (1) and (2) we re-run estimates of columns (2) and (4) of Table 1, replacing the *PROCEDE* variable to be measured as the log certified area per 10,000 inhabitants plus 1. Moreover, columns (3) and (4) follow a similar structure though this time we replace the dichotomous dependent variable with the log count of organized crime deaths per 10,000 inhabitants plus 1. Furthermore, in columns (5) and (6) we proceed to replace both variables, with those described above. As can be seen, in all cases the interaction term remains positive and statistically significant. Next, in columns (7) and (8) we conduct a falsification test using the log count of accidents and suicides per 10,000 people plus

1 as dependent variable. As can be seen, the interaction term turns negative, and it is statistically insignificant. Overall, results so far are consistent with our expectations.

4.2 Robustness checks

4.2.1 Correlation or causation?

One important concern for our estimates is that that land certification may lead to a loss of social control by local authorities, resulting in an increase in the cultivation of illicit crops that in turn can raise drug trade-related deaths. If this is the case, and PROCEDE rollout captures an increase in illicit drug production, then our measure shows simply a correlation. To show that this is not the case, in Table 2 we augment Equation (1) with the interaction of our political variable and four different variables of illicit drug production – namely *Log marijuana eradication*, *Log poppy eradication*, *Log Marijuana seizures* and *Log poppy seizures*. As can be seen, in columns (1)-(4) we add one variable at the time, interacted also with the political variable *PRI municipio break*, whereas the specification in column (5) includes all new variables and their interaction terms. Columns (6)-(10) follow a similar structure when the political variable is *PRI break* instead. In all cases, our estimates for the interaction term are stable and statistically significant at the 1% level, disregarding this concern.

[Insert Table 2, here]

To alleviate further endogeneity concerns of the rollout of PROCEDE, our next exercise is to implement a two-stage-least-square (2SLS) strategy employing the first informational meeting by authorities as an instrument for certification (see, also, de Janvry et al., 2014; Castaneda Dower and Pfutze, 2015). In particular, our *Instrument* is the proportion of ejidos to the total number of ejidos in the municipality that had their first meeting prior to certification. To use it, it must satisfy both the exclusion restriction and the relevance requirements. Castaneda Dower and Pfutze (2015) provide a lengthy discussion to support the exclusion restriction requirement. They show that their instrument is not correlated with municipal socioeconomic or political characteristics. The most important correlates

are the geographic characteristics of distance to the capital and the ruggedness of the terrain. In Table A3 in the Appendix, we provide consistent evidence for the correlates of average speed of first informational meetings. As can be seen, our estimates return significant coefficients for ruggedness, highway presence, distance to air force base and indigenous population all of which are related to closeness or remoteness from the State city centre were the process is initiated. As such the instrument could be interpreted as a proxy measure of remoteness to the state capital. This can raise issues if remoteness can affect directly cartel deaths, and not only through the certification of ejidos. Someone could argue that remoteness can affect cartel deaths if in these areas there is weak state presence, higher drug crop suitability or other characteristics (e.g., development) that make them more susceptible to illicit drug production. Yet, our exclusion restriction is a reasonable one, particularly because we control for several state presence measures (e.g., distance to police station, homicide rate 90-92), maize and drug crop suitability and other important trends of municipal characteristics (e.g., access to electricity) that could both correlate with remoteness and the probability of having a cartel death. Moreover, any correlation between remoteness and cartel deaths should result in very different estimates between Table 1 and Table 3 (that we present our IV estimates), which is not the case.

Columns (1)-(2) and (4)-(5) show results for the first stage regressions. The two pairs of columns show estimates on the certification variable *PROCEDE* and its interaction term with the political variable. The first two columns correspond to the model where *PRI municipio break* is the political variable, whereas in columns (4)-(5) the latter is replaced with *PRI break*. Effectively what we have is two endogenous variables (*PROCEDE* and its interaction with the political variable) and two exogenous variables (Instrument and its interaction with the political variable). As can be seen, the instrument and its interaction term are highly significant and enter with the expected sign. In addition, the Kleibergen Paap F-statistic of excluded instrument is always very large. Therefore, our instrument satisfies also the relevance requirement. The IV estimates are reported in columns (3) and (6). In both cases the interaction term remains positive and statistically significant, and the coefficients

do not differ substantially from those in Table 1. These results support the claim that the rollout of PROCEDE can be treated as quasi-random and OLS estimates are unbiased and efficient. As an additional indication, in columns (9)-(10) of Table A2 in the Appendix we add municipality time trends in the full OLS specifications of columns (2) and (4) of Table 1. Once more, the interaction terms are positive and statistically significant at the 1% level. More importantly, the coefficients with and without municipality time trends do not differ substantially indicating that our original results do not suffer from omitted variable bias.

[Insert Table 3, here]

4.2.2 *Sample restrictions*

The next important robustness check is to break the sample in two sub-periods. In particular, in columns (1) and (2) of Table 4 we re-run the specification of column (2) in Table 1 for the sub-periods 1995-1999 and 2000-2006. Columns (3) and (4) of Table 4 follow the same structure for the specification of column (4) in Table 1. The logic is to support our argument that we capture the effect of democratisation at the local level, rather than the effect of a national shock due to the election of PAN in 2000. As can be seen, although the magnitude of the interaction term increases in the second part of the sample - still all interaction terms are positive and statistically significant.

[Insert Table 4, here]

Finally, in Table 5, we divide the sample into the three major areas of Mexico: north, centre, and south. In particular, columns (1)-(3) re-run the specification of column (2) in Table 1, whereas columns (4)-(6) the specification of column (4) in Table 1. This test allows to explore if our results are driven by the more violent municipalities in northern Mexico. According to the results, this is not the case. In particular, all six interactions terms are positive, whereas five of them are also statistically significant invalidating our concern that local democratic pluralism inflated violence only in the north of Mexico.

