# The Monopoly of Peace: Gang Criminality and Political Elections in El Salvador

Eleno Castro[1] Randy Kotti[2]

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**Abstract**

Despite the growing body of qualitative evidence suggesting collusion between gangs and political parties in various parts of the world, little has been done to study quantitatively the extent to which criminal organization may affect political elections in such context. Using police data and voting results in El Salvador, we find that homicides in gang-controlled neighborhoods tend to decrease by 24 percent of the mean during electoral seasons. We also estimate that gang control is associated with a 2.75 percentage point increase in electoral participation. These effects are especially significant in the neighborhoods where political parties have a strong voting base. Consistent with the interviews we conducted, this suggests that parties negotiate with gangs to mobilize electoral participation in the areas where they are more likely to receive electoral support and thus increase their chances of winning. To conduct our analysis, we geolocated the homicides reported daily in the registry of the National Civil Police from 2005 to 2019 crossed with electoral results reported at the voting-center level across El Salvador. We exploit the sudden and exogenous decrease in criminality resulting from the 2012 truce between the government and the two main gangs in El Salvador to identify gang-controlled neighborhoods. We also use penitentiary data from the General Directorate of Prisons for robustness measures.

**Keywords:** political elections, organized crime, participation
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[1]Harvard Kennedy School & Johns Hopkins University
[2]Harvard Kennedy School & CREST - Ecole Polytechnique
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# 1 Introduction

How do criminal organizations influence elections? Criminal groups threaten democracy and the development of free institutions. From a theoretical standpoint, criminal organizations may interfere with political elections to seek their own gain, either by strong-arming candidates or colluding with them (Dal Bó and Di Tella, 2006). In various geographical contexts indeed, evidence shows that organized crime may increase violence prior to elections, either to deter inconvenient politicians from running in the election (Daniele and Dipoppa, 2017) or to force voters' participation (Bullock, 2021). Alternatively, organized crime may target newly elected politicians shortly after the elections to sway their policy making (Pinotti, 2012; Alesina, Piccolo and Pinotti, 2019). However, when it comes to collusion between criminal organizations and political parties, empirical evidence on organized violence and its consequences on political elections remains limited.

This is what we explore using neighborhood-level police data and election results between 2011 and 2019 in El Salvador, one of the most violent countries in Latin American with deeply rooted criminal groups (Figure 1). We provide novel evidence that gangs may leverage their control of violence and instrumentalize the absence thereof to sway elections in a context of collusion with political parties.

We also conducted interviews with two journalists, one campaign manager, one former congressmen, two academics, and one member of the SEC. From these discussions, we understand that gangs seem to affect elections mostly through voters' choices, by controlling political campaigns' access to gang-controlled areas, and electoral participation, by either encouraging votes or gate keeping voting centers.

To carry our quantitative analysis, we obtained the electoral results from local and national elections disaggregated at the voting-center level between 2011 to 2019 from the Supreme Electoral Court (SEC). We also geolocated the homicides reported daily in the registry of the National Civil Police from 2005 to 2019 across El Salvador based on street addresses. We then matched the homicides to the corresponding neighborhoods and voting centers across

the entire country, which allows use to study variations in violence in relation with electoral results. We exploit the sudden and exogenous decrease in criminality resulting from the 2012 truce between the government and the two main gangs in El Salvador to identify gang-controlled neighborhoods. Since the truce was enforced by gang leaders across the country, any significant reduction in criminality after the truce reveals gang activity and tighter gang-control. We verify this measure using reports of gang-related murders in the National Police data prior to the truce.

In line with Alesina, Piccolo and Pinotti (2019) and Daniele and Dipoppa (2017), our first set of estimation relies on a Two-Way Fixed Effect (TWFE) model (year-week and voting center fixed effects) to study the differential effect of electoral seasons and gang-control on violence at the voting-center level. In a second set of estimations, we also use year and municipality fixed effects to identify the effect of gang-control on participation and electoral results at the voting-center level. Variations in electoral participation and violence are place and time dependent. The TWFE strategy enables us to estimate the differential impact of gang-control and electoral seasons on our outcomes, while controlling for place and time related confounders.

First, we find that homicides in gang-controlled neighborhoods tend to decrease by about 24 percent of the mean during the electoral seasons. Second, we find that electoral participation is higher by 2.75 percentage point in gang-controlled neighborhoods. These effects are especially significant in the neighborhoods where political competition is low, meaning that political parties have more certainty about the voting base. Consistent with the interviews we conducted, this suggests that parties, left and right, negotiate with gangs to mobilize electoral participation in the areas where they believe they are more likely to receive electoral support and thus increase their chances of winning. Our results are robust to alternative measures of gang-control derived from incarcerated gang members' neighborhood of origin obtained from penitentiary data.

This paper contributes to a growing body of evidence studying the effect of criminal organizations on political elections and democracy. Dal Bó and Di Tella (2003) developed a

model within which "nasty" groups can harass policymakers into implementing policies that benefit their interests instead of society's. Building on these findings, Dal Bó and Di Tella (2006, 2007), show how a combination of money incentives ("plata") and punishments ("plomo") can reduce the quality of policymakers and increase corruption in weak judiciary systems. Most empirical evidence focuses on violence against politicians as a means for criminal organization to enforce their agenda. Daniele and Dipoppa (2017) rely on media data to show that violence against local politicians in the south of Italy increases in high organized crime regions mostly after elections, not before, especially when there is a change in local government. This suggests that mafia groups target newly elected politicians at the beginning of their mandate. In the same context, Pinotti (2012) and Alesina, Piccolo and Pinotti (2019) find on the contrary that violence against politicians increase before national elections in the regions where organized crime exerts high influence. Pre-election periods are even more violent when the outcome of an election is uncertain. This tends to prove that Mafia groups focus their action primarily before elections by deterring inconvenient politicians from running for office in the first place. Consistent with this view, Bullock (2021) also finds that organized crime leads to less political competition, as rival candidates are prevented from campaigning in crime dominated areas. We also find evidence of gate-keeping in our analysis, but we conclude that crime tends to decrease during electoral seasons in gang-controlled neighborhoods. Our qualitative study did not unearth evidence of targeted violence against politicians themselves, but rather of broad collusion between political parties and gangs.

On political participation, the empirical evidence is also mixed, if not contradictory. According to one view, organized crime seems to increase turnover through different mechanisms. Politicians may strike alliances with criminal groups, who will tilt the elections in their favor by mobilizing voters they control. In areas controlled by organized crime, this translates into higher coerced participation (Bullock, 2021). More indirectly, Blattman (2009) finds that greater exposure to violence increases electoral participation, as traumatic effects could boost personal growth and foster political activity. These findings can be generalized to different geographic context, especially in Latin America (Bateson, 2012). According to

another view, gang activity seem to negatively affect electoral and non-electoral political participation (Córdova, 2019). Baires, Sviatschi and Vargas (2019) also finds that policies aiming to increase electoral turnover in El Salvador have had little effect in gang-controlled areas. We find that electoral participation is positively associated with gang-control, which suggests that gangs may encourage or coerce voting, especially in low-competition neighborhoods.

The rest of the paper is organized as follows. Section 2 provides additional information on the context of El Salvador. Section 3 studies the different mechanisms through which gangs may affect elections in El Salvador as gathered from news investigations and our own interviews. Sections 4 and 5 present the data and methodology we use, while Section 6 reports our quantitative results. Section 7 concludes.

# 2 Context

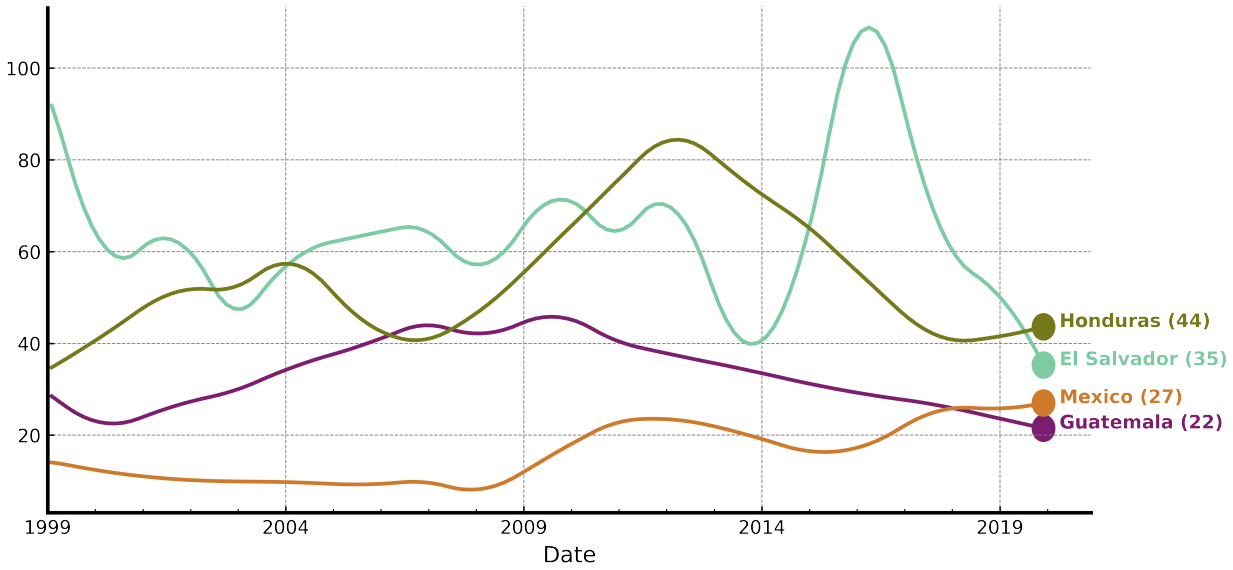
## 2.1 Criminal structures in El Salvador

El Salvador is one of the most violent countries in Latin American (Figure 1). In 2015, the country reached a maximum peak that exceeded 100 homicides per 100,000 inhabitants, five times higher than the average for Latin America. According to data from the National Police, a third of homicides are due to gangs. The economic cost of violence as a percentage of GDP is estimated between 6.5% and 16% (Jaitman et al., 2017; Peñate et al., 2016). Gangs are mainly responsible for the high level of crime observed in the country. Melnikov, Schmidt-Padilla and Sviatschi (2020) show that households in gang neighborhoods are seriously affected by gang influence on a broad range of socio-economic indicators: income, education, and housing quality. Gangs impose their own rules and restrict people's freedom. These differences did not exist before the consolidation of gangs in those areas.

