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The Mexican Drug War: Elections and Homicides*

Aixa García-Ramos†

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Abstract

Mexico has experienced a dramatic increase in violence during the last decade. This increase has been associated with turf wars among Drug Trafficking Organisations (DTOs) for the control of strategic territories. This paper examines whether these territorial disputes are higher during the lame duck period, when incumbent DTOs might be relatively weaker. Using homicides as a proxy for turf wars, my results show support for this hypothesis. The increase in homicides is concentrated on municipalities in which the PRI wins the election. In contrast, those in which the PAN wins experience a decrease.

JEL Classification: D72, K42

Keywords: Organised crime, violence, elections

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1 Introduction

Homicides have increased significantly in Mexico since 2008 with approximately 50,000 deaths related to DTOs between 2007 and 2011. The negative consequences have been myriad including rising insecurity, deterred economic growth (Enamorado et al., 2014), reduced labour force participation (BenYishay & Pearlman, 2013; Velásquez, forthcoming), decreased birth weight (Brown, 2018), as well as lower educational performance (Jarillo et al., 2016) and school completion rates (Brown & Velasquez, 2017). One of the main explanations put forward in the previous literature is the crackdown on DTOs initiated by President Felipe Calderón—from the conservative party, i.e., National Action Party (PAN)—in December 2006. A key aspect of this enforcement strategy has been the deployment of thousands of military and federal police forces (about 45,000 by 2011) to debilitate DTOs including through the arrest and killing of their leaders. As a consequence, major DTOs have fragmented and turf wars for leadership and control of strategic territories have spurred (Calderon et al., 2015; Dell, 2015; Escalante Gonzalbo, 2011; Guerrero-Gutiérrez, 2011).

In this paper, I shed some light on the temporal and regional variation of this violence by linking it to the electoral cycle. I particularly examine whether turf wars among DTOs for the control of strategic territories increase during the lame duck period (i.e. between the election and inauguration of the new term) as compared to other periods of the electoral cycle within this context of increasing conflict among DTOs. This hypothesis is based on two observations. First, there is plenty of evidence showing that DTOs capture politicians, public officials, and police officers, which would suggest that there are implicit agreements between DTOs and authorities (Morris, 2012). Second, until 2014 (2017 in practice) re-election was not possible for any political position at the municipality level and thus an election always represented the entrance of a new government. Given these two observations, the entrance of a new government into office might imply the breakdown of the *status quo* including of any agreement between DTOs and authorities. If this is the case, this would leave DTOs already operating in the municipality (i.e. incumbent DTOs)—other things equal—in a relatively weaker position in the lame duck period. If this is exploited by rival DTOs, then turf wars should increase during this time.[1] At the same time, the lame duck period is a time in which the elected government is taking important decisions (e.g. election of police directors). This creates an additional incentive for DTOs to eliminate rival ones. In this context, one would also expect to find differences depending on the party affiliation of the elected government. Given that PAN mayors—i.e. mayors of the same party as the federal government—are likely to have implemented the crackdown on DTOs relatively more intensively (Dell, 2015), one would expect to see territorial disputes concentrated on municipalities in which non-PAN mayors win the election.[2]

[1] A pre-condition for observing an increase in turf wars during the lame duck period is that there is conflict between DTOs. Although conflict already occurred before December 2006, it has reached unprecedented levels after this time.

[2] This would occur if DTOs try to avoid crackdowns, which is a rational strategy to follow given the

A proxy for turf wars among DTOs is homicides. I exploit an official government database on killings perpetrated by DTOs on other DTOs at the municipality and monthly levels for the period between December 2006 and December 2010. I look at both the probability of having at least one homicide and the homicide rate. I define the lame duck period based on the dates of the election and inauguration, which I manually collect from each of the 32 electoral institutes of Mexico. Whether a territory is strategic for DTOs is based on its proximity to the United States (US). I also use a number of other datasets including overall intentional homicides, killings of journalists and politicians, and hand-collected electoral outcomes.

I estimate the effect of being in the lame duck period interacted with whether the municipality is strategic for DTOs on homicides controlling for municipality, year and month fixed effects as well as a linear time trend. In some specifications, I control for municipality-specific time trends. The identification strategy relies on the exogeneity of elections after controlling for the bunch of fixed effects and trends. This is a plausible assumption given that the dates of elections are set in the constitutions and electoral laws of each state. In additional specifications, particularly when considering the results of elections, I use a regression discontinuity (RD) design in which I exploit close elections.

The baseline findings show that the probability of having at least one homicide as a consequence of targeted killings among DTOs significantly increases by 2.9 percentage points (or 27% of the sample mean) in the lame duck period, as compared to other periods of the electoral cycle, in municipalities valuable for DTOs. The homicide rate also increases by about 6-7% or 24% of the sample mean. These results hide, however, heterogeneous effects by the winning party of the election. Focusing on municipalities close to the US, those in which the PAN wins experience a decrease in homicides, regardless of the definition used, while those in which it loses experience an increase. In particular, the increase in homicides is driven by municipalities in which the Institutional Revolutionary Party (PRI)—the largest political party of Mexico and main opponent of the PAN—wins the election.[3] The effect is large and significant across the three definitions of homicides (47-48% of the sample mean).

Taken together, my findings are consistent with the hypothesis outlined above. First, turf wars increase in municipalities more valuable for DTOs during the lame duck period when incumbent DTOs might be relatively weaker compared to other periods of the electoral cycle. I also present evidence that this increase is not driven by political party turnover, but rather by the change in the government. Second, DTOs do not dispute territories which are expected to have a crackdown on drugs, i.e., those in which a PAN mayor has been elected. Instead, they concentrate the territorial disputes on municipalities in which a PRI mayor has been elected.

negative consequences that they have on their criminal activities (Dell, 2015).

[3]A third major party during my time span is the Party of the Democratic Revolution (PRD). No significant association between the lame duck period and homicides is observed when the PRD wins the election.

I also rule out that confounders are driving these findings, e.g., greater enforcement during the lame duck period. In addition to providing suggestive evidence for this, I show that there is no systematic increase in violence during the lame duck period. I proxy for violence using other types of DTO-related homicides (e.g. killings of police and military agents by DTOs), murders of politicians and murders of journalists.

This paper contributes to two strands of previous literature. First, a body of research that aims to understanding the reasons behind the boost in violence in Mexico. My paper contributes by examining the role of the electoral cycle—the lame duck period—in explaining turf wars. Studying elections is important given the close link between DTOs and authorities, and the likely incentive that the former have to dispute territories following an election. Previous studies have looked at a number of other factors being the crackdown on drugs initiated in December 2006 the one that has attracted most attention. Calderon et al. (2015) and Dell (2015) find both support for this hypothesis. Exploiting close elections, Dell (2015) finds that homicide rates increase in the post-inauguration period in municipalities in which the PAN barely wins the election—i.e. municipalities more likely to have implemented the crackdown on drugs more intensively—as compared to those in which it barely loses. This is driven by regions more valuable for DTOs. She interprets her findings as evidence that crackdowns weaken incumbent DTOs, which increases the incentives of rival ones to fight over the territory. My findings are in line with the hypotheses that territorial disputes are more likely to occur when incumbent DTOs are weaker, and that turf wars in PAN municipalities are not likely to occur before the crackdown takes place. Unlike Dell (2015), the source of the weakness of incumbent DTOs is not the crackdown but arises because of the lame duck period. Thus, both papers should be seen as complementary.

Calderon et al. (2015) compare municipalities in which a kingpin or a lieutenant is arrested or killed with a synthetic control group of municipalities before and after the arrest or killing. They find that murdering a DTO leader increases the number of homicides in the six months after the neutralisation, which is concentrated on valuable municipalities. Several other studies have gone beyond the crackdown on drugs to explain the boost in homicides. Castillo et al. (2020) find that seizures of cocaine in Colombia have led to an increase in homicide rates in Mexico. They motivate this finding with a model in which cocaine supply shortages lead to an increase in the potential revenue from cocaine, provided that its demand is inelastic, which in turn raises violence. Dube et al. (2016) show that negative shocks to the maize price represent an incentive for producers to increase their cultivation of illegal drug crops, as well as for DTOs to expand into maize-suitable municipalities, which increases turf wars. A recent paper by Dell et al. (2019) finds that trade-induced manufacturing job losses in urban areas increases DTO-related homicides, which is concentrated in municipalities with DTO presence.

My paper is also related to a second body of research, which aims to analyse the relationship between electoral cycles, DTOs and violence (Alesina et al., 2019; Daniele & Dippopa, 2017). Alesina et al. (2019) develop a model in which criminal organisations use violence to help the captured party become elected. Using national elections over a long period of time, they find an increase in murders of politicians and overall homicides in regions with presence of organised crime the year before an election. Daniele & Dippopa (2017) analyse the effect of elections on pre- and post-electoral violence.[4] Unlike Alesina et al. (2019), they focus on municipal elections during 2010-2014, and look at attacks towards politicians. Their results show that attacks increase in the month after the election—when important decisions by the elected government are made—in regions with historical presence of the Mafia. In addition, they find that the increase in violence is driven by municipalities in which the government changes. My paper adds to these two previous studies in two ways. First, by examining whether electoral cycles affect homicides in the context of a Latin American country and, in particular, Mexico. Mexico represents a unique case study in the sense that it has recently experienced unprecedented levels of violence.[5] Second, by analysing homicides perpetrated by DTOs on other DTOs. Previous studies have mainly looked at overall homicides or murders of politicians. However, if homicides are related with DTOs, one would expect these organisations not only to be the perpetrators of violence but also the victims of it.

The rest of the paper is organised as follows. Section 2 highlights some particular features of the Mexican context. Section 3 describes the data and sample. Section 4 presents the identification strategy. Section 5 reports the results, including the baseline estimates, heterogeneous effects by winning party, and robustness checks. It also rules out alternative explanations for my findings. Finally, section 6 concludes.

2 Relationship between politics and DTOs in Mexico

The relationship between politics and DTOs in Mexico cannot be understood without making reference to the PRI. The PRI was founded in 1929 and for nearly 60 years dominated all levels of government (i.e. federal, state and municipal). This was accomplished through a variety of strategies which ranged from vote buying to electoral fraud passing through patronage and control of mass media (Schedler, 2002). The PRI lost its first municipality (Ciudad Juárez, Chihuahua) in 1983 against the PAN, which denoted the start of the hegemony breakdown. In 1989, it lost its first state government (Baja California), which was followed by eventually the Presidency against the PAN in 2000.

The control of the political arena by the PRI facilitated the emergence of a clearly defined structure of corruption in which DTOs operated with relatively permissiveness in exchange

[4]Dal Bó & Di Tella (2003) and Dal Bó et al. (2006) provide a framework to understand post-electoral violence. The first paper develops a model in which there is a honest government and an interest group. The latter uses threats of punishment (e.g. physical violence, legal harassment and smear campaigns) to influence the actions of the government and divert them towards its own interests. Dal Bó et al. (2006) extend this model by considering that interest groups use not only threats of punishment but also bribes.

[5]According to data from the United Nations Office on Drugs and Crime, the overall homicide rate in Mexico between 2007 and 2010 was 14.7%, while in Italy 1.0%. Moreover, 14.7% is larger than the homicide rate experienced in Italy during its most violent periods, e.g. in the turn of the 20th century, and between the mid-1970s and mid-1990s.

for bribes, no violence, discretion and no drugs staying in Mexico. During this time, a few DTOs with strong leaders existed, and the levels of violence were relatively stable. This system started to erode in the 1990s as political competition increased and Mexico became a key actor in the international drug trade business. In the new scenario, the rules governing the relationship between politicians and DTOs were no longer centralised by a single party. Instead, DTOs had to individually capture politicians and other public authorities.[6]

The new scenario also came with an increasing use of enforcement as a way to fight DTOs. One of the main tools employed consisted in the deployment of police and military forces to dismantle DTOs through, for instance, the arrest of their leaders. This strategy became more evident with the victory of Vicente Fox (2000-2006)—from the PAN—, which represented the turnover in the federal political party after 70 years of PRI control. It further intensified with his successor, Felipe Calderón (2006-2012), who deployed thousands of agents to confront DTOs. The magnitude of the military deployment and the number of arrests in this latter administration represent a significant change with respect to the previous governments.[7] In 2012, the PRI returned to power, but the crackdown on drugs did not change.[8]

This enforcement strategy has helped to fragment the major DTOs that existed in the 1980s, and spurred conflict within them for leadership, as well as among them for the control of strategic territories. For instance, the number of major DTOs increased from 6 in 2006 to 16 in 2011 (Guerrero-Gutiérrez, 2011). Disputes between DTOs are likely to intensify in the lame duck period given the change in the *statu quo*. If political turnover represents a breakdown of the 'agreements' between the incumbent DTOs and authorities, the former will become relatively weaker during this period. This increases the likelihood that rival DTOs will attempt to usurp territories.

3 Data and sample

3.1 Homicides

The main analysis uses official government data on homicides related with DTOs. These were published during the administration of Felipe Calderón. The database distinguishes three types of homicides. First, 'executions', which refer to the targeted killings of DTO members perpetrated by other DTOs. Second, 'aggressions', which are the direct attacks of DTOs on authorities (this mainly includes military and police forces). Third, 'confrontations', which are the deaths of DTOs or authorities as a consequence of confrontation between them. These data cover the period between December 2006 and September 2011,

[6]See Celaya Pacheco (2009); Hernández (2010); Morris (2012); Osorio (2016), and Snyder & Duran-Martinez (2009) for more details on the evolution of Mexican politics, the history of DTOs, and their interconnection.

[7]See Chabat (2010) and Guerrero-Gutiérrez (2011) for more details on the enforcement strategies.

[8]This period is, however, outside my sample, and thus it will not affect the interpretation of my findings.

although the disaggregated sub-categories are only available until December 2010. The total number of DTO-related homicides until December 2010 was 34,612. 89% of them are classified as executions, 2% as aggressions, and 9% as confrontations. Although I am mainly interested in executions since this is the type of homicide that captures turf wars between DTOs[9], I will also use aggressions and confrontations in some specifications.

In addition to DTO-related homicides, I use three additional types of homicides. The first one refers to overall intentional homicides, which are based on death certificates obtained from INEGI *(Instituto Nacional de Estadística y Geografía)* [National Institute of Statistics and Geography]. They include deaths coded under the causes X85-Y09 of the ICD-10 (International Statistical Classification of Diseases and Related Health Problems 10th Revision), and refer to the municipality and time of occurrence.

A second source of homicides refers to murders of politicians. These include homicides of mayors, ex-mayors, candidates for mayor, elected candidates for mayor (not in office yet), substitute mayors, councillors, ex-councillors, candidates for councillor, and public trustees. I have constructed this database using information from two primary sources, namely the *Asociación de Autoridades Locales de México* (Association of Local authorities of Mexico) and the newspaper *El Universal*.[10] I have validated all homicides employing the main newspapers of the country.[11] Finally, I also look at murders of journalists. These data come from the *Federacion de Asociaciones de Periodistas Mexicanos* (Federation of Associations of Mexican Journalists).[12]

For each type of homicide, I construct two dependent variables. The first one is a dichotomous variable equal to one if there has been at least one homicide in the municipality in that year and month, and zero otherwise. Focusing on executions, 7% of observations have a value of one, and, within these, the average number of homicides is 16.3. Moreover, 73% and 92% of the observations with at least one homicide have at most two and five homicides, respectively. Taken together, this suggests that using an indicator is an appropriate dependent variable.

The second one is the homicide rate, which is the number of homicides per 100,000 inhabitants in each municipality, year and month. The average value in my sample is 1.2. Population data are obtained from CONAPO (*Consejo Nacional de Población)* [National Council of Population].

Given that the homicide rate is highly skewed to the right, my first approach is to use this variable in natural logarithms.[13] The problem with using logarithms is that there are a large number of observations with zero homicides. To address this, I add a parameter equal to one

[9] I use the words executions and homicides interchangeably from now on.

[10] `http://interactivo.eluniversal.com.mx/2016/alcaldes-asesinados/`.

[11] For instance, *El Universal, Reforma, Milenio, Excélsior* and *La Jornada*.