[Insert Table 5, here]

4.3 Cartel activity

The empirical analysis so far added evidence on the collapse of informal protection networks between local authorities and cartels due to democratisation and the subsequent increase in intercartel deaths. This violence is inextricably linked to the geographic expansion of cartel operations, which fuelled a rise in confrontations between criminal syndicates. To this end, in the last step of our empirical analysis we replace the dependent variable *OCD* with the variables *Any cartel*, *Multiple cartels*, and *First cartel presence* that we obtain from Dube et al. (2016) whose primary source is Coscia and Rios (2012). The novel dataset constructed by Coscia and Rios (2012) tracks the presence of ten drug cartels at the municipality level within the Mexican territory. In particular, the authors employ a search algorithm that queries archived publications in Google News. This algorithm identifies the presence of a criminal organization in a municipality if the frequency of hits for a particular municipality–organization pair exceeds a threshold determined by the searchable material available for a given municipality–year. Using this data Dube et al. (2016) construct the three aforementioned variables. The variable *Any cartel* captures whether any cartel is present in the municipality; the variable *Multiple cartels* is an indicator for the operation of multiple cartels in that municipality; and the variable *First cartel presence* is an indicator for the first year in which any cartel is present in that municipality. Before estimating Equation (1) with these measures of cartel activity, it should be noted that we enrich the set of controls with the variables *Log marijuana eradication*, *Log poppy eradication*, *Log Marijuana seizures* and *Log poppy seizures*. The reason is that we want to capture cartel expansion cases, and not cartel presence linked to incidents of drug eradication and seizures.

Results are reported in Table 6. Columns (1) and (2) report estimates when the dependent variable is *Any cartel* for specifications that the political variables are *PRI municipio break* and *PRI break*, respectively. Columns (3)-(4) and (5)-(6) follow a similar structure when the dependent variables are *Multiple cartels* and *First cartel presence*, respectively. As can be seen, the specification with the most relevant dependent variable to capture cartel expansion operations (i.e., *First cartel*

presence) returns positive and statistically significant effects for both interaction terms in columns (5) and (6). Moreover, as shown in Figure 3 the effect of a municipal political change after the implementation of PROCEDE (panel e) increases the probability of cartel expansion operations. This effect is further reinforced when we have a combined transition at the municipal and state levels (panel f). Moreover, when we employ the 2SLS strategy (discussed above) in Table A4 in the Appendix, the same specification returns even stronger results. It should be noted that the effect of the interaction term in column (2) seems also strong throughout. This result indicates that the effect of a combined transition at the municipal and state levels after the implementation of PROCEDE increases the probability of *Any cartel* presence. Overall, these results are consistent with our expectations. In particular, political transition in municipalities that PRI has strong roots disrupted implicit agreements between local authorities and cartels causing expansion operations from rivals and an increase in drug trade-related violence.

[Insert Table 6, here]

[Insert Figure 3, here]

5. Conclusions

After the dissolution of state protection rackets created during the 1940s and up to the 1980s, turf wars erupted within the Mexican territory involving the main drug trafficking organisations operating in the country. Especially relevant for the fall of informal networks of protection between criminal organisations and corrupted state officials was the gradual subnational democratisation in municipalities and states first, eventually reaching the national level with the victory of the main opposition party, PAN, in 2000. According to previous studies a large-scale land titling reform (PROCEDE) that secured property rights for the electorate breaking the clientelistic association between the electorate and the PRI that dominated the political landscape for seven decades is of paramount importance for this development.

Taking into account the link between the rollout of PROCEDE and subnational democratisation, and the latter with the onset of the Mexican drug war during the 1990s we examine whether mayorship and gubernational turnovers from PRI after the implementation of PROCEDE lead to an increase of OCDs between 1995-2006. Consistent with expectations a political change at the municipality level after the rollout of PROCEDE is a significant determinant of OCDs. This is because the fall of the PRI at the subnational level after the rollout of PROCEDE - to signify its strong local roots - broke the equilibrium between corrupted local officials and local drug cartels making the latter more vulnerable to expansion operations of rival cartels resulting in more OCDs. Moreover, we provide evidence that a municipal change when combined with a change at the gubernational level is even more detrimental. This is because state officials are higher in the ranking and cover wider geographical areas within the Mexican territory, thus a simultaneous change augment the extent of disruption of government protection towards cartels causing even higher instability and more OCDs. Finally, we provide evidence that increased intercartel violence is inextricably linked to the geographic expansion of cartel operations. Overall, although the Mexican drug war escalated dramatically since 2007, its origin is in the 1990s turf wars between rival cartels that spread around the Mexican territory due to the gradual subnational democratisation process.

