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ARTICLE

Meet the *Narco*: increased competition among criminal organisations and the explosion of violence in Mexico

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ABSTRACT

Several previous studies have found that interventions by security forces against criminal organisations result in increased violence related to organised crime. However, much less is known about how and why this effect occurs. Our study not only identifies the causal mechanisms that explain this outcome, but also evaluates the empirical validity of these mechanisms. Employing a novel data set, we find that following security-force intervention, the number of criminal organisations increases, and such greater fragmentation in turn raises the incidence of violence among criminal organisations as the relative power of the organisations changes. We employ a mediation model to verify the existence of these causal mechanisms. In addition, we find a decreasing rate of rise in levels of violence as the number of organisations increases.

KEYWORDS

Violence; criminal organisations; public security forces; Mexico

While drug trafficking and violence related to organised crime are not inextricably linked,[1] they are often related and usually do occur together. The intensity of relationship between drug trafficking and violence also seems to vary substantially over time and across countries. Several studies have analysed the effects of law enforcement on violence to explain this variation. These approaches have theorised that law enforcement destabilises drug markets and leads to an upsurge in violence.[2] According to Werb et al.,[3] most of these studies (91% in 11 studies that have employed regression analysis) report that law enforcement increases violence. Previous studies have shown that if law enforcement dismantles criminal organisations' leadership through capture or assassination, splits are triggered from within those organisations; this fragmentation then increases violence[4] among criminal organisations[5] as factions engage in violent succession battles.[6] Thus, a high level of competition among a greater number of criminal organisations – characterised as a 'cottage industry'[7] – increases levels of violence.[8]

While international literature has addressed the causal mechanism between law enforcement and violence, to our knowledge there is no study that integrates this two-step causal chain in a single empirical analysis. This study examines, step-by-step, the explanatory validity of the entire causal chain that describes *how* and *why* law

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enforcement affects violence. In this regard, we focus on explaining confrontations *exclusively* among members of the same or different criminal organisations (in which the public security forces do not intervene),[9] which account for the majority of deaths in Mexico since 2006.[10] We also find that a positive marginal impact of fragmentation of criminal organisations on violence, but that this diminishes as fragmentation grows.

We also verify that law enforcement triggers violence by changing the relative strength of criminal organisations, since organisations are prone to take advantage of new found superiority and attack others.[11] Law enforcement may also foster violence among leaders within the same organisation, who fight for the position left by a killed or arrested leader[12] even when criminal organisations do not split. We incorporate a separate test for this potential impact on violence among criminal organisations in our empirical model; and we also find support for this argument in the short term.

Our study analyses the effects of interventions of public security forces after the Mexican government adopted an aggressive policy in 2006. Several recent studies have connected former President Felipe Calderón's 2006 drug interdiction policy with the explosion of violence in Mexico. Calderón's strategy of substantially increasing police and military forces in response to criminal organisations (most of them closely related to illegal drug trafficking) has been seen as escalating violence, rather than reducing it.[13] As such, large-scale attacks on criminal organisations by security forces characterise this new stage in the Mexican government's war on drugs. As Astorga and Shirk,[14] Ríos[15] and Chabat[16] argue, the Mexican government altered its approach towards criminal organisations from a policy based on tolerance and secret pacts[17] (in which corruption was rampant) to one characterised by recurrent and violent attacks. In addition to deploying the military and the navy in the fight against criminal organisations,[18] President Calderón also introduced several important reforms to the criminal justice system to severely penalise organised crime.[19]

This change of policy exactly coincided with a pronounced upsurge of violence related to the activities of criminal organisations.[20] As such, we focus our evaluation using data on violence registered after 2006.[21] The substantial heterogeneity of criminal organisations, together with the concentration of violence at the subnational level,[22] makes Mexico an ideal setting to examine the effects of changing numbers of criminal organisations and law enforcement on violence.

Our work presents four contributions to the literature about the relationship between law enforcement and violence. First, we evaluate the validity of a causal chain that explains how confrontational law enforcement triggers violence. We demonstrate that such intervention leads to assassinations and arrests, which in turn increases the number of criminal organisations. As a result, more organisations attack each other when competing for control of access to drug markets, boosting levels of violence.

Second, our empirical analysis employs new measures of law enforcement that include: (1) the homicide of *any member* of a criminal organisation through confrontation with public security forces and (2) the detention of *any member* of a criminal organisation through confrontation with public security forces. Calderón et al.[23] posit that while the capture of leaders and detention of lieutenants promote violence in the succeeding 12 and 6 months, respectively, such effects tend to disappear in the long term. In contrast, Phillips[24] finds that homicides and arrests of leaders are associated with *decreases* in violence in the first 6 months post-interdiction, but that violence

actually *increases* in the long run. Although both studies predict that law enforcement tends to increase violence, they differ on the timing of these effects. Such differences might be explained by how law enforcement is measured (capture and assassination of leaders and/or lieutenants).

Instead of focusing only on the capture or homicide of leaders and lieutenants, our indicators include assassinations or arrests of any criminal group member, since such interventions can produce both organisational fragmentation and weakening, allowing stronger criminal organisations to seize competitive advantage. In fact, several new criminal organisations have indeed emerged since 2006.[25] The aggregated, broader and more inclusive measure we employ allows us to estimate the impact of such interventions more comprehensively, rather than estimating only partial effects taking into account the impact of deaths or detentions of leaders and lieutenants alone.[26]

Third, our study offers a count of the number of criminal organisations, allowing us to estimate the impact of fragmentation of illegal drug market suppliers on violence. Fourth, we select the Mexican context to test our hypotheses, as it provides an ideal case study on the effects of a very aggressive policy against criminal organisations. Unlike most empirical analyses, this study assesses the relationship between law enforcement and violence in a non-US setting. This exercise helps evaluate the generalisability of the existence of a positive relationship between law enforcement and violence that has been noted by prior studies.[27]

This study is also important in evaluating the costs involved in aggressive drug interdiction policies. Specifically, our study provides critical context on the effects of the reforms initiated by President Calderón. Such policies might also be considered by other nations with a strong presence of criminal organisations, such as Guatemala, El Salvador, Honduras, Nicaragua and Philippines. Criminal organisations have been found to depress political and electoral participation,[28] while simultaneously pursuing political goals such as gaining control of local governments (municipalities) by distorting campaigns and elections.[29] Furthermore, Viridiana Ríos[30] calculates that the war against criminal organisations produces annual economic losses of about US$4.3 billion in Mexico.[31] In addition to these economic and political costs, this study reveals that this aggressive policy is extremely costly in terms of human lives and human rights violations, and produces a general perception of insecurity.

The Mexican case

Research on the evolution of violence – measured by the number of homicides – indicates that the last decade has witnessed an explosion of violent events. Figure 1 provides a glimpse of how violence has evolved over the period from 1990 to 2012, measured by the number of homicides per year; consistent with several studies,[32] it shows that homicides declined in number between 1992 and 2007, but increased substantially following 2007.

What can explain the explosion of violence since 2007? As mentioned above, several studies blame President Calderón's aggressive drug policy. Calderón's policy departed from a long-standing position of tolerance to one characterised by recurrent, coordinated and violent attacks on criminal organisations by the military,[33] the navy and the police.[34] The policy of tolerance, abandoned by President Calderón, has

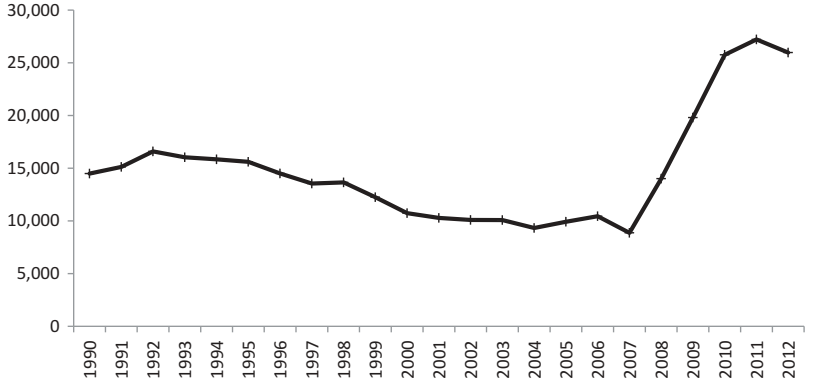

Figure 1. Number of homicides per year in Mexico.
Source: National Institute of Statistics and Geography (INEGI).