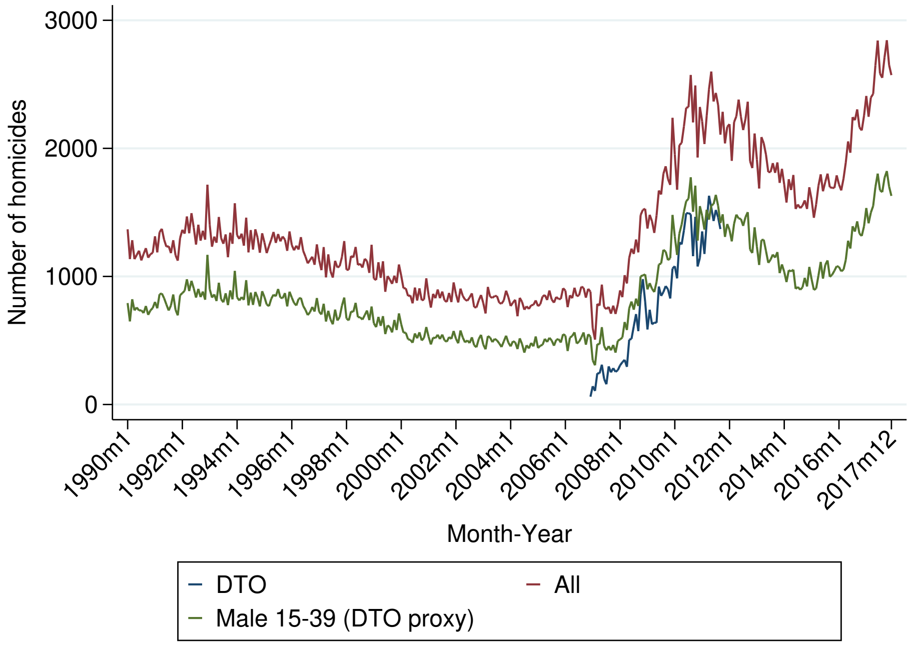
[12] I have complemented it using several additional sources including the Committee to Protect Journalists and the main newspapers of the country.

[13] This has been a common approach in the previous criminal literature (Castillo et al., 2020; Enamorado et al., 2016).

to the homicide rate, and then take the natural logarithm of this sum. My second approach to deal with the high skewness of the homicide rate is to employ the inverse hyperbolic sine[14], which, unlike the log transformation, is defined at zero. The interpretation is similar to that when the homicide rate is transformed with the natural logarithm (Burbidge et al., 1988; Pence, 2006).

Figure 1 shows the evolution of the overall intentional homicides and DTO-related ones. Since data for the latter refers to December 2006-September 2011, I compute a proxy over a longer period of time, namely, intentional homicides committed by males aged 15-39.[15] As can be seen, both types of homicides have followed a very similar trend. Moreover, during the period December 2006-September 2011, DTO-related ones represent, on average, 48% of all homicides with this number increasing over time.

Figure 1: Overall intentional homicides and DTO-related homicides



Notes: Overall intentional homicides refer to the period 1990-2017, whereas DTO-related ones to December 2006-September 2011. The X axis refers to month-year. Overall intentional homicides are based on death certificates obtained from INEGI. They include deaths coded under the causes X85-Y09 of the ICD-10.

3.2 Elections

The main sample uses electoral data on municipal elections occurring between 2007 and 2010. I obtain these data from each of the 32 electoral institutes of Mexico (one for each state). When the information was not available in the website, I made freedom of informa-

[14]For a given variable y, the inverse hyperbolic sine is defined as $ln(y + \sqrt{1+y^2})$.

[15]Previous studies have concluded that this group more closely resembles the DTO-related killings sample (Calderon et al., 2015).

tion requests. In particular, I employ the date of the election, the date of inauguration, the number of votes obtained by candidate, and the electoral turnout.

I define the electoral cycle as consisting of 13-18 months. These months include the following sub-periods: the 6 months before the election, the month of the election, the lame duck period which ranges between 0 and 5 months[16], the month of the inauguration, and 5 months of post-inauguration. The lame duck period is the period between the month after the election and the month before the inauguration. Depending on its length, the number of observations per electoral cycle varies. As a robustness check, I will consider alternative definitions of the electoral cycle and lame duck period. By defining the electoral cycle as 13-18 months I ensure that I include one electoral cycle for each municipality. In particular, of the states included, 13 have elections in 2007, 5 in 2008, 13 in 2009, and 1 in 2010. The last column of table A1 in the Appendix shows the specific electoral year for each of the 32 states. The other two columns will be used in additional specifications. In this table, one can also see that, with a few exceptions, elections are usually held every three years.

For conducting my analysis, I drop municipalities that do not have elections following the system of political parties, but rather *Usos y Costumbres* ('Laws and Customs').[17] The reason is twofold. First, the date of the election is chosen, with some restrictions, by the indigenous communities and, consequently, it can be endogenous. Second, there are no political parties, which I will need for further analyses. Furthermore, I drop extraordinary elections because the date of the election could be endogenous to the evolution of homicides. I also remove municipalities which have been created during my time span. After these adjustments, my sample consists of 2011 municipalities (of a total of 2,456 during my time span) and 35,774 observations.

4 Identification strategy

The baseline equation is given by the following expression:

$$Homicide_{myd} = \alpha + \beta Electoral_{myd} + \delta_m + \gamma_y + \mu_d + \eta t(yd) + \varepsilon_{myt} \tag{1}$$

where m stands for municipality, y for year and d for month. $Homicide_{myt}$ can take three different definitions: an indicator of whether there has been at least one homicide, the natural logarithm of the homicide rate, and the inverse hyperbolic sine transformation of the homicide rate. $Electoral_{myt}$ is a measure of the electoral cycle. I am mainly interested in an indicator of whether the month is part of the lame duck period. I will also consider alternative periods throughout the analysis. δ_m is a vector of municipality fixed effects that controls for unobservable time-invariant factors that vary across municipalities. γ_y is a vector

[16]It is zero in only one state, namely Estado de Mexico.

[17]This applies to some indigenous communities, especially in the southern state of Oaxaca. These communities have specific rules for the election of the town council.

of year fixed effects which captures specific aggregate shocks that affect all municipalities, such as national reforms (e.g. Criminal Procedure Reform of 2008). μ_d is a set of monthly dummies to account for seasonality of homicides. $t(yd)$ is a linear time (year-month) trend to account for confounders including the upwards trend in crackdowns in Mexico and in cocaine seizures in producing countries such as Colombia (Castillo et al., 2020). ε_{myt} is the error term. I cluster the standard errors at the municipality level to allow for autocorrelation within municipalities over time (Bertrand et al., 2004).

In order to test for the hypothesis outlined in section 1, I augment equation 1 by interacting $Electoral_{myt}$ with an indicator of whether the municipality is valuable for DTOs. One proxy for whether a municipality is valuable is its proximity to the US.[18]. I define proximity to the US as an indicator of whether the municipality is below the median distance to the closest entry point in the US[19]

$$\begin{aligned} Homicide_{myt} =& \alpha + \beta_1 Electoral_{myt} + \beta_2 Electoral_{myt} \times Close_m + \delta_m + \gamma_y \\ & + \gamma_y \times Close_m + \mu_d + \mu_d \times Close_m + \eta t(yd) + \eta t(yd) \times Close_m + \varepsilon_{myt} \end{aligned} \tag{2}$$

The indicator '$Close_m$' is absorbed by the municipality fixed effects, δ_m. I also interact this indicator with γ_y, μ_d and $\eta t(yd)$ to capture yearly, monthly, and time trend differences between valuable and non-valuable municipalities in terms of, for instance, the crackdown on drugs and cocaine supply shocks. As an extension of equation 2, in some specifications I control for municipality specific time (linear, quadratic and cubic) trends to allow for different trends in enforcement and seizures across municipalities.

The identification of the effect of elections on homicides relies on the exogeneity of the timing of elections and the length of the lame duck. Exogeneity is a plausible assumption given that the dates of the election and inauguration are set in the constitutions and electoral laws of each state. Moreover, since the late 1990s all states have independent and autonomous electoral institutes in place.

Even when exogeneity is a plausible assumption, there can still be time-varying factors correlated with the electoral cycle and homicides. For instance, there is evidence of electoral cycles in public spending (Vincenzo Bove, 2017) and tax rates (Alesina & Paradisi, 2017). It could be that government spending on enforcement is lower during the lame duck period, which would be biasing the estimates if this is correlated with homicides. Furthermore, the crackdowns on drugs have only targeted specific municipalities and have been implemented

[18]This proxy has been used in a number of previous studies including Castillo et al. (2020) and Dell (2015).

[19]I calculate the distance between the centroid of the municipality and the closest point of entry in the US, and then compute the median value of all the municipalities. Using this information, I construct a dichotomous variable equal to one if the distance is smaller than the median value, and zero otherwise. The centroid is obtained using GIS, while the coordinates of the entry points using Google Earth. By point of entry to the US I am referring to Mexico-US border crossing points and main seaports in Mexico usually employed by DTOs for trafficking drugs.

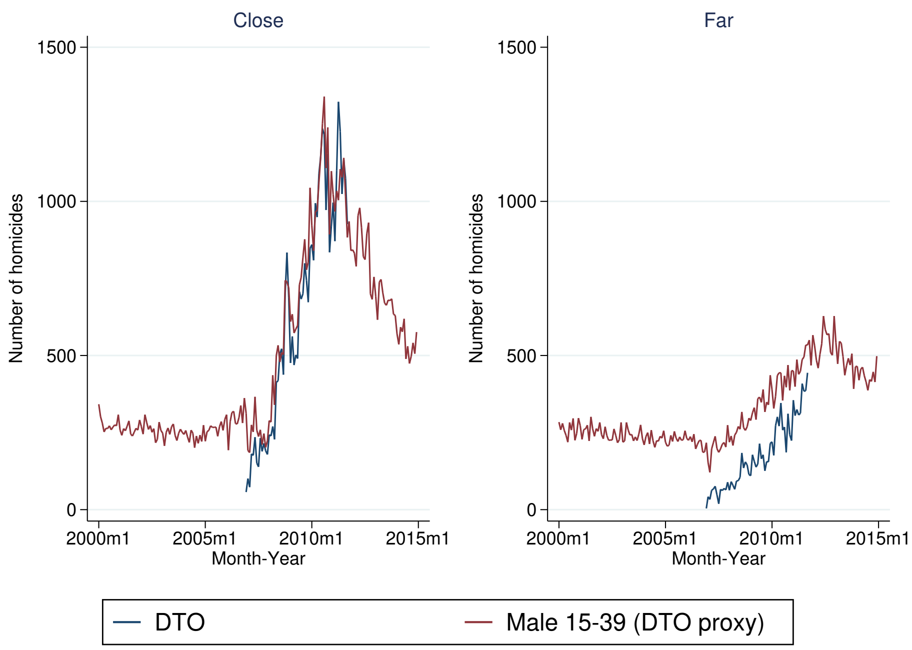
at different points of time. If the target timing is correlated with the election date (e.g. municipalities less likely to be targeted during the lame duck period) and, given the evidence of the impact of crackdowns on homicides (Dell, 2015), the estimates would also be biased. Concerns in this regard are mitigated by controlling flexibly for municipality-specific time trends. In the robustness checks section, I will further explore this potential threat.

5 Results

5.1 Descriptive statistics

As a starting point, I present some descriptive statistics for the dependent variable. Figure 2 depicts the number of overall intentional homicides for males aged 15-39 and the DTO-related homicides by whether the municipality is strategic for DTOs. As can be seen, strategic municipalities (left panel) have experienced a larger increase in homicides than non-strategic municipalities. It is also interesting to observe that the number of homicides before 2006 was very similar in both types of municipalities. One can also observe, that overall homicides closely resemble DTO-related ones for municipalities close to the US, which suggests that restricting overall homicides to this subsample is a good proxy for the DTO sample.

Figure 2: Overall intentional homicides and DTO-related homicides by distance



Notes: Overall intentional homicides include homicides perpetrated by men aged 15-39. They refer to the period 2000-2015, whereas DTO-related ones to December 2006-September 2011. The X axis refers to month-year. 'Close' includes municipalities below the median distance to the closest point of entry in the US. 'Far' includes the rest.

Table 1 reports the mean values of the dependent variable. 11% of the observations below the median distance have at least one homicide, while this figure decreases to 5% for those above. The natural logarithm of the homicide rate is 0.2 versus 0.06, respectively. These differences are statistically significant at the 1% level.

Table 1: Descriptive statistics — By distance to the US

	(1)	(2)	(3)
	All	Close	Far
Homicide≥1	0.074	0.108	0.047
Ln(Homicide rate)	0.139	0.231	0.065
IHS(Homicide rate)	0.172	0.284	0.081
Observations	35,774	15,966	19,808

Notes: 'Close' includes municipalities below the median distance to the closest point of entry in the US. 'Far' includes the rest.

Taken together, both figure 2 and table 1 suggest that the variable 'Close' is indeed capturing whether a municipality is strategic for DTOs.

5.2 Effect of lame duck period on executions

Table 2 presents the results from estimating equations 1 (panel A) and 2 (panel B). I define 'Electoral' as an indicator of whether the month is part of the lame duck period. The dependent variable in columns 1-4 is an indicator of whether at least one homicide has occurred, in columns 5-8 the natural logarithm of the homicide rate, and in columns 9-12 the inverse hyperbolic sine transformation of the homicide rate. Specifications 2-4, 6-8 and 10-12 flexibly control for municipality specific time trends.

Focusing on column 1 of panel A, the coefficient of the 'lame duck' variable is statistically insignificant, regardless of the definition of the dependent variable. Including municipality-specific time trends leads to the same conclusions. Panel B shows that this is hiding heterogeneous impacts by how close the municipality is to an entry point in the US. Municipalities above the median distance experience a statistically significant decrease in the probability of having a homicide and in the homicide rate during the lame duck period. The point estimate does not change when adding municipality-specific time trends. In contrast, municipalities below the median distance experience a significant increase (see row 'Lame duck (Close=1)'). Including municipality-specific linear time trends increases the estimated coefficient and significance (columns 2, 6 and 10). It is further increased when adding quadratic time trends (columns 3, 7 and 11). Specifications 4, 8 and 12, which control for a cubic time trend, are very similar to those only controlling up to a quadratic trend.

In the rest of the paper, I will use either the specification with no municipality-specific time trends or with a quadratic trend. Focusing on the later, the probability of having at least one homicide in the lame duck period, as compared to other months, is 2.9 percentage points (significant at the 1% level), which is significantly different than the effect for municipalities far from the US. Compared to the average value in the sample (0.102), it represents a 27% increase. The homicide rate has also risen (6% or 24% of the sample mean) in municipalities close to the US during the lame duck period (column 4). Estimating the impact on the inverse hyperbolic sine transformation (column 6) yields similar results–i.e. an increase of 7% or 24% of the sample mean. Moreover, the difference between both groups of municipalities is statistically significant.

Table 2: Effect of lame duck period on executions — Baseline specification

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Homicide≥1				Ln(Homicide rate)				IHS(Homicide rate)			
Panel A: Homogeneous effects												
Lame duck	-0.003	0.002	0.002	0.002	-0.010	0.007	0.007	0.007	-0.013	0.007	0.007	0.007
	(0.005)	(0.005)	(0.006)	(0.006)	(0.012)	(0.013)	(0.013)	(0.014)	(0.014)	(0.016)	(0.016)	(0.017)
Panel B: Heterogeneous effects by distance to the US												
Lame duck	-0.014***	-0.014***	-0.014**	-0.014**	-0.021***	-0.021***	-0.020**	-0.020*	-0.027***	-0.027***	-0.026**	-0.026**
	(0.004)	(0.004)	(0.006)	(0.006)	(0.008)	(0.008)	(0.010)	(0.010)	(0.010)	(0.010)	(0.012)	(0.013)
Lame duck × Close	0.037***	0.040***	0.043***	0.043***	0.062***	0.070***	0.075***	0.075***	0.077***	0.087***	0.094***	0.094***
	(0.010)	(0.010)	(0.011)	(0.011)	(0.023)	(0.024)	(0.025)	(0.026)	(0.028)	(0.029)	(0.031)	(0.032)
Linear trend	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Quadratic trend	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
Cubic trend	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes
Observations	35,774	35,774	35,774	35,774	35,774	35,774	35,774	35,774	35,774	35,774	35,774	35,774
Municipalities	2,011	2,011	2,011	2,011	2,011	2,011	2,011	2,011	2,011	2,011	2,011	2,011
Lame duck (Close=1)	0.024***	0.026***	0.029***	0.029***	0.040*	0.049**	0.056**	0.055**	0.050*	0.060**	0.068**	0.068**
	(0.009)	(0.009)	(0.010)	(0.010)	(0.022)	(0.022)	(0.023)	(0.024)	(0.026)	(0.027)	(0.028)	(0.029)

Notes: This table estimates equations 1 (panel A) and 2 (panel B). The dependent variable in columns 1-4 is an indicator of whether there has been at least one homicide, in columns 5-8 the natural logarithm of the homicide rate (number of homicides per 100,000 inhabitants), and in columns 9-12 the inverse hyperbolic sine transformation of the homicide rate. 'Lame duck' is an indicator of whether the month is part of the lame duck period (period between the month after the election and the month before the inauguration of the new term). 'Close' is an indicator of whether the municipality is below the median distance to the closest point of entry in the US. 'Linear (quadratic, cubic) trend' stands for municipality-specific linear (quadratic, cubic) time trend. All specifications control for a full set of municipality, year and month fixed effects, and a linear (year-month) time trend. Robust standard errors clustered at the municipality level in parentheses. ***significant at 1% level, **at 5%, *at 10%.