The main gangs in El Salvador are Barrio-18 (B-18) and Mara Salvatrucha 13 (MS-13), formed by Latin American migrants in Los Angeles. The gangs developed in poor neighborhoods with high violence rates. In 1996, the US Illegal Immigration Responsibility Act substantially increased the number of deportations targeting convicted migrants, among which gang members. Between 1998 and 2010, approximately 300,000 people with criminal records were deported to Central America. These massive deportations facilitated the spread of criminal groups throughout Central America, El Salvador being one of the most affected countries (Sviatschi, 2020). There are currently 100,000 gang members in Central America.

Gangs threaten the democratic institutions that the country has built. El Salvador has managed to consolidate democracy after the civil war that ended in 1992. After the conflict, a two-party system was consolidated: the left-wing, the FMLN party, and the right-wing, the ARENA party. A new party, Nuevas Ideas, was created in the center-right in 2017 and won the most recent elections. According to Freedom House, the country was considered

**Figure 1: International homicide rate (per 100,000 people)**




Source: Own elaboration based on data from the World Bank and InsightCrime

democratically free until 2019 (currently it is considered partially free). This contrasts with neighboring countries such as Nicaragua, Guatemala, and Honduras and even surpasses other countries with better economic development such as Mexico, Ecuador, and Colombia, which are ranked lower in Freedom House's index.

## 2.2 Political response

In 2012, the government facilitated a highly criticized truce dialogue between the main gang leaders in prisons. According to journalistic investigations, the government offered better incarceration conditions and less police repression to incentivize gang leaders to strike a truce among themselves. The truce became effective after the March 2012 elections and led to a 48% decrease in murders within a month. Despite the significant drop, the public opinion remained mostly opposed to the truce. The government was blamed for legitimizing gangs by engaging with them and indirectly reinforcing gangs' control over some territories by reducing police enforcement. Although murders reduced, petty crimes,

extortions, and drug trafficking kept increasing (Lohmuller, 2015).

In 2014, Salvador Sánchez Cerén from the left-wing party FMLN won the presidential elections by 6,364 votes only. Shortly after his election, the administration started backing up from the 2012 truce. Gang leaders were transferred to maximum security prisons in January 2015, battalions of Special Forces were deployed in May 2015 to combat the gangs, and in August 2015, the two main gangs were declared "terrorist groups" by the Supreme Court. Criminality reached a new peak, with about 110 murders per 100,000 inhabitants reported in 2015, almost 1.5 times higher than pre-truce levels.

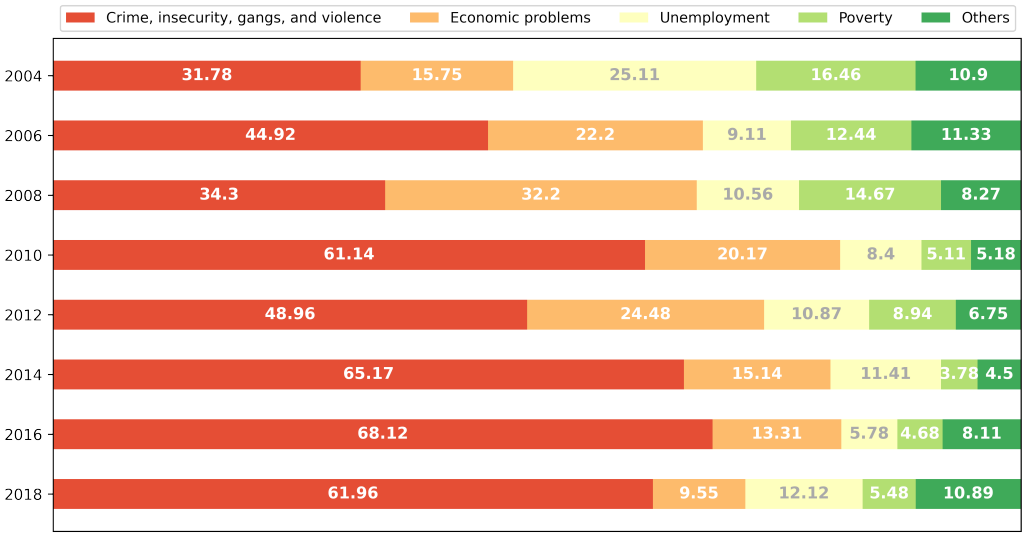
The truce consolidated the gangs' political agenda. In 2015, the two main gangs in El Salvador released a joint statement claiming that they would be open to negotiating a truce with the government (Reuters, 2015). In 2021, investigations by the U.S. Department of the Treasury (2021) indicated that the Government of Nayib Bukele (Nuevas Ideas) held negotiations with gangs to win elections. In other words, the truce shifted the conflict from gang rivalry to politically motivated violence.

# 3 Gangs and political elections: mechanisms of action

## 3.1 Crime and voter preferences

According to *The AmericasBarometer by the Latin American Public Opinion Project (LAPOP)* (2004 - 2018), since 2004, Salvadorans have consistently reported that crime, insecurity, gangs, and violence are the most severe problem in the country. Theses concerns have increased since 2004, from 32% to 62% in 2018. Crime and insecurity seem to have remained the main problem for the country, even in times of economic recession. Hence, voters will tend to favor politicians who are able to reduce criminality (see Figure 2)

**Figure 2: Voters' main concerns in El Salvador**




Source: The AmericasBarometer by the Latin American Public Opinion Project (LAPOP). 1,500 Salvadorans participate in the survey each year. The surveys are nationally representative.

On the other hand, since 2010, between 15 and 20% of Saladorans have reported living in a neighborhood seriously affected by gangs. This share increased during the truce between 2012 and 2014, despite decreasing homicides. Although the increase is not significant, it could indicate that the gangs maintained or even strengthened their control during the truce (see Appendix Figure A4).

## 3.2 Newspapers and official investigations

Given that crime remains the primary concern of Salvadoran voters, secretly negotiating with gangs to reduce homicides, probably the most high profile crimes, could be an effective strategy to attract voters. In 2012 indeed, the Government of El Salvador secretely facilitated a truce process between gang leaders. The truce was highly effective in reducing the high homicide rates: in just one month, homicides fell by 48%, an unprecedented drop in the country's recent history. In return, the Government agreed to improve prison conditions for gang leaders and reduced police control in some areas. The truce made it possible to recognize the gangs and legitimize power in their territories (Lohmuller, 2015).

The truce also proved to politicians that dialogue with gangs can be a solution to the high levels of criminality in the country. After the truce, in 2014, the former mayors of San Salvador, Norman Quijano and Ernesto Muyshondt, were accused of negotiating electoral favors with gang leaders (*Avanza causa penal contra políticos por pacto con pandillas en El Salvador*, 2020; Caceres, 2020). According to journalists from *El Faro*, former Mayor Norma Quijano offered to eliminate the anti-gang law and reduce police control in certain areas in exchange for support in the 2014 presidential elections.

According to journalistic investigations, Martinez (2020) and Roberto Valencia (interviewed), the actual number of negotiations between gangs and political leaders remains unknown. Using videos and audio leaks by gang members, journalists have been able to reveal many negotiations between politicians and gangs. In 2016, the leader of the Barrio-18 gang assured that all political parties engaged in negotiations with gangs (Martinez, 2016) for the 2014 presidential election. This was also confirmed by the former mayor of San Salvador Ernesto Muyshondt in public statements (Labrador and Martinez, 2016).

More recently, the U.S. Department of the Treasury (2021) revealed that Osiris Luna, Vice Minister of Justice of the Nayib Bukele Government, held secret negotiations with MS-13 and Barrio-18 gang leaders. According to the Treasury, in 2020, the Government offered financial incentives for the gangs to keep the number of homicides low and support the

Nuevas Ideas party in the legislative and municipal elections of 2021. In addition, the Government of El Salvador offered special privileges to leaders in prisons such as cell phones and prostitutes. This is not the first time that members of the Nuevas Ideas party have been accused of negotiating with gangs. Martinez (2018) revealed that in 2015, delegates from Nayib Bukele offered money to gang leaders not to disturb his candidacy.

Candidates also seem to be interested in the gang members' votes themselves. The exact number of gang members is currently unknown, but some estimates points toward 60,000 members and 500,000 support base (relatives and collaborators), which would represent 8% of the population of El Salvador (Zaidi, 2019; Raderstorf and Meléndez Sánchez, 2015; International Crisis Group, 2017). This number is significant, especially when considering that there was only about 6,000 votes separating the winner from the defeated candidate during the 2014 presidential election.

## 3.3 Qualitative evidence

To complement these reports, we conducted interviews with two journalists, one campaign manager, one former congressmen, two academics, and one member of the Supreme Electoral Court (SEC). We adopted an emic approach and derived common themes from our discussions. We understand that gangs seem to affect elections mostly through (1) voters' choices and (2) electoral participation.

The following is based on what our interviewees have experienced or observed themselves on the field. This enables us to formulate hypotheses that we test quantitatively in the next sections. The interviewees will remain anonymous.

(1) Voters' choice

   (a) Gangs can prevent specific parties to campaign within the neighborhoods they control (checkpoints, patrols). Politicians need to negotiate safe access.

   (b) Gang leaders usually offer their members' votes to the candidates in exchange

for several advantages (cash, in-kind favors, reduced police enforcement). Gangs can also ask their relatives to support a specific party.

(2) Electoral participation

(a) Gangs can increase violence prior to the elections and use checkpoints to prevent people from voting. Conversely, they can also reduce violence to make people feel safer to vote.

(b) Gang members may be collecting identity cards prior to the elections to prevent certain people from voting. They can also announce that they will check hands to verify that these people did not go to vote (voting centers mark voters' hands with ink to prevent multiple voting).

(c) On election day, certain people are in charge of encouraging people to vote. Usually this role is performed by a member of a party (moving people on buses, reminding residents to vote, etc). In some neighborhoods, gang members take on this role to tacitly force people to vote. People in the neighborhoods are intimidated by the role of authority that gang members have in the community.

# 4 Data

Table 1 below summarises the data sources we use in this paper.

**Table 1: Data Summary**

| Source | Description | Geographic Unit | Time Span |
|---|---|---|---|
| Electoral Supreme Court | Electoral results | 1500 voting centers | 2012 - 2019 |
| National Civil Police | Daily murders | 1500 voting centers | 2011 - 2019 |
| Newspapers (elfaro.com) | Gang-controlled areas | Neighborhood | 2014 & 2018 |
| General Directorate of Prisons | Convicts' data | Neighborhood | 2000 - 2020 |

**Electoral results** To analyze elections, we use voting-center level results of the number of votes cast for each party. Based on these data, we created different measures of political outcome, such as electoral participation, votes for left and right parties, and whether incumbent parties stay in power. We also computed competitiveness indicators (see Appendix C). The data includes all voting centers in El Salvador from 2011 to 2019 (1500 units per year, with their geographic locations and associated areas).