been widely studied in the literature. For instance, during the administrations of the *Institutional Revolutionary Party* (PRI), the Mexican government allowed criminal organisations to trade or transport their illegal products relatively freely.[35] Other studies discuss the existence of secret government pacts, where Mexican state authorities provided protection to criminal organisations from the aggression of others whose allegiance with the government was weaker.[36] According to these agreements, in exchange for government sanction, criminal organisations were prohibited from engaging in the open sale of drugs in the Mexican market or committing violent acts in Mexican territory.[37]

Once the Mexican government shifted to a confrontational policy, the systematic arrests or killings of criminal leaders by public security forces led to further violence,[38] as criminal groups fought amongst themselves to fill the power vacuums that ensued.[39] As internal fights precipitated splits in organisations along lines drawn by competing factions,[40] the number of criminal organisations grew rapidly, from 20 in 2007 to nearly 80 in 2011.[41] Several scholars contend that greater competition for monopolistic control of territory and routes to the US market triggered further violence[42] as confrontations among criminal organisations for the control of territory and routes became more frequent.[43]

Key violence indicators reveal that most of the increase in violence experienced in Mexico since 2006 has occurred exclusively in confrontations between members of different criminal organisations. In this study, we categorise this mode of violence as 'private'. While 334 members of public forces were killed during 2007 in confrontations with criminal organisations, deaths resulting from confrontations *exclusively* between members of criminal organisations totalled 2347 in the same year. During 2011, public forces casualties rose to 739, while 'private' violence between criminal organisations ballooned to 12,896. Thus, the rates of growth in violence between 2007 and 2011 saw 30% for the deaths of public officers and 112% for deaths among members of criminal organisations. Clearly, violence among or within criminal groups is much more prevalent, and it is the type of violence that has grown the most.

Key data points reveal a disturbing trend relating to the change in intervention strategy. In 2007, 203 criminal organisation members were arrested and 60 were killed by public security forces. However, between 2007 and 2011, during Calderón's presidency, the average number of annual arrests grew 181%, from 203 to 1673, while the average number of members killed by public security forces grew 710%, from 60 to 1753. Overall, these features confirm that the new interventionist policy was not only more aggressive, but also more lethal.[44]

Law enforcement, the fragmentation of criminal organisations and violence: our hypotheses

Eck and Gersh[45] contend that low levels of law enforcement produce both low levels of violence and a monopolistic structure of the drug market that they call 'concentrated industry'. In this type of market, criminal organisations avoid the use of violence since this strategy is not needed and might attract further law enforcement. However, the capture or assassination of criminal leaders may lead to splits between factions[46] that then fight for control of the organisation.[47] If these competing factions do not reach an agreement about succession due to a lack of formal dispute mechanisms,[48] they will keep fighting indefinitely. Kleiman et al.[49] maintain that even high-level drug dealers can be replaced fast; but when this does not happen, competing factions keep fighting each other and soon emerge as new criminal organisations. As this proliferation produces a 'cottage industry', numbers of both possible targets and potential aggressors grow.[50]

Furthermore, with rising numbers of members (leaders or not) killed or captured by security forces, the power base of existing criminal organisations weakens. Embroiled criminal organisations may experience not only economic losses[51] but also reductions in their capacity to attack or defend due to the loss of members. This reducing power base may facilitate the emergence of new or neighbouring criminal organisations,[52] triggering further fragmentation[53] in a particular area.[54] These considerations lead us to propose our first hypothesis:

Hypothesis 1: *Enhancements in law enforcement increase the number of criminal organisations in a specific territory.*

Several studies contend that criminal organisations aim to expand their military efforts to maximise profits as the number of their competitors grow,[55] increasing the likelihood of violent confrontations. To choose the scope of violence criminal organisations want to employ, they take into account the expected benefits of increasing violence and the costs necessary to finance such changes.[56] According to Castillo et al.,[57] criminal organisations could divide the market peacefully when a new entrant shows up, but strong incentives exist to employ violence to increase revenues substantially in a market with weakly defined property rights.[58] Thus, criminal organisations are likely to employ violence against new entrants as competition intensifies over the same market.[59]

In addition to this rational choice argument, Papachristos[60] proposes a sociological explanation. He points out that criminal group behaviour is governed by norms of retaliation against competitors to repair respect or enhance a reputation as the

dominant organisation. Once organisations start fighting each other due to internal splits or the emergence of a new ambitious entrant, they will continue attacking each other in subsequent periods.[61] In other words, if law enforcement actions make emerging or existing organisations fight each other, they will continue doing so by themselves. Considering these two arguments, we present our second hypothesis:

Hypothesis 2: *An increase in the number of criminal organisations raises incidence of violence among criminal organisations.*

Of course, a sceptical reader might believe that government interventions could eliminate some or all criminal organisations from a territory, and consequently, reduce violence. This would lead to an alternative hypothesis: that the interventions of public security forces decrease the number of criminal organisations in a territory, and such reduction depresses violence among criminal organisations. Nevertheless, the extremely high profits that drug production and trafficking offer make this scenario highly unlikely. It is much more reasonable to think that the existence of very high profits encourages the reorganisation of criminals, the emergence of new organisations, the arrival of other organisations to fight for territory and routes,[62] and the hiring of new members who tend to be infinitely replaceable,[63] especially in developing countries with relatively high levels of poverty.

Although violence and the fragmentation of criminal organisations can be positively related, we do not know whether such a relationship intensifies or declines as the scope of fragmentation varies. In particular, we argue that as fragmentation increases, which is very likely a consequence of internal splits or of the arrival of newcomers, the organisational capacity of the average criminal group may weaken and the use of sophisticated technology may decrease.[64] If the organisational capacity has weakened, recovery efforts to enhance firepower might become more costly as the number of members has reduced. Having fewer members might increase the opportunity costs for the organisation since its members might already be fulfilling other important tasks.[65] Under these circumstances, gaining additional firepower to attack other organisations might become more costly after suffering a split. Furthermore, there could be decreasing marginal returns to investment in violence,[66] since potential revenues are not endless (they might become increasingly scarcer as more organisations participate in a market) and the increase of competitors might make revenue capture more costly. Specifically, an increase in the number of violent competitors is likely to strengthen the barriers an average criminal organisation has to face when attempting to capture these resources. In sum, while greater fragmentation triggers violence, the strength of incentives to employ violence weakens, marginal revenues decline and marginal costs mount.

Finally, existing criminal organisations might become more cautious when deciding to attack others, as a greater number of organisations might themselves now strike. Thus, although both the number of possible targets and the number of potential aggressors grow as fragmentation increases, which should increase violence as Hypothesis 2 predicts, the remaining competitors might become more risk averse in combatting others as further splits occur or newcomers emerge. These arguments lead us to propose our third hypothesis:

Hypothesis 3: *There is a decreasing rate of rise in levels of violence as the number of organisations increases (there are diminishing effects to the number of criminal organisations).*

The following section evaluates these hypotheses.

Empirical analysis

In order to test our three hypotheses, we use a data set gathered by the Drug Policy Program at the Centre for Research and Teaching in Economics (CIDE) that includes information of events related to organised crime. The data comprises 36,378 events from December 2006 to November 2011. This data set constitutes the largest repository of violent events related to the activities of criminal organisations in Mexico; and to our knowledge, this is the first analysis to use this resource to assess the relationship between law enforcement, the degree of fragmentation of the drug-related illegal market and violence.[67] For each event, the data set shows information regarding the affiliation (public security forces or criminal organisations) of the victims and perpetrators. For more information regarding the complete data set, see Atuesta et al.[68]

Since the variable we aim to explain is ('private') violence between and within criminal groups, we employ the rate of criminal members' deaths per 100,000 inhabitants (specifically resulting from inter-organisational confrontation). As we note above, we are excluding from this variable the deaths of governmental or police officers, because we are only testing the mechanism by which governmental intervention affects the number of criminal organisations, and to what extent fragmentation affects private violence. As we state above, these violent episodes account for most violence (as measured by deaths) in Mexico (95.02% of violence). Figure 2 shows the distribution per municipality of the rate of private violence per 100,000 inhabitants throughout the Mexican territory. As shown, private violence is highly localised. In fact, not all the municipalities had positive rates during the period of 2007–2011. Of the 2438 municipalities in Mexico, 50.94% did not experience any killing through inter-organisational confrontations (1242 municipalities).

We use two variables as proxies for law enforcement: the number of criminal organisations' members detained in confrontations with the government, and the number of criminal organisations' members killed in confrontations with the government. Both variables measure a direct intervention by public security forces that could divide or weaken criminal organisations. Either indicator provides a direct measure of the loss of members for a criminal organisation. Since we are interested in examining the mechanisms through which law enforcement affects the number of groups in a specific territory and the scope of private violence, we are including in the regressions both the present and lagged variables of the law enforcement variables to account for different dynamic and temporal effects.