In sum, the results so far suggest that the probability of having a homicide and the homicide rate significantly increase during the lame duck period, as compared to other periods, for municipalities close to the US. This is in line with the hypothesis outlined in section 1, i.e. turf wars among DTOs should be higher in municipalities valuable for DTOs during the lame duck period when fighting over territories might be relatively easier (due to the weakening of the incumbent DTOs) as compared to other periods of the electoral cycle. The finding that turf wars are more likely to occur in territories strategic for DTOs when the incumbent DTOs become weaker is in line with the findings in Dell (2015). As mentioned earlier, one of the main differences of my paper with respect to hers is that she focuses on the effect of crackdowns—through PAN victories—, while I look at the impact of holding elections.

5.3 Heterogeneous effects by winning party

The effect of being in the lame duck period on executions could differ by whether the PAN wins the election.[20] Municipalities governed by a PAN mayor are likely to have implemented the crackdown on drugs more intensively than municipalities governed by a non-PAN mayor (Dell, 2015). As a consequence, DTOs might decide not to fight over valuable territories before the PAN takes office as a way to avoid the direct consequences of crackdowns.[21] If this hypothesis is in place, executions in municipalities with a PAN victory should not increase in the lame duck period. In order to analyse this, I interact the 'lame duck' and 'Close' variables with an indicator of whether the PAN has won the election. Panel A of table 3 presents the results. As hypothesised, the probability of having a homicide, as well as the homicide rate, do not significantly increase in the lame duck period when the PAN wins the election (and the sign is negative in all cases). In contrast, when the PAN loses, homicides increase significantly, and the difference between both groups is statistically significant.[22]

Given that executions increase when the PAN does not win the election, in panels B and C I examine whether this is driven by the PRI and/or PRD, respectively. Unlike municipalities in which the PAN wins the election, those in which the PRI does experience a statistically significant and large increase in the probability of having a homicide and in the homicide rate during the lame duck period. For instance, the probability of having a homicide increases by 5 percentage points (column 2), while the homicide rate by 12% (column 4) and 15% (column 6), which represent 47%, 48% and 48% of the sample mean, respectively. The results for the PRD show that both municipalities close and far from the border experience an increase in homicides, although the coefficient is statistically signifi-

[20]The PAN wins in 24% of municipalities, the PRI in 57% and the PRD in 15%. The rest up to 100% corresponds to minor parties.

[21]Instead, they might decide to dispute the territory once the crackdown has occurred, which would be in line with the findings in Dell (2015).

[22]The number of observations is smaller than in table 2 because I remove (i) elections in which the winner is a coalition formed by at least two major parties, and (ii) elections in which the party (PRI, PAN or PRD) does not run for election. This latter is the reason for the different number of observations across panels.

cant only for the latter. Moreover, the difference between both groups is not statistically distinguishable from zero. These results show that, although municipalities where the PRD wins also experience an increase, as hypothesise, those in which it loses experience a greater increase, probably driven by the PRI. Given these results, in subsequent specifications I focus on the PRI and PAN only.[23]

[23] Indeed, consistent with the results in table 3, estimates in subsequent regressions are all insignificant when there is a PRD victory.

Table 3: Effect of lame duck period on executions — Heterogeneous effects by winning party

	(1)	(2)	(3)	(4)	(5)	(6)
	Homicide≥1		Ln(Homicide rate)		IHS(Homicide rate)	
Panel A: PAN wins						
Lame duck	-0.017***	-0.017***	-0.028***	-0.025**	-0.036***	-0.032**
	(0.005)	(0.006)	(0.008)	(0.010)	(0.010)	(0.013)
Lame duck × Close	0.047***	0.052***	0.097***	0.104***	0.119***	0.128***
	(0.011)	(0.013)	(0.027)	(0.030)	(0.032)	(0.036)
Lame duck × Close× PAN	-0.035*	-0.036*	-0.130***	-0.115**	-0.155***	-0.142**
	(0.018)	(0.021)	(0.043)	(0.047)	(0.052)	(0.057)
Linear trend	No	Yes	No	Yes	No	Yes
Quadratic trend	No	Yes	No	Yes	No	Yes
Observations	34,190	34,190	34,190	34,190	34,190	34,190
Municipalities	1,923	1,923	1,923	1,923	1,923	1,923
Lame duck (Close=1/PAN=0)	0.030***	0.035***	0.068***	0.079***	0.083***	0.096***
	(0.010)	(0.011)	(0.025)	(0.028)	(0.031)	(0.034)
Lame duck (Close=1/PAN=1)	-0.005	-0.001	-0.061	-0.036	-0.072	-0.045
	(0.017)	(0.019)	(0.039)	(0.041)	(0.047)	(0.051)
Panel B: PRI wins						
Lame duck	-0.005	-0.008	-0.001	-0.007	-0.002	-0.009
	(0.006)	(0.008)	(0.012)	(0.015)	(0.014)	(0.019)
Lame duck × Close	0.020	0.021	0.010	0.023	0.014	0.028
	(0.013)	(0.015)	(0.030)	(0.033)	(0.037)	(0.041)
Lame duck × Close× PRI	0.032**	0.039**	0.095***	0.097**	0.115***	0.120**
	(0.015)	(0.018)	(0.036)	(0.040)	(0.043)	(0.049)
Linear trend	No	Yes	No	Yes	No	Yes
Quadratic trend	No	Yes	No	Yes	No	Yes
Observations	35,432	35,432	35,432	35,432	35,432	35,432
Municipalities	1,992	1,992	1,992	1,992	1,992	1,992
Lame duck (Close=1/PRI=0)	0.015	0.014	0.009	0.015	0.013	0.019
	(0.011)	(0.012)	(0.028)	(0.029)	(0.034)	(0.036)
Lame duck (Close=1/PRI=1)	0.047***	0.053***	0.104***	0.112***	0.128***	0.138***
	(0.013)	(0.015)	(0.030)	(0.034)	(0.036)	(0.041)
Panel C: PRD wins						
Lame duck	-0.015***	-0.015**	-0.024***	-0.021*	-0.030***	-0.027*
	(0.005)	(0.006)	(0.009)	(0.011)	(0.011)	(0.014)
Lame duck × Close	0.041***	0.049***	0.067**	0.084***	0.083***	0.105***
	(0.011)	(0.013)	(0.027)	(0.029)	(0.032)	(0.036)
Lame duck × Close× PRD	-0.010	-0.018	-0.009	-0.016	-0.011	-0.020
	(0.022)	(0.024)	(0.047)	(0.051)	(0.057)	(0.063)
Linear trend	No	Yes	No	Yes	No	Yes
Quadratic trend	No	Yes	No	Yes	No	Yes
Observations	32,878	32,878	32,878	32,878	32,878	32,878
Municipalities	1,845	1,845	1,845	1,845	1,845	1,845
Lame duck (Close=1/PRD=0)	0.027***	0.034***	0.043*	0.064**	0.053*	0.078**
	(0.010)	(0.011)	(0.025)	(0.027)	(0.030)	(0.033)
Lame duck (Close=1/PRD=1)	0.017	0.016	0.034	0.048	0.042	0.058
	(0.021)	(0.023)	(0.045)	(0.050)	(0.056)	(0.0611)

Notes: The dependent variable in columns 1-2 is an indicator of whether there has been at least one homicide, in columns 3-4 the natural logarithm of the homicide rate (number of homicides per 100,000 inhabitants), and in columns 5-6 the inverse hyperbolic sine transformation of the homicide rate. 'Lame duck' is an indicator of whether the month is part of the lame duck period, which is defined as the period between the month after the election and the month before the inauguration of the new term. 'Close' is an indicator of whether the municipality is below the median distance to the closest point of entry in the US. 'PRI' is an indicator of whether the PRI wins the election. 'PAN' and 'PRD' are defined in an analogous way. 'Linear (quadratic) trend' stands for municipality-specific linear (quadratic) time trend. All specifications control for a full set of municipality, year and month fixed effects, and for the *Lame duck* × *PAN*. Robust standard errors clustered at the municipality level in parentheses. ***significant at 1% level, **at 5%, *at 10%.

The estimates presented in table 3 might, however, suffer from endogeneity. For instance, whether the PAN wins the election might be correlated with unobservable municipality characteristics, such as voting preferences, which could also influence homicides. To deal with endogeneity concerns, I next identify the impact of winning the election on executions using a sharp RD design of close elections. Specifically, I compare homicides in municipalities where the party of interest barely wins—treatment group—with municipalities in which it barely loses—control group.[24][25]

I estimate the following equation using a local polynomial method, which has been shown to have better properties than the global polynomial method (Hahn et al., 2001; Porter, 2003). This approach restricts the sample to municipalities defined as having a close election, where close is computed according to the optimal bandwidth selection procedure in Calonico et al. (2014).[26]

$$Homicide_m = \beta_0 + \delta_1 Win_m + f(MV_m) + \delta_2 Win_m \times f(MV_m) + \varepsilon_m \quad (3)$$

where m stands for municipality. $Homicide_m$ is the outcome of interest defined in the three ways explained before. It refers to homicides during the lame duck period. Win_m is an indicator of whether the party wins the election. This equation is estimated separately for the PAN and PRI. MV_m is the margin of victory, i.e. the running variable. This is defined as the share of votes obtained by the party in question minus the share of votes obtained by its strongest opponent. δ_1 captures the causal impact of winning the election on executions. $f(MV_m)$ fits a first or second-order polynomial of the margin of victory, which is allowed to differ on each side of the discontinuity. The Appendix provides information on the validity of the RD design.

A particularity of the Mexican electoral system is that, in a large percentage of elections, parties run in the form of a coalition.[27] The treatment given to these observations is, therefore, important. When a coalition is formed by one of the three major parties (PAN, PRI, PRD) and small parties, I consider the coalition to be represented by the major party.[28] In the very few cases (less than 1%) in which more than one major party is part of the coalition, I drop these observations.[29]

[24]For a review of RD design see Cattaneo et al. (2018a,b); Imbens & Lemieux (2008) and Lee & Lemieux (2010).

[25]Relying on RD designs for estimating causal effects has been an increasingly used approach in the literature in recent years. Examples exploiting close elections include Brollo & Nannicini (2012); Brollo & Troiano (2016); Clots-Figueras (2012); Ferreira & Gyourko (2014); Gagliarducci & Paserman (2012); Lee (2001); Lee et al. (2004); Lee (2008); Pettersson-Lidbom (2008) and Vogl (2014).

[26]The regression uses a triangular kernel function, which assigns the maximum weight to observations at the cutoff. The weight declines as observations lie further away from the cutoff being zero for those outside the optimal bandwidth.

[27]In about 8% of the cases for the PAN, 61% for the PRI, and 33% for the PRD.

[28]The reason is that, in most occasions, a coalition between major and small parties is leaded by the former party. I have data to precisely identify the party affiliation of the candidate for mayor in a very small number of elections, but it points into this direction. Moreover, when looking at the number of votes by party rather than coalition, in most cases the major party obtains the largest proportion.

[29]Although not reported in the results, the estimates are not sensitive to controlling for whether the PAN

Results from estimating equation 3 splitting the sample by municipalities' distance to the US are reported in table A2. None of the estimates of interest are statistically significant, but their sign and magnitude vary considerably across panels. PAN victories lead to a decrease in homicides for municipalities close to the US, which points in the same direction as the findings in table 3. In contrast, when the PRI wins the election, homicides increase in these municipalities. Moreover, this increase is considerably larger than that experienced by municipalities far from the US.

Taken together, the results in this section suggest that the rise in homicides seen in the baseline specification (panel B of table 2) is hiding heterogeneous effects by which party wins the election. In particular, PAN victories seem to decrease homicides in the lame duck period, which is in line with the hypothesis that DTOs perceive these victories as associated with a stronger risk of crackdowns. In contrast, PRI victories increase executions significantly in both statistical and economic terms, which suggests that turf wars are concentrated on these municipalities.

5.4 Robustness checks

In this section I conduct several robustness checks. First, I test for whether my results are sensitive to changing the length of the electoral cycle. Second, I test for whether they hold if I control for pre-electoral and post-inauguration periods. Third, I define distance to the US in a different way.

5.4.1 Alternative length of the electoral cycle

The definition of electoral cycle used so far is somehow restrictive, since only 6 months of pre-electoral and post-inauguration data have been considered. This responded to the objective of including one electoral cycle for each municipality. Table 4 presents the results after extending the electoral cycle, which can also be interpreted as a sensitivity test of the estimates to the municipalities included in the sample. Columns 1, 3 and 5 extend it to include 6 months more of pre-electoral period, i.e. the electoral cycle ranges between 19 and 24 months instead of 13-18 months. This drops all elections occurring in 2007 and the net effect is a reduction in the number of observations. Columns 2, 4 and 6 further expand the electoral cycle to also include 6 additional months of the post-inauguration period, i.e. 25-30 months of electoral cycle. This in addition drops states that had elections in 2010.

or PRI are part of a coalition.

Table 4: Effect of lame duck period on executions — Alternative length of the electoral cycle: Extended pre-electoral and post-inauguration periods

	(1)	(2)	(3)	(4)	(5)	(6)
	Homicide≥1		Ln(Homicide rate)		IHS(Homicide rate)	
	19-24	25-30	19-24	25-30	19-24	25-30
Panel A: No distinction by winning party						
Lame duck	-0.013	-0.013	-0.016	-0.017	-0.020	-0.022
	(0.009)	(0.011)	(0.011)	(0.014)	(0.014)	(0.017)
Lame duck × Close	0.060***	0.054***	0.086***	0.077***	0.109***	0.097***
	(0.017)	(0.017)	(0.027)	(0.028)	(0.034)	(0.035)
Observations	21,536	24,097	21,536	24,097	21,536	24,097
Municipalities	915	809	915	809	915	809
Lame duck (Close=1)	0.047***	0.040**	0.070***	0.060**	0.088***	0.075**
	(0.014)	(0.013)	(0.025)	(0.024)	(0.031)	(0.030)
Panel B: Winning party PAN						
Lame duck	-0.029**	-0.029*	-0.028*	-0.032*	-0.036*	-0.041*
	(0.014)	(0.016)	(0.015)	(0.017)	(0.019)	(0.022)
Lame duck × Close	0.094***	0.089***	0.121***	0.127***	0.153***	0.158***
	(0.024)	(0.024)	(0.037)	(0.037)	(0.046)	(0.046)
Lame duck × Close× PAN	-0.073**	-0.064**	-0.109**	-0.103**	-0.140***	-0.130**
	(0.032)	(0.031)	(0.049)	(0.051)	(0.062)	(0.063)
Observations	15,794	18,922	15,794	18,922	15,794	18,922
Municipalities	901	795	901	795	901	795
Lame duck (Close=1/PAN=1)	-0.008	-0.004	-0.017	-0.009	-0.023	-0.012
	(0.030)	(0.029)	(0.044)	(0.046)	(0.055)	(0.057)
Panel C: Winning party PRI						
Lame duck	0.005	0.011	0.010	0.015	0.011	0.020
	(0.015)	(0.016)	(0.019)	(0.020)	(0.020)	(0.025)
Lame duck × Close	0.029	0.033	-0.004	-0.042	-0.004	-0.052
	(0.025)	(0.023)	(0.031)	(0.040)	(0.039)	(0.050)
Lame duck × Close× PRI	0.090***	0.075***	0.122***	0.117***	0.156***	0.147***
	(0.033)	(0.027)	(0.050)	(0.044)	(0.063)	(0.054)
Observations	15,974	19,156	15,974	19,156	15,974	19,156
Municipalities	911	805	911	805	911	805
Lame duck (Close=1/PRI=1)	0.124***	0.124***	0.163***	0.174***	0.207***	0.219***
	(0.029)	(0.028)	(0.043)	(0.042)	(0.054)	(0.052)

Notes: The dependent variable in columns 1-2 is an indicator of whether there has been at least one homicide, in columns 3-4 the natural logarithm of the homicide rate (number of homicides per 100,000 inhabitants), and in columns 5-6 the inverse hyperbolic sine transformation of the homicide rate. The electoral cycle in columns 1, 3 and 5 covers 19-24 months, while in columns 2, 4 and 6 25-30 months. 'Lame duck' is an indicator of whether the month is part of the lame duck period, which is defined as the period between the month after the election and the month before the inauguration of the new term. 'Close' is an indicator of whether the municipality is below the median distance to the closest point of entry in the US. 'PRI' is an indicator of whether the PRI wins the election. 'PAN' is defined in an analogous way. All specifications control for a full set of municipality, year and month fixed effects, and municipality-specific linear and quadratic time trends. Robust standard errors clustered at the municipality level in parentheses.***significant at 1% level,**at 5%,*at 10%.

