Peace Dividends:
The Economic Effects of Colombia's Peace Agreement*

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Abstract

The last decades have seen a resurgence of armed conflict around the world, renewing the need for durable peace agreements. In this paper, I evaluate the economic effects of the peace agreement between the Colombian government and the largest guerrilla group in the country, the FARC, putting an end to one of the longest and most violent armed conflicts in recent history. Using a difference-in-difference strategy comparing municipalities that historically had FARC presence and those with presence of a similar, smaller guerrilla group, the ELN, before and after the start of a unilateral ceasefire by the FARC, I establish three sets of results. First, violence indicators significantly and sizably decreased in historically FARC municipalities. Second, despite this large reduction in violence, I find precisely-estimated null effects across a variety of economic indicators, suggesting no effect of the peace agreement on economic activity. Furthermore, I use a sharp discontinuity in eligibility to the government's flagship business and job creation program for conflict-affected areas to evaluate the policy's impact, also finding precisely-estimated null effects on the same economic indicators. Third, I present evidence that suggests the reason why historically FARC municipalities could not reap the economic benefits from the reduction in violence is a lack of state capacity, caused both by their low initial levels of state capacity and the lack of state entry post-ceasefire. These results indicate that peace agreements require complementary investments in state capacity to yield an economic dividend.

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"My country celebrates and welcomes these (Sustainable Development) Goals, because we are aware that they are also necessary conditions for building peace and, in turn, peace in Colombia will have very high economic, social and environmental dividends. It will be a virtuous circle."

– Juan Manuel Santos, then President of Colombia, to the UN in 2015.

1 Introduction

Over the past two decades, armed conflict has substantially increased across the globe. Von Einsiedel et al. (2017) show that since 2007 the number of major civil wars has almost tripled and that there has been a six-fold increase in battle fatalities, with 2014 and 2015 being the deadliest years since the end of the Cold War. The increase in armed conflict leads to the question of how best to proceed *after* conflict has come to an end. While there are many ways in which armed conflicts can end, peace agreements between warring parties are a common conflict-ending mechanism. Over one third of all conflicts waged between 1989 and 2018 were resolved by peace agreements, with over 350 agreements in total (Pettersson, Högbladh, and Öberg, 2019).[1] Despite comprehensive peace agreements being considered "the gold standard in international peacemaking" (Pospisil, 2022), they almost always entail lengthy negotiations and their effectiveness is unclear, both in terms of reducing the likelihood of conflict reemerging or in bringing economic prosperity. In fact, around 60% of conflicts resolved in the early 2000s relapsed within five years (Von Einsiedel et al., 2017). Given the popularity of peace agreements, understanding what pre-conditions need to exist and how they should be implemented is critical to bring economic prosperity and to avoid the reemergence of violence, questions that have yet to be satisfactorily answered.

This paper investigates the economic effects of a recently-signed peace agreement, the 2016 peace agreement between the Colombian government and the Revolutionary Armed Forces of Colombia (FARC). The agreement put to an end the FARC as an insurgent group, ending over 50 years of conflict, the longest on-going conflict at the time (Fisas, 2012). The conflict in Colombia has been bloody and violent: since 1985, Colombia's Victims' Unit has registered over 9 million people as victims of conflict, with over 8 million forced displaced, 1 million murdered, around 200.000 forced disappeared, and almost 90.000 terrorist acts/fights (as of May 2022). One of the main goals of the peace agreement was to promote the economic development of the areas most affected by the conflict, as frequently mentioned by government officials during the negotiations (e.g. the statement by Colombia's President at the time, Ministry of Foreign Affairs, 2015). Expectations for the agreement were high, with the then-president Juan Manuel Santos receiving the Nobel Peace Prize for his "resolute efforts to bring the country's more than 50-year-long civil war to an end".

[1] Examples include the 1998 Good Friday Agreement in Northern Ireland, the 2015 agreement between the Malian government and the CMA, the 2018 agreement between the Ethiopian government and the Ogaden National Liberation Front, and the 2020 agreement in South Sudan.

I use a difference-in-difference strategy, leveraging the fact that the 2016 peace agreement involved only one insurgent group in the country, the FARC. Other criminal groups remained operational, including the National Liberation Army (ELN), a smaller guerrilla group. More specifically, I compare the evolution of municipalities under FARC control to that of municipalities under ELN control. The FARC and ELN share a broadly similar history and evolution. While the FARC was always larger than the ELN, the ELN was not an insignificant power. Despite this, it did not participate in the peace discussions and continued operating after the demobilization of the FARC. Identifying which group has (historically) controlled a municipality is challenging, with much of their authority exerted through soft power and intimidation. However, there is one common element in the way the FARC and ELN manifested their control – the use of violence. Arjona and Otálora (2011) highlight that, for guerrilla groups in Colombia, violent activity by a given group is highly indicative of the group's presence. Thus, I use detailed administrative data on the number of criminal actions by insurgent groups to create two measures of municipalities most affected by the FARC and ELN. I provide evidence that both measures capture and distinguish areas historically associated with either FARC and ELN presence, and the results are robust to using either measure.

My analysis proceeds in three parts. Mack et al. (2012) show that, between 1950 and 2004, ceasefires and peace agreements were followed by renewed violence within five years in 38.2% and 32.4% of cases, respectively. Thus, I first evaluate whether the start of the unilateral ceasefire by the FARC in December 2014 as part of the peace negotiations translated into a reduction of violence in FARC-controlled municipalities. Using official data from the Victims' Unit, the Ministry of Defense, and other sources, I consistently find large, significant reductions in measures of crime and violence in FARC-controlled municipalities after the start of the unilateral ceasefire relative to ELN-controlled municipalities. In my preferred specification, I find large reductions in forced displacement (50% of the pre-treatment mean across FARC and ELN municipalities), forced disappearances ($\sim$40%), theft ($\sim$40%), homicides ($\sim$15%) and clashes between armed actors (50%), among other indicators. Moreover, these reductions were not short-lived, with most of them persisting until 2019. These results suggest that the unilateral ceasefire and subsequent agreement did indeed lead to a drastic reduction in crime and violence.

Given that the ceasefire successfully reduced violence in municipalities previously affected by the FARC, in a second step I evaluate whether this new-found peace brought economic improvements to these areas. As conflict-affected municipalities tend to be hard-to-reach, small and poor, measuring economic activity there is difficult. I use a battery of different economic indicators to assess the economic effects of the peace agreement. These include official GDP estimates from the National Statistical Office, nighttime light intensity data, a measure of urban built-up created using satellite images, proxies of agricultural productivity and production, firm entry and formal

employment from administrative data, and the share of urban population in a municipality. Overall, I find precisely-estimated null effects across the different measures. For example, using a summary measure of these variables, I find an insignificant *reduction* of economic activity of just 0.004 SD, with tight SEs that would allow me to reject the null of an increase as small as 0.06 SD. Moreover, event-study regressions show no upward trajectory for these measures up to four years post-ceasefire, ruling out that this overall effect of the ceasefire is masking an improvement over time. In an additional exercise, I evaluate a government program that specifically targeted economic activity in conflict-affected areas by providing large fiscal incentives for firms to operate in those areas, again finding no improvement in the different economic indicators. Thus, conflict-affected municipalities did not seem to have benefitted economically from the peace agreement, even those aided with large economic government programs.

In the third part of my analysis, I turn to investigating mechanisms potentially behind this puzzling set of results. Reports have suggested that the implementation of the peace agreement has been lagging, with the Colombian government absent from areas previously under FARC control (e.g., Washington Office on Latin America, 2021; Piccone, 2019; United Nations, 2021). Theory suggests that state capacity plays an important role in spurring economic growth and, importantly, that very low levels of state capacity can lead to self-perpetuating poverty traps (Besley and Persson, 2010). I present two pieces of evidence along the lines of this theory, with a lack of state capacity preventing FARC-controlled municipalities from economically benefiting from the large reduction in violence post-ceasefire. First, FARC-controlled municipalities had much lower levels of state capacity than the rest of the country at the outset. Second, and in line with the reports, I find no improvement in a wide array of state capacity indicators such as tax revenue per capita, provision of public goods, and indicators of municipal government performance in FARC-controlled municipalities after the start of the ceasefire. These results suggest that these areas did not experience economic improvements due to low initial levels of state capacity and a lack of state entry post-ceasefire. Furthermore, I present evidence to suggest that alternative mechanisms, including credit constraints for agricultural producers, coca production, migration of Venezuelan migrants, a shift from production towards education, land restitution issues, and a lack of support/trust in the agreement, are unlikely to explain the results.

Finally, I show that my results are robust to a multitude of checks. These include using different (violence-based) definitions of FARC- and ELN-controlled municipalities, employing an alternative summary index, controlling for municipalities' pre-intervention characteristics, using placebo tests in the pre-intervention period, a permutation test randomly assigning municipalities to treatment and control groups, and estimating the different parts using the synthetic difference-in-difference estimator developed by Arkhangelsky et al. (2021). I also check the robustness of the results to violations of the parallel trend assumption, following Roth (Forthcoming), and to spillovers on the control municipalities, following Butts (2021).

This study contributes to several literatures. First, while the literature on the effects of armed conflict is large, there are few studies studying the effects of *peace*.[2] Conflict has been shown to have large negative effects on economic growth (Abadie and Gardeazabal, 2003), educational attainment (Akbulut-Yuksel, 2014), health outcomes (Bendavid et al., 2021), human capital (Waldinger, 2016), house prices (Besley and Mueller, 2012), among others (see Rohner and Thoenig, 2021, for a review). However, there is little to suggest that simply ending conflict will be enough to bring about the converse effects. While large-scale destruction can happen quickly, recovery can take long, or not even materialize again. This paper is one of the first ones to provide rigorous evidence on the causal effects of peace on economic activity.[3] I find that, while the peace agreement did lead to a considerable reduction in violence in FARC-controlled municipalities, this new-found peace did not translate into improvements of economic indicators in the short- and medium-run, suggesting that, contrary to physical capital shocks that usually dissipate quickly (Brakman, Garretsen, and Schramm, 2004; Davis and Weinstein, 2002; Miguel and Roland, 2011), long-drawn, violent conflicts can have persistent effects even after their end.

This study also contributes to the literature evaluating the relationship between state capacity and economic growth (see Besley and Persson, 2014, for a review). Besley and Persson (2010) suggest, using a theoretical model, that state capacity is an important determinant of economic growth. This theoretical prediction has received some empirical support. For example, Dincecco and Katz (2016) suggest that European governments that undertook fiscal centralization reforms experienced faster economic growth over the long run. Aneja and Xu (2022) show that the strengthening of the US Post Office in the late 19th century facilitated long-distance innovation, a key determinant of economic growth. The results in this study suggest that the reason why FARC municipalities did not benefit economically from the reduction in violence caused by the peace agreement is because the state did not enter these long-neglected areas, with no improvement in state capacity indicators. Given the low initial level of state capacity of these municipalities, the results are in line with the theoretical prediction that a basic level of state capacity is needed in order for peace to translate into economic growth.

[2] In their review of (civil) war's causes, conduct and consequences, Blattman and Miguel (2010) state that in terms of post-conflict recovery policy, "most of that literature comes in the form of best practices summaries, case studies, and other literature produced by international aid organizations, governments, and NGOs. Academic research remains limited, and where it exists, tends to focus on high-level analysis", highlighting the need for rigorous, high-quality research on post-conflict themes.

[3] Other papers that have investigated the economic consequences of peace using microdata are Hönig (2021) in Nigeria and Bernal et al. (2022) investigating entrepreneurship dynamics in Colombia. Several papers have been written evaluating the effects of Colombia's agreement on the killing of social leaders (Prem et al., 2022), credit access (De Roux and Martínez, 2021), coca cultivation (Prem, Vargas, and Mejía, 2021), deforestation (Prem, Saavedra, and Vargas, 2020), and demography (Guerra-Cújar et al., 2021), most of them using difference-in-difference strategies comparing municipalities that experienced at least one FARC-related criminal attack between 2011-2014 to the rest of the country.

Finally, there is a large literature in political science trying to understand the effectiveness of peace agreements and what preconditions are needed for their success. On the one hand, there is a strand of the literature that tries to understands how support for peace agreements is formed (see, e.g. Matanock and Garbiras-Díaz, 2018; Garbiras-Díaz, Garcia-Sanchez, and Matanock, 2021; Haas and Khadka, 2020). On the other hand, and more related to this work, another strand of the literature tries to determine what factors lead to the success of peace agreements, such as Matanock and Lichtenheld (2022), Gartner (2011), White (2020) and Joshi and Quinn (2017). For armed conflicts fueled by financial motives, post-conflict economic growth is likely a necessary condition for peace to be maintained. This study contributes to this literature by analyzing the economic effects of a recent comprehensive peace agreement. It suggests that a reduction of violence is not a sufficient condition for the design of effective peace agreements, but complementary investments in state capacity are needed for the economic benefits of such agreements to materialize and, therefore, for their ultimate success. Indeed, there is qualitative evidence suggesting that conflict is starting to reemerge in Colombia (see, e.g. International Crisis Group, 2021, 2022), likely due to a lack of economic opportunities for former combatants and local communities that never received the promised peace dividends.

This study also has important policy implications for other countries and Colombia. Milián et al. (2021) mention that in 2021, peace negotiation processes were ongoing in 37 different countries. In Colombia, the idea of negotiating a peace agreement with the ELN has been around for some years, with the recently-elected president Gustavo Petro starting preliminary peace dialogues with the ELN in October 2022. He has even opened the doors to similar dialogues with other criminal organizations. The results in this paper provide a cautionary tale for those peace efforts and highlight the importance of a strong government presence post-agreement in previously-disputed areas.

The paper proceeds as follows. Section 2 provides more details about the history of the armed conflict in Colombia and the peace negotiation process, and describes the different data sources. Section 3 introduces the identification strategy I employ to recover the causal effects of peace in Colombia, followed by the results on violence and economic activity in Section 4. In Section 5, I present evidence in support one potential mechanism that might be driving the results in Section 4: a lack of state capacity in previously-affected municipalities. Different robustness checks to the baseline results are presented in Section 6. Section 7 concludes.

2 Context & Data

2.1 Conflict in Colombia

Colombia has had a long story of armed conflict and violence. During the 19th and early 20th centuries, traditional political parties used violence to settle disputes and

to fight for political power. The fight between the Liberal and Conservative parties, the two largest traditional parties in the country, reached its highest point between 1946 and 1958 (a period called "La Violencia"). This led to the creation of the bipartisan "National Front" in 1958. During the years of the "National Front" (1958-1974), the presidency was rotated between the two dominant parties every four years. Even though one of the reasons behind the "National Front" was to reduce the competition between the two parties, and by extension the violence in the country, violence against agrarian, worker and left-wing urban movements continued (GMH, 2014).

In the mid-1960s, the decades of political violence and growing urban-rural inequality led to the emergence of both the FARC and the ELN. The FARC started as a Marxist-Leninist peasant self-defense organization in distant, rural regions, with close connections to Colombia's Communist Party. Similarly, the ELN was Marxist-Leninist at its outset, although with a more visible military orientation. It was primarily composed of students, rural organizers, and religious leaders, and inspired by the Cuban Revolution. In addition to their similar ideologies, the two groups share a very similar trajectory: until around 1982, they remained very small and isolated, then between 1982 and 1996 they experienced large growth, both in numbers and territory, with this growth coinciding with the growth of Colombia's drug trafficking business. Bejarano et al. (1997) and Arias et al. (2014) estimate that the FARC went from 7 fronts and 850 fighters to 66 fronts and over 16.000 fighters between 1978 and 2000, while the ELN grew from 3 fronts and 350 fighters to 35 fronts and 4.000 fighters from 1982-2000. The most violent period of the conflict took place between 1996 and 2005, when both groups continued expanding and the government focused on a military solution to the armed conflict. This military campaign significantly weakened both groups, particularly from 2005, although they remained sizable and with continued presence throughout the country. Both the FARC and ELN have used violence and terror extensively as part of their strategy to control areas and exert pressure on the government (GMH, 2014; Feldmann, 2018). While at times they fought each other, most notably in the department of Arauca, their main enemies have been far-right paramilitary groups and the state (Echandía Castilla, 2019; InSight Crime, 2020).

There had been several attempts at brokering a peace agreement between the government and the FARC. In the 1990s, both discussed a possible agreement several times, with the most serious attempt taking place between 1998 and 2002, which ultimately failed. Contacts were reestablished in secret in 2011, with negotiations starting in Cuba in 2012, and the story leaking later that year. While the ELN indicated a desire to also participate in the negotiations, they ultimately did not. The negotiations led to the FARC announcing a unilateral ceasefire in December 2014, with the final agreement reached in 2016. This agreement was put to a popular vote in a plebiscite in October 2016, where it was narrowly rejected. Following the rejection of the referendum, a revised agreement was signed in November 2016 and approved by Congress. As part of the agreement, the FARC committed to hand over their weapons, temporar-

ily concentrate its troops in remote areas where they would be safe, and participate in a commission to understand the history of the conflict in Colombia. They also transitioned into being a political party, and were given seats in Congress for two terms.

One of the main goals of the peace deal was to promote the economic development of the areas that suffered the most from the armed conflict. As stated by the official government institution in charge of the implementation of the peace agreement, part of the Peace Treaty's first objective was the "Integral Rural Reform (RRI)". It was "developed to reverse the effects of the conflict and guarantee the sustainability of the peace agreement" which "aims to increase the well-being of rural habitants and spurring the integration of regions and social and economic development, promoting opportunities for rural Colombia and especially for the populations most affected by the conflict and poverty" (see *here*). Moreover, the first point of the final peace agreement remarks that "an integral rural development is key to spur the integration of the regions and the equitable social and economic development of the country". It goes on to admit that "while access to land is a necessary condition for the transformation of the countryside, it is not sufficient. Thus, national plans, financed and promoted by the government, ought to be designed that target rural development and provide public goods and services such as education, health, recreation, infrastructure, [...], that provide wellbeing to the rural population" (see *here*, pages 10 and 11).