The second element to be operationalised is fragmentation of organised crime. Fragmentation is measured by the number of criminal organisations in a specific municipality and in a specific moment.[69] To evaluate the validity of our third hypothesis, we use a quadratic of the number of criminal organisations, whose estimated coefficient we expect to be negative. This configuration allows us to test for the presence of

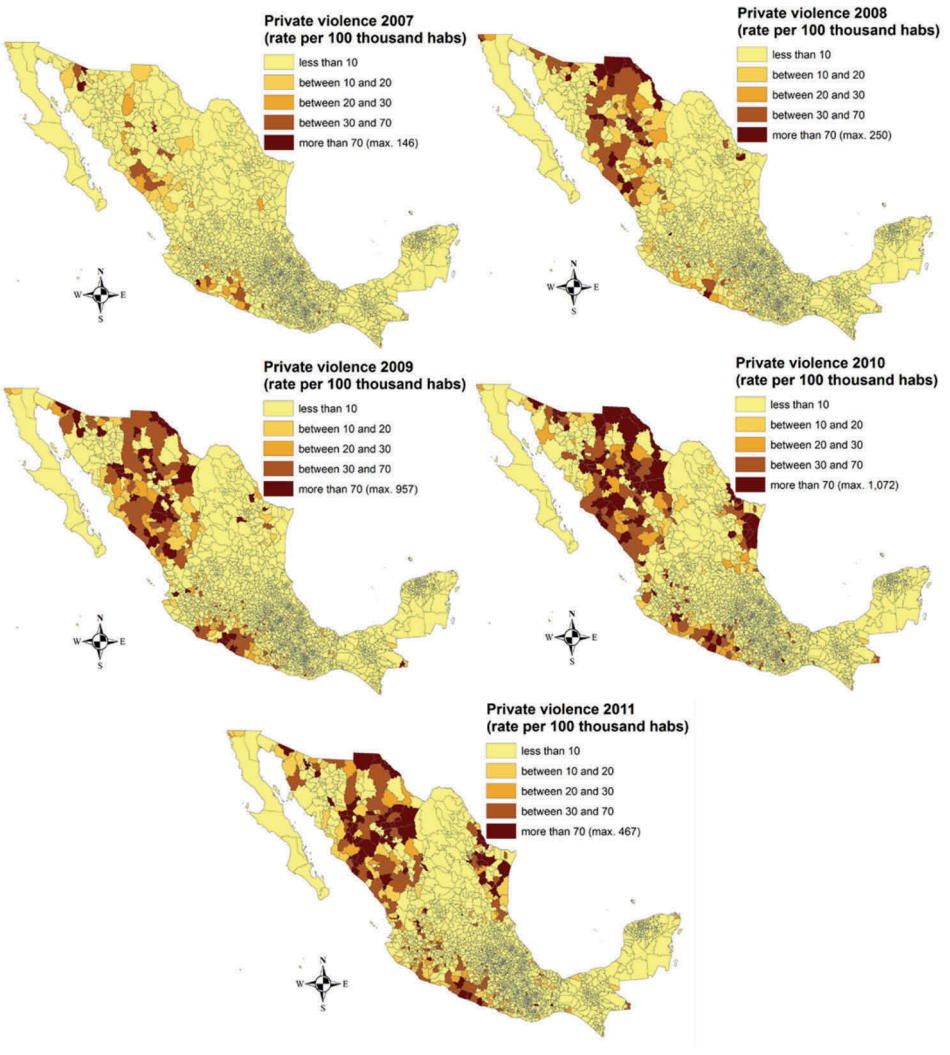

Figure 2. Rates of private violence by 100,000 inhabitants (measured by the number of criminal organisations' members killed in inter-organisational confrontations).

diminishing effects to the number of criminal organisations. Figure 3 shows the fragmentation and the dispersion of the number of criminal organisations across municipalities. As with violence, we find patterns of high concentration of criminal organisations throughout the Mexican territory. We also observe how the number of criminal organisations has proliferated rapidly since 2007.

We also consider the possibility that fights proceeding from power vacuums (at any level of command) as a product of law enforcement could produce further violence, even if the organisations did not fracture.[70] For instance, Rasmussen and Benson[71] provide an explanation for why this might happen. Massive arrests of drug offenders can increase other crime rates because resources allocated to law enforcement are scarce.[72] If the proportion of arrests of drug offenders increases, the proportion of

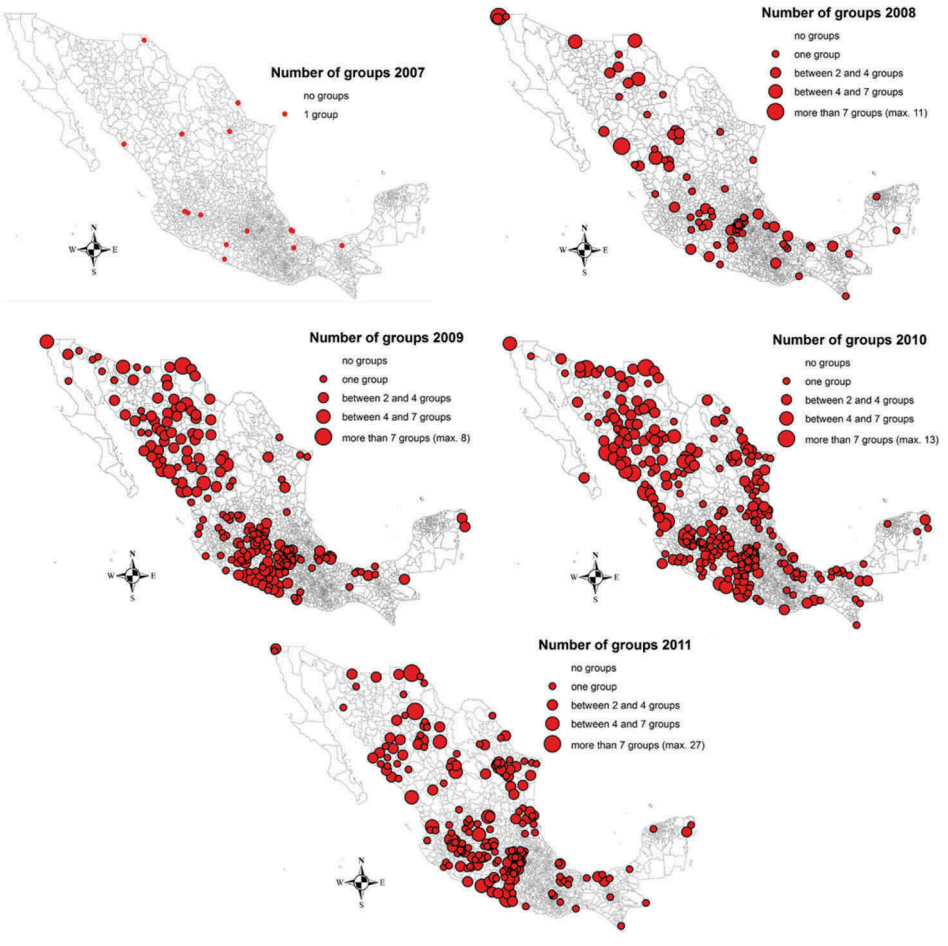

Figure 3. Number of active criminal groups per municipality per year.

arrests of non-drug offenders committing crimes is going to decrease, as law enforcement resources are limited.[73] Since drug offenders commit relatively fewer crimes (e.g. those of drug consumers) than other offenders,[74] the opportunity cost of this allocation is likely to be high; consequently, other violent crime rates will go up.[75]

Furthermore, individuals within criminal organisations may seek promotion to available positions by employing violence as a show of strength and qualification for these roles.[76] If members agree on a command structure, such fights, if they ever occur, will soon end. Thus, this effect on private violence might decline relatively fast. If the factions never agree, they are likely to split shortly thereafter into different organisations to continue earning profits and minimising losses. Finally, interventions of public security forces might also distort the relative distribution of power among criminal organisations. These changes could also boost confrontations among them.[77] Criminal organisations that become relatively stronger might be tempted to attack the weakened ones.

Figure 4 summarises the arguments that inspire our first two hypotheses and this upsurge of violence, due to either temporary internal fights for leadership or changes in the relative strength of criminal organisations.