**Registry of the National Civil Police** We measure criminality based on the homicides reported in the daily registry of the National Civil Police (NPC). From this registry, we derived weekly homicide rates excluding non-culpable homicides. The database was cross-verified with other sources of information such as the health system homicide data. It also includes information about the victims' occupations and the textual address where the homicide was committed.

We georeferenced these addresses using a database of all the neighborhoods in El Salvador and their coordinates from the General Directorate of Statistics and Census. We could not use Google Maps as many areas in El Salvador are not referenced there. Once georeferenced, we matched the homicide data with the voting centers by counting the number of

homicides that occurred within each voting center's geographic polygon.

**General Directorate of Prisons** To validate and complement the analysis of gang presence, we use carceral data. This data enables us to identify the main neighborhoods where convicted gang members lived before going to prison. We use the same methodology as for the homicides to georeference the addresses in this base.

**Gang-controlled areas in San Salvador** We obtained gang-controlled areas in the city of San Salvador and other surrounding municipalities for the years 2014 and 2018. In 2014, the digital newspaper El Faro published the area of some gang-controlled neighborhoods in San Salvador, the capital city of El Salvador. The 2018 maps were created from reports from the National Civil Police. We use these maps to run geographic regression discontinuities by crossing gang-controlled areas and voting center locations (Appendix A).

# 5 Methodology

## 5.1 Identifying gang-controlled municipalities

### 5.1.1 Gang-related homicides

Along with the homicides and their approximate location, the daily registry of homicides made available by the National Police also reports victims' occupations. Based on this, we identified gang-related murders by looking for victims either directly categorized as gang members or involved in extortion and drug trafficking. We also included murders committed against the police as markers of gang violence.

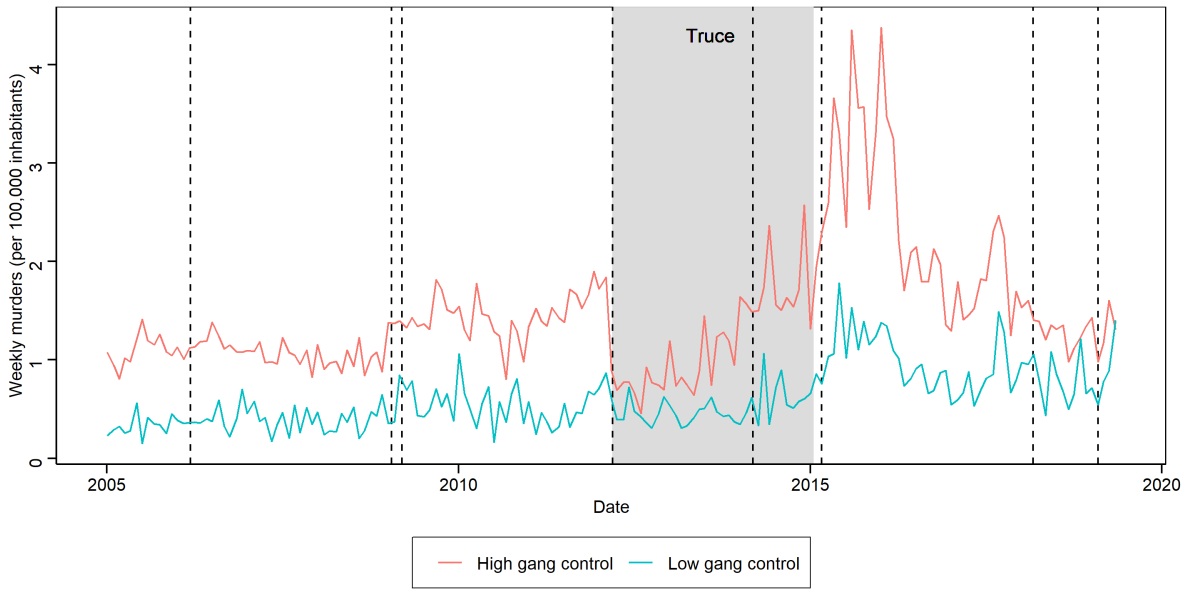
This measure of gang violence may present two problems. First, gang-related murders reported by the police may be a sign of gang weakness rather than gang control. In the municipalities where gangs wield enough influence, they might be able to act so that the homicides they commit don't get linked to them, or don't get reported altogether. High gang violence could also be the result of gangs struggling to keep their power over certain localities. Second, gang-related homicides are strongly correlated with the measure of homicides in general (correlation at $.51$). This poses endogeneity concerns when it comes to analyzing criminality in gang-controlled areas as measured through gang-related criminality.

### 5.1.2 The 2012 truce: an exogenous shock revealing gang control

To mitigate these identification concerns, we consider the variation in criminality brought by the 2012 truce. The government and gangs endeavoured to keep the negotiation process secret as long as they could. Gangs agreed to split some territories and committed to reducing violence. In exchange, the government conceded a reduction in police violence and economic stimuli for some designated localities (Lohmuller, 2015). As soon as the agreement was reached on March 9, 2012, national gang leaders, most of them from prisons, sent orders to their members. This led to a sudden and exogenous variation in criminality,

especially so in locations where gangs had an influence (see Figure 3).

**Figure 3: Murder rate evolution: gang-controlled areas compared to non-gang-controlled areas**




Source: own elaboration based on police data (PNC) at the municipality level.

This exogenous shock in criminality enables us to identify the municipalities and voting centers where gangs had control in 2012. More specifically, we define gang-controlled locations as those where the relative decrease in murder rates, measured over a one-year period before and after the truce, was above the median.

### 5.1.3 Gang-control and truce: validity check

To verify the relevance of our indicator of gang-control, we associated the decrease in criminality induced by the truce in 2012 with the number of gang-related murders before the truce since 2005 at the municipal level. Results are reported in Table 2.

All estimates are positive and statistically significant, meaning that the municipalities where the criminality rate reduced the most following the truce are also those municipalities where gang-related murders where high before the truce. This correlation holds both looking at

short-term (column (1)) and longer-term trends (columns (2) and (3)). These results tend to validate that the variation in criminality during the truce reveals gang-control at the time of the truce.

**Table 2: Criminality Reduction at the Truce and Gang-Related Murders in El Salvador**

| | Dependent variable | | |
|---|---|---|---|
| | Gang-Related Murder Rate (2005-2012) | | |
| | (1) | (2) | (3) |
| 6-month decrease in crime at the truce | 2.021* | | |
| | (1.139) | | |
| 1-year decrease in crime at the truce | | 2.848*** | |
| | | (.703) | |
| 2-year decrease in crime at the truce | | | 3.217*** |
| | | | (.780) |
| Observations | 197 | 212 | 228 |
| $R^2$ | .010 | .040 | .046 |
| Adjusted $R^2$ | .005 | .035 | .042 |

*p<0.1; **p<0.05; ***p<0.01

*Notes: This table reports the association between gang-related criminality prior to the truce (between 2005 and 2012) and the variation in murder rates due to the truce in 2012, measured over a 6-month, 1-year and 2-year window.*

### 5.1.4 Alternative measures of gang presence and gang heterogeneity

Using the data we georeferenced based on the General Directorate of Prisons, we are able to identify the neighborhoods where gang members were sent to jail. This provides another metric of gang-presence that we use for robustness: neighborhoods where the number of convicted gang-members is above median.

We use information about 29 gang leaders and their neighborhoods of origin among convicted gang members. We use this as a last robustness metric of gang-control: neighborhoods where at least one gang leader was living before being convicted.

Prior to the truce, gang members used to be incarcerated in different penitentiaries based on their gang affiliation (Barrio-18 or MS-13) to avoid bringing gang wars from the streets to the prisons. For this purpose, gang affiliation was systematically gathered in the data, which allows us to distinguish neighborhoods with a higher MS-13 or Barrio-18 control.

## 5.2 Regression models

### 5.2.1 Two Way Fixed Effect Estimations

Our main estimations rely on a Two Way Fixed Effects strategy at the voting center level where we use cumulatively year ($v_t$), week ($w_t$), and voting center ($f_n$) fixed effects. This allows us to identify variations in criminality independently from the expected level of criminality at a given time in a given place and better isolate the effect of electoral seasons and gang-control. The week fixed effect in particular enables us to control for crime seasonality, knowing that elections are not always held the same week of the year.

$$\begin{aligned} \text{Murder Rate}_{n,t} = \alpha\ &\text{Electoral Season}_t \\ &+ \beta\ \text{Electoral Season}_t \times \text{Gang Control}_n \\ &+ \gamma\ v_t + \sigma\ w_t + \tau\ f_n + \epsilon_{n,t} \end{aligned} \tag{1}$$

In the estimation above, the term Gang Control$_n$ alone is absorbed in the voting center fixed effect $f_n$. We also extend Equation 1 to identify the patterns of criminality during electoral seasons in gang-controlled neighborhoods where political competition is low (meaning that a given party has a strong base). To prevent endogeneity concerns, we measure political competition as given by the previous election.

Although this approach does not provide for a proper causal identification, the TWFE controls for place and time related confounders, such as socio-demographic characteristics, partisan history, and baseline criminality. Only confounders varying both in time and space are not accounted for.

$$
\begin{aligned}
\text{Murder Rate}_{n,t} = \alpha\ & \text{Electoral Season}_t \\
& + \omega\ \text{Low Competition}_{n,t-1} \\
& + \delta\ \text{Electoral Season}_t \times\ \text{Low Competition}_{n,t-1} \\
& + \beta\ \text{Electoral Season}_t \times \text{Gang Control}_n \\
& + \phi\ \text{Gang Control}_n \times \text{Low Competition}_{n,t-1} \\
& + \psi\ \text{Electoral Season}_t \times \text{Gang Control}_n \times\ \text{Low Competition}_{n,t-1} \\
& + \gamma\ v_t + \sigma\ w_t + \tau\ f_n + \epsilon_{n,t}
\end{aligned}
\tag{2}
$$

In order to identify the distinctive effect of gang-control on outcomes such as political participation and specific parties' vote shares ($\text{Y}_{n,t}$), we use a variation of Equation 1, where the voting center fixed effect becomes a municipality fixed effect $\tilde{f_m}$:

$$
\text{Y}_{n,t} = \alpha\ \text{Gang Control}_n + \gamma\ y_t + \sigma\ w_t + \tau\ \tilde{f_m} + \epsilon_{n,t} \tag{3}
$$

This estimation allows us to identify the specific effect of gang-control while controlling for location confounders at the municipality level. This does not allow for a proper inference but should at least eliminate a significant fraction of the omitted bias. Similarly as before, we use a variation of Equation 3 allowing for an heterogeneous effect in Low Competition neighborhoods.

$$
\begin{aligned}
\text{Y}_{n,t} = \beta\ & \text{Low Competition}_{n,t-1} \\
& + \delta\ \text{Low Competition}_{n,t-1} \times \text{Gang Control}_n \\
& + \gamma\ y_t + \sigma\ w_t + \tau\ f_n + \epsilon_{n,t}
\end{aligned}
\tag{4}
$$

For all estimations, we use robust standard errors clustered either at the voting center or the municipality level where appropriate.