At the time of the agreement's signing, several organizations forecasted what its economic impact would be. The most optimistic estimates came from Colombia's National Planning Department, which predicted a 1.1pp-1.9pp increase in GDP growth (Gaviria et al., 2015). Less optimistically, the Ministry of Finance suggested that GDP growth would only increase by 0.3pp in the 15 years following the signature of the agreement, very close to estimates from Bank of America - Merril Lynch (Villar et al., 2017). In between these two, Clavijo, Vera, and Ríos (2017) estimated that the reduction in conflict and drug trafficking would translate into 0.5%-1% higher GDP growth over the decade after 2016 and that the implementation of the peace agreement would cost around 5% of GDP per year during the same time. Thus, while all studies agreed that the peace agreement would bring economic growth, the magnitude of such effects was believed to be small *for the whole country*. Other than one contemporaneous and related study to this (Bernal et al., 2022, who find that the peace agreement had no overall effects on entrepreneurship dynamics), there have been no attempts to quantify whether the peace agreement realized the expansion of economic activity it aspired to, especially in the areas most affected by the conflict, a void that this study helps to fill.

2.2 Data

The data used in this paper come from multiple sources. Most of the data are provided by CEDE at Universidad de los Andes, which provides a municipality-level panel on

a multitude of variables since the 1990s. CEDE collects data mostly government agencies. Appendix A contains a variable-by-variable description of data sources.

One of the main difficulties of evaluating the impact of Colombia's peace agreement in municipalities previously affected or controlled by the FARC is the lack of administrative data on the presence of insurgent groups across municipalities over time. This is a general difficulty in the literature studying conflicts. However, Arjona and Otálora (2011) suggest that the infliction of violence by an insurgent group tends to be a good predictor of their presence/control in Colombia. The literature analyzing the effects of Colombia's peace agreement have therefore used an insurgent group's criminal activity as a proxy for its presence (see, e.g. De Roux and Martínez, 2021; Bernal et al., 2022; Guerra-Cújar et al., 2021, among others). Thus, I propose two different measures of FARC/ELN presence based on the location of their violent actions.

Both measures are based on administrative data from the National Police and Administrative Department of Security, which contain disaggregated data on a multitude of criminal acts committed at the municipality-year-insurgent group level. I focus on the period between 1996 and 2008, the highest point of the conflict and before the start of the peace negotiations. My preferred measure, used for all the baseline results, is meant to capture the "extensive margin" of conflict and aims to identify municipalities that were constantly exposed to FARC/ELN actions in that timeframe. More specifically, in the baseline definition of this variable, I classify a municipality as having been affected by, or under the control of, an insurgent group (I use these terms interchangeably) if the municipality has at least one criminal act committed by the insurgent group in at least 60% of the years for which data are available (8 years).[4] I exclude the top 2% largest municipalities, which never were under FARC or ELN control.

The second measure is meant to capture the "intensive margin" of conflict and aims to identify the municipalities that were hit hardest by the activities of a particular insurgent group. First, I calculate the average number of criminal acts per 100.000 inhabitants for each municipality over time. In the baseline definition of this variable, I classify a municipality as having been affected/under the control of the FARC/ELN if its average number of events per 100.000 inhabitants between 1996 and 2008 is at the top 20% of the average across all municipalities. Thus, while the first measure identifies municipalities that were exposed to a certain insurgent group for an extended period of time, the second one identifies municipalities that were hit particularly hard during this timeframe. While the main results will use the "extensive margin" measure, in Section 6 I conduct several robustness checks to make sure that the results do not depend on this specific measure of presence. First, I show that all the results are

[4]The criminal acts used for the creation of the two measures are: attacks and assaults against the population, incursions to populated center, incendiary terrorist acts, explosive terrorist acts, offensive actions, kidnappings of politicians, members of armed forces and civilians, attacks against transport infrastructure, illegal road checkpoints, armed harassment, attacks against official entities, illegal roadblocks, assaults against private property, political attacks, ambushes, clashes, armed contacts, homicides, armed forces wounded and killed, and killings of members of the insurgent group.

virtually identical using the "intensive margin" measure. Second, I test the robustness of the baseline results to using different cut-off levels for the creation of both variables.

Figure 1 shows the distribution of municipalities categorized as having been affected/under the control of the FARC (treatment) and the ELN (control) according to the "extensive margin" measure in Panel A and to the "intensive margin" measure in Panel B. Note that municipalities that are classified as both under the FARC and ELN control are excluded from the analysis. Reassuringly, these broadly correspond to the areas in which the FARC and ELN operated according to other sources (for example, Echandia, 1998; PARES, 2015), and there is significant overlap between the two maps. They also correspond to areas that have been historically associated with each of the two groups, with the FARC operating in the central departments (e.g. Tolima, Huila, Meta and Caquetá), and the ELN further north, in Santander, Norte de Santander, and Cesar. Moreover, over 80% and 95% of the municipalities studied in Blair et al. (2022), which were selected due to having had "historical FARC presence" where "other armed groups (including ELN and paramilitaries) were historically present as well", are correctly identified by the intensive and extensive margin measures.[5] Thus, while each measure has different advantages and disadvantages, they both seem to accurately locate the presence of these insurgent groups.

3 Identification Strategy

Having identified which municipalities were most affected/under control of the FARC for most of the pre-agreement period, the next question is how to identify the agreement's causal effects. Simply comparing the evolution of FARC municipalities against that of the rest of municipalities in the country in a difference-in-difference setting (which is what most of the literature has done) is unlikely to recover the causal effects of the agreement. The municipalities affected by the FARC are radically different from the rest of the country, and it is unlikely that the parallel trends assumption needed for the difference-in-difference estimation is satisfied. In fact, Table 1 shows how different

[5]There are several additional pieces of evidence that suggest that these measures are indeed capturing FARC/ELN municipalities. First, all municipalities that were part of the El Caguán Demilitarized Zone (an area where the FARC has historically had control) as part of the negotiations with the FARC between 1999 and 2002 are classified as having been under FARC's presence. Second, after the signature of the peace agreement, FARC members were located in 26 camps (*Zonas Veredales Transitorias de Normalización* and *Puntos Transitorios de Normalización*, ZVTN and PTN respectively) across 25 municipalities in areas in which the FARC used to operate. For the extensive (intensive) margin measure of presence, 23 (22) out of 25 municipalities that were either PTN or ZVTN are classified as being under FARC/ELN control. Third, there is qualitative evidence suggesting that criminal groups recruit mostly where they operate (see, e.g. *Razón Pública, 2013* and *Semana, 2006*). Table F1 shows the number of demobilized members of FARC and ELN that state they live in FARC/ELN/rest of the country municipalities after demobilizing. Demobilized FARC (ELN) members consistently name municipalities classified as FARC (ELN) municipalities as their municipality of residence (first four columns for FARC, last four columns for ELN). Importantly, FARC (ELN) members locate in ELN (FARC) and rest of the country municipalities in similar proportions, again suggesting that these are indeed ELN (FARC) municipalities. The same pattern holds when looking at captures of FARC/ELN members using data between 2010 and 2017.

FARC (column 2) and non-FARC municipalities (column 1) are along a multitude of characteristics in the pre-negotiation period. FARC municipalities are much less populated and have consistently worse economic, social and performance indicators than non-FARC municipalities. It is especially hard to believe that violence in the rest of the country, which includes large cities like Medellín, Bogotá and Cali, would have evolved in the same way as in FARC-controlled municipalities in the absence of the peace agreement.

Instead of comparing FARC and all non-FARC municipalities, I use a difference-in-difference strategy comparing municipalities with a long-lasting FARC presence (treatment) and those with ELN presence (control), before and after the start of the unilateral ceasefire announced by the FARC in December 2014. There are several reasons to believe this comparison would satisfy the parallel trends assumption needed to recover the agreement's causal effect. The FARC and ELN were both left-wing guerrilla organizations created around the same time for similar reasons, and they have shared the same trajectories over time, as described in Section 2. They both have used violence and terror as a way of imposing their control; kidnapped and extorted as a way of funding their operations; and fought the state and paramilitary forces for decades. Figure 4 of Feldmann (2018) shows how closely the number of terror acts from the two groups has moved over time. While the ELN was always smaller than the FARC and focused mostly on extracting resources from oil-producing regions, in recent times it has followed the FARC in trafficking drugs. The FARC and ELN even joined forces with other smaller guerrilla groups in an effort to consolidate under a single organization between 1987 and 1994, the Coordinadora Guerrillera Simón Bolívar. The ELN was also interested in joining the FARC's peace negotiations, indicating that the two groups still had connections. Moreover, while not identical to FARC's municipalities, Table 1 shows that municipalities with FARC and ELN presence were much more similar before the start of the peace negotiations than FARC and non-FARC municipalities.

I estimate two different regression equations. First, I estimate the following two-way fixed-effects regression to recover the overall effects of the start of peace on municipalities with historical FARC presence relative to those with ELN presence:

$$y_{mt} = \beta Ceasefire_t \times FARC\ Presence_m + \eta_m + \mu_t + \varepsilon_{mt} \tag{1}$$

where y_{mt} is the outcome of municipality m in year t, $Ceasefire_t$ is a dummy that equals one for the post-ceasefire years (from 2015 onwards), $FARC\ Presence_m$ is a dummy that equals one for municipalities that are classified as having had FARC's presence according to either one of my two measures of presence, and zero for municipalities classified as having had ELN's presence,[6] η_m are municipality fixed-effects, μ_t are year fixed-effects, and ε_{mt} is an error term. Standard errors are clustered at the municipality

[6] I exclude municipalities classified as having had both FARC and ELN presence according to my measures throughout the paper, as it is not clear to which group they should belong to.

level. For most variables, the regression is estimated using data from 2009 (the year after the period used to create the presence measures) to 2019. Note that while there is now a large literature highlighting problems in the estimation of TWFE regressions (for reviews, see De Chaisemartin and D'Haultfoeuille, 2022; Roth et al., 2022), these are not relevant in this setting as the treatment is not staggered, i.e. all treated units are treated at the same time in December 2014.

Second, I estimate event-study-like TWFE regressions to study the dynamics of the treatment effects, which also allows the evaluation of parallel trends before the start of the ceasefire. Formally, I estimate:

$$y_{mt} = \sum_{j \in T \notin 2014} \alpha_j (\mathbb{1}[t = j] \times FARC\ Presence_m) + \eta_m + \mu_t + v_{mt} \tag{2}$$

with indicator variables for each year between 2009 and 2019, T, with the last pre-treatment period (2014) omitted. The parameters α_j measure the difference in the outcome variable in municipalities with FARC's presence and municipalities with ELN's presence, in year j relative to 2014, the last year before the ceasefire started. Standard errors are clustered at the municipality level.

4 Results

In this Section, I present the main results of this study. First, in Subsection 4.1 I show that the start of the ceasefire led to a large reduction in violence indicators in municipalities with FARC presence relative to ELN's. Then, in Subsection 4.2 I analyze whether this reduction in violence translated into improvements of economic indicators. I show that this is not the case, with precisely-estimated null effects on economic activity. Using a different identification strategy, I evaluate a government program specifically designed to spur economic activity in conflict-affected municipalities by granting tax incentives to firms opening in those areas, also finding precisely-estimated null effects.

4.1 Violence

Table 2 shows the results of estimating Equation (1) for a battery of violence-related indicators, defining the treatment and control groups using the extensive margin measure of presence. Panel A shows the results using different measures from the Victims' Unit, while Panel B uses measures from different sources, mostly from the Ministry of Defense. Appendix A contains a full list of data sources for each variable. All measures are standardized per 1000 inhabitants to account for differences in municipalities' size.

A consistent picture emerges from this Table: most indicators show a significant and large decline in violence after the start of the ceasefire for municipalities with FARC presence relative to those with ELN presence. Interpreting the coefficients, mu-

nicipalities with previous FARC presence experienced decreases of 0.046 forced disappearances, 0.608 property losses, 0.019 clashes between different groups, 0.292 mine events, and 10 forced displacements per year (among others) after the start of the ceasefire relative to municipalities with ELN presence, with the decreases being between 40%-50% of the pre-treatment mean in FARC and ELN municipalities.

To summarize the different measures in a single variable and increase power, I create an index following Anderson (2008)'s approach. In brief, it is an inverted-covariance-weighted mean of the different standardized measures, with several attractive properties relative to other summary indices. Appendix A provides details on how this index is created. Column 7 of Panel B shows the result for this summary measure. It also shows a significant, negative and sizable decrease in overall violence.

To understand the dynamics of these effects, and to check whether trends look parallel for pre-intervention periods, I follow Freyaldenhoven et al. (2021)' suggestions and estimate Equation (2). For brevity, I only present results for the Anderson Index in Figure 2. The results for each individual measure can be found in Appendix E. There are several takeaways from this Figure. First, violence is decreasing over time after the ceasefire, suggesting that at least until 2019, the decrease in violence was sustained. Following the advice in Roth (Forthcoming) and Freyaldenhoven et al. (2021), I conduct a test of joint-significance of all the pre-intervention coefficients. The p-value of such test is shown at the bottom left part of each figure, and I can't reject the null of no joint pre-intervention effects. This is also the case when using the pre-trends test suggested by Borusyak, Jaravel, and Spiess (2021), in the second line at the bottom left part of each figure. There is also no individually-significant coefficient. Moreover, there is no discernible trend in the pre-intervention periods, with all coefficient around the same magnitude. Finally, as suggested by Freyaldenhoven et al. (2021), the sup-t confidence band is also plotted around the coefficients, which is a more adequate way of testing for the event-time path of the outcomes. Reassuringly, this sup-t confidence band covers 0 for all the pre-intervention periods. Overall, while the parallel trends assumption is untestable, these results for the pre-intervention period are supportive of the validity of the assumption in this context.

Two open questions remain: Are these reductions in violence present for all FARC municipalities? And, if the FARC stopped operating in these municipalities, did other criminal groups start operating there? To address the first question, I check whether the violence effect varies by whether the municipality is specially attractive for armed groups. Two important sources of income for armed groups in Colombia are illegal gold mining and coca production. In Figure E1, I show that violence also significantly decreased in municipalities with geochemical gold anomalies where the probability of finding gold is higher, or that are more suitable for growing coca (from Mejia and Restrepo, 2013), or both (last row). Thus, it seems like the decrease in violence happened across FARC municipalities. To address the second question, I use data from Osorio et al. (2019). They use NLP tools to identify the armed group responsible for

human right violations (and geolocate these) based on reports from a Colombia NGO, CINEP. CINEP has been gathering information related to HR incidents related to the armed conflict in Colombia since 1987. These data allow me to check HR violations by armed group before and after the start of the ceasefire. The results of estimating (1) for each armed group are presented in Table F2. The Table shows, consistent with the results above, that FARC-associated HR violations decreased significantly. There are also large reductions in activity by the government (although insignificant) and other criminal groups. The last column shows, as before, that HR violations went down after the start of the ceasefire. Importantly, there is no increase in criminal activity by other groups (ELN, criminal bans, paramilitaries), suggesting that the FARC was not simply replaced by other criminal groups. While there is an increase in HR violations by FARC dissident groups, this comes mostly in 2019, the magnitude is small, and it is because they have emerged in municipalities where FARC were previously active.

4.2 Economic Indicators

The results from the previous Subsection suggest that the start of the ceasefire did decrease violence in municipalities with historical FARC presence relative to ELN municipalities, and that this effect has persisted over time. In this Subsection, I evaluate whether this decrease in violence translated into improvement of economic indicators. While the reduction in violence following the ceasefire is a worthy achievement in itself, one of the agreement's stated goals was to bring economic prosperity to areas affected by the conflict. The analysis here follows in two parts. In the first part, I evaluate the economic impacts of the ceasefire using the same difference-in-difference strategy as in Section 4.1. In the second part, I focus on municipalities that received a fiscal incentive program for firms and analyze whether this government economic program targeting conflict-affected municipalities succeeded in improving economic indicators.

4.2.1 Difference-in-Difference

Measuring economic activity in municipalities that experienced the presence of armed groups is difficult given that i) these tend to be small, distant, rural communities, ii) there is a lack of survey- or individual-level data in Colombia representative at the municipality level with good geographical coverage, and iii) any data collection effort is made more difficult by the insecurity created by the presence of armed groups. Thus, I use a variety of indicators of economic activity to provide a general perspective. While neither of these measures is perfect, together they paint a consistent picture.

Table 3 shows the results from estimating Equation (1) on different economic indicators using the extensive margin measure of presence. First, following a large recent literature (see for example, Donaldson and Storeygard, 2016; Henderson, Storeygard, and Weil, 2012; Henderson et al., 2018), I use nighttime light intensity as a proxy for

economic development in column 1.[7] For comparability, I standardize this measure for each year. Column 2 uses official estimates on municipality GDP from the National Statistical Office (DANE), available between 2011 and 2020. Column 3 uses estimates on municipality GDP following the methodology proposed by Sánchez Torres and España Eljaiek (2012) for Colombia. Column 4 uses satellite data to estimate the amount of urban built-up within each municipality, more precisely the Band Ratio for Built-Up Area (BRBA) proposed by Waqar et al. (2012), which has been shown to perform well in settings like Colombia (Valdiviezo-Navarro et al., 2018). However, this index still suffers from difficulties separating urban and bare soil and is affected by external factors, such as cloud cover, and thus, results using this measure need to be analyzed with caution. Given that the analyzed municipalities tend to be mostly rural, agricultural municipalities, in columns 5 and 6 I use data from the Ministry of Agriculture and analyze agricultural productivity (tonnes/area cultivated) and production (tonnes per capita), based on the cultivation of over 270 crops. Column 7 uses the share of the population living in urban areas, based on census data and official projections from DANE. Column 8 uses firm entry data from the *Registro Único Empresarial y Social* (RUES) collected by the Confederation of Chambers of Commerce. Colombian firms must obtain a license from their local Chamber of Commerce within a month of starting their commercial activity for many regular business activities. However, this license does not imply formalization, as registration with tax authorities is a separate process, meaning that at least some part of the informal sector will be captured by this measure.[8] Column 9 uses data from the Ministry of Health's *Planilla Integrada de Liquidación de Aportes* (PILA), which captures formal employment. PILA records, for all formal wage-earners and self-employed individuals in the country, their monthly contributions to healthcare, pension funds and workers' compensations. I estimate the average number of active contributors across months in each municipality as a measure of formal employment. The last column presents the results of the Anderson Index composed of the measures in columns 1, 2, 5, 7, 8 and 9, created as in the previous Section.[9]

The results using the different proxies of economic development are consistent: they suggest that despite the large reduction in violence following the FARC's ceasefire, economic indicators did not improve in areas previously affected by the FARC.[10] If anything, some of the results point towards *negative* effects, as shown by the coeffi-

[7] The data come from Li et al. (2020). Pixels are assigned to municipalities in the proportion that they lie within the municipality but the results are robust to using a measure that assigns a pixel to a given municipality if the pixel's centroid lies within the municipality.