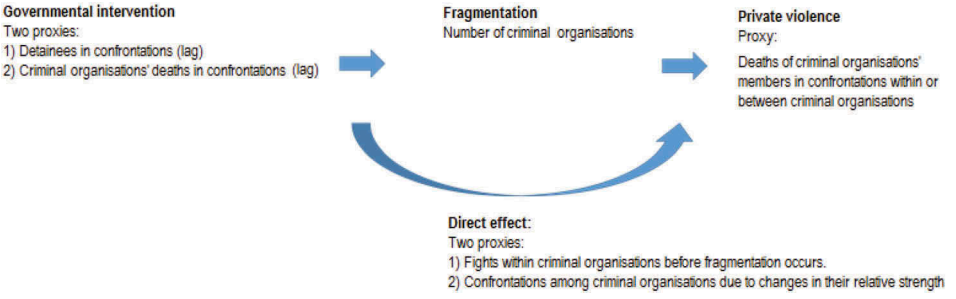

Figure 4. Our theoretical arguments.

To test our hypotheses, we use mediation analysis in which the variable of interest (in this case governmental intervention) affects the output variable (private violence) directly and through a mediator variable (fragmentation). Mediation analysis can allow us to test separately the arguments explained in this article and displayed in Figure 4. The 'indirect effect' in this empirical approach is the following: law enforcement increases the number of criminal groups in a specific territory (hypothesis 1); then, the increase in the number of criminal groups competing for territorial control increases incidence of violence among criminal organisations (hypothesis 2). As explained above, even if the number of groups remains equal, governmental interventions may also increase private violence because they can generate clashes within groups and between existent groups to rebalance power. The mediation analysis estimates this impact through the 'direct' effect in which law enforcement affects the level of private violence. In sum, these are the two mechanisms by which violence can be affected by the introduction of governmental public security forces in a specific territory. The mediation model allows us to estimate the magnitude and statistical significance of the 'indirect effect' while controlling for the influence of the 'direct effect'.[78]

We employ hierarchical structural equation (mediation) modelling that employs both a Gaussian estimator (censored at zero) and a negative binomial estimator to account for the distributions of the output and mediator variables, respectively.[79] In this model, the output variable is the rate of private violence per 100,000 inhabitants; the key independent variable is either one of the measures of law enforcement; and the mediator variable is the number of criminal organisations.[80]

We employ two levels of analysis in the model: events and municipalities. The multilevel model allows us to predict random effects in the variance–covariance matrix for the municipality level while controlling for the event level. This exercise enables us to find unbiased standard errors.[81] This technique thus provides a more conservative inference for the aggregate effect.

The two equations (output and mediator equations) of the model to be estimated are the following:

$$Y_{it} = \beta_0 + \alpha_t + \beta_1 Y_{it-1} + \beta_2 G_{it} + \beta_3 G_{it-1} + \beta_4 F_{it} + \beta_5 F_{it}^2 + \mathbf{X}'\beta_k + \varepsilon_1, \quad (1)$$

and

$$F_{it} = \beta_0 + \beta_2 G_{it} + \beta_3 G_{it-1} + \mathbf{X}'\beta_k + \varepsilon_2, \quad (2)$$

where Equation (1) estimates the total effect of the governmental intervention and group fragmentation on private violence, using a Gaussian left-censored estimation,[82] and Equation (2) estimates the effect through the influence of governmental intervention in group fragmentation (from which the indirect effect is estimated), using a negative binomial estimation. Y_{it} is private violence within municipality i at time t, measured by the number of criminal group members killed per 100,000 inhabitants in each municipality; Y_{it-1} is private violence in municipality i at time $t-1$[83]; G_{it} measures law enforcement in municipality i at time t; G_{it-1} represents this intervention in municipality i at time $t-1$ (both are measured by the number of detainees *and* the number of criminal group members killed in confrontations with the government);[84] F_{it} is group fragmentation in municipality i at time t, measured by the number of active criminal organisations in each municipality; and the matrix X' is a $k \times n$ matrix of control variables.

The control variables are drawn from the significant factors affecting violence identified in previous literature. As already identified by Phillips,[85] Dell[86] and Osorio,[87] violence has spill over effects, and the level of violence in a specific municipality is affected by the level of violence in neighbouring municipalities. Therefore, we include the average number of homicides in neighbouring municipalities. Moreover, Moeller and Hesse[88] and Phillips[89] suggest that the level of violence depends on the level of violence observed in the previous period, for which reason our model includes the lag of private violence as an explanatory variable. Furthermore, Dell[90] shows that the level of violence is influenced by the political party in office, as municipalities ruled by the Partido Acción Nacional (PAN) experience more violence than municipalities governed by alternative parties. We incorporate two dummies that indicate whether the PAN party was in charge of the state, and whether the PAN party was ruling the municipality. The location of municipalities might also matter, since the most violent municipalities are located in those areas of the country where drugs are produced or commercialised (either domestically or trafficked to the US). Then, three binary variables control for whether or not municipalities are located on the Pacific Coast, on the US border or on the Gulf of Mexico. Finally, we control for the percentage of the population living in poverty, since violence could be influenced by the lack of economic opportunities.[91]

Both equations include time-fixed effects and state-fixed effects, and are estimated using hierarchical modelling in which observations of the same municipality are nested together. We also employ short-, mid- and long-term effects to assess the duration of the effects of law enforcement on private violence. This exercise can shed light on whether these effects are temporary or long-lasting, as previous studies also explore.[92] For this purpose, we use quarters for short-term periods, semesters for mid-term periods and years for long-term periods.[93] These periods are not only similar to those of previous studies, but also appropriate to evaluate over time the evolution of the magnitude of the marginal effects of law enforcement.

Analysis of the results

The results of the direct and indirect mediation effects, which test our hypotheses, as well as the coefficients for the number of criminal organisations and for the squared number of criminal organisations in each municipality, are shown in Tables 1, 2 and 3 for the short-, mid- and long-term effects, respectively. In Tables A1, A2 and A3, we display the whole set of results, including those measuring the impact of our control variables. We estimate two regressions for each period of time (quarters, semesters and years). In the first

Table 1. Short-term results of the mediation analysis (indirect, direct and total effects).

	Column A	Column B
	Mediator: fragmentation measured by the number of criminal groups	
Short-term effects	Governmental intervention: lag of detainees in confrontations	Governmental intervention: lag of criminal organisations' members killed in confrontations
Number of criminal organisations	17.60***	17.26***
	(0.89)	(0.89)
Number of organisations squared	−1.81***	−1.72***
	(0.16)	(0.16)
Indirect effect	0.73***	0.74**
	(0.21)	(0.24)
Direct effect	0.55**	0.31
	(0.20)	(0.23)
Total effect	1.28***	1.05***
	(0.29)	(0.33)

Standard errors in parentheses.
***$p < 0.001$, **$p < 0.01$

Table 2. Mid-term results of the mediation analysis.

	Column A	Column B
	Mediator: fragmentation measured by the number of criminal groups	
Mid-term effects	Governmental intervention: lag of detainees in confrontations	Governmental intervention: lag of criminal organisations' members killed in confrontations
Number of criminal organisations	17.60***	17.41***
	(1.13)	(1.12)
Number of organisations squared	−1.10***	−1.05***
	(0.12)	(0.12)
Indirect effect	0.99***	0.87**
	(0.27)	(0.28)
Direct effect	0.29	−0.85**
	(0.28)	(0.30)
Total effect	1.28***	0.02*
	(0.38)	(0.41)

Standard errors in parentheses.
***$p < 0.001$, **$p < 0.01$, *$p < 0.05$

Table 3. Long-term results of the mediation analysis.

	Column A	Column B
	Mediator: fragmentation measured by the number of criminal groups	
Long-term effects	Governmental intervention: lag of detainees in confrontations	Governmental intervention: lag of criminal organisations' members killed in confrontations
Number of criminal organisations	18.20***	17.62***
	(1.21)	(1.20)
Number of organisations squared	−0.80***	−0.77***
	(0.09)	(0.09)
Indirect effect	0.26*	0.15
	(0.11)	(0.16)
Direct effect	−0.58*	−0.89*
	(0.25)	(0.35)
Total effect	−0.32	−0.75^
	(0.27)	(0.39)

Standard errors in parentheses.
***$p < 0.001$, *$p < 0.05$, ^$p < 0.1$.

column (column A), the proxy for law enforcement is the number of detainees in confrontations with the government (current and lagged one period), while in column B, the proxy for governmental interventions is the number of criminal group members killed in confrontations with the government (current and lagged one period). For each of these law enforcement variables, the measure of fragmentation used is the number of criminal organisations in each municipality.