All panels shows a similar pattern to that observed in tables 2 and 3. The coefficients of interest for municipalities close to the US (last row in each panel) are now larger in magnitude in panels A and C, while smaller in panel B. This could be reflecting the fact that the effect is larger for municipalities that have been aware (and maybe experienced directly) the War on Drugs for a longer period of time.

5.4.2 Controlling for pre-electoral and post-inauguration periods

In order to examine whether my estimates are sensitive to the baseline period considered, I include indicators for the pre-electoral and post-inauguration periods along with the indicator for the lame duck period. This can also shed some light on whether executions have increased outside the lame duck months and thus speak to some of the theoretical predictions in the literature. Table 5 presents the results for the heterogeneous effects by distance to the US. Columns 1, 3 and 5 include an indicator of whether the month is part of the 6 months before the election. Columns 2, 4 and 6 do the same for the six months of the post-inauguration period (includes the month of the inauguration and the five after). As can be seen, the coefficient associated with the 'lame duck' for municipalities close to the US is positive, statistically significant and economically large in all specifications. Moreover, this coefficient is significantly larger than that reported for municipalities far from the US, which is not the case for the 'Pre-electoral' and 'Post-inaug.' periods. 'Pre-electoral (Close=1)' and 'Post-inaug. (Close=1)' show negative and statistically insignificant coefficients.

Table 6 analyses heterogeneity by the winning party.[30] As can be seen, the points estimates for the lame duck period in valuable municipalities are all statistically significant when the PRI wins the elections, regardless of the specification, whereas those when the PAN wins insignificant. This confirms the results in table 3. Regarding the coefficients of interest for the pre-electoral and post-inauguration indicators, they are insignificant across all specifications in both tables.

[30] I only report the overall effect of interest for the pre-electoral and post-inauguration periods for expository purposes.

Table 5: Effect of elections on executions — Controlling for pre-electoral and post-inauguration periods

	(1)	(2)	(3)	(4)	(5)	(6)
	Homicide≥1		Ln(Homicide rate)		IHS(Homicide rate)	
Lame duck	-0.013**	-0.013**	-0.018*	-0.020*	-0.024*	-0.025*
	(0.006)	(0.006)	(0.011)	(0.011)	(0.013)	(0.014)
Lame duck × Close	0.040***	0.036***	0.074***	0.063**	0.091***	0.077**
	(0.012)	(0.012)	(0.028)	(0.028)	(0.034)	(0.034)
Pre-electoral	0.005		0.004		0.005	
	(0.007)		(0.015)		(0.018)	
Pre-electoral × Close	-0.009		-0.005		-0.007	
	(0.014)		(0.035)		(0.042)	
Post-inaug.		0.003		0.000		0.001
		(0.006)		(0.011)		(0.013)
Post-inaug. × Close		-0.015		-0.027		-0.035
		(0.011)		(0.028)		(0.034)
Observations	35,774	35,774	35,774	35,774	35,774	35,774
Municipalities	2,011	2,011	2,011	2,011	2,011	2,011
Lame duck (Close=1)	0.027***	0.023**	0.055**	0.043*	0.067**	0.052*
	(0.010)	(0.011)	(0.026)	(0.026)	(0.032)	(0.032)
Pre-electoral (Close=1)	-0.004		-0.001		-0.002	
	(0.012)		(0.031)		(0.038)	
Post-inaug. (Close=1)		-0.013		-0.027		-0.034
		(0.009)		(0.026)		(0.032)

Notes: The dependent variable in columns 1-2 is an indicator of whether there has been at least one homicide, in columns 3-4 the natural logarithm of the homicide rate (number of homicides per 100,000 inhabitants), and in columns 5-6 the inverse hyperbolic sine transformation of the homicide rate. 'Lame duck', 'Pre-electoral' and 'Post-inaug.' are indicators of whether the month is in the lame duck period, in any of the 6 months before the election, and in any of the 6 months after the mayor has taken office (including the one in which she takes office), respectively. 'Lame duck' is defined as the period between the month after the election and the month before the inauguration of the new term. 'Close' is an indicator of whether the municipality is below the median distance to the closest point of entry in the US. All specifications control for a full set of municipality, year, and month fixed effects, and municipality-specific linear and quadratic time trends. Robust standard errors clustered at the municipality level in parentheses. ***significant at 1% level, **at 5%, *at 10%.

Table 6: Effect of lame duck period on executions — Heterogeneous effects by winning party: Controlling for pre-electoral and post-inauguration periods

	(1)	(2)	(3)	(4)	(5)	(6)
	Homicide≥1		Ln(Homicide rate)		IHS(Homicide rate)	
Panel A: Winning party PAN						
Lame duck	-0.015**	-0.015**	-0.024**	-0.024**	-0.031**	-0.031**
	(0.006)	(0.006)	(0.011)	(0.012)	(0.014)	(0.014)
Lame duck × Close	0.049***	0.043***	0.108***	0.090***	0.133***	0.110***
	(0.014)	(0.014)	(0.032)	(0.033)	(0.039)	(0.040)
Lame duck × Close× PAN	-0.035	-0.028	-0.137**	-0.100*	-0.166**	-0.123*
	(0.024)	(0.024)	(0.053)	(0.057)	(0.065)	(0.069)
Observations	34,190	34,190	34,190	34,190	34,190	34,190
Municipalities	1,923	1,923	1,923	1,923	1,923	1,923
Lame duck (Close=1/PAN=1)	-0.001	0.000	-0.052	-0.034	-0.064	-0.044
	(0.022)	(0.022)	(0.048)	(0.052)	(0.059)	(0.063)
Pre-electoral (Close=1/PAN=1)	0.001		-0.056		-0.064	
	(0.028)		(0.074)		(0.089)	
Post-inaug. (Close=1/PAN=1)		-0.003		-0.004		-0.006
		(0.020)		(0.058)		(0.069)
Panel B: Winning party PRI						
Lame duck	0.001	-0.017**	0.006	-0.027**	0.007	-0.034**
	(0.007)	(0.007)	(0.009)	(0.011)	(0.012)	(0.013)
Lame duck × Close	0.010	0.012	-0.002	-0.001	-0.003	-0.000
	(0.013)	(0.012)	(0.022)	(0.021)	(0.027)	(0.026)
Lame duck × Close× PRI	0.029*	0.033**	0.067**	0.075***	0.084**	0.094***
	(0.016)	(0.016)	(0.028)	(0.028)	(0.034)	(0.034)
Observations	35,432	35,432	35,432	35,432	35,432	35,432
Municipalities	1,992	1,992	1,992	1,992	1,992	1,992
Lame duck (Close=1/PRI=1)	0.049***	0.044***	0.112***	0.100***	0.138***	0.123***
	(0.016)	(0.017)	(0.037)	(0.038)	(0.045)	(0.047)
Pre-electoral (Close=1/PRI=1)	-0.014		0.001		-0.003	
	(0.020)		(0.045)		(0.055)	
Post-inaug. (Close=1/PRI=1)		-0.018		-0.026		-0.033
		(0.014)		(0.034)		(0.042)

Notes: The dependent variable in columns 1-2 is an indicator of whether there has been at least one homicide, in columns 3-4 the natural logarithm of the homicide rate (number of homicides per 100,000 inhabitants), and in columns 5-6 the inverse hyperbolic sine transformation of the homicide rate. Columns 1, 3 and 5 control for an indicator of whether the month lies within the 6 months of pre-electoral period, while columns 2, 4 and 6 control for an indicator of whether the month lies within the 6 months of the post-inauguration period. 'Lame duck', 'Pre-electoral' and 'Post-inaug.' are indicators of whether the month is in the lame duck period, in any of the 6 months before the election, and in any of the 6 months after the mayor has taken office (including the one in which she takes office), respectively. 'Lame duck' is an indicator of whether the month is part of the lame duck period, which is defined as the period between the month after the election and the month before the inauguration of the new term. 'Close' is an indicator of whether the municipality is below the median distance to the closest point of entry in the US. 'PRI' is an indicator of whether the PRI wins the election. 'PAN' is defined in an analogous way. All specifications control for a full set of municipality, year and month fixed effects, and municipality-specific linear and quadratic time trends. Robust standard errors clustered at the municipality level in parentheses. ***significant at 1% level, **at 5%, *at 10%.

5.4.3 Alternative definition of distance

I now construct a categorical variable with 4 categories, namely whether the municipality lies below the 25th percentile of the distance to the closest point of entry in the US, between the 25th and 50th percentile, between the 50th and 75th, and above the 75th. The results are reported in table 7. Panel A shows that, as expected, those municipalities below the 50th percentile (i.e. those classified as 'Close' so far) experience an increase in homicides, while those above it a decrease. However, for the closest ones (i.e. <25th percentile) the coefficient is statistically insignificant and smaller in magnitude than that observed for the 25-50th group. This is no longer the case when the PRI wins the election (panel C). In this case, municipalities below the 25th percentile experience the largest increase in homicides—3 percentage points or 12-14%, which is statistically significant at the 5% level. These numbers decrease in magnitude as the municipalities lie farther from the US. Finally, panel B does not show a clear pattern. Indeed, the closest municipalities to the US experience a large, although insignificant decrease in homicides, while the farthest ones experience a statistically insignificant increase.

Table 7: Effect of lame duck period on executions — Heterogeneous effects by winning party: Alternative definition of distance

	(1)	(2)	(3)
	Homicide≥1	Ln(Homicide rate)	IHS(Homicide rate)
Panel A: No distinction by winning party			
Lame duck (Close=1/<25th=1)	0.017	0.033	0.039
	(0.012)	(0.031)	(0.038)
Lame duck (Close=1/25-50th=1)	0.036***	0.054*	0.069*
	(0.013)	(0.031)	(0.038)
Lame duck (Close=1/50-75th=1)	-0.022***	-0.032*	-0.040*
	(0.008)	(0.017)	(0.021)
Lame duck (Close=1/75-100th=1)	-0.008*	-0.016**	-0.020**
	(0.005)	(0.006)	(0.008)
Observations	35,774	35,774	35,774
Municipalities	2,011	2,011	2,011
Panel B: Winning party PAN			
Lame duck (Close=1/<25th=1)	-0.011	-0.069	-0.084
	(0.020)	(0.048)	(0.058)
Lame duck (Close=1/25-50th=1)	0.038	0.054	0.070
	(0.030)	(0.070)	(0.086)
Lame duck (Close=1/50-75th=1)	0.003	0.055	0.063
	(0.016)	(0.039)	(0.047)
Lame duck (Close=1/75-100th=1)	0.002	0.042	0.048
	(0.014)	(0.030)	(0.037)
Observations	34,190	34,190	34,190
Municipalities	1,923	1,923	1,923
Panel C: Winning party PRI			
Lame duck (Close=1/<25th=1)	0.029**	0.111**	0.133**
	(0.018)	(0.048)	(0.057)
Lame duck (Close=1/25-50th=1)	0.040**	0.044	0.059
	(0.017)	(0.036)	(0.044)
Lame duck (Close=1/50-75th=1)	-0.041**	-0.090***	-0.110***
	(0.012)	(0.029)	(0.034)
Lame duck (Close=1/75-100th=1)	-0.015	-0.044*	-0.054*
	(0.012)	(0.025)	(0.031)
Observations	35,432	35,432	35,432
Municipalities	1,992	1,992	1,992

Notes: The dependent variable in column 1 is an indicator of whether there has been at least one homicide, in column 2 the natural logarithm of the homicide rate (number of homicides per 100,000 inhabitants), and in column 3 the inverse hyperbolic sine transformation of the homicide rate. 'Lame duck' is an indicator of whether the month is part of the lame duck period, which is defined as the period between the month after the election and the month before the inauguration of the new term. All specifications control for a full set of municipality, year and month fixed effects, and municipality-specific linear and quadratic time trends. Robust standard errors clustered at the municipality level in parentheses. ***significant at 1% level, **at 5%, *at 10%.

5.5 Threats to the identification strategy

One potential threat to the identification of the effect of the lame duck period on homicides refers to the possibility that the increase in homicides during the lame duck period is due to factors other than the electoral cycle. One example could be the intensification of enforcement by the lame duck government after elections.[31] I do not have disaggregated information in this regard at the municipality level. However, several facts do not point in this direction. As mentioned in section 2, the come to power of President Felipe Calderón in December 2006 came with an unprecedented crackdown on drugs consisting of the deployment of a large number of military and police forces to dismantle DTOs (mainly through the arrest of kingpins). This started as soon as the President took office in December 2006 with the deployment of 6,700 agents in the state of Michoacán. In the two subsequent years, a total of eight similar operations were implemented, following with much lower-scale interventions during the second-half of the administration. Moreover, some argue that it was a mean to validate the electoral results given the narrow victory in the federal elections of 2006. In addition, the first operation in Michoacán was well received by the population (Guerrero-Gutiérrez, 2011). Taken together, this shows no support for a potential increase in enforcement in the latter stages of the administration, but rather to an increase in the earlier ones.

There is also evidence that this national strategy has been implemented more intensively in municipalities governed by a PAN mayor—same party as the federal government. It is important to mention that these operations are implemented upon a request from the mayor.[32] Although there is no reason to suggest that these requests would have been larger during the lame duck period, I further examine this by estimating the differential impact of being in the lame duck period on executions in municipalities close to the US depending on whether the PAN is the incumbent party. If PAN mayors are more likely to make requests for implementing crackdowns than non-PAN mayors, homicides (which are the consequence of these crackdowns) should be higher when the incumbent is the PAN. Table A3 in the Appendix presents the results, which show no support for this explanation. Although this does not provide direct evidence, it suggests that there are no differences in enforcement between municipalities where the PAN is the incumbent and those where it is not.

Finally, I test for whether there might be any confounders (greater enforcement or others) driving my results by estimating the effect of interest on other types of DTO-related homicides, i.e. those as a result of aggressions and confrontations; and in other types of homicides, such as murders of politicians and journalists. If confounders were driving the results, one would expect to see an increase in any of these alternative measures of violence.

[31]Notice that, in the context of the study, greater enforcement is expected to lead to an *increase*, not a *decrease*, in homicides, since greater enforcement in Mexico has been associated with more violence (Dell, 2015). Consequently, a reduction in government spending on police and military forces is expected to be associated with a decrease in executions.

[32]Dell (2015) provides an excellent motivation, as well as evidence, for this.

Table 8 reports the results. Panel A focuses on aggressions, panel B on confrontations, panel C on murders of politicians, while panel D on killings of journalists. In none of these four panels the coefficients of interest are statistically significant. Moreover, their magnitude is very close to zero, regardless of whether the municipality is close to the US. In sum, it does not seem to be the case that violence has systematically increased during the lame duck period.