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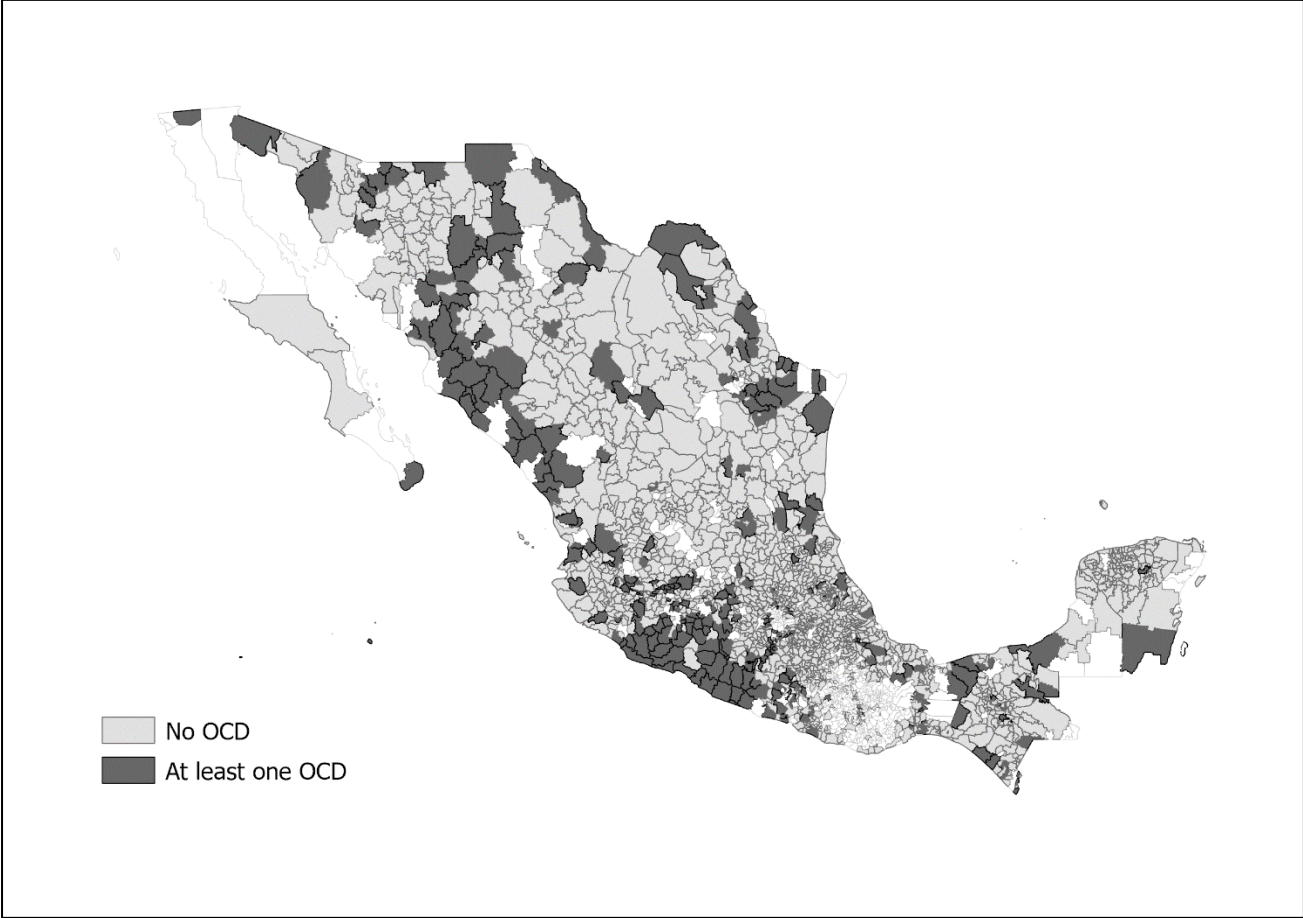
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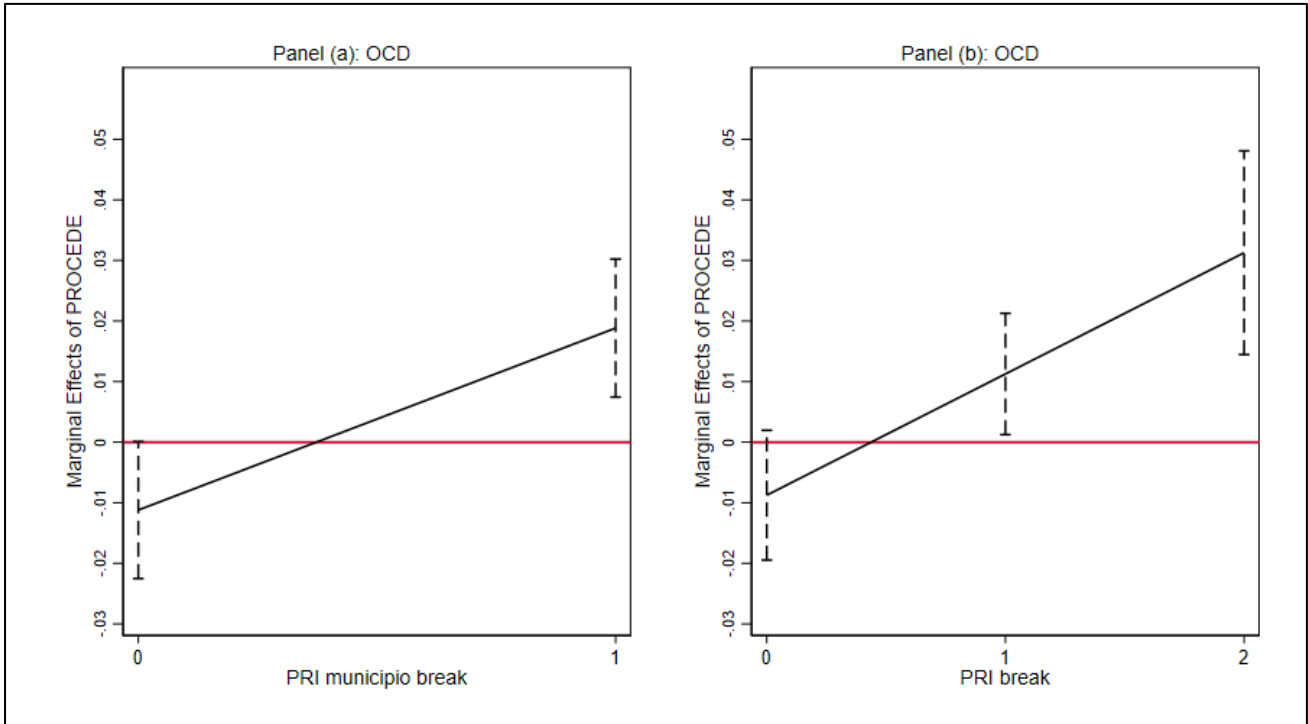
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Figure 1. Organised crime deaths (OCD), 1995-2006