Table 1 shows the different effects described above for the short-term period. The indirect effect is positive and statistically significant in both specifications, corroborating our first two hypotheses in the short term (Table A1 also confirms the validity of hypotheses 1 and 2 separately: law enforcement increases the number of criminal organisations, and such increase leads to further private violence). Moreover, we observe that interventions by public security forces affect private violence through the 'direct effect', as argued in previous studies.[94] The combination of both indirect and direct effects results in a positive and statistically significant total effect: confrontational law enforcement raises levels of violence.[95]

Our third hypothesis is corroborated by observing the coefficient of the number of criminal organisations squared. The diminishing effect to the number of criminal organisations matters and also shapes violence. As Table A1 shows, the lagged dependent variable, the location next to the US border and the Pacific Coast, and the average number of homicides in neighbouring municipalities matter consistently when explaining violence in Mexico.

Medium-term effects of governmental intervention on private violence are displayed in Table 2. The indirect effects matter in both specifications, indicating that an increase in criminal group detainees or members killed in confrontations increases the number of criminal organisations in a municipality, ultimately raising levels of 'private' violence. Moreover, the coefficient for the squared number of criminal organisations in a municipality is also negative and statistically significant in both models, indicating the existence of decreasing marginal effects to the number of criminal organisations on 'private' violence. As in the short term, we verify the validity of the three hypotheses in the middle run. Interestingly, the direct effect disappears in the mid-term. This result confirms that this effect dilutes over time, as expected by Dickenson's study.[96] Finally, the relevance of the control variables is similar to what we found when analysing the short-term effects (see Table A2).

Table 3 shows the mediation analysis for the long term. These results suggest that the indirect effect loses significance, implying that the impact of governmental interventions weakens over time, but that this decay is much less rapid than that of the direct effect. Although the coefficient for the number of criminal organisations is still positive and statistically significant (suggesting that a higher number of groups in a territory leads to more private violence), governmental interventions do not seem to produce a significant indirect effect on private violence in the long term. Furthermore, the coefficient for the square of the number of groups is negative and statistically significant with the two proxies of governmental intervention, corroborating the third hypothesis of diminishing effects to the number of criminal organisations.

Although most of the positive effect on violence that law enforcement creates dilutes over time, the degree of fragmentation of criminal organisations, possibly resulting from law enforcement, still increases the scope of violence in the long run. This result suggests that the damage law enforcement produces tends to diminish over time, but it is unlikely to disappear in the long run if law enforcement increased the number of

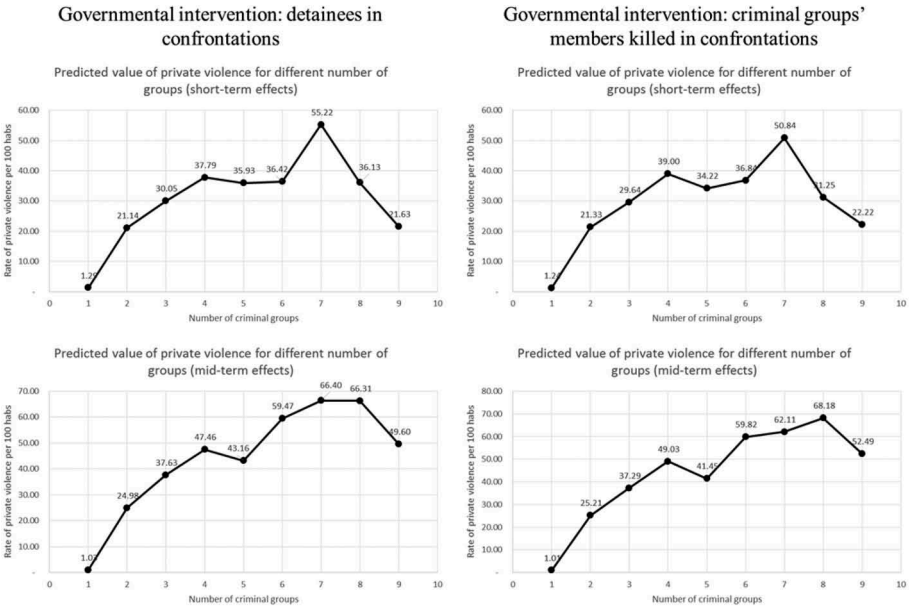

Figure 5. Predicted values of private violence for different number of groups.

criminal organisations. This finding teaches us that the design of law enforcement matters. Confrontational law enforcement strategies that split criminal organisations are more likely to increase violence in the long run. The effect on the degree of fragmentation of criminal organisations is paramount to understanding the long-lasting effects of law enforcement on violence. Finally, the effects of control variables also tend to weaken in the long run, as Table A3 shows.[97]

Evidence confirming our hypotheses is better observed in Figure 5, in which the predicted values of private violence are shown for different numbers of criminal organisations, keeping all other independent variables in the model at their mean values. We are analysing these effects for the short and mid-term (since in these periods we find significant indirect effects of law enforcement on private violence), using as proxy for law enforcement the number of criminal group members detained or killed in confrontations with the government. We note that the trend observed in the increase of private violence is greater when the criminal organisations change from zero to two, but after two criminal organisations, the increase in private violence diminishes marginally. These results corroborate our third hypothesis: as the number of criminal organisations increases, the rise in 'private' violence slows.

Conclusions

This study provides several lessons. First, our work confirms the existence of a positive relationship between greater law enforcement and violence in a non-US setting, which supports the generalisability of this finding by prior studies.[98] Our study also shows that the relationship between law enforcement and violence is complex, and that variations in the design of law enforcement might change its marginal effect on violence. Our empirical

analysis warns that law enforcement strategies designed to weaken criminal organisations are likely to produce a long-lasting effect on violence, particularly if this weakening leads to splits in criminal organisations. Since these effects tend to endure over time, the scope of violence is likely to increase fast when following this strategy. Our analysis questions the idea that a confrontational approach, producing the multiplication of criminal organisations, is an acceptable strategy for decreasing the levels of violence currently observed in Mexico.

Second, this article explains the increase in violence in Mexico as a consequence of the implementation of the 'war against organised crime' during the government of Felipe Calderón. The 'beheading' strategy triggered violence through an increase in the fragmentation of criminal groups. Additionally, we find that the increasing effect of organisational fragmentation on violence becomes smaller as the number of organisations increases. In sum, our results indicate that, regardless of the proxies used or the time periods analysed (short, mid or long term), strengthening confrontational law enforcement has contributed decisively to an explosion of violence in Mexico.

Third, our results suggest that confrontational law enforcement in a specific territory disrupts the status quo of organised crime, and this disequilibrium causes a significant rise in violence between and within groups. If confrontational law enforcement has consistently increased violence in recent years, should not the Mexican government change strategies? We recognise that designing a different policy for tackling organised crime is not an easy task, but at this point, after more than 5 years of hard evidence and observing booming violence and its political and economic costs, it is imperative to think about alternative policies. For instance, further research should evaluate strategies designed to directly attack the financial structure of these criminal organisations, such as anti-money-laundering policies or the legalisation/regulation of currently illegal drugs. Although criminal groups are already diversifying their activities, the regulation of illegal drugs would take away their main source of income, directly attacking their financial structures. These two examples of interventions do not directly disrupt the status quo, nor do they increase competition/fragmentation among different criminal organisations for the control of territory. As such, their costs regarding violence are likely to be lower than those of the current policy.

Finally, results shown in this article open the window for further research. For instance, other variables should be included to measure the disequilibrium of the status quo caused by law enforcement. According to Atuesta and Pérez-Dávila,[99] the evolution of organised crime can be observed through not only fragmentation, but also cooperation. In fact, the impact on violence might differ in the case of alliances or cooperation, and that this impact could be influenced by the territorial control of each criminal organisation. Analysing these different effects should be of great interest to those seeking to understand how alliances shape private violence. Furthermore, other methods of governmental intervention for tackling organised crime could be analysed, for instance, comparing the effects of interventions by military forces in *joint operations* with local and state forces with those of government interventions with local forces only.