[8] For more information on RUES, see Bernal et al. (2022) or Londoño-Velez, Guarin, and Posso (2022).

[9] To avoid double counting variables when creating the Index, I only use the official GDP per capita from DANE and agricultural productivity. The built up index is excluded as its quality depends on factors outside of anyone's control (e.g. cloud cover). The results are qualitatively unchanged when including the omitted variables in the Index, together or one by one.

[10] Note that the insignificant effects on firm entry are similar to those found by Bernal et al. (2022) when looking at the whole post-ceasefire period (their Table 2). Unlike them, there is no differential result for this variable when analyzing the post-ceasefire, pre-agreement, and the post-agreement periods separately, probably due to the different identification strategy and definition of the outcome variable.

cients for GDP per capita and urban built up. Moreover, this does not seem to be due to a lack of power or imprecisely estimated treatment effects, as the null effects are quite precisely estimated. For example, for nighttime light intensity data, the estimates suggest a reduction in light intensity of 0.007 SD, with SEs that would identify significant effects of around 0.03 SD, a small effect in magnitude. Similarly for GDP per capita, the SEs on the estimates are around 1/10 and 1/15 of the overall pre-intervention mean across FARC and ELN municipalities. Thus, even small effects in magnitude would have been picked up. The results using the Anderson Index in the last column are also insignificant and precisely-estimated. Overall, while each measure has advantages and disadvantages for measuring economic activity in this context, the results are consistent and indicate that the ceasefire, while proceeded by a decrease in violence, did not bring economic improvements to areas previously affected by the FARC.

A natural concern with the results in Table 3 is that, given the short post-intervention panel analyzed, the analysis might simply be ignoring dynamics. It could be the case that the economic returns from peace do not happen immediately but take some time to materialize. To analyze the dynamic evolution of the different indicators, I estimate Equation (2) following Freyaldenhoven et al. (2021)'s suggestions. Figure 3 shows the event study graphs for the different measures of economic activity.

There are several takeaways from Figure 3. First, for almost all joint significance tests of pre-intervention periods, the null hypothesis of no effect is not rejected, using either a test of joint significance of all pre-treatment coefficients or the pre-trends test suggested by Borusyak, Jaravel, and Spiess (2021). For the two graphs for which the null is rejected, there is no trend pre-intervention (the pre-intervention coefficients are simply flat), and the sup-t confidence bands cover 0. Moreover, for the Anderson Index, the significant joint test comes entirely from the firm entry measure, as shown in Figure D3, although the main coefficient is robust to the composition of the index. Thus, there seems to be no violation of the parallel trend assumption in the pre-intervention period, providing supportive evidence of the validity of the identification strategy. Second, and most importantly, it does not seem to be the case that the economic effects of the ceasefire are materializing in the medium-run. The coefficients remain close to zero for the entire post-intervention period, with no clear improvement over time, or a differential effect before or after the actual ratification of the peace agreement in 2016.

4.2.2 Difference-in-Discontinuities – ZOMAC Program

The results from the previous Subsection find no improvement in economic indicators when comparing FARC and ELN municipalities, before and after the start of the ceasefire. In this Subsection, I go one step further and analyze a government policy designed to spur economic activity in conflict-affected areas. Importantly, the inclusion of municipalities in this program was based on set thresholds of some economic and violence indicators. I briefly introduce the program, identification strategy and results in this Subsection, with a more detailed exposition in Appendix B.

In order to incentivize business and employment creation in areas that had been affected by the conflict (ZOMAC municipalities), the government started a tax incentive program for firms in 2017. The main incentive is a progressive business tax tariff for a period of 10 years starting in 2017, which varies depending on the size of the firm, as shown below in Table 4. The reduction in business tax rates are sizeable. For firms to benefit from the tax reduction they must i) have been created after the December 29, 2016, ii) have their main address in a ZOMAC municipality, iii) perform their whole productive processes in ZOMAC municipalities, and iv) satisfy some investment and job-creation requirements. These investment and job-creation requirements vary depending on the sector and the size of the firm.[11] Informal firms that formalize and meet these criteria can also benefit from these incentives.

Participation in the program was based on several different socioeconomic indicators, with clear cutoffs. I exploit the discontinuity in participation caused by an index of incidence of the armed conflict (IICA)[12] by embedding a regression-discontinuity design based on this variable in a diff-in-diff set-up. Such an approach was first formalized by Grembi, Nannicini, and Troiano (2016), and called the "difference-in-discontinuity" estimator. It allows me to compare the evolution of those municipalities just below and above the inclusion threshold over time. Three assumptions need to be satisfied to recover this estimator: first, all the potential outcomes must be continuous at the discontinuity; second, an assumption similar in spirit to the parallel trends assumption in traditional difference-in-difference settings; and third, the effect of the treatment at the discontinuity does not depend on any confounding policy. I describe these assumptions in detail, and present evidence in support of their validity, in Appendix B.

Following Grembi, Nannicini, and Troiano (2016), I estimate the regression:

$$\begin{aligned} y_{it} =& \delta_0 + \delta_1 IICA^*_m + \delta_2 IICA\ Treatment_m + \delta_3 IICA^*_m \times IICA\ Treatment_m \\ &+ \delta_4 Post_t + \delta_5 Post_t \times IICA^*_m + \delta_6 Post_t \times IICA\ Treatment_m \\ &+ \delta_7 Post_t \times IICA\ Treatment_m \times IICA^*_m + u_{mt} \end{aligned} \tag{3}$$

where $IICA^*_m$ is the normalized IICA score ($IICA^*_m = IICA_m - 0.0191$) of municipality m in year t, $IICA\ Treatment_m$ is a dummy for municipalities with an $IICA$ score above 0.0191 (i.e. ZOMAC municipalities), and $Post_t$ is an indicator for the post-treatment period. As the ZOMAC program started in 2017, in these regressions I denote the post-treatment years as those from 2017. Standard errors are clustered at the municipality

[11] For example, a micro firm in the agricultural sector must invest 40 monthly minimum wages (SMLMV, around 30M COP) and generate two jobs to receives the incentives. A large firm in the same sector must invest 7800 SMLMV (1.5M USD) and generate 49 direct jobs in order to benefit. The table in the appendix of Ministry of Finance (2015) stipulates the requirements for each firm type and industry.

[12] The IICA score is the average across six violence-related variables between 2002 and 2013 and the participation threshold is set at 0,019, with municipalities with a score above that included in the program, conditional on some additional variables.

level. The difference-in-discontinuity estimator of interest is the coefficient δ_6 and identifies the treatment effect of receiving the fiscal incentives for firms.

Table 5 shows the estimates $\hat{\delta}_6$ from estimating Equation (3) on the different indicators of economic activity. To estimate the optimal bandwidth for each dependent variable, I follow Calonico, Cattaneo, and Titiunik (2014) and implement two different procedures. The bandwidth is selected to minimize the Mean Square Error, but the results are qualitatively similar if the bandwidth is selected to minimize the Coverage Error Rate instead. Following Grembi, Nannicini, and Troiano (2016), I select the bandwidth to be the average of the bandwidth calculated in the pre-treatment and in the post-treatment periods.

The results are in line with those found in the previous Subsection: the creation of the ZOMAC program to incentivize firm and employment creation in areas affected by the conflict did not lead to improvements in a wide array of economic indicators. All the coefficients are statistically insignificant, but for the share of the urban population, which shows a modest *decrease*. The estimates are precisely-estimated and the null result is not due to large standard errors. The main drawback of this evaluation is the short post-intervention period considered, with only three years of data available after the start of the ZOMAC program. However, given that the incentives were larger for early-movers, it would have made sense for businesses considering this opportunity to start as soon as possible to be able to enjoy the tax reductions for longer. Even for firm entry (column 8) and formal employment (column 9), outcomes specifically targeted by this program, there is no significant improvement. Thus, this shows that even municipalities specifically targeted by government programs to spur economic activity, there is no economic progress.

5 Mechanisms: State Capacity

The results from the previous Sections are puzzling. On the one hand, the results in Section 4.1 show that the start of the ceasefire led to a large decrease in violence in municipalities that have historically had FARC presence relative to those with ELN presence. On the other hand, the results in Section 4.2 show that the start of the ceasefire and its subsequent reduction in violence did not lead to improvements in a wide array of economic indicators in the short- and medium-run, even in municipalities specifically targeted by the government with economic policies. In this Section, I investigate one potential channel that could reconcile these two seemingly contradictory results: a general lack of state capacity in these areas, due to their long-term neglect during the most violent periods of the conflict and a lack of state entry post-ceasefire, left them unable to economically benefit from their new-found peace.

In Colombia, areas affected by the armed conflict have been long ignored by the government due to corruption, difficulties reaching those distant, rural areas, and the

inherent difficulties of imposing government authority in areas with presence of armed groups. Colchester, Henao Izquierdo, and Lustenberger (2020) have noted the failure of the Colombian government to engage effectively in conflict-affected areas, saying "state institutions in Colombia have suffered from a lack of capacity and effectiveness, especially in the marginalized regions which were particularly affected by the armed conflict leading to ineffective implementation responses." Futher, García-Villegas and Espinosa (2015) show that the judicial system has less presence and less efficiency in conflict-affected areas than the rest of the country. Nor was this an unknown factor, with several different organizations and reports during the peace negotiations emphasizing the importance of the state consolidating its presence in areas previously under the control of the FARC in order for the agreement to succeed (GMH, 2014; Meacham, Farah, and Lamb, 2014; Washington Office on Latin America, 2014; PARES, 2015).

However, in recent years concerns have grown that under the new government, which was opposed to the agreement, its implementation has lagged behind, with the state still not entering previously FARC areas. Evaluating the implementation of the agreement in 2021, five years after its ratification, the Washington Office on Latin America (2021) stated that, as the rural reform at the heart of the agreement falls behind, "so does Colombia's effort to govern its own territory – especially its effort to govern democratically, with the whole state, not just the security forces – in parts of the countryside where that has never happened before." Piccone (2019) similarly observed that "the heavy demands of addressing multiple challenges simultaneously – (...) building a state presence for rural development – are taxing, if not overwhelming, the government's capacity to keep the process on track." Several different programs, such as the Territorially Focused Development Programme (PDETs), designed to increase the state's presence in affected municipalities, have had disappointing results due to their flawed implementation, or its lack thereof (García-Giraldo, 2020). Using a difference-in-difference strategy, Prem et al. (2022) find that, since the ceasefire, the killing of community leaders has increased significantly in former FARC strongholds, and these killings have been performed by non-FARC criminal organizations, suggesting attempts to fill in the power vacuum left by the FARC.

I present two pieces of evidence that suggest that the lack of economic benefits from the reduction in violence is due to i) these areas having very low initial levels of state capacity, likely due to their sustained exposure to illegal armed groups; and ii) a lack of state entry and improvement of local state capacity after the start of the ceasefire. This would be in line with the theoretical model put forward by Besley and Persson (2010), which suggests that low state capacity can lead to self-reinforcing low income traps. Consequently, investments in state capacity to at least a certain level are needed to break from this poverty trap. Given that the literature has highlighted many

meanings and definitions of "state capacity", I will interpret it broadly, presenting multiple measures commonly associated with state capacity.[13]

Table 6 shows the mean value of a multitude of state capacity measures in FARC (column 2) and ELN municipalities (column 3), as well as across the rest of the country (column 1), in 2008 before peace negotiations started.[14] Municipalities with FARC and ELN presence, while similar to each other in terms of initial levels of state capacity, have much lower levels than the rest of the country to begin with. This is likely due to the decades of armed conflict they experienced and a historical lack of state presence in these areas. The second row shows that total tax revenue per capita (perhaps the most common measure of state capacity) is on average around 102.000 COP across the rest of the country, while in FARC and ELN municipalities it is considerably lower at around 70.000 COP.[15] This difference is statistically significant between the two groups and the rest of the country (but not when comparing FARC and ELN municipalities). The same pattern holds for other financial measures. These municipalities also receive lower transfers from the central government than the rest of the country (3rd row). The results suggest that conflict-affected municipalities have much lower levels of institutional quality and performance (rows 8-10) and also that they provide fewer basic public goods such as aqueduct, garbage collection and sewage services (rows 11-13).

A great deal of emphasis was given during the peace negotiations to the importance of the state establishing a firm presence in former FARC municipalities to avoid other criminal organizations taking over this territory. I analyze whether the start of the ceasefire led to an improvement in state capacity measures in former FARC municipalities relative to ELN municipalities in Table 7, which shows the results of estimating Equation (1). Panel A shows the results using different financial measures, while Panel B uses measures of municipalities' institutional performance.

The results in Table 7 using these state capacity indicators are consistent: after the start of the ceasefire, state capacity indicators did not improve in former FARC municipalities relative to ELN municipalities, suggesting that the state did not enter these areas to fill in the vacuum left by the FARC. Panel A shows no significant improvements

[13]There is a long literature discussing what state capacity is and how it can be measured. Measuring state capacity at the subnational level is even more difficult due to a general lack of indicators at a disaggregated level (Hanson and Sigman, 2021). Earlier work originally referred to it as the power of the state to raise revenue (North, 1981; Tilly et al., 1985). Based on Mann's concept of infrastructural power (the capacity of the state to penetrate society and "to implement logistically political decisions throughout the realm", Mann, 1984), another strand of the literature has emphasized it as the state's ability to provide the basic infrastructure necessary to sustain economic activity, including the provision of public goods (Hanson and Sigman, 2021). Yet another strand of the literature follows Weber's definition of the state not just by its monopoly on the legitimate use of force but also the effectiveness in which this monopoly is used by an organized bureaucracy and thus focuses on measures of bureaucratic quality (Hendrix, 2010). As each of these different definitions captures important components of a state's capacity, I use a broad range of different state capacity indicators based on these literatures.

[14]The results area identical if one uses instead the average of these measures between 2008 and 2012.

[15]100.000 COP are around 26.5 USD according to the exchange rate in June 2, 2022.

in any of the financial indicators. The estimates are precisely estimated, suggesting that the insignificance is not due to noisy estimates. For example, column 1 shows that total revenue increased by 30.000 COP per year on average in FARC municipalities relative to ELN municipalities, which is only 3% of the pre-intervention mean across FARC and ELN municipalities. The SEs would pick up effects of around 60.000 COP per year, which are small in magnitude. For tax revenue in column 2, it actually decreases by 9.000 COP per year, which is less than 10% of the pre-intervention mean across FARC and ELN municipalities, with small SEs. Column 3 shows that these municipalities did not start receiving more resources from the government post-ceasefire, again suggesting that the state did not fulfill its promise of shifting resources towards previously-affected municipalities. Similar results hold for the remaining financial measures. Column 8 shows the results of combining all these financial measures into a single index, following Anderson (2008), also finding an insignificant effect.

Turning now to measures of local government performance, the results in Panel B show a similar picture. Most of the performance indicators show precisely-estimated null effects, with the exception of a significant increase in information openness. There seems to be no improvement in terms of the municipalities' savings capacity (column 1), or measures of financial (column 2) and overall local government performance (column 3). The summary index based on these different measures is also statistically insignificant (column 5).[16]

Event-study plots are displayed in Figure 4. I show the results from per capita tax revenue (the most commonly-used state capacity measure), government transfers and the Anderson Indices based on the financial and performance measures. The main takeaway is that there is no apparent upward trend in these measures post-ceasefire, which would be expected if improvements took some years to materialize. Pre-intervention trends also look parallel, with the sup-t confidence bands covering the zero in all figures and only one individual coefficient being significant across the four figures.

While I have so far focused on state capacity as being the mechanism driving the results, there could be alternative mechanisms that explain why the reduction in violence did not translate into economic improvements in FARC areas. In Appendix C, I present evidence suggesting that several alternative mechanisms are unlikely to be causing the results. More specifically, I show that i) FARC municipalities did not produce more coca than ELN municipalities, nor were they disproportionately targeted by the government's eradication program; ii) FARC municipalities did not receive more Venezuelan migrants (which might shock these small labor markets) than ELN municipalities; iii) small agricultural producers in FARC municipalities started receiving more

[16]Contrary to improving state capacity, the ceasefire led to more extortion, less garbage collection coverage and a decrease in the measure of state capacity proposed by Harbers (2015), validated using Ecuadorian micro-data, in FARC municipalities. Moreover, there is no improvement in the provision of other public goods or participation in elections at any level.

credit after the signature of the peace agreement, suggesting that credit constraints do not explain the results; iv) there was no shift from productive activities to education in FARC municipalities; v) claims for land restitution have evolved in a similar way in FARC and ELN municipalities; and vi) residents of FARC municipalities were supportive of the peace agreement, believed that it would benefit them (both economically and in terms of security) and were knowledgeable about the content of the agreement.