# 6 Quantitative Results

## 6.1 Party preferences in gang-controlled areas

Whether gang leaders only encourage their members and relatives to vote for a given party, or if they directly coerce voters, we expect to observe a difference in voting patterns in gang-controlled areas. To verify this, we relate the impact of gang-control at the voting center level on FMLN and ARENA's vote shares and control for municipality fixed effects (see Equation 3). Each municipality encompasses on average 6 voting centers. Given that gangs' support for specific parties has changed overtime, we considered the different elections separately.

The results are reported in Table 3. We observe that gang-controlled areas have voted significantly more for FMLN (left wing) in 2014 (column (1)) and against in 2019 (column (3)). Areas under gang influence have voted consistently against ARENA (right wing) across the period (columns (4) to (6)). The direction of the estimates is consistent with the claims that FMLN managed to outbid ARENA for gang support in 2014 and that Nayeb Bukele's Nuevas Ideas party relied on gangs for the 2019 election against both FMLN and ARENA (see section 3.2).

The magnitude of the effects is rather large, between 0.9 and 2.5 percentage points, especially considering that FMLN won the 2014 election by about 6,000 votes only. Appendix F shows that these results are consistent using alternative measures of gang-control. Even descriptive, these results support the broader hypothesis that gang influence may affect electoral results in some ways, whether legally or not. In the next sections, we verify some of the mechanisms that could explain this.

**Table 3: Party Preferences in Gang-Controlled Areas**

| | Dependent variable | | | | | |
|---|---|---|---|---|---|---|
| | FMLN (2014) | FMLN (2018) | FMLN (2019) | ARENA (2014) | ARENA (2018) | ARENA (2019) |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Gang-Control | 1.641** | .906 | −1.369** | −1.513** | −.985 | −2.508*** |
| | (.678) | (.692) | (.604) | (.663) | (.648) | (.594) |
| Municipality FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations Mean | 49.2 | 28 | 17.8 | 49.7 | 39.6 | 29.4 |
| Observations | 1,427 | 1,428 | 1,422 | 1,427 | 1,428 | 1,422 |
| $R^2$ | .464 | .764 | .663 | .463 | .763 | .486 |
| Adjusted $R^2$ | .353 | .715 | .592 | .352 | .714 | .378 |

*p<0.1; **p<0.05; ***p<0.01

*Notes: This table reports the association between gang contol and party specific votes in the 2014, 2018, and 2019 elections at the voting center level. Gang control is defined as the neighborhoods where the decrease in homicides due to the 2012 truce was above median. We added municipality fixed effects and clustered the standard errors by municipality.*

## 6.2 Buying peace: gang criminality during electoral seasons

We turn to criminality patterns to study quantitatively the effect of gangs on political elections. We use the Two Way Fixed Effect estimation described in section 5.2.1 (Equation 1). We relate the weekly murder rate per 100,000 inhabitants to an indicator variable equal to 1 during electoral seasons. We define electoral seasons as the period starting 3 months prior to the elections and ending 3 months after, 3 months being the typical campaign duration in El Salvador. We also verify the robustness of our results using different time windows (see Appendix E).

We excluded the 2012 and 2015 elections from this analysis to ensure that our estimates would not be biased by the particular events that unravelled these years. Indeed, the 2012 truce was struck three days before the elections and mechanically led to a strong reduction in criminality. Conversely, the FMLN government announced drastic measures against gangs two weeks before the 2015 elections, including the return to maximum security prisons for gang leaders and the deployment of special forces in gang areas. This was effectively the end of the truce, and the beginning of a new era of high crime (see Figure 3).

Table 4 reports the results we obtained following this specification. Columns (1) and (2) show that homicides tend to increase both before and after elections across El Salvador.

In gang-controlled areas however, the homicide rate significantly reduces when compared to non gang-controlled areas (column (3)) by about 0.24 mean prior to an election. We observe a similar pattern for gang-related murders (column (4)) with a differential decrease of about 0.23 mean prior to an election. This rather large reduction in criminality in gang-controlled areas confirms the hypothesis that gangs use peace rather than violence itself to weigh on political elections in El Salvador.

**Table 4: Criminality in Gang-Controlled Areas during Electoral Seasons**

| | Dependent variable | | | |
|---|---|---|---|---|
| | Homicide Rate (per 100,000 inhabitants) | | | Gang-Related |
| | (1) | (2) | (3) | (4) |
| Electoral Season | .209*** | | | |
| | (.060) | | | |
| Before Election | | .270*** | .437*** | .193*** |
| | | (.068) | (.088) | (.049) |
| After Election | | .120 | .304*** | .123** |
| | | (.081) | (.103) | (.057) |
| Before Election × Gang-Control | | | −.347*** | −.107* |
| | | | (.107) | (.056) |
| After Election × Gang-Control | | | −.381*** | −.188** |
| | | | (.126) | (.078) |
| Time and Voting Center FE | Yes | Yes | Yes | Yes |
| Observations Mean | 1.42 | 1.42 | 1.42 | 0.45 |
| Observations | 415,224 | 415,224 | 415,224 | 415,224 |
| $R^2$ | .055 | .055 | .055 | .023 |
| Adjusted $R^2$ | .052 | .052 | .052 | .019 |

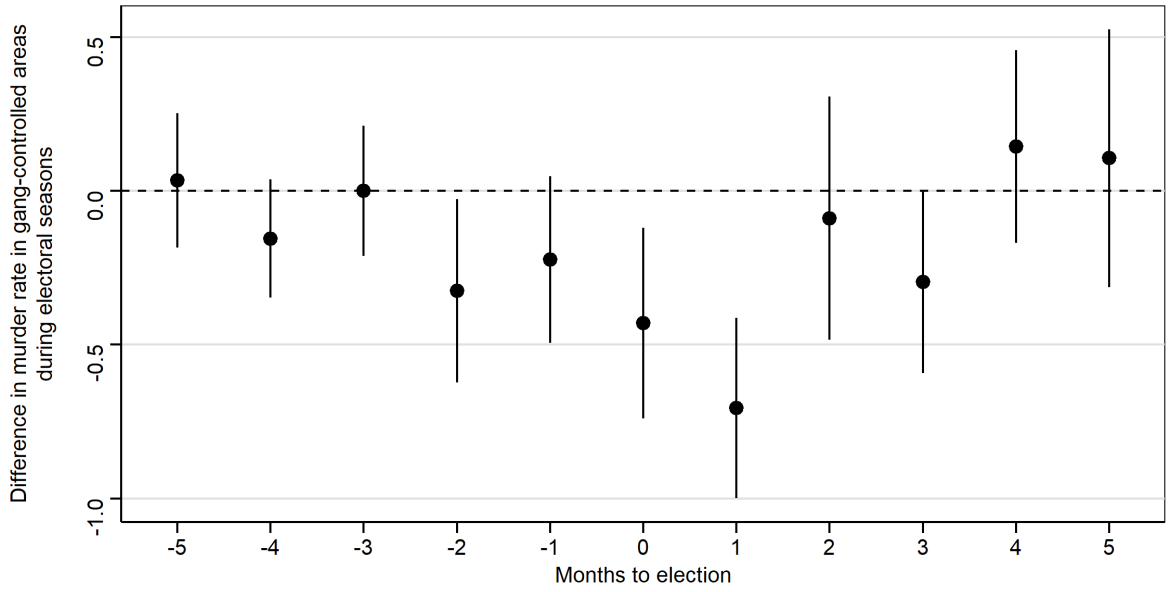
*p<0.1; **p<0.05; ***p<0.01

*Notes: This table reports the association between criminality and electoral season, specifically in gang-controlled areas between 2012 and 2019. Electoral season is an indicator variable equal to one 12 weeks before and after an election. The homicide rate is measured weekly and annualized per 100,000 inhabitants. Gang control is defined as the neighborhoods where the decrease in homicides due to the 2012 truce was above median. Robust standard errors clustered by voting center are reported between parenthesis. The 2012 and 2015 elections were removed from the sample because of outside events affecting the depending variable (resp. truce and end of truce)*

Table 5 reports the same analysis conducted with our alternative measures of gang-control: neighborhoods with a high number of convicted gang members (High-Prisoners), and gang leaders' neighborhoods of origin (Gang-Leaders). We observe similar results: criminality reduces in gang-controlled areas during elections. We also introduced gang-heterogeneity (columns (4) and (5)) and observe that this reduction in criminality is particularly significant in neighborhoods controlled by MS-13, less so in neighborhoods controlled by B-18. MS-13's leadership is known to have a tighter control on its members (Lohmuller, 2015) as compared to B-18 which suffers more internal divisions. Hence, MS-13 could be better positioned to negotiate agreements with parties themselves, especially during national elections.

Figure 4 plots the differential effect of gang-control on criminality over time during electoral seasons. The reduction in criminality during electoral seasons in gang-controlled areas seems particularly strong in the 2 months preceding and the month following an election.

**Figure 4: Difference in Homicide Rate in Gang-Controlled Areas during Electoral Seasons**




Source: own elaboration based on police data (PNC) at the voting center level.

## Table 5: Criminality in Gang-Controlled Areas during Electoral Seasons (robustness to gang control)

| | Dependent variable | | | | |
|---|---|---|---|---|---|
| | Homicide Rate (per 100,000 inhabitants) | | | | |
| | (1) | (2) | (3) | (4) | (5) |
| Election | .382*** | .283*** | .222*** | .236*** | .283*** |
| | (.078) | (.069) | (.061) | (.069) | (.069) |
| Election × Gang-Control | −.358*** | | | | |
| | (.090) | | | | |
| Election × High-Prisoners | | −.597*** | | | |
| | | (.207) | | | |
| Election × Gang-Leaders | | | −.655* | | |
| | | | (.380) | | |
| Election × B-18 | | | | −.211 | |
| | | | | (.199) | |
| Election × MS-13 | | | | | −.584*** |
| | | | | | (.201) |
| Time and Voting Center FE | Yes | Yes | Yes | Yes | Yes |
| Observations Mean | 1.42 | 1.42 | 1.42 | 1.42 | 1.42 |
| Observations | 415,224 | 415,224 | 415,224 | 415,224 | 415,224 |
| $R^2$ | .055 | .055 | .055 | .055 | .055 |
| Adjusted $R^2$ | .052 | .052 | .052 | .052 | .052 |

*p<0.1; **p<0.05; ***p<0.01

*Notes: This table reports the association between criminality and electoral season, specifically in gang-controlled areas between 2012 and 2019. Electoral season is an indicator variable equal to one 12 weeks before and after an election. The homicide rate is measured weekly and annualized per 100,000 inhabitants. Gang control is defined as the neighborhoods where the decrease in homicides due to the 2012 truce was above median. High-Prisoners represents the neighborhood where the number of convicted gang members was above average. B-18 and MS-13 are constructed similarly based on B-18 and MS-13 convicts. Gang-Leaders represents the neighborhoods of origins of convicted gang leaders. Robust standard errors clustered by voting center are reported between parenthesis. The 2012 and 2015 elections were removed from the sample because of outside events affecting the depending variable (resp. truce and end of truce)*

## 6.3 Crime reduction and participation increase

The reduction in criminality around elections that we established in the previous section is consistent with the results of our interviews, according to which parties negotiate safe access to gang-controlled territories in order to campaign. Whether directly because of the overall reduction in criminality, or because parties are better able to campaign in safer neighborhoods, we expect to see an increase in political participation in gang-controlled areas as a result of the decrease in crime.