Notes

1. Snyder and Durán-Martínez, "Does Illegality Breed Violence?"

2. Benson et al., "Deterrence and Public Policy"; Friedman, "The War We Are Losing"; Miron, "Violence and the U.S. Prohibitions"; Miron, "Violence, Guns and Drugs"; Moeller and Hesse, "Drug Market Disruption"; Rasmussen and Benson, "The Economic Anatomy of a Drug War"; Werb et al., "Effect of Drug Law Enforcement on Drug Market Violence."
3. Werb et al., "Effect of Drug Law Enforcement on Drug Market Violence."
4. Calderón et al., "The Beheading of Criminal Organizations"; Durán-Martínez, "To Kill and Tell?"; Guerrero-Gutiérrez, "Cómo reducir la violencia en México"; Guerrero-Gutiérrez, "La Raíz de la Violencia"; Phillips, "How Does Leader Decapitation Affects Violence?"; Reuter, "Systemic Violence in Drug Markets."
5. In Goldstein's tripartite conceptual framework, "The Drugs/Violence Nexus" and Reuter, "Systemic Violence in Drug Markets" characterise this type of drug-related violence as 'systemic violence'. Unlike the other two modalities of drug-related violence – the psychopharmacological violence and the economic compulsive violence – the systemic type causes a high number of murders mostly involved in drug use or trafficking (Goldstein, "The Drugs/Violence Nexus"; Reuter, "Systemic Violence in Drug Markets"). Rasmussen and Benson, "The Economic Anatomy of a Drug War", also warn that most users of illegal drugs do not commit crimes against people and property (manifestations of both the psychopharmacological violence and the economic compulsive violence). Therefore, enhancing drug enforcement cannot be easily justified based only on these two types of violence (Rasmussen and Benson, "The Economic Anatomy of a Drug War").
6. Calderón et al., "The Beheading of Criminal Organizations"; Guerrero-Gutiérrez, "La Raíz de la Violencia"; and Phillips "How does Leader Decapitation Affects Violence?"
7. Eck and Gersh, "Drug Trafficking as a Cottage Industry."
8. Gambetta, "The Sicilian Mafia"; Volkov, "Violent Entrepreneurs"; Williams, "The Debate over Mexican Drug Trafficking."
9. Our analysis distinguishes how these interventions cause posterior violent actions in which criminal organisations *exclusively* intervene (fights in which security forces do not intervene) from those interventions prompting posterior violent acts in which public security forces participate. In the latter case, criminal organisations might also seek to retaliate against security forces in revenge (Jordan, "When Heads Roll.") or to show strength to either the state (federal or local authorities) or other competitors. Criminal organisations could also seek to correct deviations of local authorities with whom they negotiated a pact of no-aggression or to negotiate pacts of non-aggression in more favourable conditions.
10. Calderón et al., "The Beheading of Criminal Organizations".
11. Moeller and Hesse, "Drug Market Disruption"; Rasmussen and Benson "The Economic Anatomy of a Drug War."; Storti and Grauwe, "Modelling Disorganized Crime."
12. Dickenson, "The Impact of Leadership Removal."
13. See note 10 above; Chabat, "La Respuesta del Gobierno de Calderón"; Dell, "Trafficking Networks and the Mexican Drug War"; Grillo, "El Narco"; Guerrero-Gutiérrez "Cómo reducir la violencia en México"; Osorio, "The Contagion of Drug Violence"; Phillips "How does Leader Decapitation Affects Violence?".
14. Astorga and Shirk, "Drug Trafficking Organizations and Counter-Drug Strategies."
15. Ríos, "How Government Coordination Controlled Organized Crime."
16. Chabat "La Respuesta del Gobierno de Calderón.".
17. The existence of pacts among criminal organisations (*mafia* families) and politicians can also be found in Italy (Gambetta, "The Sicilian Mafia"). In the Italian case, these pacts are institutionalised through the creation of the *commissiones*, which are forums responsible for the implementation of rules regulating the use of violence (granting permissions to commit murder), market distribution, recruitment and dispute resolution for leader replacement within *mafia* families (Gambetta, "The Sicilian Mafia"). This body, usually formed by families' bosses, could ameliorate the use of violence especially within families (Gambetta, "The Sicilian Mafia"). This degree of institutionalisation has been absent in Mexico, especially to resolve internal disputes. It is no surprise that the replacement of leaders provokes bloodshed.
18. See note 10 above; see note 16 above.

19. See note 16 above.
20. See note 10 above; Grillo, "El Narco"; Guerrero-Gutiérrez, "Cómo reducir la violencia en México"; Phillips, "How Does Leader Decapitation Affects Violence?".
21. Unfortunately, data on violence related to the activities of criminal organisations is not available prior to 2006 to make comparisons over time.
22. Atuesta and Pérez-Dávila, "Fragmentation and Cooperation."
23. See note 10 above.
24. Phillips, "How Does Leader Decapitation Affects Violence?".
25. See note 14 above.
26. We acknowledge that although our measures of violence more accurately register the effects of law enforcement, our analysis cannot offer a specific account of the increases in violence as a consequence of the killings and detentions of members of a specific rank within the criminal organisations, as noted in other studies (see note 16 above; see note 24 above).
27. See note 3 above.
28. Bateson, "Crime Victimization and Political Participation"; Carreras, "The Impact of Criminal Violence"; Trelles and Carreras, "Bullets and Votes."
29. Ponce, "Cárteles de Droga, Violencia y Competitividad Electoral a Nivel Local."
30. Ríos, "Evaluating the Economic Impact of Drug Traffic in Mexico."
31. This amount represents approximately 10% of US expenses on drug prohibition. Miron and Waldock, *The Budgetary Impact of Ending Drug Prohibition*, estimate $41.3 billion per year in government expenditure on enforcement of prohibition. In another estimation of the economic costs of violence, Londoño and Guerrero, "Violencia en América Latina", calculate that these losses could represent 12.3% of the total Mexican GDP.
32. Velasco, "Drogas, Seguridad y Cambio Político en México"; Cadena Montenegro, "Geopolítica del Narcotráfico"; Ríos, "To Be or Not To Be a Drug Trafficker"; Montero, "La Estrategia contra el Crimen Organizado en México."
33. In addition, the Calderón administration created a new Federal Police force and replaced the Attorney General's Federal Agency of Investigations with the new Federal Ministerial Police, see note 14 above.
34. See note 16 above; Cadena Montenegro, "Geopolítica del Narcotráfico"; See note 16 above; Guerrero-Gutiérrez, "Cómo reducir la violencia en México"; Bailey and Taylor, "Evade, Corrupt, or Confront?"; Ríos and Shirk, "Drug Violence in Mexico"; Papachristos, "Murder by Structure"; Pereyra, "México: Violencia Criminal y "Guerra Contra el Narcotráfico.""
35. See note 16 above.
36. Astorga, "Seguridad, Traficantes y Militares"; see note 14 above; Carvajal-Dávila, "Todo lo que Usted Debería Saber Sobre el Crimen Organizado en México"; Dell, "Trafficking Networks and the Mexican Drug War"; Pimentel, "The Nexus of Organized Crime and Politics in Mexico"; see note 1 above.
37. See note 15 above.
38. For instance, the Mexican government claims to have detained or killed 20 leaders of criminal organisations between 2007 and 2010 (Pereyra, "México: Violencia Criminal y "Guerra Contra el Narcotráfico".")
39. See note 12 above; Guerrero-Gutiérrez, "La Raíz de la Violencia."
40. Guerrero-Gutiérrez, "La Raíz de la Violencia."
41. See note 22 above.
42. Bailey and Taylor, "Evade, Corrupt, or Confront?"; see note 10 above; Casas-Zamora, "Mexico's Forever War."; Guerrero-Gutiérrez, "La Raíz de la Violencia."; see note 24 above.
43. Casas-Zamora, "Mexico's Forever War"; Durán-Martínez, "To Kill and Tell?"; Guerrero-Gutiérrez, "La Raíz de la Violencia"; Trelles and Carreras, "Bullets and Votes"; Pereyra, "México: Violencia Criminal y "Guerra contra el Narcotráfico.""
44. Other explanations proposed to justify the rapid increase in violence since 2007 include the arguments that: (1) decentralisation of federal Mexican institutions made strategic coordination

against criminal organisations ineffective (Montero, "La Estrategia contra el Crimen Organizado en México"); (2) drug-related corruption diminished the effectiveness of Mexican state efforts to successfully combat criminal organisations due to collusion between criminal organisations and officials (Dell, "Trafficking Networks and the Mexican Drug War"; Montero, "La Estrategia contra el Crimen Organizado en México"); (3) relatively high rates of unemployment and the low wages young Mexicans receive induced them to join criminal organisations (Ríos, *To Be or Not to Be a Drug Trafficker*); (4) cocaine shortages triggered further violence (Castillo, Scarcity without Leviathan); (5) increasingly frequent victories of parties other than the PRI in subnational elections weakened previous agreements between government officials and criminal organisations (see note 10 above; Ríos, *To Be or Not to Be a Drug Trafficker*; Snyder and Durán-Martínez, "Does Illegality Breed Violence?"); and (6) easy access to weapons in the US market (Bailey and Taylor, "Evade, Corrupt, or Confront?"; Dube et al., Cross-Border Spillover).