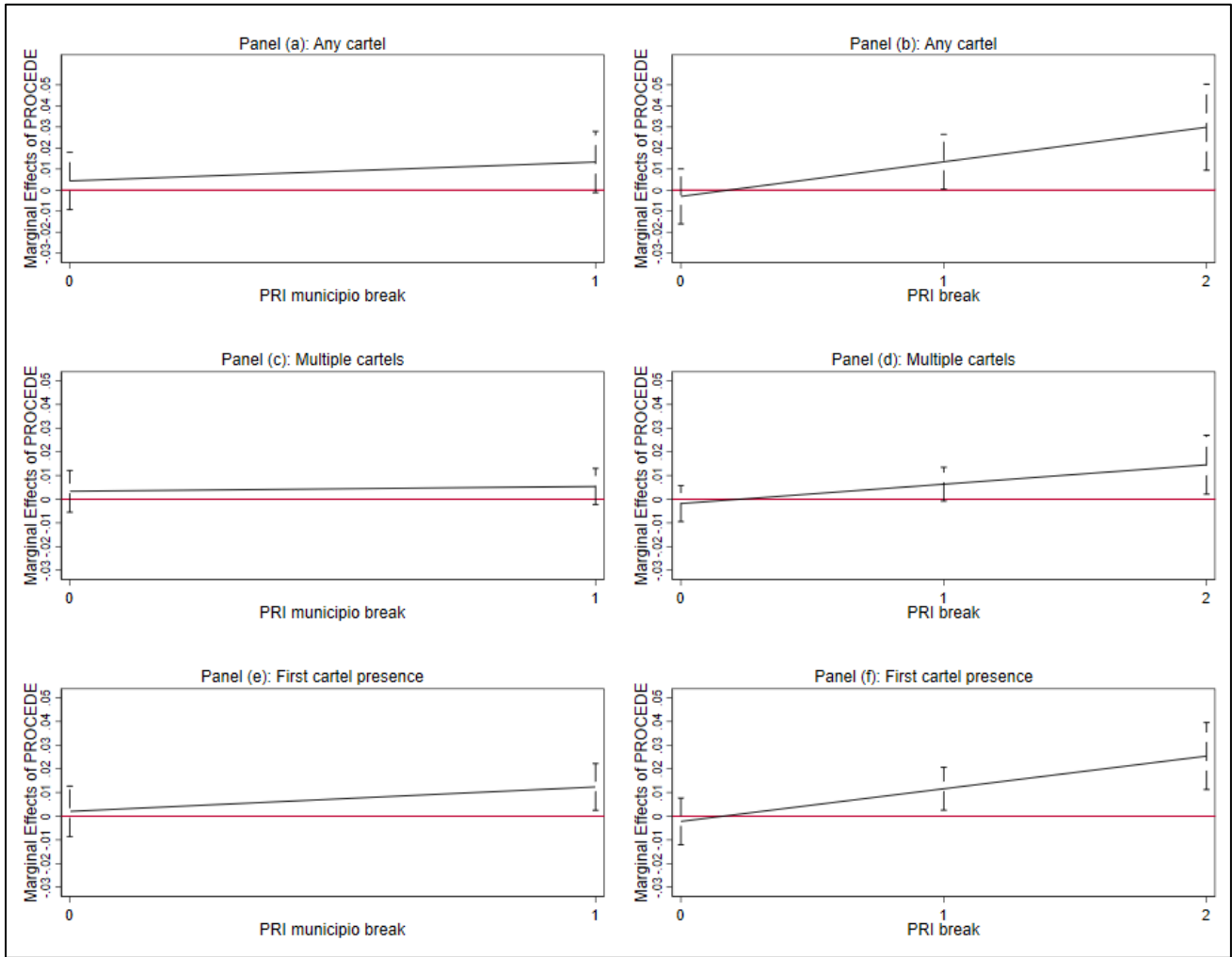
Notes: This map shows municipalities with at least one OCD between 1995-2006. White polygons indicate municipalities that do not appear in the sample. The data come from Trejo and Ley (2018).

Figure 2. Conditional effect of PROCEDE on OCD



Notes. This graph shows the conditional effects of ‘PROCEDE’ with and without political breaks at the subnational level. The conditional effects in panels (a) and (b) are calculated based on the specifications of columns (2) and (4) of Table 1. All other covariates are held constant at their means. Dashed lines signify 95% confidence intervals. Red horizontal line marks marginal effect of 0.

Figure 3. Conditional effect of PROCEDE on cartel activity



Notes. This graph shows the conditional effects of ‘PROCEDE’ with and without political breaks at the subnational level. The conditional effects in panels (a)-(f) are calculated based on the estimates of columns (1)-(6) of Table 6. All other covariates are held constant at their means. Dashed lines signify 95% confidence intervals. Red horizontal line marks marginal effect of 0.

Table 1. PROCEDE rollout, subnational democratization and Organised crime deaths (OCD)

	(1)	(2)	(3)	(4)
<i>Political variable:</i>				
<i>PROCEDE</i>	-0.009 (0.006)	-0.011* (0.006)	-0.008 (0.006)	-0.009 (0.005)
<i>Political variable</i>	-0.017*** (0.006)	-0.020*** (0.006)	-0.009** (0.004)	-0.009** (0.005)
<i>PROCEDE* Political var.</i>	0.029*** (0.007)	0.030*** (0.007)	0.020*** (0.005)	0.020*** (0.005)
No of Observations	22512	22512	22512	22512
R Squared	0.019	0.060	0.019	0.060
Mun. and year FE	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes

Notes: The table reports OLS estimates of equation (1). The dependent variable OCD is a dichotomous indicator of whether a municipality has at least 1 organized crime death. The variable PROCEDE is the proportion of certified area of ejidos to the total area of ejidos in a municipality. The variable PRI municipio break takes the value 1 after a win in local elections of a non-PRI mayor, and zero otherwise. The variable PRI break takes value 0 when there is no alteration in a municipality or a gubernational office; it takes the value 1 after an electoral loss of PRI in mayoral elections; it takes value 2 if the break in power at the municipal level is combined with a break in power at the gubernational level. All estimates include municipality and year fixed-effects. Controls include the interaction of year dummies and: (i) the Log population in 1990, (ii) the Young males' (15-29) ratio in 1990; (iii) the Adult females' ratio in 1990; (iv) the Access to electricity in 1990; (v) the Indigenous ratio in 1990; (vi) the Log Homicides in 1990-92; (vii) the Log distance to border; (viii) the Log distance to nearest police station; (ix) the Log distance to nearest military region; (x) the Log distance to nearest security air force base; (xi) the Maize suitability; (xii) the Log drug crop suitability. Robust standard errors, clustered by municipality, are reported in parentheses. *, **, *** denote statistical significance at the 10%, 5%, 1% level respectively.