Table 8: Effect of lame duck period on homicides — Other homicides

	(1)	(2)	(3)	(4)	(5)	(6)
	Homicide≥1		Ln(Homicide rate)		IHS(Homicide rate)	
Panel A: Aggressions						
Lame duck	0.0001	0.0003	0.0006	0.0002	0.0007	0.0002
	(0.0009)	(0.0010)	(0.0020)	(0.0019)	(0.0024)	(0.0023)
Lame duck × Close	-0.0008	-0.0011	0.0017	0.0023	0.0023	0.0029
	(0.0020)	(0.0022)	(0.0035)	(0.0038)	(0.0044)	(0.0047)
Panel B: Confrontations						
Lame duck	0.0011	0.0028	0.0014	0.0022	0.0017	0.0028
	(0.0017)	(0.0019)	(0.0025)	(0.0026)	(0.0031)	(0.0033)
Lame duck × Close	-0.0025	-0.0005	-0.0010	0.0048	-0.0015	0.0054
	(0.0038)	(0.0042)	(0.0065)	(0.0071)	(0.0081)	(0.0089)
Panel C: Politicians						
Lame duck	-0.0001	-0.0001	-0.0001	-0.0002	-0.0002	-0.0002
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)
Lame duck × Close	-0.0002	-0.0007	0.0003	-0.0006	0.0004	-0.0007
	(0.0006)	(0.0007)	(0.0005)	(0.0006)	(0.0007)	(0.0008)
Panel D: Journalists						
Lame duck	-0.0000	-0.0002	0.0000	-0.0000	0.0000	-0.0000
	(0.0001)	(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Lame duck × Close	0.0011	0.0011	0.0010	0.0007	0.0012	0.0009
	(0.0007)	(0.0010)	(0.0008)	(0.0010)	(0.0010)	(0.0013)
Linear trend	No	Yes	Yes	No	Yes	Yes
Quadratic trend	No	No	Yes	No	No	Yes
Observations	35,774	35,774	35,774	35,774	35,774	35,774
Municipalities	2,011	2,011	2,011	2,011	2,011	2,011

Notes: This table estimates equation 2. The dependent variable in columns 1-2 is an indicator of whether there has been at least one homicide, in columns 3-4 the natural logarithm of the homicide rate (number of homicides per 100,000 inhabitants), and in columns 5-6 the inverse hyperbolic sine transformation of the homicide rate. 'Lame duck' is an indicator of whether the month is part of the lame duck period, which is defined as the period between the month after the election and the month before the inauguration of the new term. 'Close' is an indicator of whether the municipality is below the median distance to the US. 'Linear (quadratic) trend' stands for municipality-specific linear (quadratic) time trend. All specifications control for a full set of municipality and year fixed effects. Robust standard errors clustered at the municipality level in parentheses. ***significant at 1% level, **at 5%, *at 10%.

5.6 Ruling out alternative potential explanations

5.6.1 Political party turnover

My results so far show that turf wars between DTOs—measured through executions—in valuable municipalities are more likely to occur during the lame duck period as compared to other periods of the electoral cycle. In section 1, I hypothesised that the reason for this is that the lame duck period represents a moment in which there are greater incentives to usurp territories as a consequence of the weakening of the incumbent DTOs.

The increase in homicides during the lame duck period could be related to the change in political party rather than in the government *per se* (Chicoine, 2017). To examine this, I follow the same procedure as the one for the heterogeneous effects by the winning party. First, I interact the 'Lame duck' and 'Close' variables with an indicator of whether the incumbent loses the election (i.e. there is political party turnover). If this alternative explanation is in place, I should see executions to be significantly higher in municipalities with political party turnover as compared to those without. The results, which are presented in table 9, show no support for this. In particular, the coefficient associated with 'Lame duck × Distance× Turnover' reports an insignificant differential effect between both municipalities across all specifications.

Table 9: Effect of lame duck period on executions — Heterogeneous effects by political party turnover

	(1)	(2)	(3)	(4)	(5)	(6)
	Homicide≥1		Ln(Homicide rate)		IHS(Homicide rate)	
Lame duck	-0.010	-0.013	-0.010	-0.009	-0.013	-0.014
	(0.007)	(0.008)	(0.013)	(0.016)	(0.016)	(0.019)
Lame duck × Close	0.033***	0.040***	0.068**	0.065*	0.083**	0.082**
	(0.013)	(0.015)	(0.030)	(0.033)	(0.036)	(0.041)
Lame duck × Close × Turnover	0.006	0.004	-0.014	0.012	-0.014	0.014
	(0.015)	(0.018)	(0.036)	(0.041)	(0.043)	(0.050)
Linear trend	No	Yes	No	Yes	Yes	Yes
Quadratic trend	No	Yes	No	Yes	No	Yes
Observations	34,698	34,698	34,698	34,698	34,698	34,698
Municipalities	1,951	1,951	1,951	1,951	1,951	1,951

Notes: The dependent variable in columns 1-2 is an indicator of whether there has been at least one homicide, in columns 3-4 the natural logarithm of the homicide rate (number of homicides per 100,000 inhabitants), and in columns 5-6 the inverse hyperbolic sine transformation of the homicide rate. 'Lame duck' is an indicator of whether the month is part of the lame duck period, which is defined as the period between the month after the election and the month before the inauguration of the new term. 'Close' is an indicator of whether the municipality is below the median distance to the closest point of entry in the US. 'Turnover' is an indicator of whether the incumbent party loses the election (i.e. there is political party turnover). 'Linear (quadratic) trend' stands for municipality-specific linear (quadratic) time trend. All specifications control for a full set of municipality, year and month fixed effects. Robust standard errors clustered at the municipality level in parentheses. ***significant at 1% level, **at 5%, *at 10%.

I next estimate the effect of political party turnover on executions using an RD design, as in equation 3. The running variable is the incumbent margin of victory, which is the share of votes obtained by the incumbent party minus the share of votes obtained by its strongest opponent, i.e. when the margin of victory is below zero it means that the incumbent party loses the election (i.e. there is political party turnover), while when it is above that it wins. I use elections occurring between 2004 and 2006 to identify the incumbent party for elections in 2007-2010 (see second column of table A1 for the specific year for each state)[33]. Moreover, I remove those observations in which the incumbent party does not run for re-election. Details on the validity of the RD design can be found in the Appendix.

The RD estimates are reported in table A4. They show no significant effect, regardless of the definition of homicides and the polynomial order. Focusing on municipalities close to the US, the coefficient is always negative and insignificant. In sum, the findings in this section show no support for this alternative explanation.

5.6.2 Differences in corruption

The heterogeneous analysis by political party affiliation showed that the increase in homicides during the lame duck period in strategic municipalities is driven by municipalities where the PRI wins the election. In contrast, those municipalities where the PAN win the election experience a decrease in homicides. The differences between the PAN and the PRI could also be the result of differences in corruption rather than in the risk of crackdowns. For instance, if PRI mayors are more corrupt and, consequently, easier to capture by DTOs than PAN mayors, one would expect turf wars to be concentrated on these municipalities, provided that they are valuable for criminal activities. Although I do not have data on corruption at the municipality level, Dell (2015) provides some evidence against this argument. Moreover, there is plenty of evidence showing that both parties are likely to engage in corruption practices.

6 Conclusion

In this paper, I have examined whether turf wars are related with the electoral cycle. Using killings between DTOs as a proxy for turf wars, my results show a significant increase in homicides during the lame duck period as compared to other periods of the electoral cycle in municipalities close to the US. The increase in executions is concentrated on those municipalities in which the PRI wins the election. Taken together, this is consistent with an explanation by which DTOs fight over valuable municipalities when the incumbent DTOs are relatively weaker. Incumbent DTOs are likely to be relatively weaker during the lame duck period because this represents a change in the *status quo* including in the agreements between incumbent DTOs and the government. Furthermore, DTOs do not attempt to gain

[33]For Yucatan I use elections in 2007 to identify the incumbent party in 2010.

control over territories that are expected to suffer a crackdown by the government, i.e. those governed by the same party as the federal government.

My results contribute to the understanding of the reasons behind the dramatic increase in violence since 2008. In particular, they highlight that the electoral cycle can help explain turf wars, which have been identified as an important source of violence. Even though my sample is restricted to December 2006-December 2010, the results are also relevant beyond this period since the situation of violence has not improved and even worsened.

The findings shed some light on how incentives of DTOs to dispute territories vary across the electoral cycle. In particular, they suggest that DTOs dispute territories when incumbent DTOs are relatively weaker as a consequence of political turnover. It is also likely that this result would not be observed if DTOs did not have the incentive to capture politicians and other public authorities during this period.

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Appendix

The Mexican Drug War: Elections and Homicides

Aixa García-Ramos

July 2022

Appendix A: Supplementary tables

Table A1: Years of elections

State	Years	State	Years
Aguascalientes	2001, 2004, 2007	Morelos	2003, 2006, 2009
Baja California	2001, 2004, 2007	Nayarit	2002, 2005, 2008
Baja California	2002, 2005, 2008	Nuevo Leon	2003, 2006, 2009
Campeche	2003, 2006, 2009	Oaxaca	2001, 2004, 2007
Coahuila	2002, 2005, 2009	Puebla	2001, 2004, 2007
Colima	2003, 2006, 2009	Queretaro	2003, 2006, 2009
Chiapas	2001, 2004, 2007	Quintana Roo	2002, 2005, 2008
Chihuahua	2001, 2004, 2007	San Luis Potosi	2003, 2006, 2009
Mexico City	2003, 2006, 2009	Sinaloa	2001, 2004, 2007
Durango	2001, 2004, 2007	Sonora	2003, 2006, 2009
Guanajuato	2003, 2006, 2009	Tabasco	2003, 2006, 2009
Guerrero	2002, 2005, 2008	Tamaulipas	2001, 2004, 2007
Hidalgo	2002, 2005, 2008	Tlaxcala	2001, 2004, 2007
Jalisco	2003, 2006, 2009	Veracruz	2000, 2004, 2007
Estado de Mexico	2003, 2006, 2009	Yucatan	2001, 2004, 2010
Michoacan	2001, 2004, 2007	Zacatecas	2001, 2004, 2007

Table A2: Effect of winning party on executions

	(1)	(2)	(3)	(4)	(5)	(6)
	Homicide≥1		Ln(Homicide rate)		IHS(Homicide rate)	
	Close	Far	Close	Far	Close	Far
Panel A: PAN wins						
Lame duck (Linear)	-0.047	-0.022	-0.243	0.037	-0.310	0.040
	(0.122)	(0.068)	(0.256)	(0.124)	(0.306)	(0.154)
Lame duck (Quadratic)	-0.070	-0.033	-0.151	0.030	-0.177	0.033
	(0.125)	(0.072)	(0.284)	(0.166)	(0.352)	(0.204)
Observations	800	1,001	800	1,001	800	1,001
Panel B: PRI wins						
Lame duck (Linear)	0.098	0.017	0.308	0.022	0.366	0.028
	(0.086)	(0.050)	(0.212)	(0.091)	(0.253)	(0.113)
Lame duck (Quadratic)	0.107	0.013	0.305	0.033	0.376	0.042
	(0.091)	(0.063)	(0.261)	(0.094)	(0.316)	(0.118)
Observations	848	1,022	848	1,022	848	1,022

Notes: The dependent variable in columns 1-2 is an indicator of whether there has been at least one homicide, in columns 3-4 the natural logarithm of the homicide rate (number of homicides per 100,000 inhabitants), and in columns 5-6 the inverse hyperbolic sine transformation of the homicide rate. 'Lame duck' is an indicator of whether the month is part of the lame duck period, which is defined as the period between the month after the election and the month before the inauguration of the new term. 'Observations' refers to the total number of observations in the sample. It does not correspond with the number of observations used for the RD analysis, which depends on the optimal bandwidth in each case. 'Close' and 'Far' are with respect to the entry point to the US. Robust standard errors in parentheses. ***significant at 1% level, **at 5%, *at 10%.

Table A3: Effect of lame duck period on executions — Heterogeneous effects by whether the PAN is the incumbent

	(1)	(2)	(3)	(4)	(5)	(6)
	Homicide≥1		Ln(Homicide rate)		IHS(Homicide rate)	
Lame duck	-0.009**	-0.010**	-0.013**	-0.011	-0.017**	-0.014*
	(0.004)	(0.004)	(0.006)	(0.007)	(0.008)	(0.008)
Lame duck × Close	0.032***	0.032***	0.039**	0.039**	0.051***	0.050***
	(0.009)	(0.009)	(0.015)	(0.016)	(0.019)	(0.019)
Lame duck × Close × PAN inc	-0.004	-0.005	-0.002	-0.004	-0.007	-0.010
	(0.017)	(0.017)	(0.030)	(0.030)	(0.036)	(0.036)
Month fixed effects	No	Yes	No	Yes	No	Yes
Observations	29,386	29,386	29,386	29,386	29,386	29,386
Municipalities	1,972	1,972	1,972	1,972	1,972	1,972

Notes: The dependent variable in columns 1-2 is an indicator of whether there has been at least one homicide, in columns 3-4 the natural logarithm of the homicide rate (number of homicides per 100,000 inhabitants), and in columns 5-6 the inverse hyperbolic sine transformation of the homicide rate. 'Lame duck' is an indicator of whether the month is part of the lame duck period, which is defined as the period between the month after the election and the month before the inauguration of the new term. 'Close' is an indicator of whether the municipality is below the median distance to the closest point of entry in the US. 'PAN inc' is an indicator of whether the PAN is the incumbent party. All specifications control for a full set of municipality, year and month fixed effects. Robust standard errors clustered at the municipality level in parentheses. ***significant at 1% level, **at 5%, *at 10%.

Table A4: Effect of political party turnover on executions

	(1)	(2)	(3)	(4)	(5)	(6)
	Homicide≥1		Ln(Homicide rate)		IHS(Homicide rate)	
	Close	Far	Close	Far	Close	Far
Lame duck (Linear)	-0.131	0.096**	-0.312	0.080	-0.378	0.105
	(0.087)	(0.046)	(0.221)	(0.053)	(0.269)	(0.067)
Lame duck (Quadratic)	-0.139	0.109**	-0.295	0.105*	-0.368	0.137*
	(0.098)	(0.053)	(0.263)	(0.061)	(0.319)	(0.078)
Observations	829	1,002	829	1,002	829	1,002

Notes: The dependent variable in columns 1-2 is an indicator of whether there has been at least one homicide, in columns 3-4 the natural logarithm of the homicide rate (number of homicides per 100,000 inhabitants), and in columns 5-6 the inverse hyperbolic sine transformation of the homicide rate. 'Lame duck' is an indicator of whether the month is part of the lame duck period, which is defined as the period between the month after the election and the month before the inauguration of the new term. 'Observations' refers to the total number of observations in the sample. It does not correspond with the number of observations used for the RD analysis, which depends on the optimal bandwidth in each case. 'Close' and 'Far' are with respect to the entry point to the US. Robust standard errors in parentheses. ***significant at 1% level, **at 5%, *at 10%.

Appendix B. Validity of regression discontinuity design

Winning party

The key identifying assumption of the regression discontinuity design outlined in equation 3 is the continuity in potential outcomes at the cutoff, i.e. any discontinuity in potential homicides at the cutoff is the consequence of winning the election. If this assumption holds, any difference in executions can be interpreted as the causal effect of winning the election. I next conduct two tests in order to provide support for the validity of this assumption.

The first one refers to whether the density of the running variable is continuous at the threshold. If it is continuous, this shows support against manipulation of the running variable. In order to examine this, I plot the density of the margin of victory (top graph of figure B1), which seems smooth at the cutoff. To test this more formally, I conduct the test proposed by McCrary (2008). The null hypothesis is that the density of the margin of victory is continuous at the zero threshold. The discontinuity estimate (log difference in height) is -0.019 with a standard error of 0.12 for the PAN, whereas it is 0.03 and 0.097, respectively, for the PRI (see the associated graph in the bottom of figure B1). In short, this shows no evidence for manipulation of the margin of victory at the zero threshold.[1]

The second way in which I examine the validity of the RD design is by looking at whether there is continuity in baseline characteristics at the cutoff. This can be interpreted as a placebo test since variables in the pre-treatment period should not be affected by electoral outcomes in subsequent periods. Figure B2 plots several political variables against the PAN and PRI margins of victory, figures B3 and B4 socio-economic characteristics, and figure B5 demographic variables, the distance to the US and DTOs presence in the municipality. For information on the construction and data sources of these variables see the *Notes* in each table. Finally, figure B6 plots executions in the three months before the election. In short, it seems that the baseline variables vary smoothly around the cutoff.