45. See note 7 above.
46. Examples of criminal organisations that split are: The Gulf Cartel and its armed wing, Los Zetas; the break-up of *El Chapo* with the *Beltrán Leyva* brothers; and the split of the Juarez Cartel and its armed wing, La Línea. Out of these fragmentations, the descendant organisations – the Gulf Cartel and Los Zetas, the Sinaloa Cartel and the Beltrán Leyva Organisation, and the Juarez Cartel and La Linea – began fighting each other for the control of key territories to sell and transport drugs. Online Appendix A provides multiple examples of descendant criminal organisations that fight each other. The Online Appendices can be found at: https://sites.google.com/site/aldofponceugolini/data. Calderón et al., "The Beheading of Criminal Organizations", point out that criminal organisations are likely to pay more to new members replacing those who were captured or murdered. This may occur because perceptions of risks associated with participation in criminal organisations might have increased.
47. See note 10 above.; see note 7 above; Grillo, "El Narco."; Guerrero-Gutiérrez, "La Raíz de la Violencia."; see note 24 above; Reuter, "Systemic Violence in Drug Markets."
48. Miron, "Violence and the U.S. Prohibitions."
49. Kleiman et al., "The "War on Terror" and the "War on Drugs.""
50. See note 45 above.
51. Calderón et al., "The Beheading of Criminal Organizations", point out that criminal organisations are likely to pay more to new members replacing those who were captured or murdered. This may occur because perceptions of risks associated with participation in criminal organisations might have increased.
52. Osorio, "The Contagion of Drug Violence", points out that several criminal organisations began a substantial process of expansion in 2006, which spurred the migration of criminal organisations to other territories.
53. Examples of new criminal organisations include *Los Caballeros Templarios* and the South Pacific Cartel. These organisations emerged in territories where *La Familia Michoacana* and the Beltran Leyva Organisation were weakened, respectively.
54. See note 10 above.; Grillo, "El Narco"; Osorio, "The Contagion of Drug Violence"; Rasmussen and Benson, "The Economic Anatomy of a Drug War."
55. Blumstein, "Youth Violence, Guns, and the Illicit-Drug Industry"; Brownstein et al., "A Conceptual Framework for Operationalizing the Relationship between Violence and Drug Market Stability"; Castillo et al., "Scarcity without Leviathan"; Reuter, "Disorganized Crime: Economics of the Visible Hand."
56. Castillo et al., "Scarcity without Leviathan."
57. Ibid.
58. Castillo et al., "Scarcity without Leviathan", find that there is a positive relationship between drug shortages from Colombia and violence. This occurs because shortages increase the potential revenues for criminal organisations and such changes enhance the incentives for the use of violence to capture these resources. Under this context, increases in the number of criminal organisations exacerbate the effects of scarcity of drugs on violence as criminal organisations became more willing to invest in violence to secure the provision and distribution of drugs, and thus maximise additional revenues (see note 56 above).

59. See note 10 above.; Durán-Martínez, "To Kill and Tell?"; Guerrero-Gutiérrez, "La Raíz de la Violencia"; see note 24 above; Reuter, "Systemic Violence in Drug Markets."
60. Papachristos, "Murder by Structure."
61. Ibid.
62. Osorio, "The Contagion of Drug Violence."
63. Kleiman et al., "The "War on Terror." and the "War on Drugs.""; Maher and Dixon, "Policing and Public Health."
64. See note 7 above
65. The number of members is a crucial consideration for criminal organisations, as these individuals transport the illegal drugs, sell them and protect the business from interference by the state or other criminal organisations.
66. See note 56 above.
67. See note 3 above.
68. Atuesta et al., "La "Guerra Contra las Drogas" en México."
    The data set was received anonymously by CIDE. The Drug Policy Program at CIDE conducted a validation exercise by comparing the data set with open sources information and with official records, concluding that the data set is trustworthy. The whole data set comprises events organised in three categories: aggressions, confrontations and executions. The variable private violence was created using the executions category, while the governmental intervention was used with information from the aggressions and confrontations categories. Atuesta et al., "La "Guerra Contra las Drogas" en México", explain in detail the validation and codification processes of the data set, as well as the variables included and their limitations.
69. In order to count the number of criminal organisations, we consider those groups that participated actively in any of the events included in the data set CIDE-PPD in a particular municipality during a period of time. Information regarding criminal organisations in a specific territory was obtained from the executions category of the data set. In total, 217 different criminal organisations were identified in the 5 years of analysis, although not all of them were present in every municipality or in every period of time. We acknowledge that the employed data set, which is the most complete reporting of violent events, hardly reflects the totality of all events in which criminal organisations participated. Although it is impossible to correct this error, we minimise it by employing the CIDE-PPD data set.
70. Benson et al., "Deterrence and Public Policy"; see note 10 above.; see note 24 above; Rasmussen and Benson, "The Economic Anatomy of a Drug War."
71. Rasmussen and Benson, "The Economic Anatomy of a Drug War."
72. Ibid.
73. Ibid.
74. Consult Rasmussen and Benson, "The Economic Anatomy of a Drug War", for detailed figures on these comparisons.
75. See note 71 above.
76. See note 12 above.
77. See note 71 above.; Storti and Grauwe, "Modelling Disorganized Crime."
78. It is relevant to highlight that the variable counting the number of criminal organisations might be correlated with the error term because of the existence of the direct effect, causing endogeneity problems. Online Appendix B discusses how the hierarchical structural equation modelling addresses this potential problem.
79. Bauer et al., "Conceptualizing and Testing Random Indirect Effects"; Preacher et al., "A General Multilevel SEM Framework for Assessing Multilevel Mediation."
80. The first multilevel mediation framework was proposed by Krull and MacKinnon, "Multilevel Modeling of Individual and Group Level", to test mediational effects in clustered data. However, the advantage of estimating mediation modelling using an SEM framework is the estimation of between- and within-group effects. See Preacher et al., "A General Multilevel SEM Framework for Assessing Multilevel Mediation", for a detailed explanation.

81. Raudenbush and Bryk, "Hierarchical Linear Models"; Steenbergen and Jones, "Modeling Multilevel Data Structures."
82. The first estimation is left censored at zero because the dependent variable does not present negative values, and the second equation is estimated using a negative binomial because the number of criminal groups is treated as a count.
83. We include this lagged variable as an independent variable because we suspect autocorrelation. In fact, we find the presence of autocorrelation when estimating the models. We adopt this similar assumption with the number of criminal organisations.
84. Law enforcement in period 1 might be correlated with law enforcement in period 0, and if law enforcement in period 1 has an effect on private violence in period 1, endogeneity might appear creating biases in the estimations. To take into account this possibility, we include measures of law enforcement in period 1 as an additional control in all the regressions.
85. See note 24 above.
86. Dell, "Trafficking Networks and the Mexican Drug War."
87. See note 62 above.
88. Moeller and Hesse, "Drug Market Disruption."
89. See note 24 above.
90. See note 86 above.
91. Hsieh and Pugh, "Poverty, Income Inequality, and Violent Crime."
92. See note 24 above; see note 10 above.
93. Online Appendix C displays descriptive statistics for the variables used in analysis.
94. See note 12 above; Rasmussen and Benson, "The Economic Anatomy of a Drug War."; see note 77 above.
95. As an additional robustness check, we replicate the estimations using the change in the number of groups as proxy for fragmentation. Results are available in the Online Appendix D.
96. See note 12 above.
97. Although we only include one lag of the dependent variables in our estimations, we run our regressions including two lags as an additional robustness check. Results are similar in sign and significance, and are available in the Online Appendix E.
98. Benson et al., "Deterrence and Public Policy"; see note 48 above; see note 88 above; Rasmussen and Benson, "The Economic Anatomy of a Drug War"; (see note 3 above.
99. See note 22 above.

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Appendices

Table A1. Short-term regression results.