Table 2. PROCEDE rollout, subnational democratization and OCD: controlling for illicit drug production

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Political var:		<i>PRI municipio break</i>					<i>PRI break</i>			
<i>PROCEDE</i>	-0.011*	-0.011*	-0.011*	-0.011*	-0.010*	-0.008	-0.008	-0.009	-0.009	-0.008
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
<i>Political variable</i>	-0.017***	-0.019***	-0.020***	-0.020***	-0.017***	-0.008*	-0.008*	-0.010**	-0.009**	-0.008*
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
<i>PROCEDE* Political var.</i>	0.029***	0.029***	0.030***	0.030***	0.029***	0.020***	0.019***	0.020***	0.020***	0.019***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
<i>Log Marijuana eradication</i>	0.010				0.007	0.005				0.001
	(0.006)				(0.007)	(0.006)				(0.007)
<i>Log Marijuana er.*Political variable</i>	-0.016*				-0.015	-0.006				-0.004
	(0.009)				(0.009)	(0.006)				(0.007)
<i>Log poppy eradication</i>		0.011			0.003		0.014			0.012
		(0.009)			(0.010)		(0.009)			(0.009)
<i>Log poppy eradication*Political variable</i>		-0.008			0.006		-0.013			-0.012
		(0.013)			(0.015)		(0.008)			(0.011)
<i>Log marijuana seizures</i>			0.001		-0.001			-0.003		-0.004
			(0.004)		(0.003)			(0.004)		(0.003)
<i>Log marijuana seizures*Political variable</i>			-0.004		-0.001			0.001		0.003
			(0.004)		(0.004)			(0.003)		(0.003)
<i>Log poppy seizures</i>				0.084**	0.081**				0.060	0.057
				(0.036)	(0.037)				(0.038)	(0.037)
<i>Log poppy seizures*Political variable</i>				-0.073*	-0.067*				-0.025	-0.020
				(0.038)	(0.040)				(0.033)	(0.032)
No of Observations	22512	22512	22512	22512	22512	22512	22512	22512	22512	22512
R Squared	0.060	0.060	0.060	0.061	0.062	0.060	0.060	0.060	0.061	0.062
Mun. and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table reports OLS estimates of equation (1), augmented with interactions between the ‘Political variable’ and measures of illicit drugs production. The dependent variable OCD is a dichotomous indicator of whether a municipality has at least 1 organised crime death. The variable PROCEDE is the proportion of certified area of ejidos to the total area of ejidos in a municipality. The variable PRI municipio break takes the value 1 after a win in local elections of a non-PRI mayor, and zero otherwise. The variable PRI break takes value 0 when there is no alteration in a municipality or a gubernational office; it takes the value 1 after an electoral loss of PRI in mayoral elections; it takes value 2 if the break in power at the municipal level is combined with a break in power at the gubernational level. Log marijuana and poppy eradication are measured as log of area eradicated per 10,000 hectares plus 1. Log Marijuana and poppy seizures are measured as the log of kilograms seized plus 1. All estimates include municipality and year fixed effects, and the same controls as in even-numbered columns of Table 1. Robust standard errors, clustered by municipality, are reported in parentheses. *, **, *** denote statistical significance at the 10%, 5%, 1% level respectively.

Table 3. PROCEDE rollout, subnational democratization and OCD: 2SLS estimates

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Political variable:</i>		<i>PRI municipio break</i>			<i>PRI break</i>	
<i>Dependent variable:</i>	PROCEDE	First stage PROCEDE* Political var.	2SLS	PROCEDE	First stage PROCEDE* Political var.	2SLS
Instrument	0.292*** (0.016)	-0.209*** (0.012)		0.300*** (0.016)	-0.270*** (0.016)	
Instrument*Political var.	0.022 (0.019)	0.707*** (0.019)		0.004 (0.013)	0.722*** (0.022)	
Political variable	-0.006 (0.016)	0.095*** (0.017)	-0.024*** (0.009)	0.005 (0.012)	0.127*** (0.021)	-0.008 (0.007)
PROCEDE			-0.018 (0.018)			-0.015 (0.018)
PROCEDE* Political var.			0.032** (0.012)			0.018* (0.009)
No of Observations	19968	19968	19968	19968	19968	19968
R Squared			0.065			0.065
First stage F-stat			201.080			199.226
Mun. and year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns (1) and (2) show first stage results for PROCEDE and its interaction term with the “Political variable”, for the specification where the latter is PRI municipio break. Columns (4) and (5) follow a similar structure when the “Political variable” is PRI break. Columns (3) and (6) report 2SLS regressions of equation (2). The dependent variable OCD is a dichotomous indicator of whether a municipality has at least 1 organised crime death. The variable PROCEDE is the proportion of certified area of ejidos to the total area of ejidos in a municipality. The variable PRI municipio break takes the value 1 after a win in local elections of a non-PRI mayor, and zero otherwise. The variable PRI break takes value 0 when there is no alteration in a municipality or a gubernational office; it takes the value 1 after an electoral loss of PRI in mayoral elections; it takes value 2 if the break in power at the municipal level is combined with a break in power at the gubernational level. The variable Instrument is the proportion of ejidos to the total number of ejidos in the municipality that had had their first informational meeting prior to certification. All estimates include municipality and year fixed effects, and the same controls as in even-numbered columns of Table 1. Robust standard errors, clustered by municipality, are reported in parentheses. *, **, *** denote statistical significance at the 10%, 5%, 1% level respectively.