To test this hypothesis, we analyze the association between homicides prior to elections and electoral participation. We used year and voting center fixed effect to control for the expected turnover in specific locations in specific years. Appendix Table A11 shows that higher homicide rates prior to elections are indeed associated with less turnover.

Building further on these results, and knowing that criminality reduces on average in gang-controlled areas during electoral season, we expect to see an increase in electoral participation in gang controlled areas. Using the same framework as Equation 2, column (1) of Table 6 reports a statistically significant and positive effect of gang-control on voters' participation. The estimate is rather large: a 2.75 percentage point increase in participation in gang controlled areas. Alternative measures of gang-control lead to consistent estimates, although more modest (columns (2) and (3)). Hence, gang influence seems to be geared toward encouraging participation in the territories they control.

These results are also consistent with LAPOP survey data between 2010 and 2018. Respondents declaring that they lived in a neighborhood where gangs had a significant influence reported on average 5.1 percent points more often that they participated during the previous election. The estimate increases to 5.4 percentage points when controlling for socio-economic indicators and adding time and location fixed effects (columns (1) and (3) of Table A12 in Appendix A10).

**Table 6: Electoral Participation in Gang-Controlled Areas**

| | Dependent variable | | |
|---|---|---|---|
| | Electoral Participation | | |
| | (1) | (2) | (3) |
| Previous Participation | .119 | .125 | .125 |
| | (.231) | (.233) | (.233) |
| Gang-Control | 2.752** | | |
| | (.870) | | |
| High-Prisoners | | 1.440 | |
| | | (.926) | |
| High-Leaders | | | 1.456* |
| | | | (.709) |
| Election and Municipality FE | Yes | Yes | Yes |
| Observations Mean | 52.5 | 52.5 | 52.5 |
| Observations | 6,834 | 6,834 | 6,834 |
| $R^2$ | .383 | .376 | .375 |
| Adjusted $R^2$ | .359 | .352 | .351 |

*p<0.1; **p<0.05; ***p<0.01

*Notes: This table reports the association between gang control and voters' turnout. Gang control is defined as the neighborhoods where the decrease in homicides due to the 2012 truce was above median. High-Prisoners represents the neighborhood where the number of convicted gang members was above average. Gang-Leaders represents the neighborhoods of origins of convicted gang leaders. We added election and municipality fixed effects and clustered the standard errors by municipality.*

## 6.4 Low competition neighborhoods: increasing favorable turnover

Gangs seem to favorably affect political turnover, either by directly encouraging voters to participate, or by generating the conditions of a safer election. Nonetheless, since negotiating with gangs is costly, parties need to have some certainty that an increase in turnover can translate into more votes in their favor. This is more likely to be the case in neighborhoods where parties know, historically, that they have a strong voting base in the first place. Following this reasoning, we expect to see stronger effects in the voting centers where political competition is low.

To measure political competitiveness in any election, we use the results of the previous election and rely on both the Herfindahl Hirschman Index (HHI) and the vote gap between first and second candidates (Vote Gap). Low competition neighborhoods are taken as the lowest quartile of these measures.

On participation, we use Equation 4 to analyze the differential effect of gang-control on voter turnout in low competition neighborhoods. Results are reported in Table 7. Both column (1) and (2) show that participation tends to increase in Low-Competition places, but even more so in gang-controlled areas. This is consistent with the hypothesis that gangs' action is triggered mostly when parties have more certainty that increased participation will translate into more favorable votes.

Using the model delineated in Equation 2, we also look at criminality patterns around electoral seasons. Results are reported in Appendix Table A9. The estimates of interest are shown in the last two lines. We observe that criminality reduces during electoral seasons in gang controlled areas particularly in places where political competition was low. Even though the differential effect is less significant than for participation, this remains consistent with the hypothesis that gangs' influence is mostly sought in neighborhoods where parties have a strong voting base.

Figure 5 summarises graphically our findings. The left regions of the graphs represent high competition (low vote gap between first and second), whereas the right regions represents

**Table 7: Electoral Participation in Low-Competition Gang-Controlled Areas**

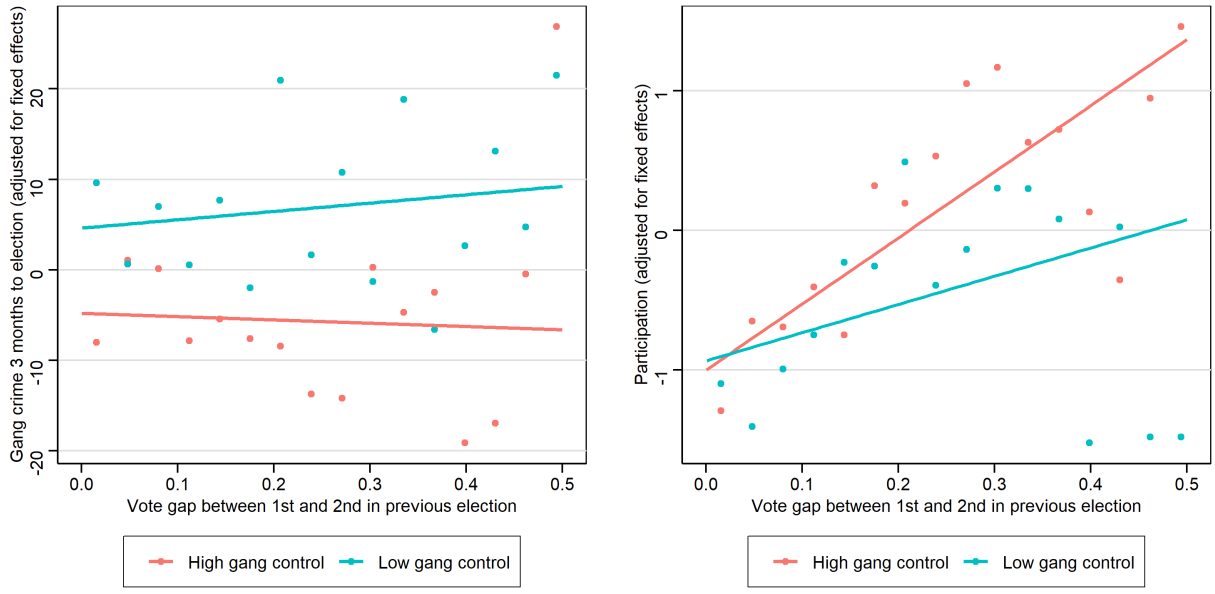
| | Dependent variable | |
|---|---|---|
| | Electoral Participation | |
| | (1) | (2) |
| Previous Participation | $-.373^{***}$ | $-.373^{***}$ |
| | (.012) | (.012) |
| Low-Competition (HHI) | $.905^{***}$ | |
| | (.343) | |
| Low-Competition (HHI) $\times$ Gang-Control | $.904^{*}$ | |
| | (.498) | |
| Low-Competition (Vote Gap) | | $1.264^{***}$ |
| | | (.396) |
| Low-Competition (Vote Gap) $\times$ Gang-Control | | $1.346^{**}$ |
| | | (.550) |
| Election and Voting Center FE | Yes | Yes |
| Observations Mean | 52.5 | 52.5 |
| Observations | 7,955 | 7,955 |
| $R^2$ | .765 | .766 |
| Adjusted $R^2$ | .688 | .690 |

$^{*}$p<0.1; $^{**}$p<0.05; $^{***}$p<0.01

*Notes: This table reports the association between gang control and voters' turnout in neighborhoods where political competition was low during the previous election. Gang control is defined as the neighborhoods where the decrease in homicides due to the 2012 truce was above median. Low competition is measured using the Herfindahl Hirschman Index (HHI) and the vote gap between first and second candidates. We added election and voting center fixed effects and clustered the standard errors by voting center*

low competition neighborhoods. In gang-controlled areas (red lines), compared to non gang areas (blue lines), participation increases more in low-competition voting centers and criminality reduces more. This supports the claim that parties may be colluding with gangs especially in the neighborhoods where they have more voters. By increasing safety, and fostering known-to-be favorable political participation, parties may collude with gangs to increase their overall vote share.

**Figure 5: Competitive districts, gang criminality, and participation**




Source: own elaboration based on police data (PNC) and electoral results by the Electoral Supreme Court at the voting center level.

These findings are also supported by the fact that there doesn't seem to be any trend difference between gang-controlled areas and non gang areas when looking at the 2012 election (see Figure A5 in Appendix G), when, gangs and political parties didn't systematically collude yet according to journalistic investigations.

# 7 Conclusion

In the context of collusion between criminal groups and political parties, we find that peace, or the absence of violence, is a viable leverage to influence political elections. El Salvador provides an example of this.

Based on our interviews and quantitative analysis, we conclude that homicides in gang-controlled neighborhoods tend to decrease during electoral seasons along with an increase in electoral participation. These effects are especially significant in the neighborhoods where political parties have a strong voting base. This suggests that parties negotiate with gangs to mobilize electoral participation in the areas where they are more likely to receive electoral support and increase their chances of winning.

Gangs also affect the quality of campaigns in the neighborhoods they control. According to interviews, the parties must ask for permission and give something in return to the gangs to enter those neighborhoods. Permission is usually granted through a party member in the community. This scheme could be depleting parties' campaign resources and hurting small parties that don't have as many members in all neighborhoods.

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# Appendices

## A Geographic Regression Discontinuity

### A.1 Methodology

We use the maps of the areas controlled by gangs in 2014 and 2018 in San Salvador to identify whether the fact that voters have to vote in a gang-controlled area affects political outcomes at the voting center level. We use the same geographic regression discontinuity framework as Melnikov, Schmidt-Padilla and Sviatschi (2020).