Outcome regression/short term		
	Proxy fragmentation: number of groups	
Dep. variable: private violence (criminal organisations' members executed per 100,000 inhabitants)	Proxy gov.int: detainees	Proxy gov.int: criminal organisations' members killed
Detainees in confrontations	0.30*	
	(0.18)	
Detainees in confrontations (lagged)	0.55***	
	(0.20)	
Criminal organisations' members killed in confrontations		1.17***
		(0.25)
Criminal organisations' members killed in confrontations (lagged)		0.31
		(0.23)
Number of criminal organisations	17.60***	17.26***
	(0.88)	(0.89)
Number of criminal organisations squared	−1.80***	−1.72***
	(0.15)	(0.16)
Private violence (lagged)	0.11***	0.11***
	(0.01)	(0.02)
Whether the municipal president belongs to PAN	0.69	0.71
	(0.93)	(0.93)
Municipalities located in the US border	18.42***	17.77***
	(4.01)	(3.99)
Municipalities located in the Pacific Coast	17.81***	17.82***
	(3.00)	(2.99)
Municipalities located in the Gulf of Mexico	5.24	5.19
	(4.03)	(4.02)
Average number of homicides in neighbouring municipalities	0.44***	0.42***
	(0.054)	(0.05)
Percentage of population in poverty	−0.38***	−0.38***
	(0.04)	(0.04)
Whether the state governor was affiliated to the PAN party	−0.24	−0.12
	(1.93)	(1.93)
Constant	−47.33***	−47.33***
	(3.94)	(3.93)
Observations	36,840	36,840

Mediation regression		
	Dep. variable: number of groups	
	Proxy gov.int: detainees	Proxy gov.int: criminal organisations' members killed
Detainees in confrontations	0.025**	
	(0.01)	
Detainees in confrontations (lagged)	0.04***	
	(0.01)	
Criminal organisations' members killed in confrontations		0.05***
		(0.01)

(*Continued*)

Table A1. (Continued).

Mediation regression		
	Dep. variable: number of groups	
	Proxy gov.int: detainees	Proxy gov.int: criminal organisations' members killed
Criminal organisations' members killed in confrontations (lagged)		0.04***
		(0.01)
Number of criminal organisations (lagged)	0.11***	0.12***
	(0.03)	(0.03)
Private violence (lagged)	0.003***	0.003**
	(0.001)	(0.001)
Whether the municipal president belongs to PAN	−0.03	−0.04
	(0.10)	(0.10)
Municipalities located in the Gulf of Mexico	1.19***	1.20***
	(0.40)	(0.39)
Municipalities located in the US border	0.48	0.43
	(0.36)	(0.36)
Municipalities located in the Pacific Coast	0.78**	0.80**
	(0.32)	(0.32)
Average number of homicides in neighbouring municipalities	0.02***	0.02***
	(0.004)	(0.04)
Percentage of population in poverty	−0.04***	−0.04***
	(0.004)	(0.004)
Whether the state governor was affiliated to the PAN party	−0.51**	−0.53**
	(0.21)	(0.21)
Constant	−4.40***	−4.40***
	(0.43)	(0.44)
Observations	36,840	36,840

Quarter and state-fixed effects. Nested observations by municipality.
Standard errors in parentheses.
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table A2. Mid-term regression results.

Outcome regression/mid-term		
Dep. variable: private violence (criminal organisations' members executed per 100,000 inhabitants)	Proxy fragmentation: number of groups	
	Proxy gov.int: detainees	Proxy gov.int: criminal organisations' members killed
Detainees in confrontations	0.14	
	(0.24)	
Detainees in confrontations (lagged)	0.29	
	(0.27)	
Criminal organisations' members killed in confrontations		1.48***
		(0.29)
Criminal organisations' members killed in confrontations (lagged)		−0.85***
		(0.30)
Number of criminal organisations	17.60***	17.41***
	(1.13)	(1.12)
Number of criminal organisations squared	−1.10***	−1.05***
	(0.12)	(0.12)
Private violence (lagged)	0.16***	0.16***
	(0.02)	(0.02)
Whether the municipal president belongs to PAN	1.48	1.50
	(1.53)	(1.52)
Municipalities located in the US border	15.47***	13.29**
	(5.18)	(5.17)
Municipalities located in the Pacific Coast	18.43***	18.36***
	(3.77)	(3.76)
Municipalities located in the Gulf of Mexico	3.18	2.84
	(5.28)	(5.36)

(*Continued*)

Table A2. (Continued).

Average number of homicides in neighbouring municipalities	0.46***	0.48***
	(0.05)	(0.05)
Percentage of population in poverty	−0.36***	−0.35***
	(0.05)	(0.06)
Whether the state governor was affiliated to the PAN party	−1.22	−1.14
	(3.35)	(3.33)
Constant	−39.16***	−39.25***
	(5.05)	(5.04)
Observations	12,280	12,280

Mediation regression

	Dep. variable: number of groups	
	Proxy gov.int: detainees	Proxy gov.int: criminal organisations' members killed
Detainees in confrontations	0.05***	
	(0.01)	
Detainees in confrontations (lagged)	0.06***	
	(0.01)	
Criminal organisations' members killed in confrontations		0.03**
		(0.02)
Criminal organisations' members killed in confrontations (lagged)		0.05***
		(0.02)
Number of criminal organisations (lagged)	0.38***	0.39***
	(0.06)	(0.06)
Private violence (lagged)	0.00001	−0.00008
	(0.001)	(0.001)
Whether the municipal president belongs to PAN	0.03	0.008
	(0.12)	(0.12)
Municipalities located in the US border	0.004	0.11
	(0.34)	(0.35)
Municipalities located in the Pacific Coast	0.57*	0.68**
	(0.29)	(0.29)
Municipalities located in the Gulf of Mexico	0.85**	0.94**
	(0.36)	(0.37)
Average number of homicides in neighbouring municipalities	0.01***	0.01***
	(0.003)	(0.003)
Percentage of population in poverty	−0.03***	−0.03***
	(0.004)	(0.004)
Whether the state governor was affiliated to the PAN party	−0.52*	−0.50
	(0.31)	(0.31)
Constant	−2.99***	−3.07***
	(0.40)	(0.41)
Observations	12,280	12,280

Semester and state fixed effects. Nested observations by municipality.
Standard errors in parentheses.
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table A3. Long-term regression results.

Outcome regression/long term		
	Proxy fragmentation: number of groups	
Dep. variable: private violence (criminal organisations' members executed per 100,000 inhabitants)	Proxy gov.int: detainees	Proxy gov.int: criminal organisations' members killed
Detainees in confrontations	0.42*	
	(0.22)	
Detainees in confrontations (lagged)	−0.58**	
	(0.25)	
Criminal organisations' members killed in confrontations		1.08***
		(0.23)
Criminal organisations' members killed in confrontations (lagged)		−0.89**
		(0.35)
Number of criminal organisations	18.20***	17.62***
	(1.21)	(1.20)
Number of criminal organisations squared	−0.80***	−0.77***
	(0.09)	(0.09)
Private violence (lagged)	0.15***	0.15***
	(0.02)	(0.02)
Whether the municipal president belongs to PAN	1.33	1.23
	(2.09)	(2.09)
Municipalities located in the Gulf of Mexico	22.55***	22.46***
	(5.53)	(5.51)
Municipalities located in the US border	2.17	1.49
	(7.52)	(7.50)
Municipalities located in the Pacific Coast	39.64***	37.28***
	(7.62)	(7.56)
Average number of homicides in neighbouring municipalities	0.44***	0.42***
	(0.04)	(0.04)
Percentage of population in poverty	−0.56***	−0.55***
	(0.07)	(0.07)
Whether the state governor was affiliated to the PAN party	9.74**	9.69**
	(4.43)	(4.42)
Constant	−34.52***	−35.15***
	(6.69)	(6.67)
Observations	9824	9824

Mediation analysis		
	Dep. variable: number of groups	
	Proxy gov.int: detainees	Proxy gov.int: criminal organisations' members killed
Detainees in confrontations	0.036***	
	(0.006)	
Detainees in confrontations (lagged)	0.014**	
	(0.006)	
Criminal organisations' members killed in confrontations		0.029***
		(0.01)
Criminal organisations' members killed in confrontations (lagged)		0.008
		(0.009)
Number of criminal organisations (lagged)	−0.02	0.009
	(0.03)	(0.03)
Private violence (lagged)	−0.001	−0.001
	(0.007)	(0.008)
Whether the municipal president belongs to PAN	0.05	0.05
	(0.10)	(0.10)
Municipalities located in the Gulf of Mexico	0.92***	0.99***
	(0.28)	(0.29)
Municipalities located in the US border	0.82**	0.89**
	(0.37)	(0.37)
Municipalities located in the Pacific Coast	0.35	0.44
	(0.33)	(0.34)

(*Continued*)

Table A3. (Continued).

Mediation analysis		
	Dep. variable: number of groups	
	Proxy gov.int: detainees	Proxy gov.int: criminal organisations' members killed
Average number of homicides in neighbouring municipalities	0.006***	0.005***
	(0.001)	(0.001)
Percentage of population in poverty	−0.04***	−0.04***
	(0.004)	(0.004)
Whether the state governor was affiliated to the PAN party	−0.55**	−0.57***
	(0.22)	(0.22)
Constant	−2.71***	−2.77***
	(0.39)	(0.40)
Observations	9824	9824

Year and state fixed effects. Nested observations by municipality.
Standard errors in parentheses.
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.