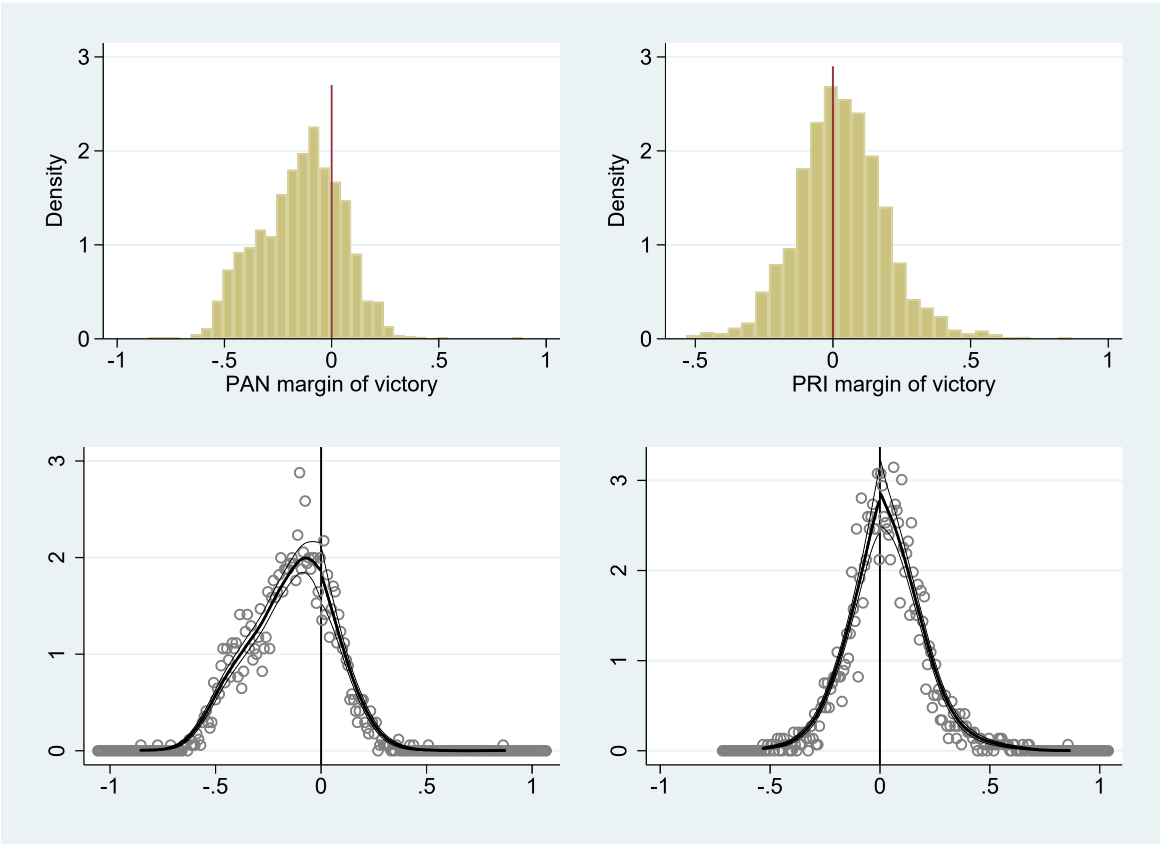
In order to more formally test for whether there is a discontinuity at the zero threshold, I estimate equation 3 using each baseline variable as outcome. Table B1 presents the corresponding RD results using a local linear method. Columns 1-3 focus on the PAN, while columns 4-6 on the PRI. Columns 1 and 3 report the RD estimates, columns 2 and 4 the corresponding standard errors, and column 3 and 6 the robust bias corrected p-value[2], As can be seen, all RD estimates, with the exception of one[3], are insignificant. Overall, the results in table B1 show support for the continuity in baseline characteristics and outcome at the cutoff, which provides validity for the RD design.

[1]An alternative manipulation test has been recently proposed by Cattaneo et al. (2019). In my specific case, the value of this test is equal to 0.68 (p-value of 0.50) for the PAN and 0.70 (p-value of 0.48) for the PRI, which essentially yields the same conclusions.

[2]For more details see Cattaneo et al. (2018).

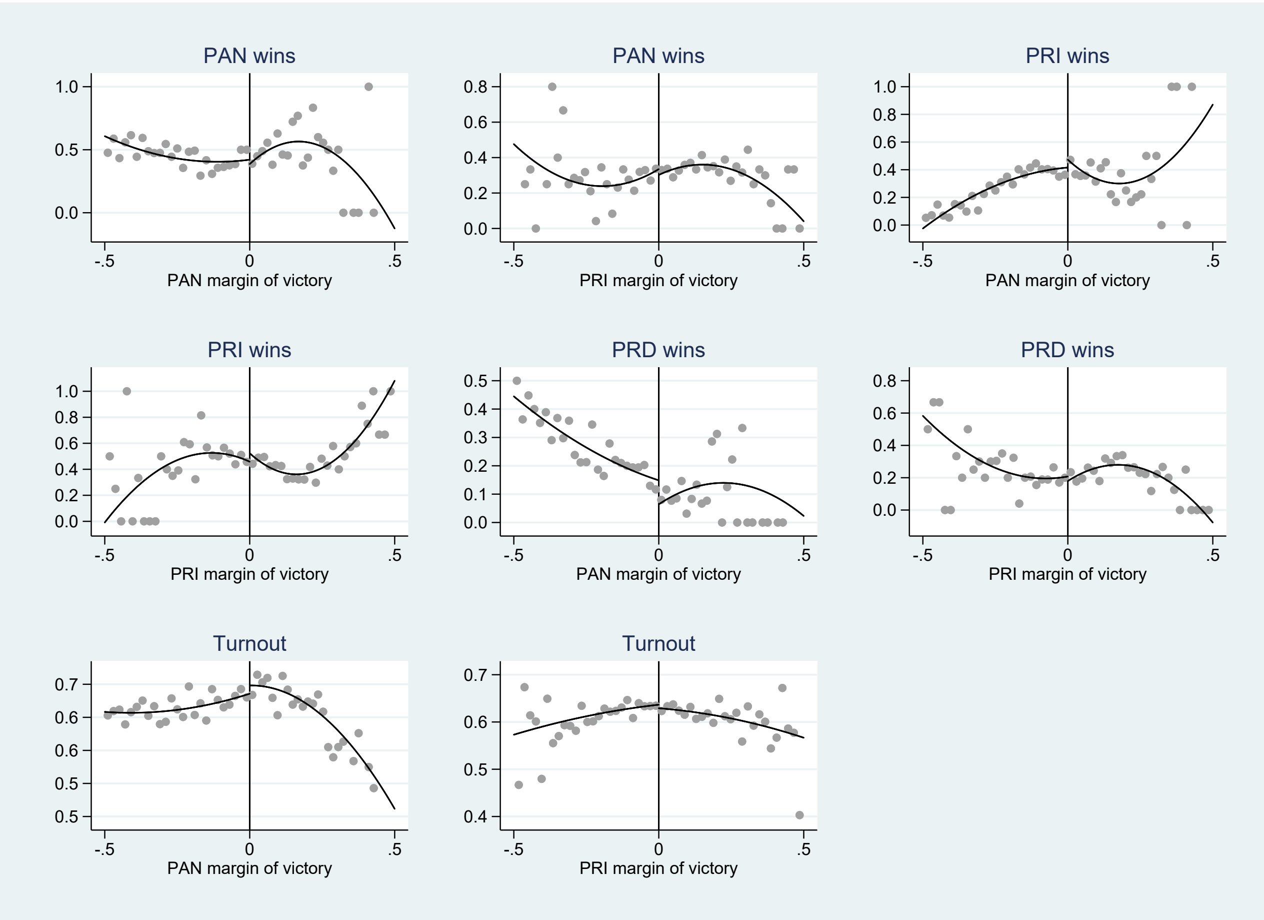
[3]This is the percentage of households without drainage, which is significant at the 5% level when it is regressed against the PRI margin of victory.

Figure B1: Validity of the RD design: Distribution of the margin of victory



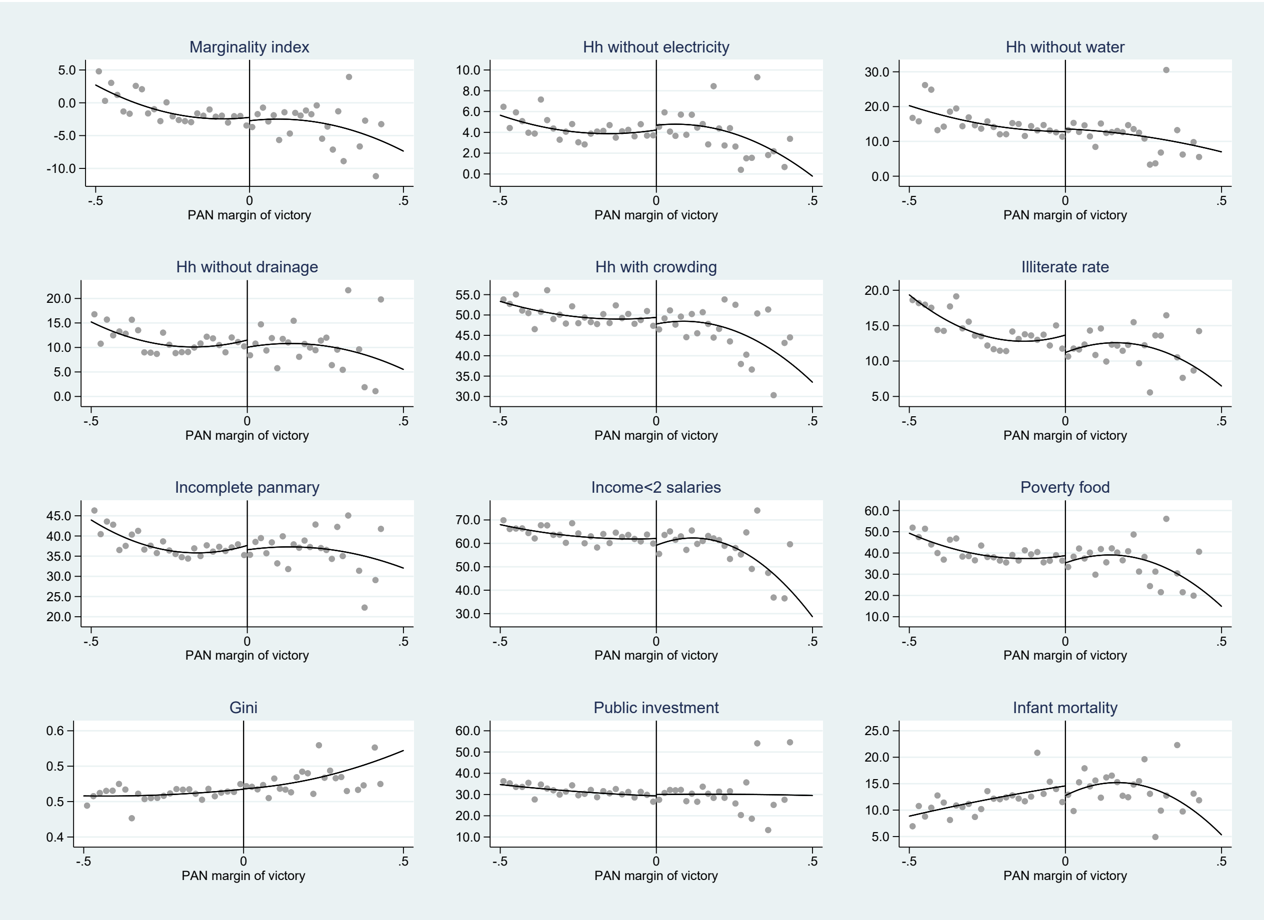
Notes: These graphs show the density of the margin of victory. The plots on the bottom panel are the graphs associated with the McCrary (2008) test. The discontinuity estimate is -0.019 and the standard error 0.12 for the PAN, whereas it is 0.03 and 0.097, respectively, for the PRI.

Figure B2: Validity of the RD design: Political characteristics



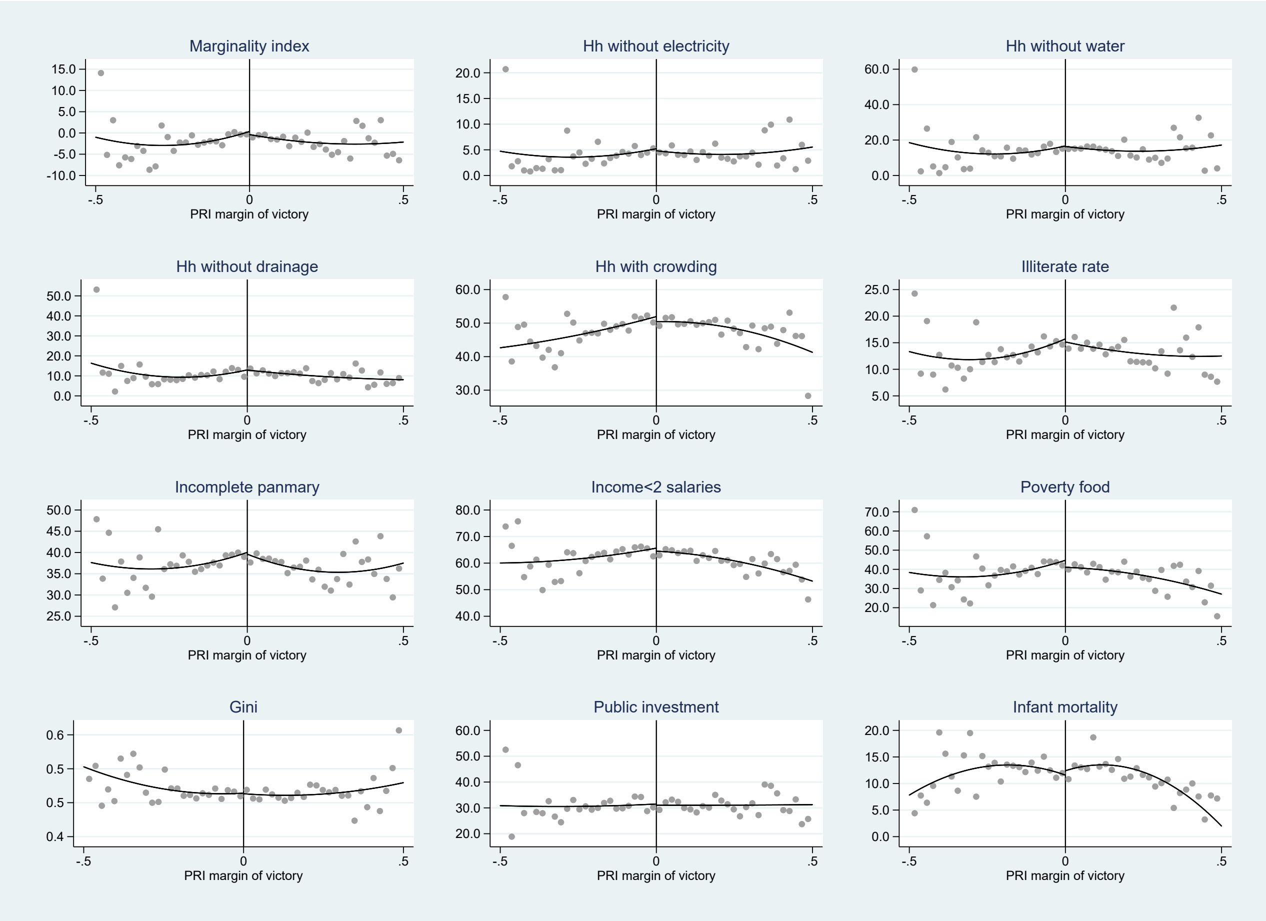
Notes: Each graph plots a different variable related with political characteristics at the baseline. The variables are calculated using data on elections occurring between 2001 and 2006 (2007 for Yucatan). See columns 1-2 of table A1 for the specific years in each state. The points represent the average value of the outcome in bins of 2 percentage points. The solid line is a second-order global polynomial fitted separately on each side of the cutoff.