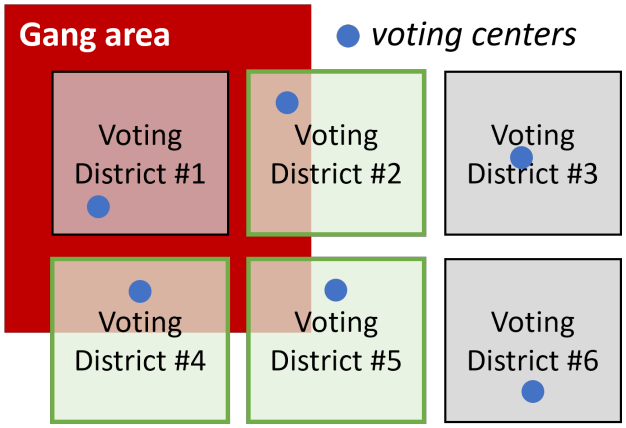
$$\begin{aligned} \text{Y}_n = \alpha + \beta\ \mathbb{1}[\text{DistanceToGang} > 0]_n + \delta\ \text{DistanceToGang}_n \\ + \rho\ \text{DistanceToGang}_n \times \mathbb{1}[\text{DistanceToGang} > 0]_n + \epsilon_n \end{aligned} \tag{5}$$

The independent variable belongs to the range of electoral outcomes such as participation, parties' vote share, and political competition indicators outlined in Appendix C (gap between the first and second most voted party, Herfindahl–Hirschman index, Political Competition index). The Calonico et al. (2017) model was used to identify the optimal bandwidth in each regression, with a degree of polynomial 2 and with a triangular kernel. Other variations were considered to strengthen the analysis.

We focus more specifically on voting areas that overlap with gang-controlled territories, without being fully inside these territories (e.g., voting centers #2, #4, and #5 on Figure A1, but not voting center #1). This enables us to pool together voters who live inside gang territories, and may have specific characteristics and preferences, with voters living outside of gang-controlled areas. By doing so, we can isolate the effect of voting centers being inside gang-controlled areas.[1]

[1]We are not able to display the detailed maps of gang-control for confidentiality reasons.

**Figure A1: Qualifying Voting Centers in the Regression Discontinuity Design**




## A.2 Results

In order to present more causal evidence, we rely on the regression discontinuity model outlined in section A. For this analysis, we use the maps of gang-controlled areas available for San Salvador in 2014 and 2018 along with the election results at the voting center level. In 2014, none of the candidates reached the 50% vote share required to win. For this reason, a second round was held, which we also took into account in the estimations.

We were not able to identify any difference in participation, whether voting centers are located inside or outside gang-controlled territories (see Table A3). Nonetheless, Tables A4 and A5 show that voting centers inside gang-controlled territories present a significant distortion in political competition as compared to voting centers outside of gang-controlled areas, even if they pool voters both from inside and outside these areas. In 2014 and 2018, the vote gap between candidates ranked first and second in these voting centers was lower by 0.70 and 0.10 points respectively (columns (2)). These results are also illustrated graphically.

The differences in vote gap between first and second candidates are not significant for other years using the same maps (columns (1) and (3)). One explanation could be that gang territories' borders may have shifted over time. Prior to 2014, according to journalists, gang members were able to strengthen control of their territory thanks to the truce. After 2015

however, the Government launched a new Security Plan that may have modified gangs' territories.

According to interviews, in 2014, the gangs tried to strongly affect the electoral results because a project called Sanctuary Municipalities had been suspended. This project had the objective of investing in infrastructure and increasing employment in specific municipalities where the gangs were. The suspension caused the gangs to be against the municipal party; this forced Norma Quijano (candidate for the presidency in those elections and Mayor of San Salvador) to negotiate with the gangs between the first and second round of voting. Subsequently, the gangs leak audio and video of the negotiations to the press.

Tables A6 and A7 present the results obtained using other measures of competitiveness (HH - Index and Political index). The results in 2014 remain significant, but not in 2018. The number of observations is quite low and could limit the correct interpretation of the results.

**Table A1: Gang-Control Effect on Gap First-Second in 2014 (RD)**

| | (1) Before 2014 | (2) 2014 | (3) After 2014 |
|---|---|---|---|
| Gang Control Area - 2014 map | -0.018 | -0.711*** | -0.046 |
| | (0.178) | (0.161) | (0.103) |
| Robust 95% CI | [-.73 ; .341] | [-1.062 ; -.269] | [-.252 ; .301] |
| Kernel Type | Triangular | Triangular | Triangular |
| BW Type | mserd | mserd | mserd |
| Observations | 41 | 94 | 170 |
| Conventional p-value | 0.922 | 0.000 | 0.653 |
| Robust p-value | 0.476 | 0.001 | 0.860 |
| Order Loc. Poly. (p) | 2 | 2 | 2 |
| Order Bias (q) | 3 | 3 | 3 |
| BW est. (h) | 98.9 | 90.5 | 97.7 |
| BW bias (b) | 132.8 | 138.8 | 151.8 |

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

**Table A2: Gang-Control Effect on Gap First-Second in 2018 (RD)**

| | (1) Before 2018 | (2) 2018 | (3) After 2018 |
|---|---|---|---|
| Gang Control Area - 2018 map | 0.008 | -0.109** | 0.043 |
| | (0.024) | (0.050) | (0.061) |
| Robust 95% CI | [-.037 ; .067] | [-.21 ; .006] | [-.09 ; .176] |
| Kernel Type | Triangular | Triangular | Triangular |
| BW Type | mserd | mserd | mserd |
| Observations | 760 | 222 | 432 |
| Conventional p-value | 0.726 | 0.030 | 0.484 |
| Robust p-value | 0.573 | 0.065 | 0.526 |
| Order Loc. Poly. (p) | 2 | 2 | 2 |
| Order Bias (q) | 3 | 3 | 3 |
| BW est. (h) | 1246.2 | 1484.7 | 1653.6 |
| BW bias (b) | 2011.6 | 2145.5 | 2255.8 |

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

**Table A3: Gang-Control Effect on Participation in 2014 and 2018 (RD)**

| | (1) Participation 2014 | (2) Participation 2018 |
|---|---|---|
| Gang Control Area | -0.021 | 0.006 |
| | (0.025) | (0.026) |
| Robust 95% CI | [-.086 ; .031] | [-.044 ; .075] |
| Kernel Type | Triangular | Triangular |
| BW Type | mserd | mserd |
| Observations | 94 | 209 |
| Conventional p-value | 0.399 | 0.825 |
| Robust p-value | 0.359 | 0.605 |
| Order Loc. Poly. (p) | 1 | 1 |
| Order Bias (q) | 2 | 2 |
| BW est. (h) | 149.5 | 933.1 |
| BW bias (b) | 220.9 | 1561.6 |

$^{*}\ p < 0.1$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$

**Table A4: Gang-Control Effect on Gap First-Second in 2014 (RD)**

| | (1) Before 2014 | (2) 2014 | (3) After 2014 |
|---|---|---|---|
| Gang Control Area - 2014 map | -0.018 | -0.711*** | -0.046 |
| | (0.178) | (0.161) | (0.103) |
| Robust 95% CI | [-.73 ; .341] | [-1.062 ; -.269] | [-.252 ; .301] |
| Kernel Type | Triangular | Triangular | Triangular |
| BW Type | mserd | mserd | mserd |
| Observations | 41 | 94 | 170 |
| Conventional p-value | 0.922 | 0.000 | 0.653 |
| Robust p-value | 0.476 | 0.001 | 0.860 |
| Order Loc. Poly. (p) | 2 | 2 | 2 |
| Order Bias (q) | 3 | 3 | 3 |
| BW est. (h) | 98.9 | 90.5 | 97.7 |
| BW bias (b) | 132.8 | 138.8 | 151.8 |

$^{*}\ p < 0.1$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$

**Table A5: Gang-Control Effect on Gap First-Second in 2018 (RD)**

| | (1) Before 2018 | (2) 2018 | (3) After 2018 |
|---|---|---|---|
| Gang Control Area - 2018 map | 0.008 | -0.109** | 0.043 |
| | (0.024) | (0.050) | (0.061) |
| Robust 95% CI | [-.037 ; .067] | [-.21 ; .006] | [-.09 ; .176] |
| Kernel Type | Triangular | Triangular | Triangular |
| BW Type | mserd | mserd | mserd |
| Observations | 760 | 222 | 432 |
| Conventional p-value | 0.726 | 0.030 | 0.484 |
| Robust p-value | 0.573 | 0.065 | 0.526 |
| Order Loc. Poly. (p) | 2 | 2 | 2 |
| Order Bias (q) | 3 | 3 | 3 |
| BW est. (h) | 1246.2 | 1484.7 | 1653.6 |
| BW bias (b) | 2011.6 | 2145.5 | 2255.8 |

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

**Table A6: Results of the RD - Validation 2014**

| | (1) Gap First-Second | (2) HH index | (3) Political index |
|---|---|---|---|
| Gang Control Area | -0.711*** | -0.115*** | 0.153*** |
| | (0.161) | (0.028) | (0.038) |
| Robust 95% CI | [-1.062 ; -.269] | [-.193 ; -.051] | [.068 ; .257] |
| Kernel Type | Triangular | Triangular | Triangular |
| BW Type | mserd | mserd | mserd |
| Observations | 94 | 94 | 94 |
| Conventional p-value | 0.000 | 0.000 | 0.000 |
| Robust p-value | 0.001 | 0.001 | 0.001 |
| Order Loc. Poly. (p) | 2 | 2 | 2 |
| Order Bias (q) | 3 | 3 | 3 |
| BW est. (h) | 90.5 | 93.6 | 93.6 |
| BW bias (b) | 138.8 | 135.0 | 135.0 |