Overall, the results in this Section are supportive of state capacity being a, if not the, potential mechanism to explain the results in the previous Section. Municipalities that have historically had FARC/ELN presence have much lower levels of state capacity than the rest of the country to begin with, probably as a consequence of the long-running conflict. Moreover, contrary to what was emphasized during the peace negotiations, the central government does not seem to have entered former FARC municipalities to build a state presence and the capacity of local governments, leading to no improvement in state capacity indicators in former FARC municipalities after the start of the ceasefire. This lack of state capacity could have hindered these municipalities from reaping economic benefits from the large reduction in violence observed after the start of the ceasefire. This is consistent with the theory in Besley and Persson (2010), in which low levels of state capacity can lead to self-perpetuating poverty traps.[17]

6 Robustness Checks

In this Section, I present different robustness checks to the results presented in Sections 4 and 5. First, the baseline extensive margin measure defines a group as being present in a given municipality if the municipality experiences events from the insur-

[17] Note that another test of this hypothesis would be to check whether municipalities with higher initial levels of state capacity experienced improvements in economic indicators post-ceasefire. However, baseline state capacity levels are much lower in FARC and ELN municipalities compared to the rest of the country (as seen in Table 6), there is little variation in these measures in the sample, and the sample size is relatively small, which difficult any meaningful heterogeneity analysis. Yet another alternative would be to compare areas in the sample where we know the state entered with certain confidence to those in which the state did not enter. However, systematically finding areas in which the state entered is difficult, as the qualitative evidence consistently points to a general lack of state entry (see, e.g. Washington Office on Latin America, 2021). One possible proxy for state entry could be participation in Territorially Focused Development Programs (PDET in Spanish). This was a key program designed by the government as part of the agreement's Comprehensive Rural Reform. PDETs consist of "plans, developed in consultation with local leaders, to address long-neglected governance and development priorities" (Washington Office on Latin America, 2021). Sixteen areas encompassing 170 municipalities were identified across the country. Thus, these are areas identified by the government in which discussions with local leaders were conducted to address the needs of their communities, arguably the closest it comes to the state "entering". However, the implementation of the program has been extremely slow, with little to show in terms of progress. By August 2018, there were plans for only 2 of the 16 regions. Only around 22% of the funding that should have been spent by 2021 had been spent. Therefore, even in PDET municipalities during the timeframe considered here, it is difficult to argue that the state entered. When estimating (1) including a triple interaction with a PDET dummy, the change in economic activity is not statistically different in FARC municipalities that are and are not part of the PDET (results available upon request).

gent group in at least 60% of the years. I test the robustness by using two alternative cutoffs, 50% and 70% of the years, to define affected municipalities. Figure 5 presents the results of varying the definition cutoff for the three sets of variables, with the top panel using the violence variables. Regardless of the thresholds used to define the presence measure, the results indicate a consistent reduction in violence in former FARC municipalities relative to ELN municipalities. Results for the economic indicators are presented in the middle figure, which show that the estimates remain consistent when using different thresholds. Finally, the bottom figure confirms that the state capacity results also remain qualitatively unchanged when using these different thresholds.

Second, while the baseline results use the extensive margin measure of presence of insurgent groups, the results are robust to using instead the intensive margin measure described in Section 2, which captures the municipalities in which a particular illegal armed group was the most violent (in per capita terms). The baseline intensive margin measure classifies a municipality as under the control of a given armed group if it belongs to the top 20% of municipalities that had the most events per capita by that armed group on average between 1996 and 2008. Tables F3, F4, F5, and F6 use the incentive margin measure and mimic Tables 2, 3, 6, and 7 using the intensive margin measure. Table F3 shows the results using the different violence measures. As with the extensive margin measure, it shows significant, large reductions in violence across multiple violence indicators. Figure E4 shows that the improvement in violence seems to have happened gradually and persisted at least until 2019, with the joint test of pre-treatment coefficients being insignificant. Moreover, the results in Table F4 also show that this large reduction in violence did not translate into improvements in economic indicators, as almost all coefficients show precisely-estimated null effects. Figure E5 shows that there is no improvement over time in these economic indicators. Turning to the mechanisms, Tables F5 and F6 show that FARC and ELN municipalities have much lower initial levels of state capacity (although the two groups are less similar than when using the extensive margin measure), and that FARC municipalities did not see improvements in these after the start of the ceasefire relative to ELN municipalities, even when looking at the event studies in Figure E6. To show that the results do not depend on the specific cutoff used to create the intensive margin measure, Figure E7 shows that the intensive margin results are robust to setting the inclusion threshold to the top 30% or 10% municipalities with the most violence by FARC or ELN.[18]

[18]In the baseline results, I use data from the National Police to create the measures of insurgent group presence. An alternative source of violence information commonly used in the literature (see, e.g. De Roux and Martínez, 2021; Dube and Vargas, 2013; Prem et al., 2022) comes from *Noche y Niebla*, a publication created by the NGO *Centro de Investigación y Educación Popular* (CINEP), which is based on news reports from over 20 major newspapers, and reports from various NGOs and the Catholic Church. Osorio et al. (2019) clean these data using Natural Language Processing (NLP) tools to locate the municipalities in which the different events took place. The problem with these data is that too few events are reported, so most municipalities observe zero events in all years. I have estimated the same set of results using the extensive margin measure created using these data instead but there are only 90 FARC and 9 ELN municipalities using the 60% cutoff. Calculating SEs using the wild-cluster

While the historical evidence suggests that municipalities under ELN's control could be a valid counterfactual for those under FARC's control, the majority of tests for joint significance of pre-intervention coefficients presented here fail to reject the null, the sup-t confidence bands recommended by Freyaldenhoven et al. (2021) cover zero, and no apparent pre-trend are observed, I present results using the synthetic difference-in-difference estimator developed by Arkhangelsky et al. (2021). This estimator tries to find a group of "donor" municipalities that mimics the treated ones in the pre-intervention period, with the intuition that if their pre-trends were parallel, then their post-treatment counterfactual evolution would also have been in parallel.[19] Appendix Tables F7 and F8 show the results using this method and the extensive and intensive margin measures of insurgent group presence, respectively. For brevity, I only present the results for violence using the Anderson Index and a different index created following the procedure suggested by Kling, Liebman, and Katz (2007), and for a subset of the state capacity measures. The results echo the results in the previous Section using historical ELN municipalities as the control group: there is a very large reduction in violence in treated municipalities, which is not followed by increases in economic indicators or improvements in state capacity levels. Appendix Figures E8, E9 and E10 show the corresponding diff-in-diff plots.

The results so far have used Anderson (2008)'s approach to summarizing different variables into a single index. Results using the summary measure proposed by Kling, Liebman, and Katz (2007) (KLK Index) are very similar to the ones using the Anderson Index (see Table D1), suggesting that the results are not driven by the construction of a specific index variable. As described in Appendix A, the two indices are created in a similar way. Nonetheless, the Anderson Index has several advantages over the KLK Index and that's why the baseline results use this index. First, the Anderson Index assigns more weight to variables that are less correlated to other component variables, as these might carry more relevant information not captured by the other component variables. Intuitively, uncorrelated indicators represent "new" information and thus receive more weight. Second, it also assigns less value to indicators with missing observations, rather than imputing missing observations using the mean of the treatment assignment group, which might artificially decrease the index's variance.

bootstrap t-statistic suggested by Cameron, Gelbach, and Miller (2008) for diff-in-diff settings with few treated/control clusters, the results are qualitatively in line with those presented here.

[19] The authors recommend restricting the donor pool somewhat to avoid having very different units as potential donors. While there is little guidance on how to do this exactly, I take a conservative approach and reject only a few municipalities that are very different to the ones with historical FARC presence. Briefly, for some variables of interest, I pick the most extreme observations (the max or the min) for the treatment group in the pre-intervention period and drop those municipalities that have even more extreme values. I select six variables to perform this restriction of the donor pool: total population, distance to the department's capital, rurality index, fiscal performance index, overall performance index and child mortality rate (below 1 year). These variables should help identify municipalities that are very different to historical FARC municipalities along economic and social measures. As an example, I check what is the largest population in my treated groups. Then ignore those municipalities with a minimum population in the pre-intervention period larger than the max population in the treated groups.

Another cause of concern is potential spillovers from the treated to the control municipalities, which would lead to a violation of the SUTVA and thus bias the coefficients. For example, the start of the ceasefire could have affected the level of violence in ELN municipalities if the government started focusing its efforts on ELN municipalities. Assuming that spillovers are local (meaning that spillovers only happen within a certain distance d of the treated units) and under a slightly modified parallel trends assumption requiring that the counterfactual trend among control units outside the spillover distance d is the same as that of all treated units, Butts (2021) shows that one can estimate two different effects: the "total" effect, which captures the effect of going from a world with no treatment to a world with the realized level of treatment (including spillovers on treated municipalities), and the spillovers on control municipalities.[20]

Table 8 shows the results of estimating the total effect and the spillovers on the control units for the four Anderson indices of each category of variables. In my preferred specification (columns 1-5), I restrict spillovers to up to 60kms from the closest treated municipality (roughly the 75^{th} percentile of distance to the closest treated municipality among control municipalities), but also show results for spillovers up to 40kms (columns 6 and 7) and up to 80 kms (columns 8 and 9), with the results very similar across these three values of d. Column 1 shows the results of the total effects when taking into account spillovers to the control units, which are very similar to the baseline results. As column 2 shows, the spillover effects on control municipalities up to 60kms away from the closest treated unit are insignificant, explaining why the total effects are close to the baseline results, and suggesting that violations to SUTVA are unlikely to be a cause of concern in this setting. When disaggregating the spillovers into 20kms bins in columns 3-5, the spillover coefficients for the violence index are increasing in the distance from the closest treated municipality (although always insignificant), suggesting that, if anything, violence decreased in the vicinity of FARC municipalities as well. The results when restricting the spillovers to within 40kms (80kms) of the closest treated municipality are very similar, with only the total effect on the violence index significant, while the spillover effects remain insignificant.

A recent literature has developed tools to measure the extent of violations of pre-trends and how these would affect the results (Rambachan and Roth, 2019; Roth, Forthcoming). Appendix Table F9 shows the results of implementing the test suggested by Roth (Forthcoming). Panel A shows the results for the extensive margin measure of presence, while Panel B shows the results for the intensive margin measure of presence. The first column of each panel shows the slope of a linear violation of the parallel trend assumption that would be detected with a power of 80%. For all measures, this slope is small in magnitude, suggesting that the tests are sufficiently powered to detect a small violation of the parallel trend assumption. For example, the slope in Panel A for

[20]To shed light on the validity of the modified parallel trends assumption, Figure E12 shows the event study plots using all treated municipalities and the control municipalities that are over 60kms away from the closest treated municipality, my preferred specification for this exercise. There is no apparent trend in the pre-treatment coefficients for either of the four Anderson indices.

the Anderson Index of violence measures says that a pre-trend with a size of 0.079 SDs is likely to generate at least one statistically significant pre-period event study coefficient. In columns 2 and 3, I calculate the unconditional and conditional (on surviving the pre-test) biases that would be caused by a trend of that size for the average of the post-treatment coefficients.[21] For example, focusing on the second column of Panel A, an unconditional bias of 0.238 SDs means that if a trend of a size of up to 0.079 SDs is indeed present (although not detectable), it would generate on average across all post-treatment periods a bias of at most 0.238 SDs, around 70% the size of the mean post-treatment coefficients. Both the conditional and unconditional biases are small in this case. Appendix Figure E11 shows the event study graphs for the Anderson Index of the violence measures, with the linear violation of the parallel trend assumption that would be detected at 80% power.

In Appendix D, I present several additional robustness checks. First, I perform a "placebo" test using data only from the pre-intervention period and assigning the treatment to the years 2011, 2012 and 2013, finding no anticipation effects. Second, I perform a "permutation" test for the violence result, randomly assigning municipalities to the treatment and control groups, finding in only 0.4% of iterations a coefficient larger in magnitude than the baseline one. Third, I use an alternative inference method, an alternative summary index (the KLK Index), add pre-treatment controls, add municipality-specific time trends, and use alternative measures of FARC/ELN presence (each of these checks separately), with the baseline results robust to these alternative specifications/checks. Then, I show that the Anderson Index's results for the different groups of variables (violence, economic, and state capacity measures) are robust to excluding each of the indices' component variables individually, showing that the results are not driven by the specific set of variables used to construct these indices. Finally, I show that the lack of economic improvements in FARC municipalities is not due the difference-in-difference estimates masking improvements in FARC and ELN municipalities with respect to the rest of the country, but rather due to a lack of catching up in those areas.

7 Conclusion

The last decades have seen a resurgence of armed conflicts around the world, which have led to the frequent use of peace agreements as conflict-ending mechanisms. Yet, while the economic literature on the effects of war is abundant, very little has been done in terms of evaluating the impacts of *peace* and the determinants of successful peace agreements. This study addresses these questions by evaluating the peace agreement in Colombia, signed between the Colombian government and the FARC, the

[21] To calculate the unconditional bias, one simply calculates the sum of the linear interpolation of the slope over the post-treatment periods. To estimate the conditional bias, I follow Roth (Forthcoming)'s Proposition 3.1. For details on how to implement each of these, see Miller, Johnson, and Wherry (2021).

largest insurgent group in the country at the time, ending what was then the longest-running, as well as one of the most violent, conflict in the world.

By comparing municipalities that historically had FARC presence and those that had had ELN presence (another similar but smaller guerrilla group), before and after a unilateral ceasefire by the FARC, the study finds three sets of results. First, a multitude of violence indicators, including forced displacement, combats, disappearances and terrorist acts, among others, significantly and sizeably decreased after the ceasefire in FARC municipalities. This suggests that the ceasefire did lead to the desired reduction in violence. Second, despite this large reduction in violence, affected municipalities did not experience improvements in a wide array of economic indicators. Using the same identification strategy and diverse measures of economic activity, from agricultural production to nighttime light intensity, the results consistently find insignificant effects on these measures. Importantly, these are precisely-estimated null effects. Even when looking at conflict-affected municipalities that received a government policy that substantially reduced business tax rates, these do not experience any economic improvement. Third, I evaluate what might explain these two seemingly-contradictory results. In line with qualitative evidence, my results suggest that the reason historically FARC municipalities could not reap the economic benefits from their new-found peace following the ceasefire is a lack of state capacity, caused both by their low initial levels of state capacity probably from decades of conflict and from the lack of state entry post-ceasefire. These results are also in line with the theoretical model of Besley and Persson (2010), which posits that low levels of state capacity can lead to self-perpetuating poverty traps.

The lack of economic improvements in historically FARC areas, while disappointing, does not mean that the peace agreement was unsuccessful. The large reduction in violence following the ceasefire is in itself a welcome and worthy development. However, this contradicts what the government promised during the negotiations and signifies a missed opportunity to help these areas that have been long ignored. More speculatively, the lack of state entry, capacity building, and economic prosperity following the ceasefire could explain why, after six years of the ratification of the agreement, peace is starting to unravel throughout the country. While the FARC transitioned to a political party as part of the agreement, amid accusations of drug trafficking by FARC leaders and problems in the implementation of different elements of the accord, it splintered in 2019 and a faction returned to arms, creating FARC dissident groups. Recent reports have associated these factions with increasing violence levels in the

country (El Espectador, 2022; El País, 2022; Fundación Ideas Para la Paz, 2022)[22] and concerns are growing that gains achieved by the agreement will be quickly undone.

There are several avenues for future research in this area. First, understanding whether a necessary condition for peace agreements to succeed is that they bring economic improvements in areas previously affected by the conflict is important. It is common for conflicts to start for economic reasons (lack of opportunities, rising inequality, an ignored countryside, etc) and agreements that fail to resolve these challenges are more likely than not to fail in time, as suggested by the results here in the case of Colombia. Second, as my results suggest that the capacity of local governments is a crucial factor to economically capitalize from peace, understanding what types of programs governments can implement to quickly fill the power vacuum left after peace agreements and to build state capacity in conflict-affected areas (along the lines of Blair et al., 2022) is crucial for the successful implementation of future peace agreements. Finally, in countries like Colombia where multiple criminal organizations co-exist, evaluating how crime and conflict reorganize after the disbandment of a criminal organization would be useful to understand the dynamics of large criminal organizations. Do new criminal organizations emerge or do already-existing organizations fight to take over the territory and businesses of the removed criminal organization? Or given that the state has one criminal organization less to worry about, can it concentrate on existing ones, leading to their weakening? Understanding these general equilibrium effects is important to guide governments' post-peace military strategy.

[22]The increase in violence is not only associated with FARC dissidents but also with increased activity from other criminal groups. For example, as retaliation for the extradition of their leader, "Otoniel", the Clan del Golfo (a paramilitary group currently the largest drug cartel in the country), imposed an armed strike for four days across several departments. 178 municipalities were affected by violent actions as a consequence of the strike, with several attacks to the armed forces, lockdowns in dozens of municipalities and closure of roads and businesses in the affected areas (BBC, 2022).