Figure B3: Validity of the RD design: Socio-economic characteristics (PAN)



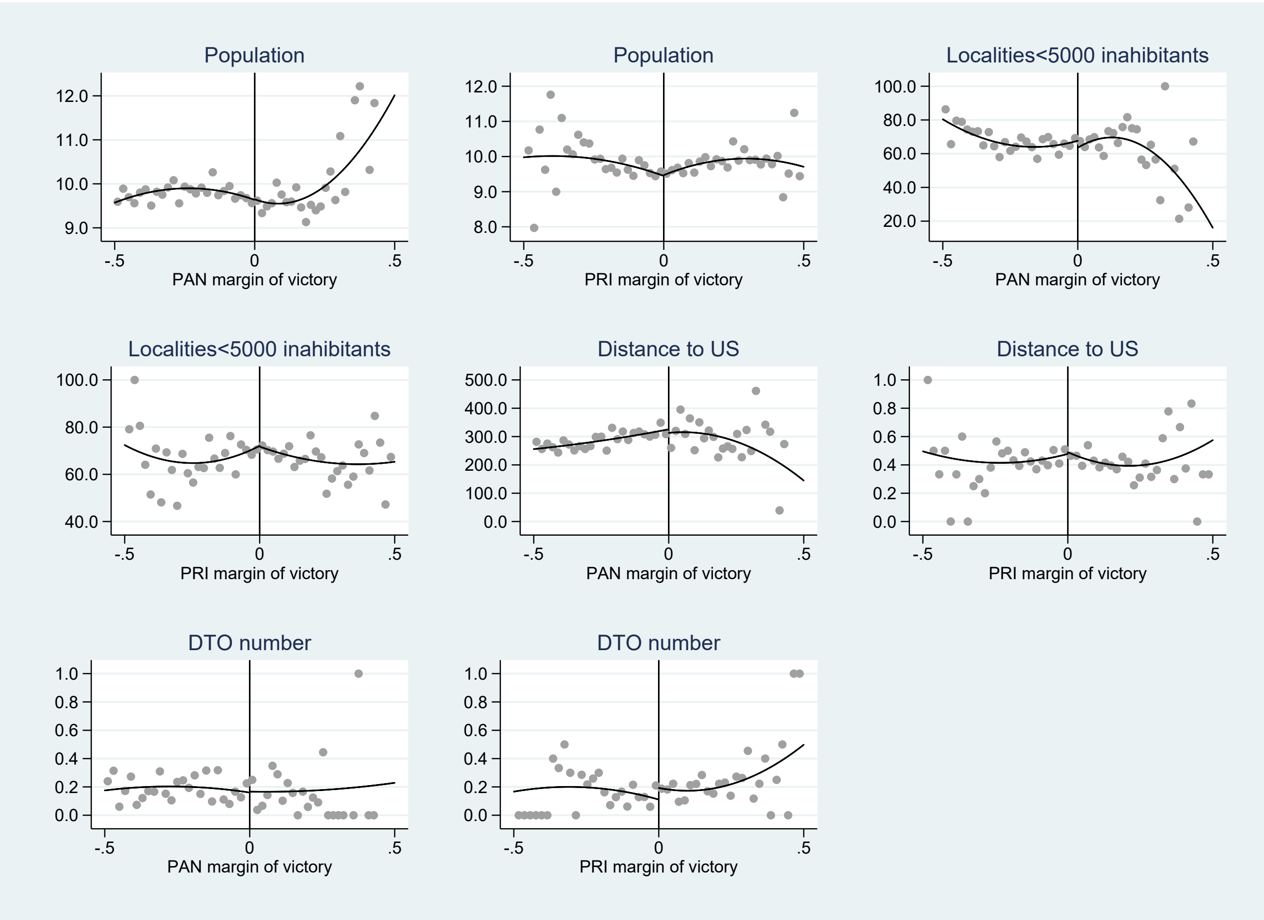
Notes: Each graph plots a different variable related with socio-economic characteristics at the baseline. The points represent the average value of the outcome in bins of 2 percentage points. The solid line is a second-order global polynomial fitted separately on each side of the cutoff. The marginality index is computed as explained in Anzaldo & Prado (2006). 'Hh without electricity' is the percentage of dwellings in the municipality without electricity. 'Hh without water', and 'Hh without drainage' are defined in a similar way. 'Hh with crowding' is the percentage of households in which more than two people sleep in a bedroom. 'Illiterate rate' is the percentage of individuals 15 or older who cannot read or write. 'Incomplete primary' is the percentage of individuals 15 or older who have not completed primary education. 'Income<2 salaries' is the percentage of individuals who receive income up to 2 minimum salaries. These 7 variables are obtained from CONAPO. They are constructed based on the Population Count of 2005 and the ENOE (*Encuesta Nacional de Ocupación y Empleo)* [National Survey of Occupation and Employment]. The Gini index is obtained from CONEVAL (*Consejo Nacional de Evaluacion de la Politica de Desarrollo Social)* [National Council for the Evaluation of Social Development Policy] and refers to the year 2000. It is computed using the 2000 ENIGH (*Encuesta Nacional de Ingresos y Gastos de los Hogares)* [National Surveyof Household Income and Expenditure]. 'Poverty' is the percentage of individuals living below the food poverty line, as calculated by CONEVAL. It is computed using the 2000 Population Census and the 2000 ENIGH. 'Public investment' is defined as the percentage of public investment over the total investment in the municipality. 'Infant mortality' is the number of deaths of children less than one year divided by the number of births per 1000. These two variables are obtained using the 2005 Population Count.

Figure B4: Validity of the RD design: Socio-economic characteristics (PRI)



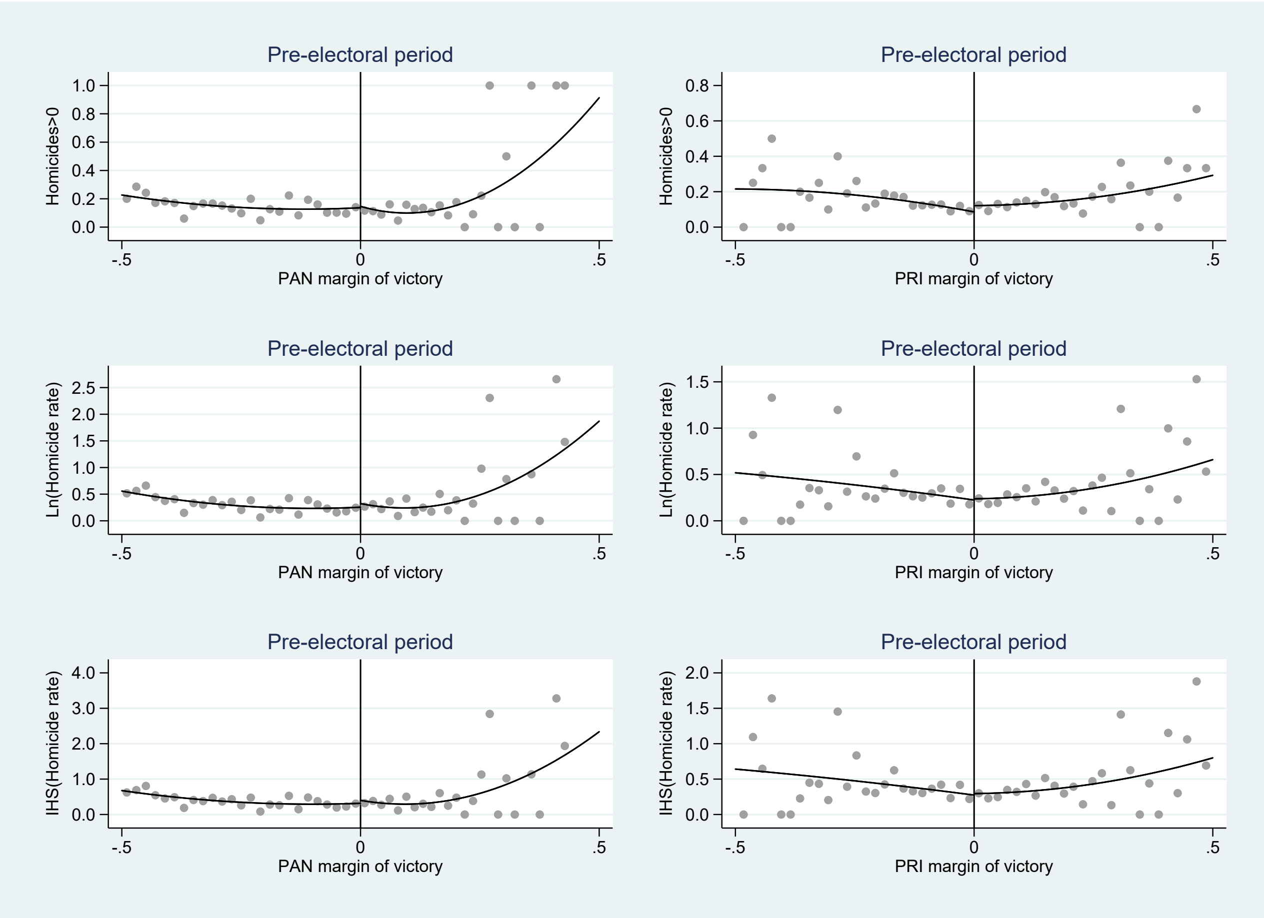
Notes: See *Notes* in figure B3.

Figure B5: Validity of the RD design: Demographic characteristics, Distance and DTOs



Notes: Each graph plots a different variable related with demographic characteristics at the baseline, distance to the US and presence of DTOs at the baseline. The points represent the average value of the outcome in bins of 2 percentage points. The solid line is a second-order global polynomial fitted separately on each side of the cutoff. 'Population' is the population in natural logarithms. 'Localities<5000 inhabitants' refers to the percentage of localities with less than 5000 inhabitants. Data come from CONAPO. 'Distance to US' is an indicator of whether the municipality is below the median distance to the closest point of entry in the US. 'DTO number' is the number of DTOs operating in the municipality in the year 2005.

Figure B6: Validity of the RD design: Homicides in pre-electoral period



Notes: 'Pre-electoral period' refers to the three months before the elections included in my main analysis. The points represent the average value of the outcome in bins of 2 percentage points. The solid line is a second-order global polynomial fitted separately in each side of the cutoff.

Table B1: Validity of RD design – Baseline variables

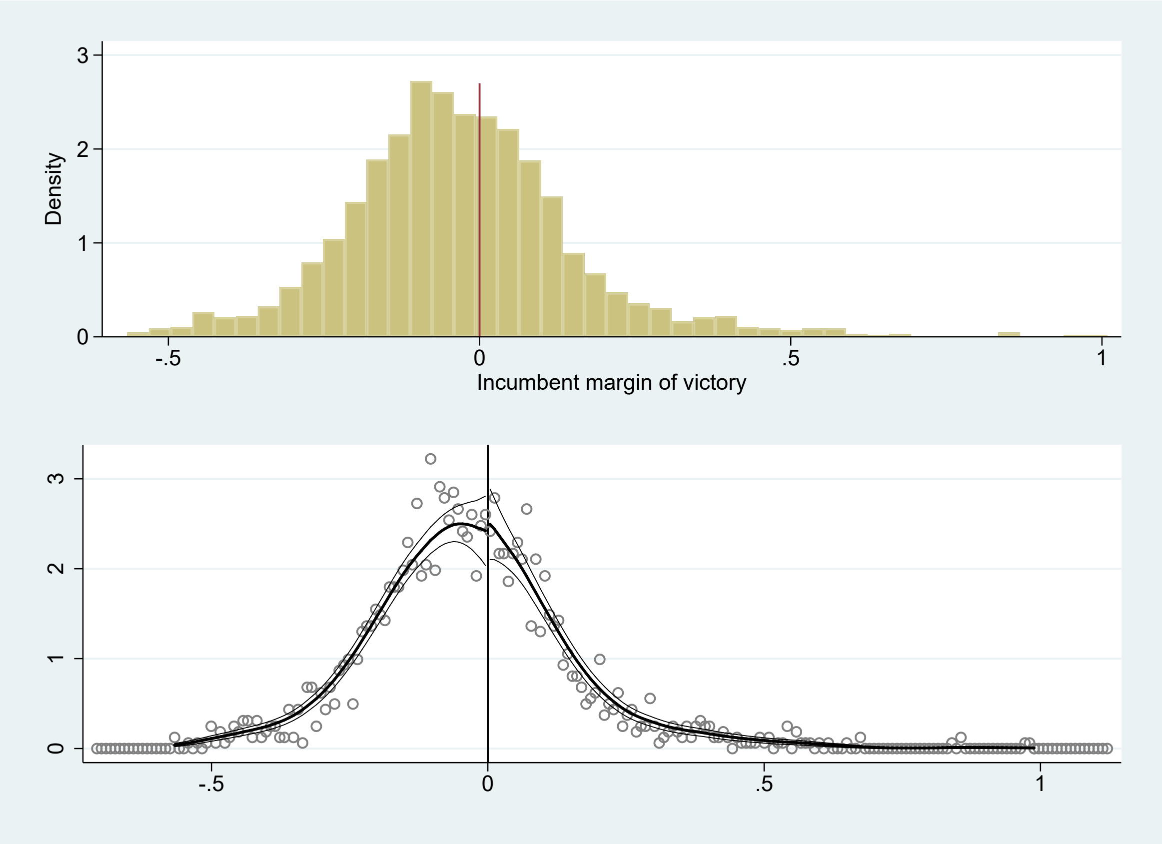
	(1)	(2)	(3)	(4)	(5)	(6)
	PAN			PRI		
	Estimate	SE	P-value	Estimate	SE	P-value
Panel A: Political characteristics						
Incumbent PRI	-0.106	(0.103)	0.304	0.071	(0.073)	0.332
Incumbent PAN	0.115	(0.110)	0.292	-0.114	(0.080)	0.152
Incumbent PRD	0.031	(0.061)	0.614	-0.017	(0.066)	0.798
Turnout	0.014	(0.020)	0.505	-0.009	(0.016)	0.586
Panel B: Socio-economic characteristics						
Marginality index	0.568	(1.566)	0.717	-1.094	(1.315)	0.405
Hh w/o electricity	1.734	(1.256)	0.167	-0.499	(0.928)	0.591
Hh w/o water	3.968	(3.040)	0.192	-0.937	(2.546)	0.713
Hh w/o drainage	-1.480	(2.316)	0.523	4.947**	(2.264)	0.029
Hh with crowding	-0.990	(2.610)	0.704	-0.610	(2.163)	0.778
Illiterate rate	-1.581	(1.679)	0.346	-0.606	(1.551)	0.696
Incomplete primary	1.409	(2.123)	0.507	-1.889	(1.844)	0.306
Income¡2 salaries	-3.985	(3.781)	0.292	0.566	(2.687)	0.833
Poverty	-1.051	(4.138)	0.799	-2.635	(3.059)	0.389
Gini	-0.000	(0.014)	0.994	0.004	(0.010)	0.716
Public investment	-0.634	(2.970)	0.831	1.229	(2.552)	0.630
Infant mortality	-0.332	(2.244)	0.883	-0.048	(1.630)	0.977
Panel C: Demographic characteristics						
Ln(population)	-0.069	(0.291)	0.811	0.054	(0.214)	0.800
Population¡5000	-1.750	(7.322)	0.811	1.244	(5.416)	0.818
Panel D: Location + DTOs						
Distance	0.137	(0.103)	0.181	-0.092	(0.083)	0.267
DTOs	-0.069	(0.112)	0.541	0.045	(0.079)	0.565
Panel E: Homicides						
Homicides¿0	-0.005	(0.068)	0.936	0.029	(0.046)	0.523
Ln(Homicides)	0.065	(0.116)	0.575	-0.009	(0.076)	0.903
IHS(Homicides)	0.076	(0.145)	0.602	0.000	(0.097)	0.997

Notes: Columns 1 and 3 report the RD estimates associated with equation 3 when a first-order polynomial is used, columns 2 and 4 the robust standard errors, and columns 3 and 6 the robust bias corrected p-values. 'SE' stands for standard errors, 'Obs.' for observations, 'Hh' for household, and 'w/o' for without. The total number of observations in the sample is 1,794 for PAN (1,862 for PRI) in panel A; and 1,907 for PAN (1,975 for PRI) in panels B, C, D and E. The effective number of observations used to compute the estimates varies depending on the optimal bandwidth. ***significant at 1% level, **at 5%, *at 10%.

Incumbent political party

As before, I first plot the density of the margin of victory and conduct the test proposed by McCrary (2008) (see figure B7). The discontinuity estimate is 0.13 with a standard error of 0.13. In short, this shows no evidence for manipulation of the margin of victory at the zero threshold[4]. I next examine whether the baseline characteristics mentioned before vary smoothly around the cutoff. Figures B8, B9, B10, and B11 plot these variables against the incumbent margin of victory. Table B2 presents the corresponding RD results using a local linear method. Two coefficients are significant at the 10% level, namely the indicator of homicides and the turnout. However, once I estimate a second- or higher-order polynomial they become insignificant and small in magnitude. In short, the results provide support for the validity of the RD design.