Table 4. PROCEDE rollout, subnational democratization and OCD: Before and after 2000

	(1)	(2)	(3)	(4)
<i>Period:</i>	<2000	>=2000	<2000	>=2000
<i>Political variable:</i>	<i>PRI municipio break</i>		<i>PRI break</i>	
<i>PROCEDE</i>	-0.002 (0.007)	-0.022* (0.012)	-0.001 (0.007)	-0.025** (0.011)
<i>Political variable</i>	-0.016* (0.009)	-0.034*** (0.010)	-0.014* (0.008)	-0.021*** (0.007)
<i>PROCEDE* Political var.</i>	0.026** (0.011)	0.050*** (0.011)	0.021** (0.010)	0.039*** (0.008)
No of Observations	9380	13132	9380	13132
R Squared	0.031	0.074	0.031	0.075
Mun. and year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes

Notes: Columns (1) and (3) report OLS estimates of equation (1) for the period 1995-1999, for the variables *PRI municipio break* and *PRI break*, respectively. Columns (2) and (4) follow a similar structure for the period 2000-2006. The dependent variable OCD is a dichotomous indicator of whether a municipality has at least 1 organised crime death. The variable PROCEDE is the proportion of certified area of ejidos to the total area of ejidos in a municipality. The variable PRI municipio break takes the value 1 after a win in local elections of a non-PRI mayor, and zero otherwise. The variable PRI break takes value 0 when there is no alteration in a municipality or a gubernational office; it takes the value 1 after an electoral loss of PRI in mayoral elections; it takes value 2 if the break in power at the municipal level is combined with a break in power at the gubernational level. All estimates include municipality and year fixed effects, and the same controls as in even-numbered columns of Table 1. Robust standard errors, clustered by municipality, are reported in parentheses. *, **, *** denote statistical significance at the 10%, 5%, 1% level respectively.

Table 5. PROCEDE rollout, subnational democratization and OCD: by region

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Region:</i>	<i>North</i>	<i>Centre</i>	<i>South</i>	<i>North</i>	<i>Centre</i>	<i>South</i>
<i>Political variable:</i>	<i>PRI municipio break</i>			<i>PRI break</i>		
<i>PROCEDE</i>	0.001 (0.018)	-0.003 (0.008)	-0.009 (0.007)	0.016 (0.018)	-0.004 (0.007)	-0.010 (0.008)
<i>Political variable</i>	-0.009 (0.019)	-0.028*** (0.009)	-0.003 (0.007)	-0.001 (0.012)	-0.009 (0.007)	-0.001 (0.006)
<i>PROCEDE* Political var.</i>	0.043* (0.024)	0.027*** (0.009)	0.013* (0.008)	0.008 (0.013)	0.020** (0.008)	0.012* (0.006)
No of Observations	5184	9360	7968	5184	9360	7968
R Squared	0.117	0.087	0.049	0.116	0.087	0.050
Mun. and year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns (1) and (4) report OLS estimates of equation (1) for municipalities in the North of Mexico, for the variables *PRI municipio break* and *PRI break*, respectively. Columns (2) and (4) and (3) and (6) follow a similar structure for municipalities on the Centre and the South of Mexico, respectively. The dependent variable OCD is a dichotomous indicator of whether a municipality has at least 1 organised crime death. The variable PROCEDE is the proportion of certified area of ejidos to the total area of ejidos in a municipality. The variable PRI municipio break takes the value 1 after a win in local elections of a non-PRI mayor, and zero otherwise. The variable PRI break takes value 0 when there is no alteration in a municipality or a gubernational office; it takes the value 1 after an electoral loss of PRI in mayoral elections; it takes value 2 if the break in power at the municipal level is combined with a break in power at the gubernational level. All estimates include municipality and year fixed effects, and the same controls as in even-numbered columns of Table 1. Robust standard errors, clustered by municipality, are reported in parentheses. *, **, *** denote statistical significance at the 10%, 5%, 1% level respectively.

Table 6. PROCEDE rollout, subnational democratization and cartel activity

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Dependent var.:</i>	Any cartel		Multiple cartels		First cartel presence	
<i>Political variable:</i>	PRI municipio break	PRI break	PRI municipio break	PRI break	PRI municipio break	PRI break
<i>PROCEDE</i>	0.004 (0.007)	-0.003 (0.007)	0.003 (0.004)	-0.002 (0.004)	0.002 (0.005)	-0.002 (0.005)
<i>Political variable</i>	-0.018*** (0.006)	-0.015*** (0.004)	-0.010*** (0.003)	-0.008*** (0.003)	-0.016*** (0.004)	-0.012*** (0.003)
<i>PROCEDE* Political var.</i>	0.009 (0.008)	0.016*** (0.006)	0.002 (0.005)	0.008** (0.004)	0.010* (0.006)	0.013*** (0.004)
No of Observations	22512	22512	22512	22512	21629	21629
R Squared	0.136	0.136	0.099	0.098	0.093	0.093
Mun. and year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Illicit drugs controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns (1), (3) and (5) report OLS estimates of equation (1) when the dependent variables are Any cartel, Multiple cartels and First cartel presence respectively, and the ‘Political variable’ is PRI municipio break. Columns (2), (4) and (6) follow a similar structure when the ‘Political variable’ is PRI break. Any cartel, Multiple cartels, and First cartel presence are dichotomous indicators of whether a municipality has any cartel, multiple cartels, or a cartel operating for the first time, respectively. The variable PROCEDE is the proportion of certified area of ejidos to the total area of ejidos in a municipality. The variable PRI municipio break takes the value 1 after a win in local elections of a non-PRI mayor, and zero otherwise. The variable PRI break takes value 0 when there is no alteration in a municipality or a gubernational office; it takes the value 1 after an electoral loss of PRI in mayoral elections; it takes value 2 if the break in power at the municipal level is combined with a break in power at the gubernational level. All estimates include municipality and year fixed effects, and the same controls as in even-numbered columns of Table 1. Additional illicit drugs controls include Log marijuana and poppy eradication and Log Marijuana and poppy seizures as defined in Table 2. Robust standard errors, clustered by municipality, are reported in parentheses. *, **, *** denote statistical significance at the 10%, 5%, 1% level respectively.