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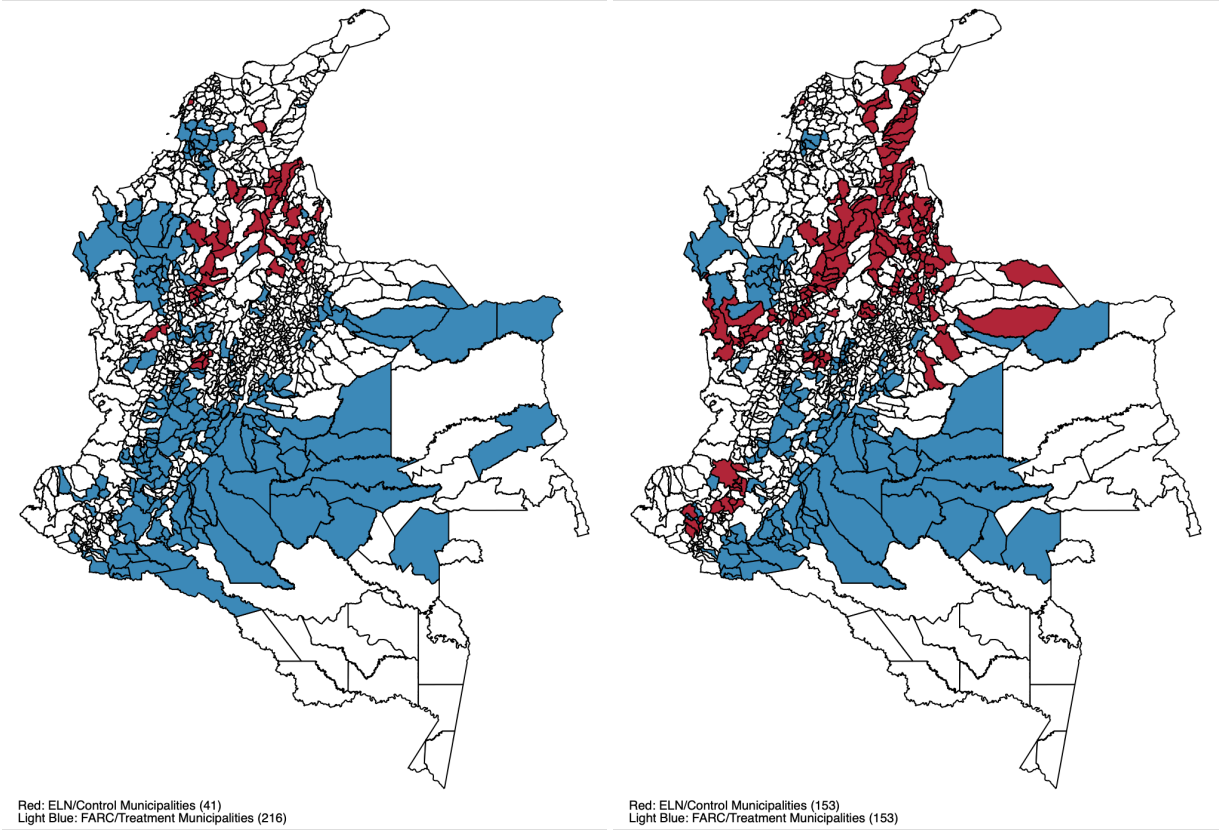
Figures

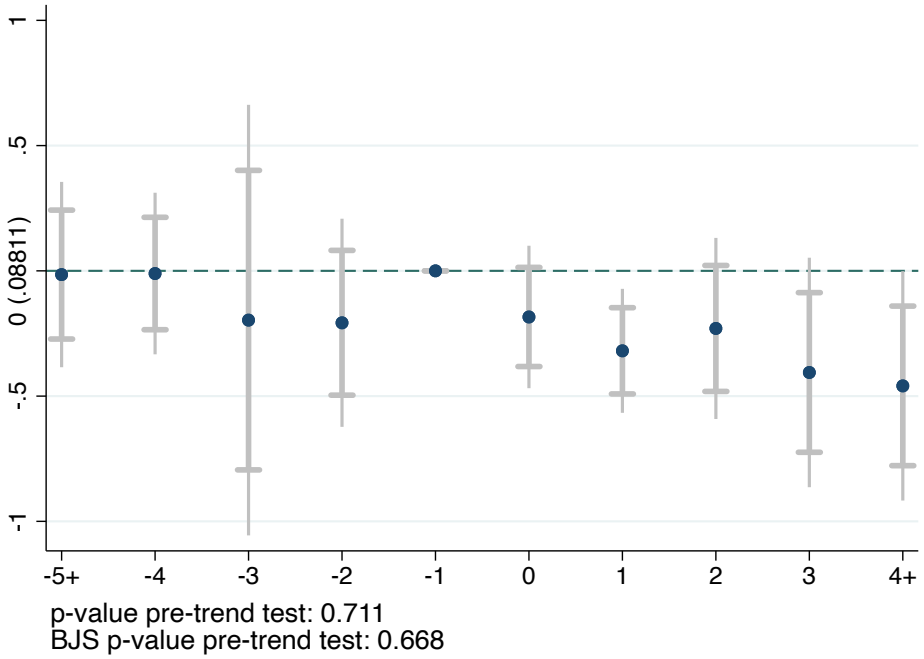
Figure 1: Baseline Treatment and Control Group Municipalities



(a) Extensive Margin, over 60% of Years **(b)** Intensive Margin, Top 20%

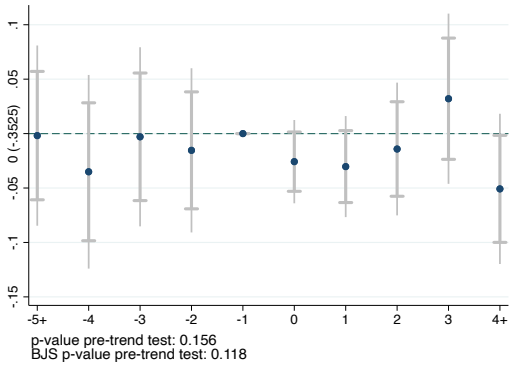
Notes: Maps show the distribution of treated (i.e. historical FARC municipalities, in blue) and control (i.e. historical ELN municipalities, in red), for the two measures of presence of these groups.

Figure 2: Violence in FARC Municipalities vs. ELN Municipalities – Extensive Margin, Events in Over 60% of Years

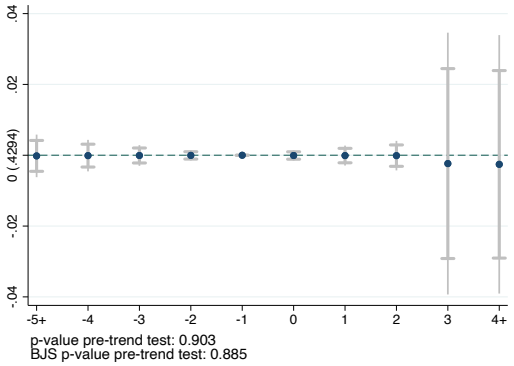


Notes: Event study plots from estimating Equation (2), including including 95% confidence intervals (based on standard errors clustered at the municipality level). The index is created following Anderson (2008) and is based on the violence measures in Table 2.

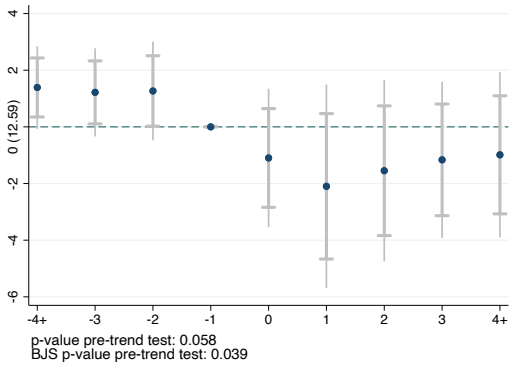
Figure 3: Economic Activity in FARC vs. ELN Municipalities – Extensive Margin, Events in Over 60% of Years



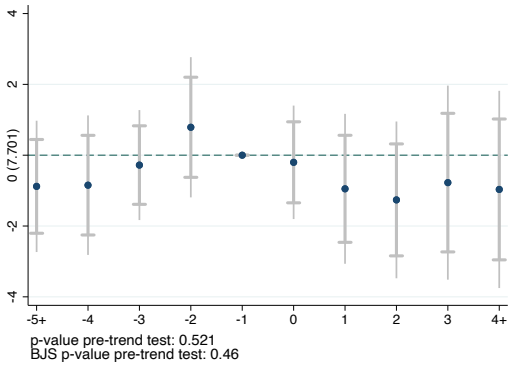
(a) Nighttime Light Weighted



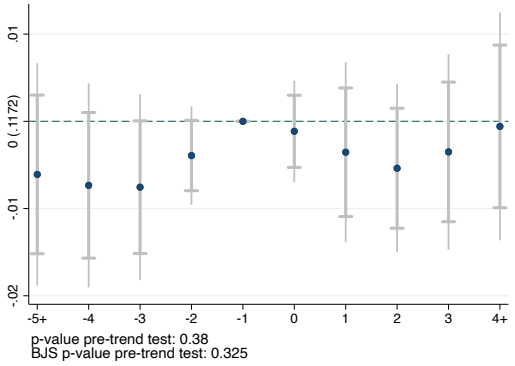
(b) Share Urban Population



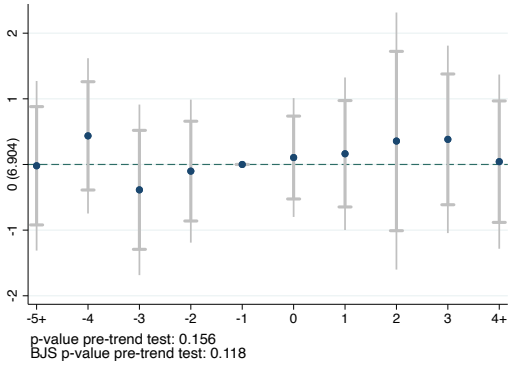
(c) GDP per Capita (DANE)



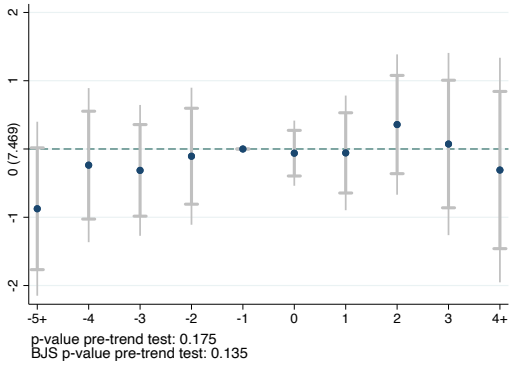
(d) GDP per Capita (S&E12)



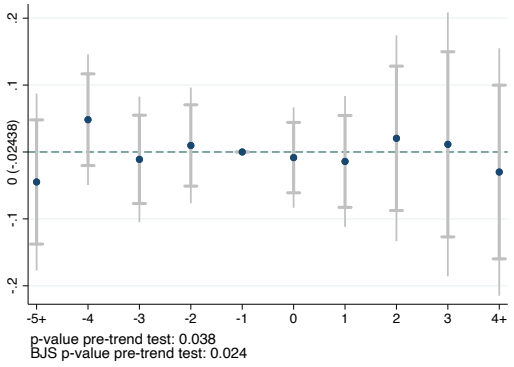
(e) Formal Employment



(f) Firm Entry



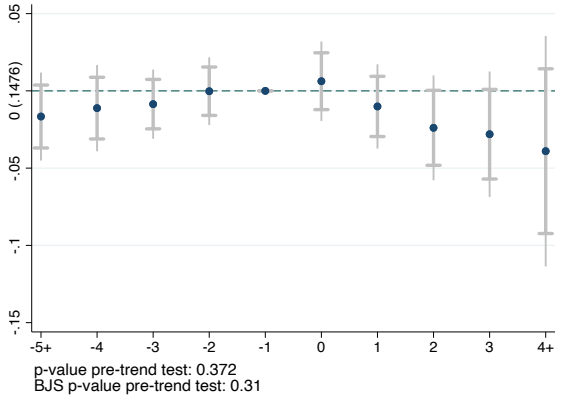
(g) Agricultural Productivity



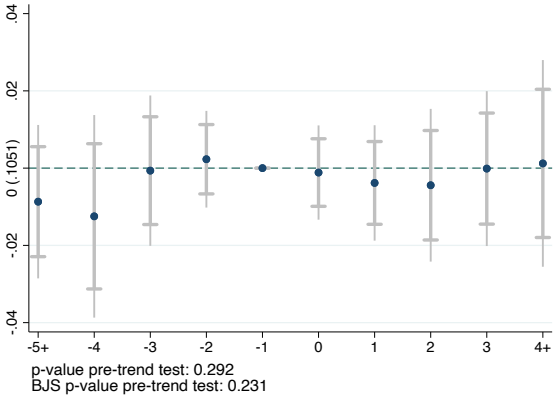
(h) Anderson Index

Notes: Event study plots from estimating Equation (2), including including 95% confidence intervals (based on standard errors clustered at the municipality level). The index is created following Anderson (2008) and is based on weighted nighttime light intensity, GDP per capita (from DANE), share of urban population, agricultural productivity, firm creation and formal employment.

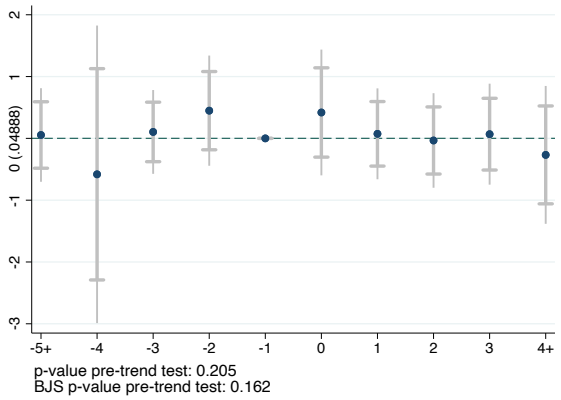
Figure 4: State Capacity Outcomes in FARC vs. ELN Municipalities – Extensive Margin, Events in Over 60% of Years



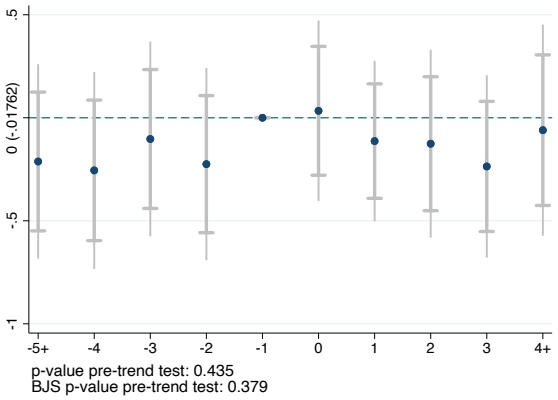
(a) Tax Revenue per Capita



(b) Government Transfers per Capita



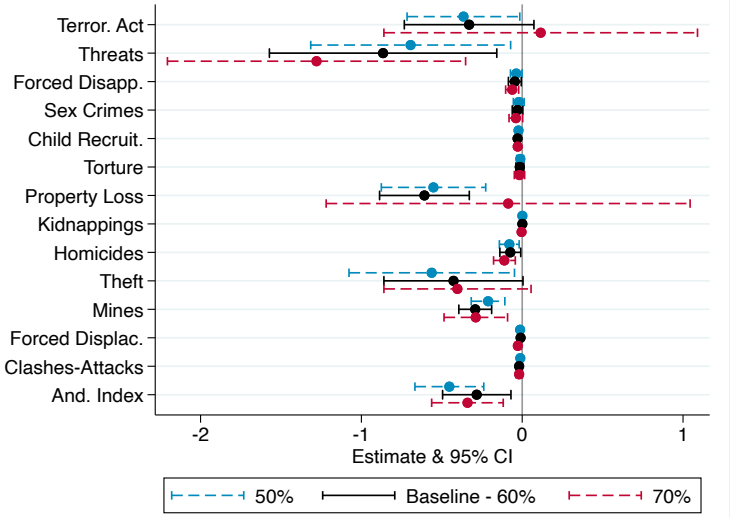
(c) Anderson Financial Perf. Index



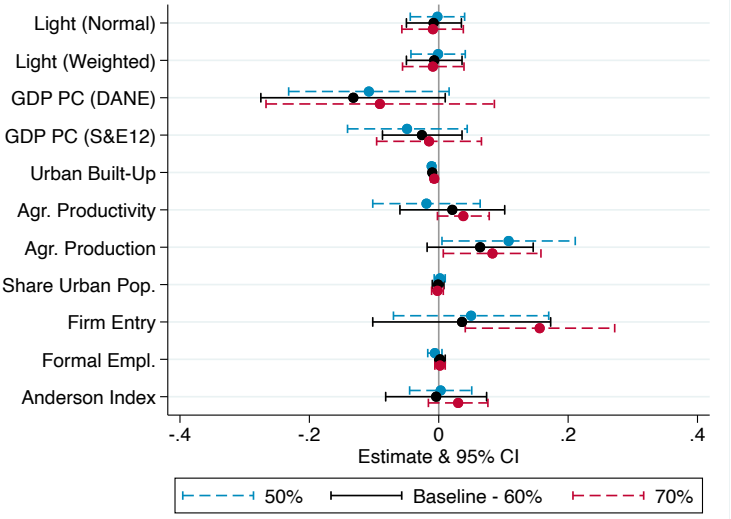
(d) Anderson Inst. Quality Index

Notes: Event study plots from estimating Equation (2) for the different state capacity measures, including including 95% confidence intervals (based on standard errors clustered at the municipality level). The financial performance index uses financial measures of local institutions (e.g. tax revenue, government transfers, expenditures, etc), while the institutional quality index uses measures of the overall performance of local institutions. Both are created following Anderson (2008).

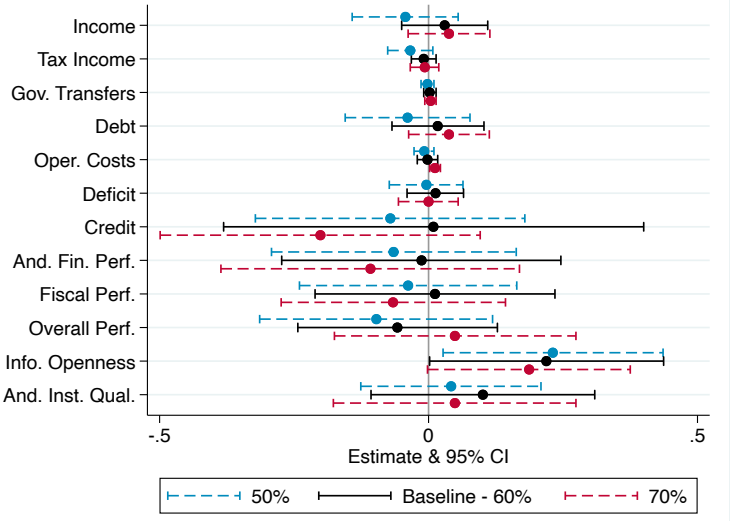
Figure 5: Robustness to Alt. Thresholds of Presence Measures – Extensive Margin



(a) Violence Measures



(b) Economic Indicators



(c) State Capacity Measures

Notes: In Panel A, all variables are in 1000s of inhabitants, except for the migration ones (forced displaced and forced migration) which are measured in per capita terms. In Panel B, the measures of GDP per capita have been standardized for comparability.