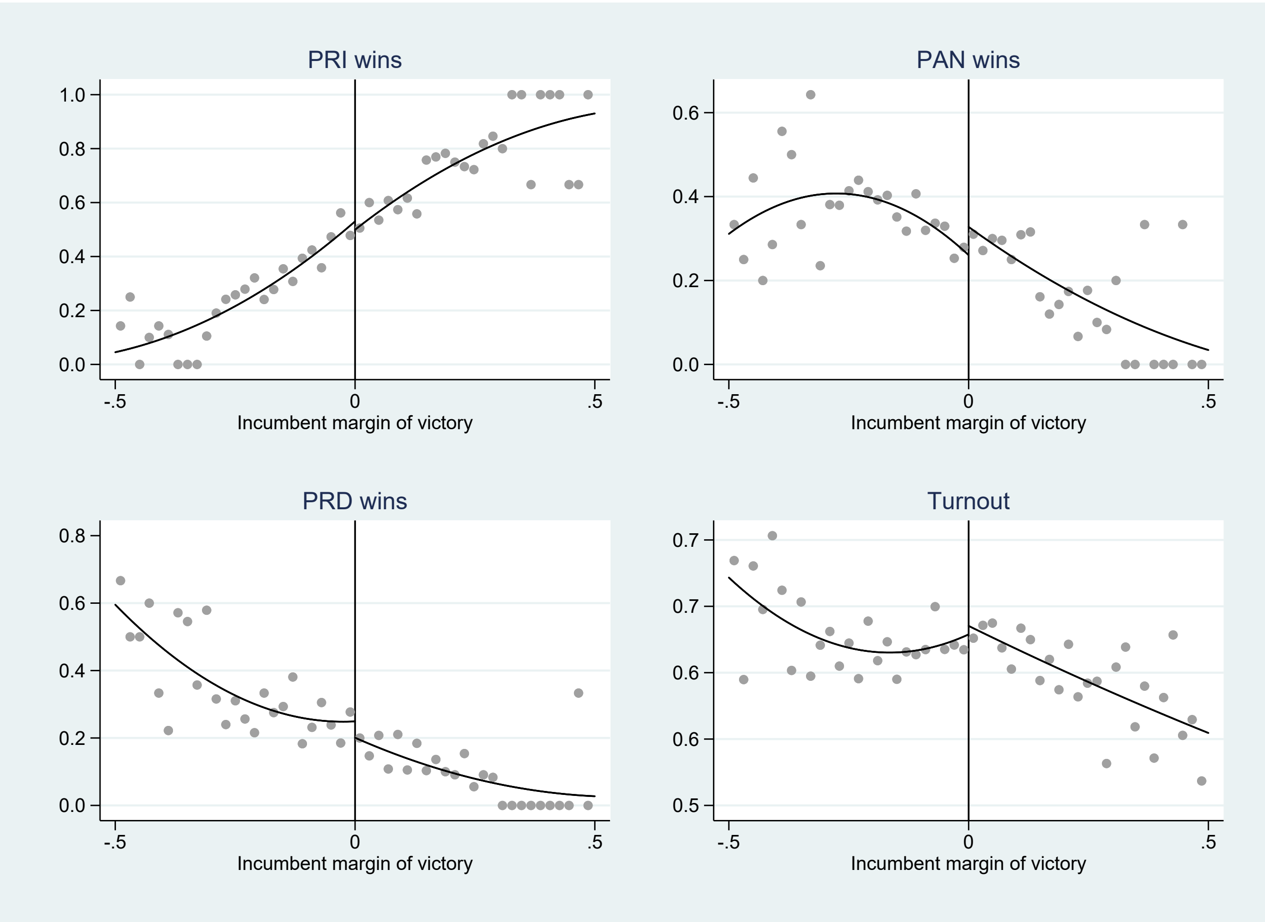
Figure B7: Validity of the RD design: Distribution of the incumbent margin of victory



Notes: The two plots show the density of the incumbent margin of victory. The bottom one is the graph associated with the McCrary (2008) test. The discontinuity estimate is 0.13 and the standard error 0.13.

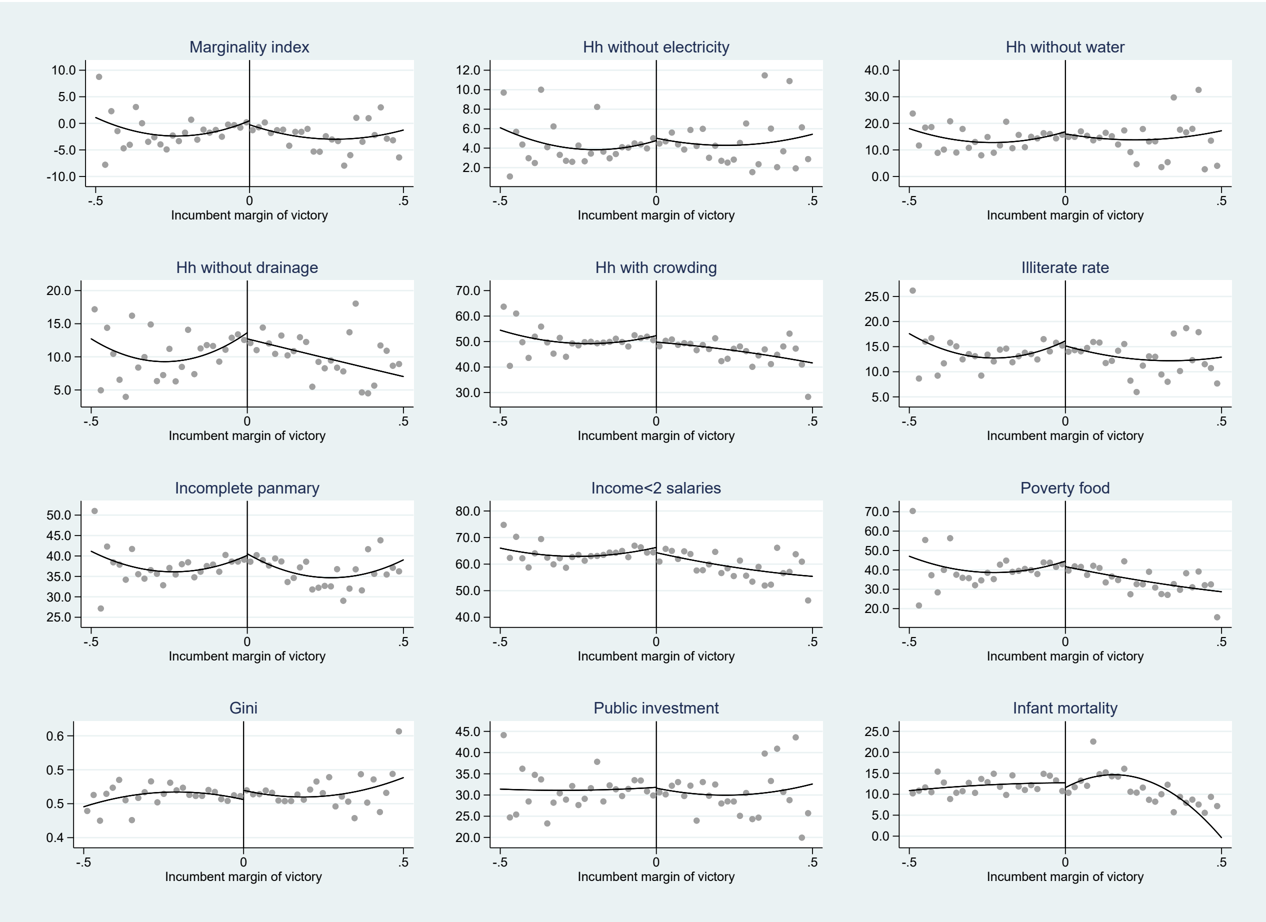
[4]The value of the test proposed by Cattaneo et al. (2019) is 0.12 and the p-value 0.90, which leads to the same conclusions.

Figure B8: Validity of the RD design: Political characteristics



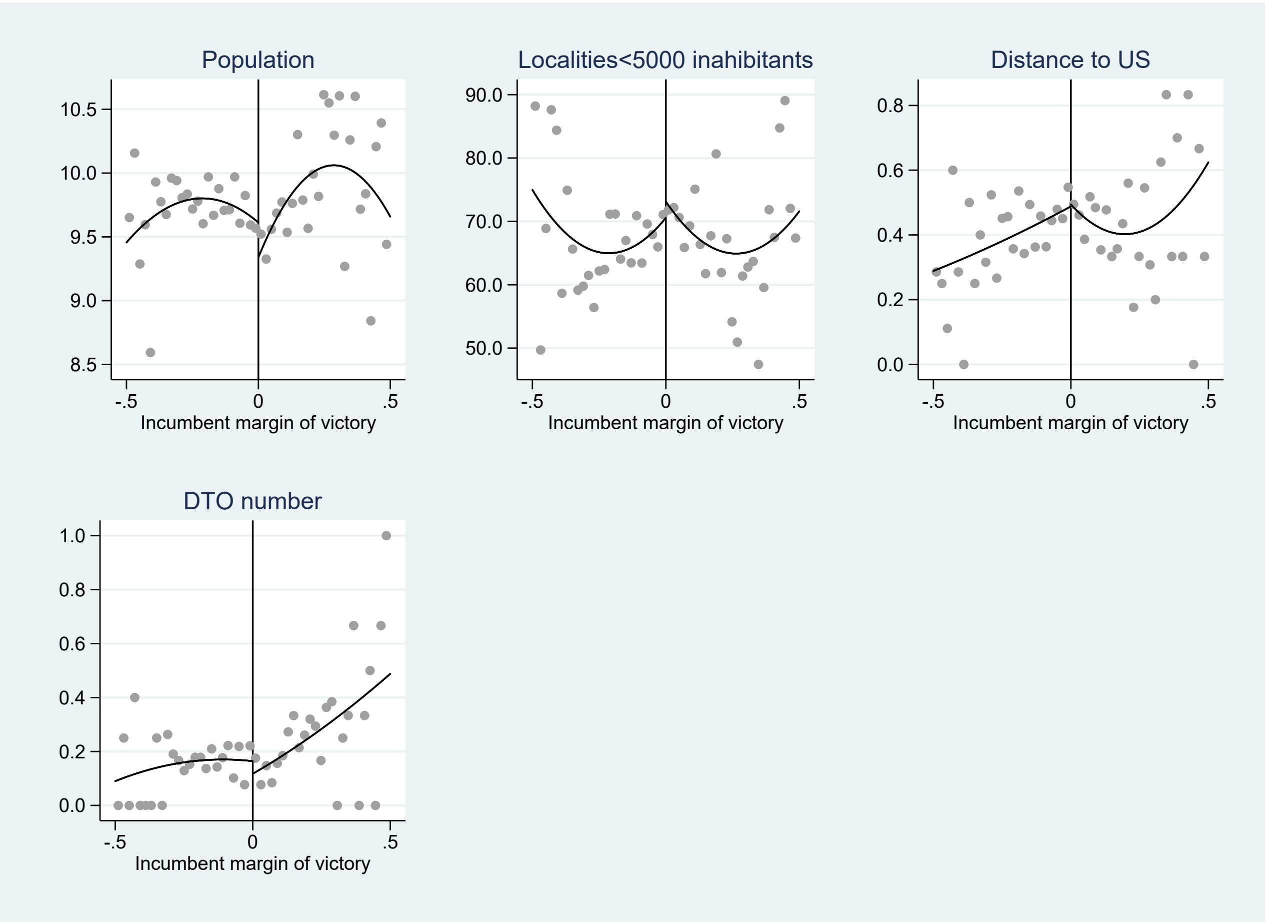
Notes: See *Notes* in figure B2.

Figure B9: Validity of the RD design: Socio-economic characteristics



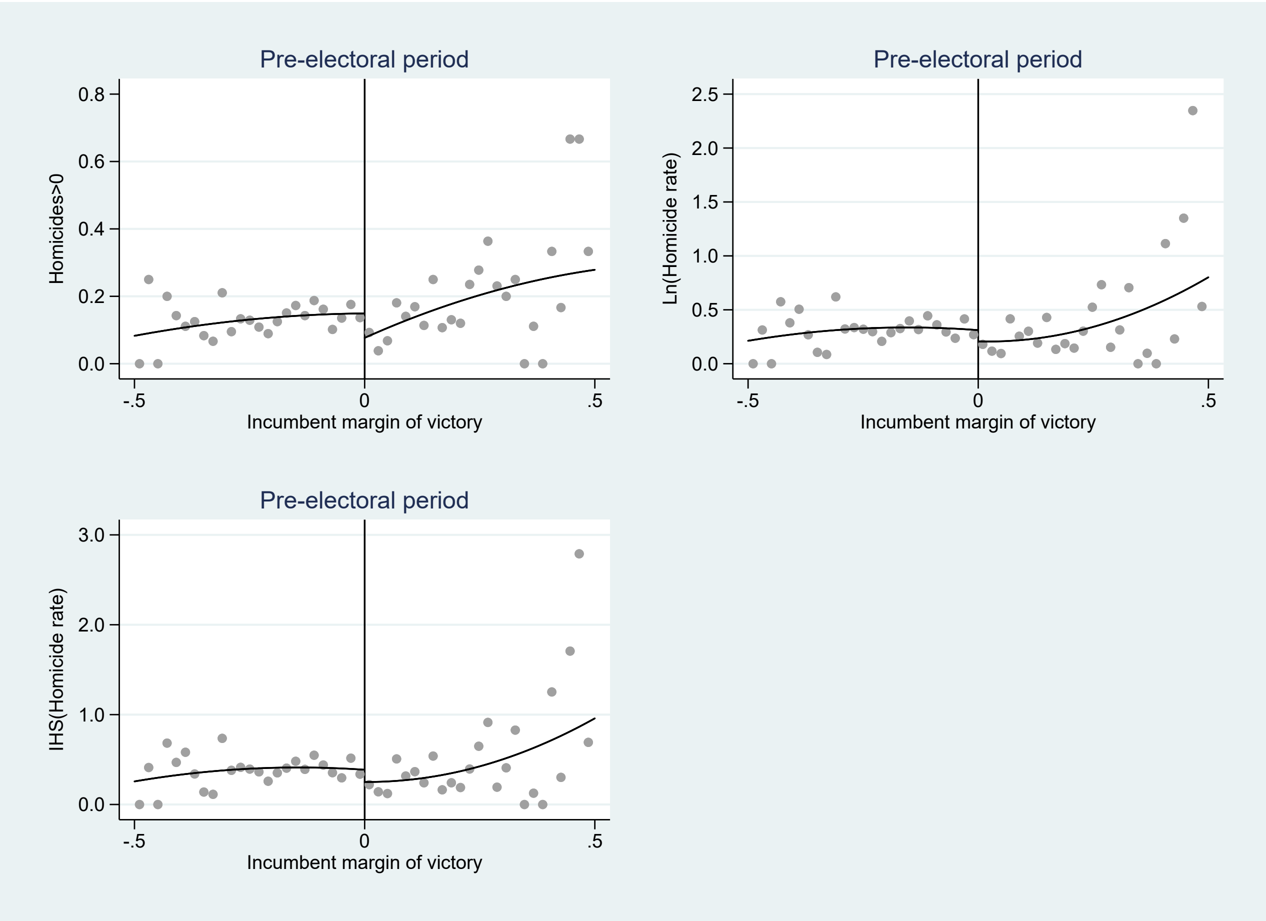
Notes: See *Notes* in figure B3.

Figure B10: Validity of the RD design: Demographic characteristics, Distance and DTOs



Notes: See *Notes* in figure B5.

Figure B11: Validity of the RD design: Homicides in pre-electoral period



Notes: See *Notes* in figure B6.

Table B2: Validity of RD design – Baseline variables

	(1)	(2)	(3)
	Estimate	SE	P-value
Panel A: Political characteristics			
Win PRI	-0.014	(0.071)	0.849
Win PAN	-0.048	(0.074)	0.515
Win PRD	0.056	(0.063)	0.375
Turnout	-0.031*	(0.018)	0.089
Panel B: Socio-economic characteristics			
Marginality index	0.690	(1.223)	0.573
Hh w/o electricity	0.373	(0.912)	0.682
Hh w/o water	1.325	(2.479)	0.593
Hh w/o drainage	0.746	(1.964)	0.704
Hh with crowding	1.563	(2.094)	0.455
Illiterate rate	1.325	(1.659)	0.425
Incomplete primary	-0.563	(2.058)	0.785
Income¡2 salaries	1.844	(2.873)	0.521
Poverty	1.948	(3.172)	0.539
Gini	0.003	(0.011)	0.793
Public investment	-1.061	(2.473)	0.668
Infant mortality	-1.492	(1.788)	0.404
Panel C: Demographic characteristics			
Ln(population)	0.192	(0.178)	0.279
Population¡5000	-4.171	(4.811)	0.386
Panel D: Location + DTOs			
Distance	0.077	(0.081)	0.342
DTOs	0.043	(0.093)	0.647
Panel E: Homicides			
Homicides¿0	0.084*	(0.046)	0.065
Ln(Homicides)	0.114	(0.088)	0.195
IHS(Homicides)	0.150	(0.111)	0.175

Notes: Columns 1 and 3 report the RD estimates associated with equation 3 when a first-order polynomial is used, columns 2 and 4 the standard errors, and columns 3 and 6 the robust bias corrected p-values. 'SE' stands for standard errors, 'Obs.' for observations, 'Hh' for household, and 'w/o' for without. The total number of observations in the sample is 1,879 in panel A and 1,919 in panels B, C, D and E. The effective number of observations used to compute the estimates varies depending on the optimal bandwidth. Robust standard errors in parentheses. ***significant at 1% level, **at 5%, *at 10%.

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