APPENDIX

Table A1. Definition of variables, data sources and descriptive statistics

Variable name	Description	Obs.	Mean	SD	Min	Max	Sources
OCD	Dummy variable that takes the value 1 if there is an organized crime death in the municipality, and 0 otherwise	22512	0.023	0.149	0.000	1.000	Trejo and Ley (2018)
Any cartel	Dummy variable that takes the value 1 if any cartel operates in the municipality, and 0 otherwise	22512	0.028	0.166	0.000	1.000	Dube et al. (2016)
Multiple cartels	Dummy variable that takes the value 1 if multiple cartels operate in the municipality, and 0 otherwise	22512	0.009	0.092	0.000	1.000	Dube et al. (2016)
First cartel presence	Dummy variable that takes the value 1 if a cartel operates for the first time in the municipality, and 0 otherwise	21629	0.013	0.114	0.000	1.000	Dube et al. (2016)
PRI municipio break	Dummy variable that takes the value 1 after the win of a non-PRI party in local elections, and zero otherwise	22512	0.612	0.487	0.000	1.000	Own calculations based on Trejo and Ley (2018)
PRI break	Index that takes the value 0 if there is no alteration in a municipality or gubernatorial office; value 1 in municipalities with a mayor from a non-PRI party; value 2 in municipalities with a break in power both at the municipal and gubernational levels	22512	0.825	0.755	0.000	2.000	Own calculations based on Trejo and Ley (2018)
PROCEDE	The proportion of certified ejido area to the total area of ejidos in the municipality	22512	0.617	0.374	0.000	1.000	Own calculations based on National Agrarian Registry
Instrument	The proportion of ejidos to the total number of ejidos in the municipality that had had their first informational meeting prior to certification	19968	0.748	0.317	0.000	1.000	Castaneda Dower and Pfütze (2015)
Log marijuana eradication	Log of marijuana area eradicated in the municipality per 10,000 hectares plus 1	22512	0.168	0.542	0.000	6.344	Dube et al. (2016)
Log poppy eradication	Log of poppy area eradicated in the municipality per 10,000 hectares plus 1	22512	0.070	0.399	0.000	6.962	Dube et al. (2016)
Log raw marijuana seizures	Log of marijuana kilograms seized in the municipality plus 1	22512	0.197	1.001	0.000	10.002	Dube et al. (2016)
Log opium gum seizures	Log of opium gums seized in the municipality plus 1	22512	0.008	0.126	0.000	4.813	Dube et al. (2016)
Log population 90	Log of population of the municipality in 1990	1876	9.443	1.078	5.932	12.461	National Institute of Statistics and Geography (INEGI)
Young males' ratio 90	The ratio of young males (15-29) to the total population of the municipality in 1990	1876	0.128	0.016	0.043	0.213	INEGI
Adult females' ratio 90	The ratio of adult females to the total population of the municipality in 1990	1876	0.258	0.023	0.188	0.364	INEGI
Access to electricity 90	The ratio of dwellings with electricity to the total number of dwellings in the municipality in 1990	1876	0.753	0.211	0.000	0.990	INEGI
Indigenous ratio 90	The ratio of indigenous population to the total population of the municipality in 1990	1876	0.142	0.250	0.000	0.871	INEGI
Log homicides 90-92	Log homicides of the municipality per 10,000 people plus 1 between 1990-1992	1876	1.023	0.936	0.000	4.523	INEGI
Log distance to border	Log distance to border	1876	5.952	0.679	1.931	6.727	Dube et al. (2016)
Log distance to nearest police station	Log distance to nearest police station	1876	3.249	0.737	0.185	5.326	Dube et al. (2016)
Log distance to nearest military region	Log distance to nearest military region	1876	3.644	0.683	0.691	5.230	Dube et al. (2016)
Log distance to nearest air force base	Log distance to nearest air force base	1876	4.331	0.681	0.561	5.505	Dube et al. (2016)
Maize suitability	Average agro-climatically attainable yield for maize (measured in kg DW/ha) for each municipality	1876	6.594	1.688	1.422	9.313	Dube et al. (2016)
Log drug crop suitability	Log of marijuana and poppy area eradicated in the municipality between 1990-1992 per 10,000 hectares plus 1	1876	0.136	0.387	0.000	3.759	Dube et al. (2016)

Table A2. PROCEDE rollout, subnational democratization and Organised crime deaths (OCD): Alternative measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Dependent var.:</i>	OCD		Log OCD pc		Log OCD pc		Log suicides and accidents		OCD	
<i>PROCEDE:</i>	Log PROCEDE pc		PROCEDE		Log PROCEDE pc		PROCEDE		PROCEDE	
<i>Political var.:</i>	<i>PRI municipio break</i>	<i>PRI break</i>	<i>PRI municipio break</i>	<i>PRI break</i>	<i>PRI municipio break</i>	<i>PRI break</i>	<i>PRI municipio break</i>	<i>PRI break</i>	<i>PRI municipio break</i>	<i>PRI break</i>
<i>PROCEDE</i>	-0.001 (0.001)	-0.001 (0.001)	-0.005 (0.006)	-0.003 (0.006)	-0.000 (0.002)	-0.000 (0.002)	0.048 (0.033)	0.049 (0.031)	-0.009 (0.007)	-0.015** (0.007)
<i>Political var.</i>	-0.019*** (0.005)	-0.010** (0.004)	-0.015** (0.006)	-0.005 (0.005)	-0.013** (0.005)	-0.005 (0.004)	0.047* (0.026)	0.034* (0.019)	-0.009 (0.007)	-0.014*** (0.005)
<i>Interaction</i>	0.005*** (0.001)	0.004*** (0.001)	0.022*** (0.007)	0.014*** (0.005)	0.003** (0.001)	0.003** (0.001)	-0.028 (0.034)	-0.024 (0.023)	0.023*** (0.008)	0.026*** (0.006)
No of Observations	22512	22512	22512	22512	22512	22512	22512	22512	22512	22512
R Squared	0.059	0.060	0.048	0.049	0.048	0.048	0.014	0.014	0.192	0.192
Mun. and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipio trends	No	No	No	No	No	No	No	No	Yes	Yes