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

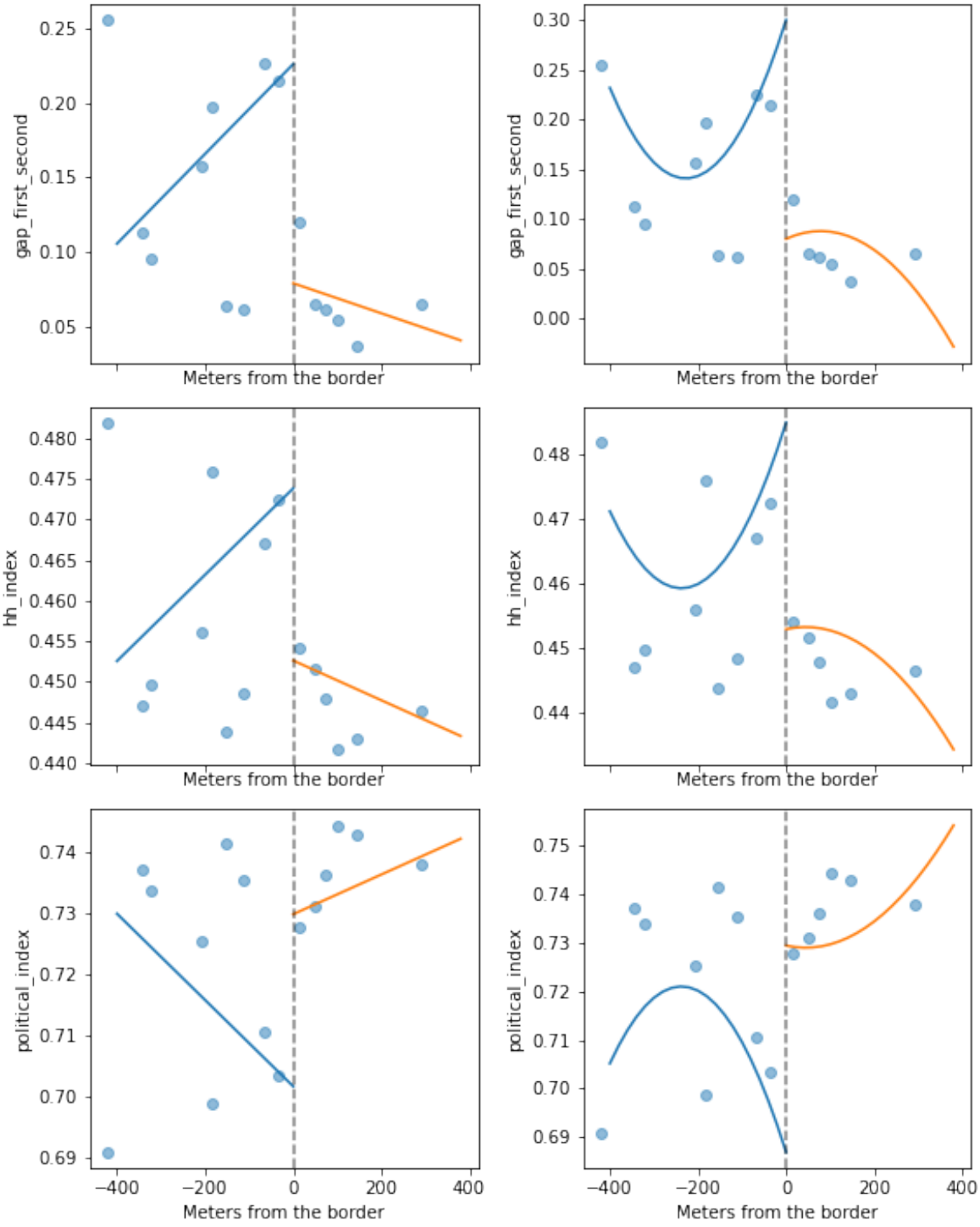
**Table A7: Results of the RD - Validation 2018**

| | (1) Gap First-Second | (2) HH index | (3) Political index |
|---|---|---|---|
| Gang Control Area | -0.109** | -0.024 | 0.026 |
| | (0.050) | (0.027) | (0.029) |
| Robust 95% CI | [-.21 ; .006] | [-.074 ; .039] | [-.042 ; .081] |
| Kernel Type | Triangular | Triangular | Triangular |
| BW Type | mserd | mserd | mserd |
| Observations | 222 | 222 | 222 |
| Conventional p-value | 0.030 | 0.376 | 0.376 |
| Robust p-value | 0.065 | 0.541 | 0.541 |
| Order Loc. Poly. (p) | 2 | 2 | 2 |
| Order Bias (q) | 3 | 3 | 3 |
| BW est. (h) | 1484.7 | 1363.7 | 1363.7 |
| BW bias (b) | 2145.5 | 1983.1 | 1983.1 |

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

# B Gang-controlled areas

**Figure A2: Results of the RD in 2014**



## C Measuring political competition

Effectively measuring political competition has proved to be controversial due to the different alternatives used. Previous researchers have operationalized this concept in a variety of ways, with the empirical results often hinging on which measure is used (Aistrup, 2014). Based on a literature review, three main indicators stood out. The first (1) simply calculates the gap competition (difference in percentage points) of the first $(F_{it})$ and second place $(S_{it})$ in the elections $(t)$ for each municipality $(i)$.

$$(1)\ X_{it} = F_{it} - S_{it}$$

The second competitive indicator (2) considered is the Herfindahl-Hirschman index (HHI) that is usually used to measure the market concentration or level of competitiveness in an industry. In this case, when the indicator is closer to one then a single political party has monopolized the share of votes in the municipality; when it is close to zero, then the share of votes is similar between many political parties. The indicator is calculated as the sum of the square of the share $(S_j)$ of each party$(N)$.

$$(2)\ X_{it} = \sum_{j=1}^{N} {S_j}^2$$

The third indicator (3) was defined by Chakravarty et al. (2020), which measures the probability that randomly chosen voters have voted for different parties. In a municipality with perfect competition, each voter has the same probability of voting for any party and the indicator would have a value of zero, whereas it will be close to one when voters choose the same party.

$$(3)\, C_{it} = \frac{|N|}{|N|-1}\left[1 - \sum_{j=1}^{N} {S_j}^2\right]$$

The advantage of this indicator is that it allows comparing the competitiveness of elections with different numbers of parties, which is convenient for the study since the number of parties has varied over time and across municipalities; hereafter referred to as the political competition index (PCI).

## D Gang-controlled areas

**Figure A3: Gang Controlled Areas and Murder Rates Across El Salvador**

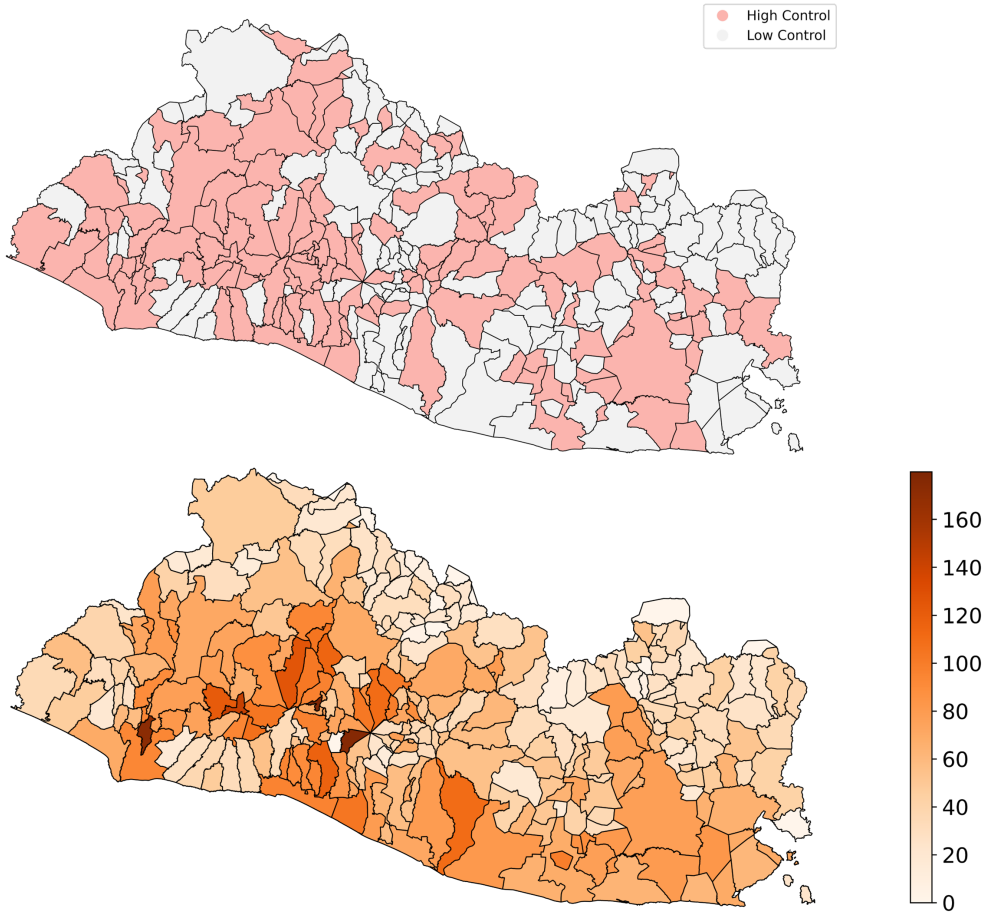
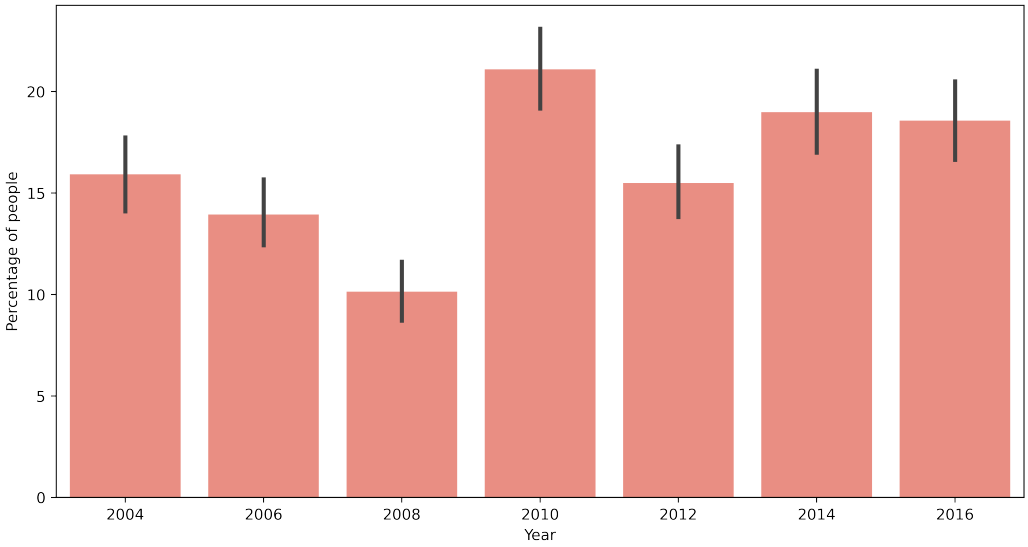


**Figure A4: People living in Gang Areas**




Source: The AmericasBarometer by the Latin American Public Opinion Project (LAPOP).