Tables

Table 1: Summary Statistics: Extensive Margin, Events in Over 60% of Years

	Mean			p-value of Difference		
	Rest Country	FARC	ELN	Rest-FARC	Rest-ELN	FARC-ELN
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Population	42.65	25.15	27.36	0.36	0.72	0.66
Area	783.28	1842.32	711.46	0	0.88	0.04
Distance Capital	81.12	79.73	101.34	0.76	0.04	0.02
Distance Bogotá	317.89	303.70	345.42	0.34	0.39	0.11
Gov. Transfers	0.07	0.05	0.03	0	0	0.13
Savings Capacity	33.81	29.26	32.15	0	0.54	0.30
%Exp. in Investment	82.41	84.22	84.09	0	0.10	0.90
Fiscal Performance	62.45	60.61	61.29	0	0.39	0.62
Overall Perf.	60.09	55.29	59.41	0	0.78	0.11
Municipal Develop.	67.75	63.84	65.31	0	0.24	0.47
Conflict in 1901/30	0.03	0.07	0.11	0.02	0	0.30
Spanish Occup.	0.46	0.18	0.07	0	0	0.08
Aqueduct	59.5	56.58	57.18	0.27	0.68	0.92
Garbage Collection	44.59	47.33	43.04	0.30	0.78	0.45
Sewage	40.45	44.70	41.58	0.10	0.83	0.58
GINI	0.44	0.46	0.46	0	0.03	0.24
MDP	68.01	73.41	72.80	0	0.07	0.79
NBI	43.95	49.06	45.41	0	0.66	0.28
Voted for Peace	0.49	0.50	0.40	0.	0.	0.
Share Voted	0.38	0.35	0.34	0.	0.	0.

Notes: All the variables are measured in the last pre-treatment year for which data are available (either 2008 or 2005). Conf. 1901/1930 denotes whether the municipality experienced social conflict between 1901-1930. Distance variables are measured in kilometers. MDP is a multidimensional poverty index. Population in 1000s. Last two rows correspond to the share of votes in favor of the peace agreement in 2016 and the share of registered voters voting in the plebiscite in 2016.

Table 2: DiD Violence Analysis: Extensive Margin, Events in Over 60% of Years

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A. UARIV	Terror. Act	Threats	Disapp.	Sex Crimes	Child Recruit.	Torture	Prop. Loss
Ceasefire × FARC	–0.330	–0.865**	–0.046**	–0.029*	–0.029***	–0.015	–0.608***
	(0.205)	(0.359)	(0.020)	(0.017)	(0.006)	(0.013)	(0.142)
Treated Munic.	216	216	216	216	216	216	216
Control Munic.	41	41	41	41	41	41	41
Mean Dep. Var.	0.649	2.508	0.107	0.068	0.037	0.022	0.689
Observations	2,827	2,827	2,827	2,827	2,827	2,827	2,827
R Squared	0.252	0.523	0.308	0.608	0.453	0.410	0.363
Panel B. Other	Kidnap.	Homicides	Theft	Mines	Forced Mig.	Clash/Att.	**And. Index**
Ceasefire × FARC	0.001	–0.074**	–0.427*	–0.292***	–10.210***	–0.019***	–0.283***
	(0.004)	(0.033)	(0.220)	(0.052)	(3.354)	(0.007)	(0.108)
Treated Munic.	216	216	216	216	216	216	216
Control Munic.	41	41	41	41	41	41	41
Mean Dep. Var.	0.013	0.443	1.100	0.460	19.870	0.036	0.057
Observations	2,827	2,827	2,827	2,827	2,827	2,570	2,827
R Squared	0.148	0.574	0.769	0.618	0.546	0.332	0.436

Notes: Results from estimating Equation (1). Standard errors clustered at the municipality level. Includes municipality and year fixed effects. Considers only years from 2009 and before 2020. Mean Dep. Var.: Mean of the dependent variable in the pre-intervention period for municipalities in the sample (FARC and ELN). Defines the post period as 2015. All variables are measures in 1000's of inhabitants. Prop. Loss: Property Loss. Clash/Att.: Number of clashes and attacks between government and paramilitary and guerrilla groups. Panel B shows variables from other data sources, with the first three columns coming from the Ministry of Defense, the fourth from the agency against anti-personnel mines (DAIMA), the fifth from the Victims' Unit, and the sixth from Juan Vargas. And. Index is a summary measure created following Anderson (2008) that summarizes all the different outcomes variables. It is the weighted average of the standardized outcomes, weighted by their inverted covariance matrix.

Table 3: DiD Economic Outcomes: Extensive Margin, Events in Over 60% of Years

	Nighttime Light	GDP Per Capita		Urban	Agricultural		Share Urban	Firm	Formal	**Anderson**
		DANE	S&E (2012)	Built Up	Productivity	Production	Population	Entry	Empl.	**Index**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Ceasefire × FARC	–0.007	–2.348*	–0.346	–0.010***	0.264	0.222	–0.001	0.177	0.002	–0.004
	(0.022)	(1.281)	(0.422)	(0.002)	(0.515)	(0.145)	(0.004)	(0.345)	(0.004)	(0.040)
Treated Munic.	216	216	216	216	216	216	216	216	216	216
Control Munic.	41	41	41	41	41	41	41	41	41	41
Mean Dep. Var.	–0.314	12.007	6.364	0.025	6.654	1.693	0.430	6.078	0.107	–0.097
Observations	2,827	2,313	2,822	2,827	2,827	2,827	2,827	2,827	2,827	2,827
R Squared	0.950	0.863	0.830	0.257	0.975	0.937	0.981	0.783	0.971	0.952

Notes: Results from estimating Equation (1). Standard errors clustered at the municipality level. Includes municipality and year fixed effects. Considers only years from 2009 and before 2020. Mean Dep. Var.: Mean of the dependent variable in the pre-intervention period for municipalities in the sample (FARC and ELN). Defines the post period as 2015. Nighttime light intensity defined so that grid cells in the border of multiple municipalities are assigned in proportion to the share of the grid cell in each municipality (weighted). GDP per capita comes from two sources: From DANE (National Department of Statistics) or based on calculations following Sanchez & Espana (2012), both in millions of COP. Agricultural productivity is defined as total tonnes produced of 271 agricultural crops divided by total area cultivated in hectares. Agricultural production is defined as total tonnes produced of 271 agricultural crops per capita. Urban built up is estimated using the Band Ratio for Built-Up Area (BRBA) index developed by Waqar et al. (2012), and measures the average amount of pixels within a municipality that are classified as urban built up based on the BRBA index. Firm entry comes from RUES and is measured per 1000 inhabitants. Formal employment is measured as the average number of individuals paying contributions to healthcare, pension funds and workers' compensations across the year in the municipality per 18-60 years old, from PILA. Anderson Index is a summary measure created following Anderson (2008) that summarizes the weighted nighttime light intensity, GDP per capita (from DANE), share of urban population, agricultural productivity, formal employment and firm entry measures. It is the weighted average of the standardized outcomes, weighted by their inverted covariance matrix.

Table 4: Percentage of Business Tax Rate Paid – ZOMAC Program

Firm Size	2017-2021	2022-2024	2025-2027	2027-
Micro & Small	0%	25%	50%	100%
Medium & Large	50%	75%	75%	100%

Table 5: Difference-in-Discontinuities Analysis: IICA Cutoff, Economic Outcomes

	Nighttime Light	GDP Per Capita DANE	GDP Per Capita S&E (2012)	Urban Built Up	Agricultural Productivity	Agricultural Production	Share Urban Population	Firm Entry	Formal Empl.	**Anderson Index**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
IICA Treatment × Post	0.031	0.692	–1.218	–0.004	–0.341	–1.567	–0.027**	–1.064	–0.001	–0.022
	(0.047)	(1.269)	(1.576)	(0.004)	(1.606)	(1.577)	(0.014)	(0.966)	(0.011)	(0.109)
Treated Municipalities	65	46	56	76	43	32	42	60	47	49
Control Municipalities	104	58	82	128	57	35	55	84	59	74
Opt. Bandwidth	0.005	0.003	0.004	0.007	0.003	0.002	0.003	0.005	0.003	0.004
Observations	1,859	936	1,516	2,244	1,100	737	1,067	1,584	1,166	1,353
R Squared	0.010	0.044	0.019	0.015	0.024	0.119	0.054	0.059	0.029	0.073

Notes: Results from estimating Equation (3). Standard errors clustered at the municipality level. Includes municipality and year fixed effects. Considers only years from 2009 and before 2020. Defines the post period as 2017. GDP per capita from DANE in millions of Pesos. Bandwidth optimally estimated using Calonico et al. (2014) approach, minimizing the Mean Squared Error. Nighttime light intensity defined so that grid cells in the border of multiple municipalities are assigned in proportion to the share of the grid cell in each municipality (weighted). GDP per capita comes from two sources: From DANE (National Department of Statistics) or based on calculations following Sanchez & Espana (2012), both in millions of COP. Agricultural productivity is defined as total tonnes produced of 271 agricultural crops divided by total area cultivated in hectares. Agricultural production is defined as total tonnes produced of 271 agricultural crops per capita. Urban built up is estimated using the Band Ratio for Built-Up Area (BRBA) index developed by Waqar et al. (2012), and measures the average amount of pixels within a municipality that are classified as urban built up based on the BRBA index. Firm entry comes from RUES and is measured per 1000 inhabitants. Formal employment is measured as the average number of individuals paying contributions to healthcare, pension funds and workers' compensations across the year in the municipality per 18-60 years old, from PILA. Anderson Index is a summary measure created following Anderson (2008) that summarizes the weighted nighttime light intensity, GDP per capita (from DANE), share of urban population, agricultural productivity, formal employment and firm entry measures. It is the weighted average of the standardized outcomes, weighted by their inverted covariance matrix.

Table 6: Baseline State Capacity Summary Statistics: Extensive Margin, Events in Over 60% of Years

	Mean			**p-value of Difference**		
Variable	Rest Country (1)	FARC (2)	ELN (3)	Rest-FARC (4)	Rest-ELN (5)	FARC-ELN (6)
1. Total Revenue	811.02	703.91	611.84	0	0	0.13
2. Tax Revenue	102.95	71.40	68.75	0	0.07	0.78
3. Gov. Transfers	92.11	65.94	52.24	0	0.01	0.13
4. Total Expenditures	855.53	777.95	634.92	0.05	0	0.07
5. Operational Exp.	122.58	95.91	81.05	0	0	0.08
6. Total Deficit	–44.50	–74.02	–23.09	0.05	0.51	0.05
7. Credit	7.21	3.71	–1.25	0.33	0.28	0.38
8. Savings Capacity	0.05	–0.20	–0.02	0	0.63	0.22
9. Fiscal Perf.	0.03	–0.17	0.03	0	0.99	0.16
10. Overall Perf.	0.07	–0.23	0	0	0.64	0.14
11. Aqueduct Cov.	59.74	54.15	54.52	0.03	0.34	0.94
12. Garbage Collec.	44.91	43.84	43.91	0.67	0.85	0.98
13. Sewage Cov.	40.52	41.29	41.63	0.76	0.83	0.95
14. Info. Openness	0	–0.10	–0.02	0.12	0.82	0.60

Notes: All the variables are measured in 2008 (the last period before the panel used in the main analysis) but for the last variable that is only available from 2010. The financial measures are in per capita terms (in thousand COP), and the performance measures are standardised (by year).

Table 7: DiD State Capacity Analysis: Extensive Margin, Events in Over 60% of Years

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A. Financial	Revenue	Tax Revenue	Gov. Transfers	Debt	Oper. Costs	Deficit	And. Fin. Perf.
Ceasefire × FARC	0.030	–0.009	0.002	0.017	–0.002	0.013	0.008
	(0.041)	(0.012)	(0.006)	(0.043)	(0.009)	(0.027)	(0.193)
Treated Municip.	216	216	216	216	216	216	216
Control Municip.	41	41	41	41	41	41	41
Mean Dependent Var.	0.954	0.100	0.080	0.979	0.118	–0.026	–0.288
Observations	2,822	2,822	2,822	2,822	2,822	2,822	2,822
R Squared	0.661	0.778	0.849	0.619	0.219	0.108	0.153
Panel B. Inst. Quality	Savings Cap.	Fiscal Perf.	Overall Perf.	Info. Openness	And. Inst. Qual.		
Ceasefire × FARC	–0.013	0.012	–0.058	0.219**	0.098		
	(0.132)	(0.113)	(0.094)	(0.110)	(0.105)		
Treated Municip.	216	216	216	216	216		
Control Municip.	41	41	41	41	41		
Mean Dependent Var.	–0.139	–0.065	–0.132	–0.073	–0.063		
Observations	2,823	2,823	2,827	2,567	2,827		
R Squared	0.496	0.548	0.483	0.409	0.575		

Notes: Results from estimating Equation (1). Standard errors clustered at the municipality level. Includes municipality and year fixed effects. Considers only years from 2009 and before 2020. Mean Dep. Var.: Mean of the dependent variable in the pre-intervention period for municipalities in the sample (FARC and ELN). Defines the post period as 2015. All the financial measures are in million COP per capita terms, and all performance measures are standardised. Transfers are transfers from the central government. Oper. Costs are the municipality's operational costs. Investment measures the share of a municipality's income that is spent on investment. Fiscal Perf. is an index created by the Department of Planning and measures how well the municipality spent its resources. Overall Perf. is also created by the Department of Planning and measures overall performance. Info. Openness is created by the Attorney General and measures how well municipalities report information and implement basic management rules. And. Index is a summary measure created following Anderson (2008) that summarizes all the different outcomes variables. It is the weighted average of the standardized outcomes, weighted by their inverted covariance matrix.

Table 8: Spatial Spillovers: Extensive Margin, Events in Over 60% of Years

	Within 60kms					**Within 40kms**		**Within 80kms**	
	Total	Spillover	0-20kms	20-40kms	40-60kms	Total	Spillover	Total	Spillover
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Violence Index	–0.365**	–0.092	–0.210	–0.027	0.173	–0.435***	–0.184	–0.464***	–0.193
	(0.153)	(0.139)	(0.144)	(0.141)	(0.238)	(0.120)	(0.116)	(0.167)	(0.156)
2. Economic Index	–0.074	–0.078	–0.099	–0.068	–0.024	–0.064	–0.073*	–0.127	–0.130
	(0.065)	(0.063)	(0.065)	(0.064)	(0.076)	(0.044)	(0.042)	(0.107)	(0.106)
3. Fin. Perfomance Index	–0.192	–0.223	–0.091	–0.404	0.168	–0.260	–0.324	–0.614	–0.658
	(0.389)	(0.413)	(0.390)	(0.489)	(0.407)	(0.249)	(0.288)	(0.688)	(0.702)
4. Instit. Quality Index	0.171	0.081	–0.030	0.158	0.227	0.078	–0.023	0.277*	0.189
	(0.112)	(0.104)	(0.110)	(0.107)	(0.152)	(0.098)	(0.081)	(0.158)	(0.147)

Notes: Considers only years from 2009 and before 2020. Defines the post period as 2015. All panels use indices created following Anderson (2008). The first panel uses the index based on the different violence variables. The second panel uses the index based on weighted nighttime light intensity, GDP per capita (from DANE), share of urban population, agricultural productivity, formal employment and firm entry measures. The third panel uses the index based on financial measures of local institutions, while the last panel is based on measures of the overall performance of local institutions. The columns show the total effect of treatment, the columns show the spillovers on control municipalities within a distance d of the closest treated municipality, with $d \in \{40, 60, 80\}$kms, and columns 3-5 disaggregate the spillover on the control within certain rings for the preferred specification with $d = 60$. Standard errors are estimated following Conley (1999), allowing for spatial correlation up to $d$kms away from a municipality's centroid.

Online Appendix

A Data Sources

First, to create the measures of historical presence of insurgent groups, I use detailed data from the National Police and the Administrative Department of Security. These data record, for different types of crimes, how many of these crimes were committed by a given insurgent group in each municipality-year pair. The criminal acts used for the creation of the two measures are: attacks and assaults against the population, incursions to populated center, incendiary terrorist acts, explosive terrorist acts, offensive actions, kidnappings of politicians, members of armed forces and civilians, attacks against transport infrastructure, illegal road checkpoints, armed harassment, attacks against official entities, illegal roadblocks, assaults against private property, political attacks, ambushes, clashes, armed contacts, homicides, armed forces wounded and killed, and killings of members of the insurgent group. The creation of the two measures is described in detail in Section 2.

Population estimates come from the latest projections (January 2022) from the Colombian National Administrative Department of Statistics (DANE), available *here*, not from CEDE.

In Table A1, I summarize the data sources of the different variables used throughout the paper. A * denotes those that come from CEDE. For the Victims' Unit measures, "events" means the number of occurrences of such an act. Therefore, a person can suffer several "events" of the same type over time.