Notes: The table reports OLS estimates of Equation (1). The dependent variable in columns (1) - (2) and (9)-(10) is a dichotomous indicator of whether a municipality has at least 1 organised crime death. The dependent in columns (3) - (6) is measured as the log count of organized crime deaths per 10,000 people plus 1. The dependent in columns (7) - (8) is measured as the log count of accidents and suicides per 10,000 people plus 1. The variable PROCEDE in columns (1) - (2) and (5) - (6) it is measured as log certified area per 10,000 people plus 1. The variable PROCEDE in columns (3) - (4) and (7) - (10) is the proportion of certified area of ejidos to the total area of ejidos. The variable *PRI municipio break* takes the value 1 after the win of non-PRI mayor, and zero otherwise. The variable *PRI break* takes value 0 when there is no alteration in a municipality or a gubernational office; it takes the value 1 after an electoral loss of PRI in mayoral elections; it takes value 2 if the break in power at the municipal level is combined with a break in power at the gubernational level. All estimates include municipality and year fixed-effects, and the following controls interacted with year dummies: (i) the Log population in 1990, (ii) the Young males' (15-29) ratio in 1990; (iii) the Adult females' ratio in 1990; (iv) the Access to electricity in 1990; (v) the Indigenous ratio in 1990; (vi) the Log Homicides in 1990-92; (vii) the Log distance to border; (viii) the Log distance to nearest police station; (ix) the Log distance to nearest military region; (x) the Log distance to nearest security air force base; (xi) the Maize suitability; (xii) the Log drug crop suitability. Columns (9) - (10) include municipality-specific time trends. Robust standard errors, clustered by municipality, are reported in parentheses. *, **, *** denote statistical significance at the 10%, 5%, 1% level respectively.

Table A3. Regression of instrument on baseline variables

Dependent var.	(1) Average speed of having the first meeting by mun.
Log population 90	0.015 (0.009)
Young males' ratio 90	-0.228 (0.390)
Adult females' ratio 90	-0.186 (0.327)
Access to electricity 90	0.046 (0.044)
Access to sewage 90	0.037 (0.046)
Access to toilet 90	-0.031 (0.036)
Unemployment rate 90	-0.802 (0.545)
Indigenous ratio 90	-0.144*** (0.038)
Log homicides 90-92	-0.005 (0.009)
Turnout 90-92	0.016 (0.042)
Pan mayor 90-92	-0.024 (0.021)
Log distance to border	-0.009 (0.010)
Log distance to nearest police station	-0.004 (0.010)
Log distance to nearest military region	-0.004 (0.010)
Log distance to nearest air force base	0.033** (0.013)
Highway presence	0.023** (0.011)
Rugged	-0.000*** (0.000)
Maize suitability	-0.004 (0.004)
Log drug crop suitability	-0.013 (0.016)
Log municipio area	0.005 (0.007)
No of Observations	1651
R Squared	0.326

Notes: The dependent variable is the average time since the first informational meeting during 1993-2007. The estimate includes state fixed effects. Robust standard errors are reported in parentheses. *, **, *** denote statistical significance at the 10%, 5%, 1% level respectively.

Table A4: PROCEDE rollout, subnational democratization and cartel activity: 2SLS estimates

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Any cartel		Multiple cartels		First cartel presence	
Political variable:	<i>PRI municipio break</i>	<i>PRI break</i>	<i>PRI municipio break</i>	<i>PRI break</i>	<i>PRI municipio break</i>	<i>PRI break</i>
<i>PROCEDE</i>	-0.015 (0.020)	-0.015 (0.020)	-0.018* (0.010)	-0.020* (0.010)	-0.031** (0.015)	-0.029** (0.014)
<i>Political variable</i>	-0.025*** (0.008)	-0.014** (0.007)	-0.012*** (0.004)	-0.007* (0.004)	-0.027*** (0.006)	-0.015*** (0.005)
<i>Interaction</i>	0.019 (0.012)	0.015* (0.009)	0.004 (0.007)	0.006 (0.005)	0.028*** (0.008)	0.019*** (0.007)
No of Observations	19968	19968	19968	19968	19113	19113
R Squared	0.136	0.136	0.097	0.097	0.096	0.096
First stage F-stat	200.900	199.062	200.900	199.062	195.494	192.901
Mun. and year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Illicit drugs controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The Table reports 2SLS regressions of equation (2). The dependent variables Any cartel, Multiple cartels, and First cartel presence are dichotomous indicators of whether a municipality has any cartel, multiple cartels, or a cartel operating for the first time, respectively. The variable PROCEDE is the proportion of certified area of ejidos to the total area of ejidos in the municipality. The variable PRI municipio break takes the value 1 after the win of non-PRI mayor, and zero otherwise. The variable PRI break takes value 0 when there is no alteration in a municipality or a gubernational office; it takes the value 1 after an electoral loss of PRI in mayoral elections; it takes value 2 if the break in power at the municipal level is combined with a break in power at the gubernational level. The instrument used is the proportion of ejidos to the total number of ejidos in the municipality that had had their first informational meeting prior to certification. All estimates include municipality and year fixed effects, and the same controls as in even-numbered columns of Table 1. Additional illicit drugs controls include Log marijuana and poppy eradication and Log Marijuana and poppy seizures as defined in Table 2. Robust standard errors, clustered by municipality, are reported in parentheses. *, **, *** denote statistical significance at the 10%, 5%, 1% level respectively.