# E Gang criminality during electoral seasons

**Table A8: Criminality in Gang-Controlled Areas during Electoral Seasons (robustness to electoral season)**

| | Dependent variable | | | |
|---|---|---|---|---|
| | Homicide Rate (per 100,000 inhabitants) | | | |
| | (1) | (2) | (3) | (4) |
| Election (4 weeks) | .115 | | | |
| | (.109) | | | |
| Election (4 weeks) × Gang-Control | −.378*** | | | |
| | (.132) | | | |
| Election (8 weeks) | | .158* | | |
| | | (.087) | | |
| Election (8 weeks) × Gang-Control | | −.349*** | | |
| | | (.104) | | |
| Election (12 weeks) | | | .382*** | |
| | | | (.078) | |
| Election (12 weeks) × Gang-Control | | | −.358*** | |
| | | | (.090) | |
| Election (16 weeks) | | | | .449*** |
| | | | | (.071) |
| Election (16 weeks) × Gang-Control | | | | −.232*** |
| | | | | (.077) |
| Time and Voting Center FE | Yes | Yes | Yes | Yes |
| Observations Mean | 1.42 | 1.42 | 1.42 | 1.42 |
| Observations | 415,224 | 415,224 | 415,224 | 415,224 |
| $R^2$ | .055 | .055 | .055 | .055 |
| Adjusted $R^2$ | .052 | .052 | .052 | .052 |

*p<0.1; **p<0.05; ***p<0.01

*Notes: This table reports the association between criminality and electoral season, specifically in gang-controlled areas between 2012 and 2019. Electoral season is an indicator variable equal to one 12 weeks before and after an election. The homicide rate is measured weekly and annualized per 100,000 inhabitants. Gang control is defined as the neighborhoods where the decrease in homicides due to the 2012 truce was above median. Robust standard errors clustered by voting center are reported between parenthesis. The 2012 and 2015 elections were removed from the sample because of outside events affecting the depending variable (resp. truce and end of truce)*

## Table A9: Criminality in Gang-Controlled Areas during Electoral Seasons

| | Dependent variable | | | |
|---|---|---|---|---|
| | Homicide Rate | | Gang-Related | |
| | (1) | (2) | (3) | (4) |
| Electoral Season | .217** | .249** | .017 | .057 |
| | (.111) | (.108) | (.061) | (.062) |
| Low-Competition (HHI) | .205 | | .111 | |
| | (.125) | | (.068) | |
| Low-Competition (HHI) × Gang-Control | .449* | | .138 | |
| | (.271) | | (.143) | |
| Electoral Season × Low-Competition (HHI) | .085 | | .056 | |
| | (.144) | | (.080) | |
| Low-Competition (Vote Gap) | | .256* | | .053 |
| | | (.138) | | (.081) |
| Low-Competition (Vote Gap) × Gang-Control | | .197 | | .031 |
| | | (.241) | | (.121) |
| Electoral Season × Low-Competition (Vote Gap) | | −.021 | | −.084 |
| | | (.143) | | (.075) |
| Electoral Season × Gang-Control | −.169 | −.205* | .052 | −.009 |
| | (.127) | (.124) | (.064) | (.065) |
| Electoral Season × Gang-Control × Low-Competition (HHI) | −.249 | | −.247** | |
| | (.223) | | (.123) | |
| Electoral Season × Gang-Control × Low-Competition (Vote Gap) | | −.144 | | −.010 |
| | | (.250) | | (.126) |
| Time and Voting Center FE | Yes | Yes | Yes | Yes |
| Observations Mean | 1.42 | 1.42 | 0.45 | 0.45 |
| Observations | 243,262 | 243,262 | 243,262 | 243,262 |
| $R^2$ | .043 | .042 | .018 | .018 |
| Adjusted $R^2$ | .037 | .037 | .013 | .013 |

*p<0.1; **p<0.05; ***p<0.01

*Notes: This table reports the association between criminality and electoral season, specifically in low-competition gang-controlled areas between 2012 and 2019. Electoral season is an indicator variable equal to one 12 weeks before and after an election. The homicide rate is measured weekly and annualized per 100,000 inhabitants. Gang control is defined as the neighborhoods where the decrease in homicides due to the 2012 truce was above median. Low competition is measured using the Herfindahl Hirschman Index (HHI) and the vote gap between first and second candidates. Robust standard errors clustered by voting center are reported between parenthesis. The 2012 and 2015 elections were removed from the sample because of outside events affecting the depending variable (resp. truce and end of truce)*

# F Party votes in gang-controlled areas

**Table A10: Party Preferences in Gang-Controlled Areas**

| | Dependent variable | | | | | |
|---|---|---|---|---|---|---|
| | FMLN (2014) | | | FMLN (2019) | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Gang Control | 1.518** | | | −1.369** | | |
| | (.666) | | | (.604) | | |
| High-Prisoners | | 1.579** | | | −1.730** | |
| | | (.681) | | | (.757) | |
| High-Leaders | | | 1.874 | | | −1.634** |
| | | | (1.324) | | | (.769) |
| Municipality FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations Mean | 48.7 | 48.7 | 48.7 | 17.8 | 17.8 | 17.8 |
| Observations | 2,854 | 2,854 | 2,854 | 1,422 | 1,422 | 1,422 |
| $R^2$ | .475 | .474 | .473 | .663 | .662 | .661 |
| Adjusted $R^2$ | .425 | .424 | .423 | .592 | .592 | .591 |

*p<0.1; **p<0.05; ***p<0.01

*Notes: This table reports the association between gang contol and party specific votes in the 2014, 2018, and 2019 elections at the voting center level. Gang control is defined as the neighborhoods where the decrease in homicides due to the 2012 truce was above median. High-Prisoners represents the neighborhood where the number of convicted gang members was above average. Gang-Leaders represents the neighborhoods of origins of convicted gang leaders. We added municipality fixed effects and clustered the standard errors by municipality.*

## Table A11: Electoral Participation and Crime

| | Dependent variable | | | |
|---|---|---|---|---|
| | Electoral Participation | | | |
| | (1) | (2) | (3) | (4) |
| 6-month Homicide Rate Prior to Election | $-.003^{***}$ | | | |
| | (.001) | | | |
| 3-month Homicide Rate Prior to Election | | $-.002^{***}$ | | |
| | | (.001) | | |
| 6-month Gang Homicide Rate Prior to Election | | | $-.004^{*}$ | |
| | | | (.002) | |
| 3-month Gang Homicide Rate Prior to Election | | | | $-.005^{***}$ |
| | | | | (.001) |
| Election and Voting Center FE | Yes | Yes | Yes | Yes |
| Observations Mean | 52.5 | 52.5 | 52.5 | 52.5 |
| Observations | 5,234 | 5,234 | 5,234 | 5,234 |
| $R^2$ | .645 | .646 | .645 | .646 |
| Adjusted $R^2$ | .526 | .527 | .526 | .527 |

$^{*}$p<0.1; $^{**}$p<0.05; $^{***}$p<0.01

*Notes: This table reports the association between criminality 6 months and 3 months prior to elections and voters' turnout. The homicide rate is measured weekly and annualized per 100,000 inhabitants. We added election and voting center fixed effects and clustered the standard errors by voting center.*

**Table A12: Participation in Gang-Controlled Areas (LAPOP survey)**

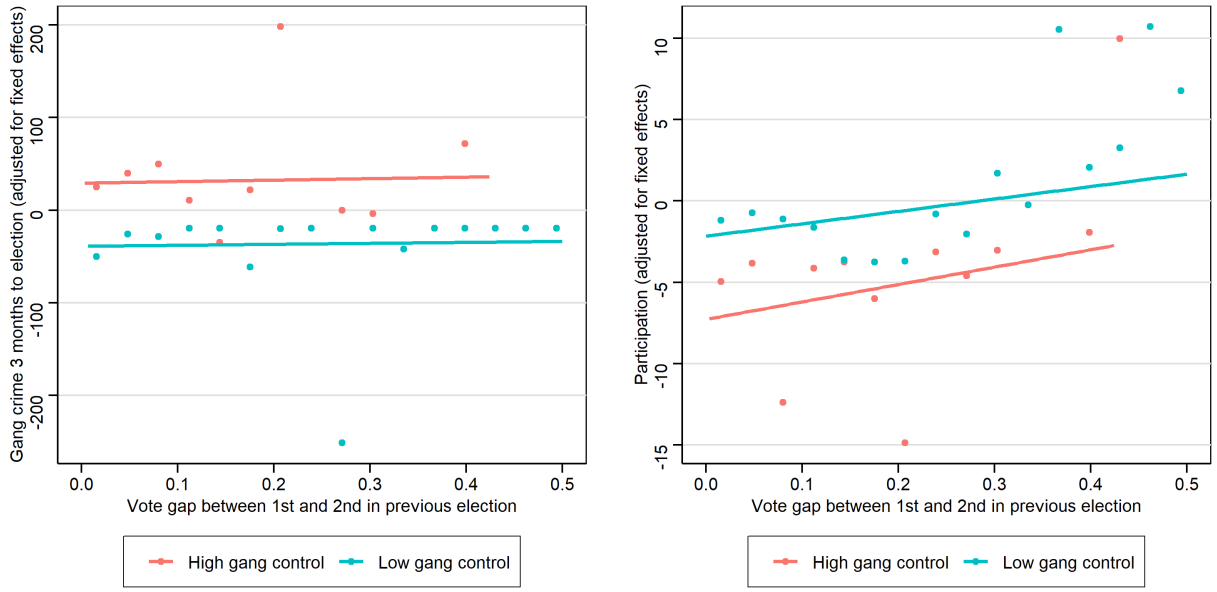
| | Dependent variable | | |
|---|---|---|---|
| | Electoral Participation | | |
| | (1) | (2) | (3) |
| Gang-Control (Survey) | 5.052*** | 6.763*** | 5.434*** |
| | (1.072) | (1.867) | (1.757) |
| Years of Education | | .972*** | 1.053*** |
| | | (.153) | (.173) |
| Urban | | −4.586*** | −3.539** |
| | | (1.522) | (1.564) |
| Gender | | 1.030 | 1.218 |
| | | (1.926) | (1.960) |
| Age | | 4.303*** | 4.326*** |
| | | (.180) | (.189) |
| $Age^2$ | | −.037*** | −.038*** |
| | | (.002) | (.002) |
| Income Category FE | No | Yes | Yes |
| Time and Province FE | No | No | Yes |
| Observations Mean | 72.3 | 72.3 | 72.3 |
| Observations | 7,573 | 3,950 | 3,950 |
| $R^2$ | .002 | .174 | .179 |
| Adjusted $R^2$ | .001 | .169 | .171 |

*p<0.1; **p<0.05; ***p<0.01

*Notes: This table reports the association between gang control and participation using LAPOP survey data between 2010 and 2018. Respondents were asked whether they thought that their neighborhoods was affected by gangs. Gang-control is an indicator variable equal to 1 when respondants replied "a lot". Robust standard errors clustered by province are reported between parenthesis.*

# G Low competition neighborhoods

**Figure A5: Competitive districts, gang criminality, and participation (2012 election)**




Source: own elaboration based on police data (PNC) and electoral results by the Electoral Supreme Court at the voting center level.