Table A1: Data Sources

Variable Name	Description	Source
Panel A. Violence Measures		
Fights	Number of terrorist acts, fights, combats, clashes and attacks (events)	Victims' Unit
Threats	Number of threats	Victims' Unit
(Forced) Disappearances	Number of forced disappearances (events)	Victims' Unit
(Forced) Displaced	Number of forced displaced individuals (events)	Victims' Unit
Homicides	Number of homicides (events), from two different sources	Victims' Unit and Ministry of Defence*
Kidnaps	Number of kidnappings (events), from two different sources	Victims' Unit and Ministry of Defence*
Torture	Number of tortures (events)	Victims' Unit

Property loss	Number of losses of real estate property (events)	Victims' Unit
Terrorist acts	Number of terrorist acts	Ministry of Defence*
Mines	Number of mine-related events	Ministry of Defence*
Theft	Total number of thefts	Ministry of Defence*
Clashes/Attacks	These data were kindly provided by Juan Vargas and have been used in a multitude of papers (see, e.g. De Roux and Martínez, 2021; Dube and Vargas, 2013; Guerra-Cújar et al., 2021). The data were originally collected by Restrepo, Spagat, and Vargas (2003) and have been updated by Universidad del Rosario. It covers the period from 1996 to 2018. De Roux and Martínez (2021) say the following about these data "records conflict events (i.e. clashes, attacks) involving the different agents in the conflict (left-wing guerrillas, right-wing paramilitaries, government forces). For each event, the dataset records of the location and the date of occurrence. The data is based on news reports from over 20 major newspapers, complemented with additional reports from NGOs and the Catholic church". Also see Dube and Vargas (2013) for more information. I simply add all the clashes and attacks between the three different groups to come to a single, aggregate measure.	Juan Vargas
Forced migration	I received data from the Victims' Unit on the amount of forced displaced coming into a municipality and the mount of individuals forced to leave a municipality. Based on these in- and out-migration flows, I create this measure of total forced migration as ((total forced migrated into municipality - total forced to outmigrate from municipality) / the municipality's population) * 1000, as a measure of total forced migration.	Victims' Unit
Panel B. Economic Indicators		
Nighttime light intensity	Nighttime light intensity from two sources (the Defense Meteorological Satellite Program (DMSP), and the Visible Infrared Imaging Radiometer Suite (VIIRS)) are combined, cleaned, and harmonized to create a single panel dataset by Li et al. (2020).	Li et al. (2020)

GDP per capita	One measure of GDP per capita at the municipal level comes from DANE, *here*, available only from 2011 to 2020. The other measure is created following the procedure proposed by Sánchez Torres and España Eljaiek (2012). This is done in the following way: first, sum the total tax intake (property plus industry and commerce) for a municipality m in department d in year t. Then, calculate the total tax intake in d in year t. Calculate the share of m's tax intake relative to the d's intake. This gives m's relative importance. Then assign this share of d's GDP to municipality m. Department GDP comes from DANE, tax revenue from the National Planning Department (DNP).	DANE and DNP*
Urban built-up	This is generated using the Band Ratio for Built-Up Area (BRBA) index developed by Waqar et al. (2012). It is measured as $BRBA = TM3/TM5$, where TM are different (spectral) bands from Landsat TM satellite images. This measure has been shown to perform very well in identifying urban built-up areas in settings like Colombia (Valdiviezo-Navarro et al., 2018). I estimate the index using Google Earth Engine. I first mask clouds and water bodies (identified using the MNDWI index), as water bodies affect the performance of the BRBA index. To classify a pixel as urban built-up, I use a threshold of 0.48 based on visual inspection of different threshold values. Values above 0.48 are classified as urban built-up. Then, I calculate the share of pixels within each municipality classified as urban.	Landsat satellite images via Google Earth Engine
Agricultural productivity	Defined as total tonnes produced of 271 agricultural crops in a given municipality divided by total area cultivated in hectares in the municipality.	Based on data from the Ministry of Agriculture*
Agricultural production	Defined as total tonnes produced of 271 agricultural crops per capita.	Based on data from the Ministry of Agriculture*
Share of urban population	Estimates of urban population based on population projections.	DANE*

Firm entry	Number of (new) businesses that requested a mercantile license from a Chamber of Commerce in a given year, and listed their commercial activities as taking place in a given municipality	Confecámaras
Formal employment	Average number of individuals (wage earners and self-employed) making contributions to healthcare (mandatory), pension funds and/or workers' compensations in a given municipality-year. Note that for some of the earlier years, data are available for only some months	Ministry of Health and Social Protection, *PILA*
Panel C. State Capacity Measures		
Total revenue	Sum of current revenue and capital income.	DNP*
Tax revenue	Total tax revenue, including property tax, industry and commerce tax, and gasoline tax, among others.	DNP*
Government transfers	Transfers to the municipality from other government levels.	DNP*
Total expenditures	Sum of current expenditures and capital expenditures.	DNP*
Operational expenditures	Expenditures on the operation of the municipality administration.	DNP*
Total deficit	Difference between current income and current expenditures.	DNP*
Credit	Net income from internal and external credits (received - paid).	DNP*
Savings capacity	Current savings over current income.	DNP*
% of Expenditures invested (also called "Investment" in some tables)	Share of expenditures used for investments.	DNP*
Fiscal performance	Index created by the DNP to measure municipalities' fiscal performance. Goes from 0 (lowest) to 100 (highest). It is composed of six different indicators: share of current income spent on the operation of the local government, total debt, share of income coming from transfers from other levels of the government, capacity to generate own income, savings capacity and size of investments.	DNP*
Overall performance	From 2016, based on score on municipal performance from DNP. Before 2016, based on the Index of Integral Performance, also by the DNP. Both try to capture the effectiveness, efficiency and administrative capacity of the municipal administration.	DNP*

Information openness	Index of Open Government created by the Office of the Inspector General of Colombia, available only since 2010. Created using measures of internal control, organization of information and document management and others. For a precise definition of this variable, see the CEDE data catalogue.	Office of the Inspector General of Colombia*
Aqueduct coverage	Total aqueduct coverage. Data from CEDE covers only from 2010 to 2016. Data from the 2018 Census is used to complement this, from DANE.	Sistema Único de Información de Servicios Públicos* and DANE
Garbage collection	Total coverage of garbage collection system. Data from CEDE covers only from 2010 to 2016. Data from the 2018 Census is used to complement this, from DANE.	Sistema Único de Información de Servicios Públicos* and DANE
Sewage coverage	Total coverage of sewage system. Data from CEDE covers only from 2010 to 2016. Data from the 2018 Census is used to complement this, from DANE.	Sistema Único de Información de Servicios Públicos* and DANE
Share voting	Voting data for elections since 2006 (both national, department, and municipal) come from CEDE.	CEDE
Panel D. Other Variables		
Area		DANE*
Dist. Capital	Distance to department's capital	DANE*
Dist. Bogotá	Distance to Bogotá	DANE*
Small credit	Value of credit to small producers	Agronet*
Total credit	Total value of credit to producers	Agronet*
Conf. 1901/30	Dummy for whether the municipality experienced a land-related conflict between 1901 and 1931	CEDE
Spanish occup.	Dummy for whether the municipality was occupied by the Spanish between 1510 and 1561	CEDE
GINI		CEDE based on census data from DANE
MDP	Municipal Poverty Incidence	CEDE based on census data from DANE
NBI	Unsatisfied Basic Needs	DANE*

Social leaders killed	Number of social leaders killed.	Somos Defensores
Extortion	Number of total extortion acts.	Ministry of Defense*
Harbers15	Tax revenue divided by nighttime light intensity (standardized).	Based on Harbers (2015)
Distance to border to Venezuela	Distance to border to Venezuela in kms.	From Martinez (2017)
Venezuelan Migrants with PEP	Numbers of Venezuelan migrants that have received a Permiso Especial de Permanencia and registered at a given municipality	From Colombia's Migration Office, can be accessed *here*
Coca production	Area cultivated with coca crops (in HAs).	Ministry of Justice
Coca eradication areas	Total area of coca crops eradicated (manually and by plane).	Ministry of Justice
PNIS program	Number of municipalities and beneficiaries from the PNIS coca cultivation program.	UNODC, from *here*
Credit to agricultural producers (Banco Agrario)	Total value of credits to different types of agricultural producers given by the Banco Agrario	Agronet*
Credit to agricultural producers (FINAGRO)	Total value of credits to different types of agricultural producers given by FINAGRO	FINAGRO
First-year students	Number of students enrolled in the first year of higher education programs (technical, university or post-graduate degrees)	Ministry of Education
Number of higher education institutions	Number of institutions providing higher educations programs (technical, university or post-graduate degrees)	Ministry of Education
Demobilized individuals	Number of demobilized members of insurgent groups (FARC/ELN) that have registered as living at a given municipality.	Agency for Reincorporation and Normalization
Variables related to land restitution processes	Number of land restitution claims presented to UAEGRTD (including the number of claimants and plots involved), number of requests handled and denied by land restitution courts, and the number of beneficiaries and plots returned by courts to claimants	Land Restitution Unit (URT)

Survey data	Data come from the AmericasBarometer surveys (since 2011) and other occasional surveys ("Muestra Especial Zonas Conflicto", for 2013, 2015 and 2017) conducted by the Observatorio de la Democracia. Can be found *here*	Observatorio de la Democracia

A.1 Creation of Summary Indices

In several of the sections of this study, I analyze the effects of the start of the ceasefire on a wide-array of outcome variables for one particular indicator (e.g. violence, economic activity or state capacity). For brevity and compactness, I use two different approaches to summarize all the different outcome variables into single measures that capture the relevant information. One is based on Kling, Liebman, and Katz (2007) and the other one is based on Anderson (2008). Here I explain how these are created:

1. Kling, Liebman, and Katz (2007): results using the index suggested by Kling, Liebman, and Katz (2007) are called "KLK index". KLK argue that "the aggregation improves statistical power to detect effects that go in the same direction within a domain". To create this index, the following steps are followed:

   (a) First, each of the measures is standardized by the pre-intervention values of the variable in the control group (note: in the original paper, there is no time dimension, so they just standardize by the control group. However, for the purposes here, only pre-intervention periods are used to avoid treatment contamination).

   (b) Some variables have missing values for some years. For variables with data missing for a year before (after) the treatment, I follow their imputation method, and assign to the control/treatment group the mean (standardized) value of the control/treatment group in the pre-(post-)treatment periods.

   (c) All variables are aligned in the same direction, such that higher values indicate "better" outcomes.

   (d) The final index is the equally-weighted average of z-scores of the index's individual component variables, created in the first two steps.

   (e) The final measure is then standardized for easiness of interpretation.

   This index has been used, for example, by Blumenstock et al. (2022) and Casey, Glennerster, and Miguel (2012).

2. Anderson (2008): the second index has been used by Egger et al. (2019); Gilligan, Pasquale, and Samii (2014); Haushofer and Shapiro (2016) and Karlan and Zinman (2010), for example. It is implemented using the "swindex" command in Stata created by Schwab et al. (2020). This one is very similar to the KLK index, but assigns more weight to component variables that are less correlated to

other component variables, as these might carry more relevant information not captured by the other component variables. Intuitively, uncorrelated indicators represent "new" information and therefore receive more weight. It also assigns less value to indicators with missing observations. The estimation procedure, detailed in Egger et al. (2019)'s PAP, is the following:

(a) For each outcome variable y_{jk}, where j indexes the outcome group and k indexes variables within outcome groups, variables are recoded so that higher values denote "better" outcomes.

(b) Then the covariance matrix $\hat{\Sigma}_j$ for outcomes in group j is estimated, which consists of elements $\hat{\Sigma}_{jmn} = \sum_{i=1}^{N_{jmn}} \frac{y_{ijm} - \bar{y}_{jm}}{\sigma^y_{jm}} \frac{y_{ijn} - \bar{y}_{jn}}{\sigma^y_{jn}}$, where N_{jmn} is the number of non-missing observations for outcomes m and n in outcome group j, $\bar{y}_{jm}$ and $\bar{y}_{jn}$ are the means for outcomes m and n in outcome group j, and the sigmas are the standard deviations in the pure control group for the same outcomes for the entire analyzed period.

(c) Then the covariance matrix is inverted, and they define the weight w_{jk} for each outcome k in outcome group j by summing the entries in the row of the inverted covariance matrix corresponding to that outcome.

(d) Each outcome variable is transformed by subtracting its mean and dividing by the control group SD, and then weighting it with the weights obtained above. Formally, $\hat{y}_{ij} = (\sum_{k \in K_j} w_{jk})^{-1} \sum_{k \in K_j} w_{jk} \frac{y_{ijk} - \bar{y}_{jk}}{\sigma^y_{jk}}$.

B Difference-in-Discontinuities – ZOMAC

In this Section, I explain in more detail the ZOMAC program, the identification strategy and the underlying assumptions that need to be satisfied. I present evidence in support of the different assumptions and robustness checks that confirm the baseline results.

As a way to incentivize business and employment creation in areas that have been affected by the conflict (ZOMAC municipalities), the government started a tax incentive program for firms in 2017. The main incentive is a progressive business tax tariff for a period of 10 years starting in 2017, which varies depending on the size of the firm, as shown below in Table 4. For firms to benefit from the tax reduction they must i) have been created after December 29, 2016, ii) have their main address in a ZOMAC municipality, iii) perform their whole productive processes in ZOMAC municipalities, and iv) satisfy some investment and job-creation requirements. These investment and job-creation requirements vary depending on the sector and the size of the firm. Informal firms that formalize and meet these criteria can also benefit from these incentives. Firms in the mining and oil sectors are excluded from the benefits.

These are the conditions the government took into account to designate a municipality as a ZOMAC municipality:

1. Municipalities that have a Multidimensional Poverty Index (IPM in Spanish) above 0,49, *or* an Index of Fiscal Performance (DF in Spanish) below 70.
2. Not be part of an agglomeration.
3. Municipalities most affected by the conflict, denoted by having a score above 0,0191 in an index of incidence of the armed conflict (IICA in Spanish). The index is calculated as the average over 2002 and 2013 of six violence-related variables: armed actions, homicides, kidnappings, antipersonal-mine victims, forced displacement, and coca crops.[23]
4. Municipalities that belong have a Territorially Focused Development Programme (PDET in Spanish).[24]
5. Municipalities below 450.000 inhabitants and more than 60 minutes away from the department's capital.

More specifically, a municipality is denoted as ZOMAC if one of the following two criteria hold:

1. It either satisfies 4) and 5), i.e. it is part of PDET and satisfies the demographic requirements, or

[23] The program's decree does not mention where these variables come from and how exactly the are aggregated into a single indicator.

[24] However, it has been reported that the implementation of these PDET has been the slowest of any of the components of the peace agreement, has been plagued by problems, and has been considerably underfunded (García-Giraldo, 2020; Washington Office on Latin America, 2021; Valencia, 2022).

2. It satisfies 1), 2), 3) and 5), i.e. it is poor *or* badly managed, affected by conflict, it is not part of an agglomeration, not a PDET, and it satisfies the demographic requirements.

The selection criteria thus depends on clear thresholds on some variables, that I exploit to create a sample of treated municipalities just above the thresholds and a sample of control municipalities just below the thresholds, in a regression discontinuity (RD) approach. I will focus on the second criterium, as being a PDET municipality or not is not defined by clear thresholds (it is simply a categorical variable). Even for the second criterium, there are several ways in which a municipality can be categorized as ZOMAC or not based on strict thresholds. In practice, among the possible selection combinations based on the second criterium, the only one that has enough municipalities near the threshold is the one based on the IICA score. More precisely, I focus on municipalities that are just above and just below the IICA score necessary to be classified as a ZOMAC municipality, and meet all the other requirements, meaning municipalities just below or above IICA $= 0{,}0191$, with IPM $>= 0{,}49$ *or* DF $<= 70$, not part of an agglomeration, below 450.000 population and over 60 minutes drive from department's capital, not PDET. For these municipalities, their IICA score was the sole determinant of ZOMAC classification or not.

The RD based on the strict IICA score among these municipalities creates a sample of municipalities that are supposed to be equal in all respects other than being a ZOMAC municipality or not, if they are sufficiently close to the IICA cutoff. Given that I am interested in understanding the dynamic effects of the peace agreement, I evaluate the evolution of these municipalities just above and just below the IICA threshold over time, basically embedding the RD design in a difference-in-difference setting. Such an approach was first formalized by Grembi, Nannicini, and Troiano (2016), and called the "difference-in-discontinuity" estimator. As this approach is new and has not been frequently used (exceptions are Bazzi, Koehler-Derrick, and Marx, 2020; Bergolo and Cruces, 2021; Grembi, Nannicini, and Troiano, 2016; Hansen, Miller, and Weber, 2020), there is no clear set of empirical guidelines or practices for using it. However, I follow the different robustness checks and assumption tests that have been used in other papers to argue that the assumptions needed for the validity of the difference-in-discontinuity estimator seem to be satisfied in this context.

To recover the difference-in-disconuities estimator, three assumptions need to be satisfied. First, all the potential outcomes must be continuous at the discontinuity. Second, if there is a different, confounding policy that affects municipalities above and below the discontinuity differently, then the effect of the confounding policy at the discontinuity in the case of no treatment must be constant over time (so that it can be netted out using the "difference" part of the estimator). This is the equivalent of the parallel trends assumption in traditional difference-in-difference settings. Third, the effect of the treatment at the discontinuity does not depend on the confounding policy. In this Appendix I present evidence in support of these three assumptions.

Following Grembi, Nannicini, and Troiano (2016), I estimate the regression:

$$\begin{aligned} y_{it} =& \delta_0 + \delta_1 IICA^*_m + \delta_2 IICA\ Treatment_m + \delta_3 IICA^*_m \times IICA\ Treatment_m \\ &+ \delta_4 Post_t + \delta_5 Post_t \times IICA^*_m + \delta_6 Post_t \times IICA\ Treatment_m \\ &+ \delta_7 Post_t \times IICA\ Treatment_m \times IICA^*_m + u_{mt} \end{aligned} \tag{4}$$

where $IICA^*_m$ is the normalized IICA score ($IICA^*_m = IICA_m - 0.0191$) of municipality m in year t, $IICA\ Treatment_m$ is a dummy for municipalities with an $IICA$ score above 0.0191 (i.e. ZOMAC municipalities), and $Post_t$ is an indicator for the post-treatment period. As the ZOMAC program started in 2017, in these regressions I denote the post-treatment years as those from 2017. Standard errors are still clustered at the municipality level. The difference-in-discontinuity estimator of interest is the coefficient δ_6 and identifies the treatment effect of receiving the fiscal incentives for firms.

While Table 5 shows the baseline results, I now assess the robustness of the results to using different functional forms, controls, definition of the post-treatment period and bandwidths. First, in Figure B1, I plot the coefficients for each of the outcome variables using 20 (evenly-spaced) different bandwidths, up to one standard deviation of the running variable. The red line indicates the optimal bandwidth selected to minimize the MSE. The results are very similar regardless of the bandwidth selected. Only for the share of urban population are small bandwidths associated with significant coefficients. Second, Panel A in Table B1 shows the robustness of the results to different methods of inference. I first estimate Conley SEs (Conley, 1999) that allow for correlated unobservables across municipalities within certain distances of the given municipality's centroid. For distances, I use the 25th, 50th and 75th percentiles of municipalities' distance to their department's capital. I also show p-values using the wild cluster bootstrap suggested by Cameron, Gelbach, and Miller (2008) for difference-in-difference settings. The SEs and results remain unchanged. In Panel B, I estimate Equation (3) controlling for municipality and year fixed effects, with the coefficients basically unchanged from the baseline scenario. Then in Panels C and D, instead of using a linear function for the running variable, I use a quadratic and cubic polynomial on either side of the cutoff. The results remain qualitatively the same and similar in magnitude, although the SEs increase. Finally, although the ZOMAC program started in 2017, to rule out any anticipatory effects, in Panel E, I run a regression defining the post period as starting in 2016 rather than 2017, which does not affect the results.

The results using the Anderson Index are not driven by any single component variable. Figure B2 shows in black the results of estimating Equation (3) including 95% confidence intervals and in blue p-values from a test of joint significance of all pre-treatment coefficients from estimates of Equation (2) following Freyaldenhoven et al. (2021), dropping each component variable individually. Regardless of the variable dropped, the results are basically identical to the baseline results, suggesting the no individual component variable is driving the results.

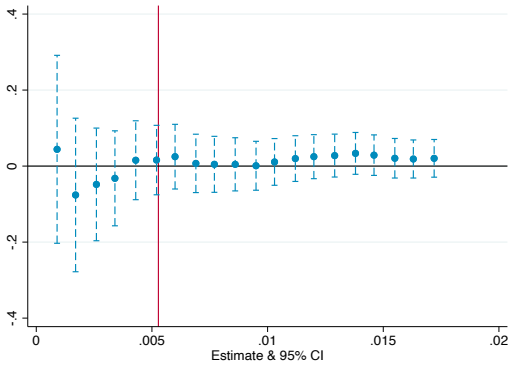
Finally, I present evidence in support of the validity of the assumptions needed to recover the difference-in-discontinuities estimator. The first assumption requires no manipulation of the running variable, as is usual in RD designs. Figure B3 shows the results of a manipulation test using local polynomial density estimators as suggested by Cattaneo, Jansson, and Ma (2020). Regardless of whether using bias correction or not, the test fails to reject the null, supporting the hypothesis of no manipulation of the running variable. This makes intuitive sense, given that the IICA score is the average between 2002 and 2013 of different violence indicators, long before the ZOMAC program was even conceived, making manipulation very unlikely. Assumptions 2 and 3 ask for municipalities above and below the cutoff to be on a (local) parallel trend in the absence of the new policy and that the effect of the treatment does not depend on other confounding policies. I provide several pieces of evidence in support of these assumptions. First, Figure B4 shows the results of estimating regressions akin to Equation 2 but for the difference-in-discontinuity setting. There seem to be no pre-trends for any of the variables. Only for three, the joint test of pre-intervention coefficients are marginally rejected, but the sup-t confidence bands cover the 0 for the entire path. For the Anderson Index, the significance of the joint test comes entirely from the agricultural productivity measure, although the main coefficient remains unchanged when excluding this variable from the index (see Figure B2). These graphs also show that there is no improvement in these economic indicators over time, as could have been expected. Second, results of running regressions of several different municipalities' characteristics pre-intervention (in 2008) on the IICA treatment dummy are presented in Appendix Table B2. Out of the 20 different characteristics, only one is marginally significantly different between municipalities just below and just above the IICA threshold, suggesting that these municipalities were very similar to being with. Finally, Appendix Figure B5 shows the results of running placebo versions of Equation (3). These placebos only use data between 2009 and 2016 (before the start of the ZOMAC policy), and assign the post-intervention period sequentially as years between 2011 and 2015. Reassuringly, the results are insignificant for all variables and placebo years, only for some years and the share of urban population are some of the results marginally significant.

Table B1: Robustness RDD Analysis Inference, Functional Form & Controls

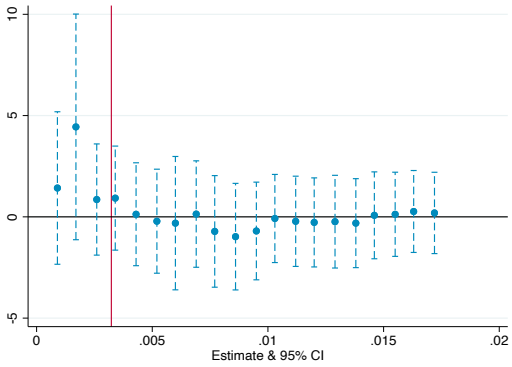
	Nighttime	**GDP Per Capita**		**Urban**	**Agricultural**		**Population**	**Firm**	**Formal**	**Anderson**
	Light	DANE	S&E (2012)	Built Up	Productivity	Production	Share Urban	Entry	Empl.	Index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A. Baseline										
IICA Treat. × Post	0.031	0.692	–1.218	–0.004	–0.341	–1.567	–0.027**	–1.064	–0.001	–0.022
	(0.047)	(1.269)	(1.576)	(0.004)	(1.606)	(1.577)	(0.014)	(0.966)	(0.011)	(0.109)
Conley Perc. 25	(0.037)	(1.313)	(1.609)	(0.004)	(1.770)	(1.526)	(0.014)	(0.918)	(0.010)	(0.095)
Conley Perc. 50	(0.039)	(1.267)	(1.527)	(0.005)	(1.612)	(1.543)	(0.014)	(0.616)	(0.011)	(0.103)
Conley Perc. 75	(0.047)	(1.187)	(2.014)	(0.005)	(1.612)	(1.576)	(0.015)	(0.846)	(0.010)	(0.134)
Wild Bootstrap p-value	[0.513]	[0.596]	[0.550]	[0.384]	[0.845]	[0.422]	[0.045]	[0.290]	[0.919]	[0.844]
Observations	1,859	936	1,516	2,244	1,100	737	1,067	1,584	1,166	1,353
R Squared	0.010	0.044	0.019	0.015	0.024	0.119	0.054	0.059	0.029	0.073
Panel B. TWFE										
IICA Treat. × Post	0.031	0.692	–1.252	–0.004	–0.341	–1.567	–0.027*	–1.064	–0.001	–0.022
	(0.049)	(1.349)	(1.659)	(0.005)	(1.690)	(1.661)	(0.014)	(1.015)	(0.011)	(0.114)
Observations	1,859	936	1,516	2,244	1,100	737	1,067	1,584	1,166	1,353
R Squared	0.941	0.867	0.840	0.357	0.970	0.862	0.989	0.771	0.962	0.935
Panel C. Quadratic Polynomial										
IICA Treat. × Post	–0.063	2.667	–3.993*	–0.010	0.904	–1.199	–0.047**	1.890	–0.027*	0.157
	(0.081)	(2.009)	(2.341)	(0.008)	(2.573)	(0.914)	(0.023)	(1.416)	(0.015)	(0.176)
Observations	1,859	936	1,516	2,244	1,100	737	1,067	1,584	1,166	1,353
R Squared	0.036	0.062	0.025	0.017	0.048	0.130	0.095	0.094	0.040	0.075
Panel D. Cubic Polynomial										
IICA Treat. × Post	–0.066	3.920	–2.490	–0.008	0.008	0.771	–0.039	0.366	–0.020	0.140
	(0.117)	(2.407)	(2.246)	(0.011)	(3.322)	(1.534)	(0.028)	(1.753)	(0.015)	(0.228)
Observations	1,859	936	1,516	2,244	1,100	737	1,067	1,584	1,166	1,353
R Squared	0.054	0.079	0.031	0.020	0.060	0.189	0.129	0.104	0.040	0.113
Panel E. Alt. Post Definition										
IICA Treat. × Post	–0.046	2.469	–3.071	–0.005	–1.869	–2.647	–0.023	–0.123	–0.018	–0.027
	(0.082)	(2.094)	(2.186)	(0.005)	(3.104)	(1.601)	(0.016)	(1.196)	(0.014)	(0.147)
Observations	913	639	1,165	2,134	627	451	451	825	385	968
R Squared	0.043	0.044	0.015	0.022	0.089	0.078	0.084	0.073	0.093	0.045

Notes: Results from estimating Equation (3). Standard errors clustered at the municipality level. Considers only years from 2009 and before 2020. Defines the post period as 2017. Bandwidth optimally estimated using Calonico et al. (2014) approach. Conley SEs at different distance bandwidths (25th, 50th and 75th percentile of municipalities' distance to department's capital). Wild bootstrap p-value in squared brackets. Panel E defines the post-treatment period as the year 2016, after the peace agreement was approved. Nighttime light intensity defined so that grid cells in the border of multiple municipalities are assigned in proportion to the share of the grid cell in each municipality (weighted). GDP per capita comes from two sources: From DANE (National Department of Statistics) or based on calculations following Sanchez & Espana (2012), both in millions of COP. Agricultural productivity is defined as total tonnes produced of 271 agricultural crops divided by total area cultivated in hectares. Agricultural production is defined as total tonnes produced of 271 agricultural crops per capita. Urban built up is estimated using the Band Ratio for Built-Up Area (BRBA) index developed by Waqar et al. (2012), and measures the average amount of pixels within a municipality that are classified as urban built up based on the BRBA index. Firm entry comes from RUES and is measured per 1000 inhabitants. Formal employment is measured as the average number of individuals paying contributions to healthcare, pension funds and workers' compensations across the year in the municipality per 18-60 years old, from PILA. Anderson Index is a summary measure created following Anderson (2008) that summarizes the weighted nighttime light intensity, GDP per capita (from DANE), share of urban population, agricultural productivity, formal employment and firm entry measures. It is the weighted average of the standardized outcomes, weighted by their inverted covariance matrix.

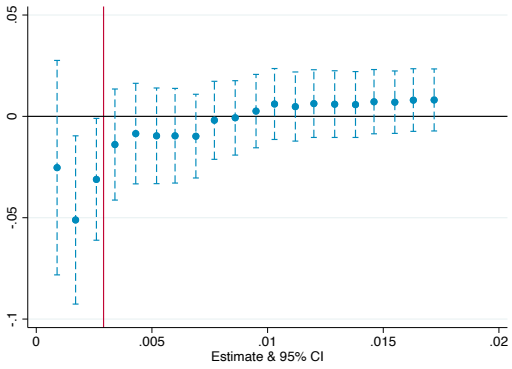
Figure B1: Robustness Difference-in-Discontinuities Results to Bandwidth Selection



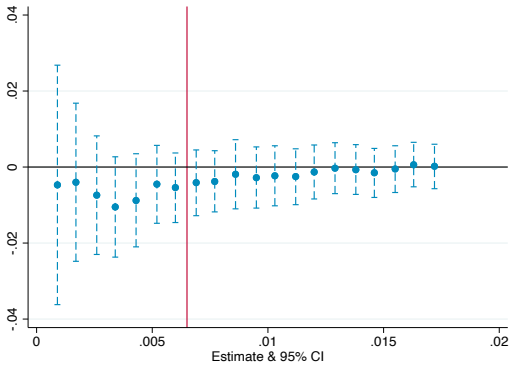
(a) Nighttime Light Intensity (Weighted)



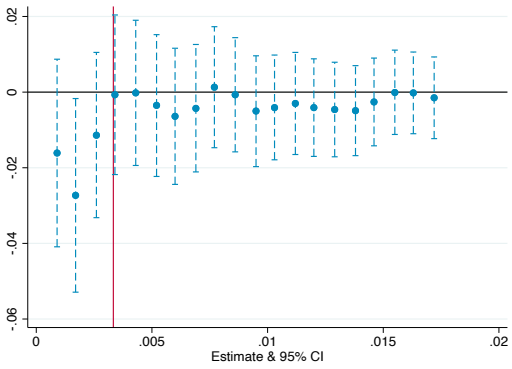
(b) GDP Per Capita (DANE)



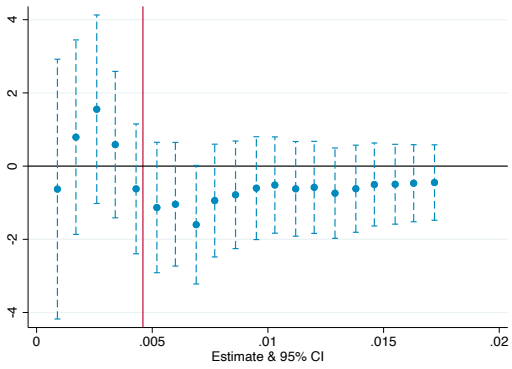
(c) Share Urban



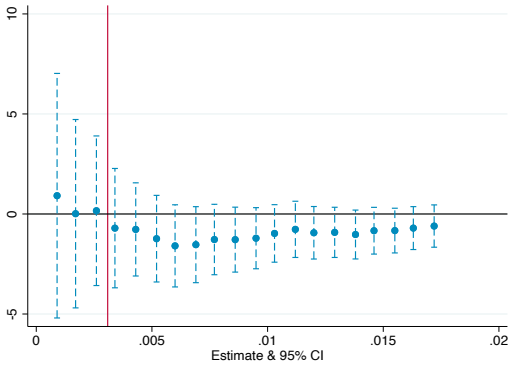
(d) Urban Built-Up



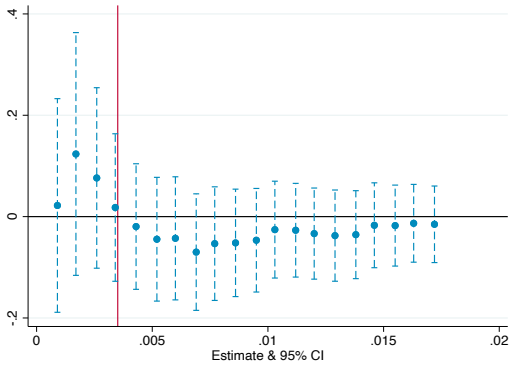
(e) Formal Employment



(f) Firm Entry



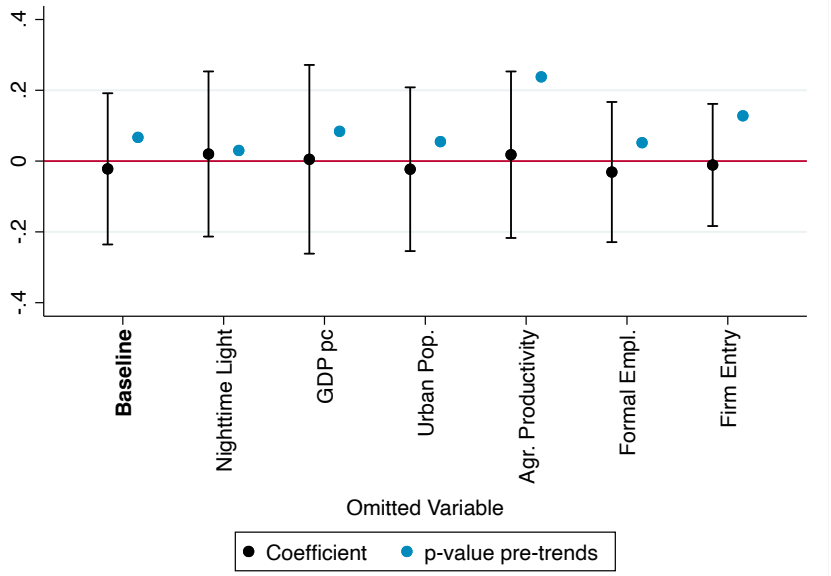
(g) Agricultural Productivity



(h) Anderson Index

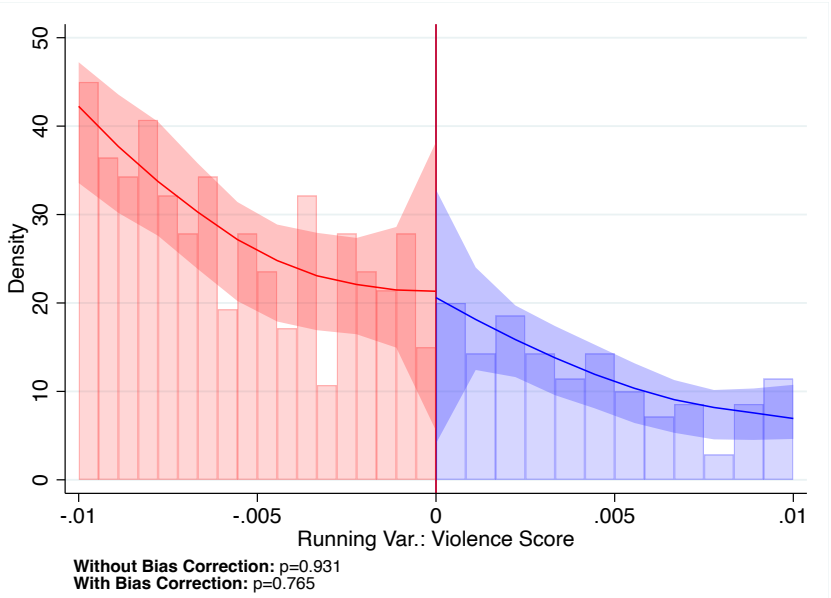
Notes: Estimates of Equation (3), including 95% confidence intervals (based on standard errors clustered at the municipality level). The red line is the optimal bandwidth calculated following Calonico, Cattaneo, and Titiunik (2014), selected to minimize the Mean Squared Error. The blue estimates and confidence intervals are the results from this same exercise but using 20 different (evenly-spaced) bandwidths.

Figure B2: Robustness of Anderson Index to Individual Component Variables



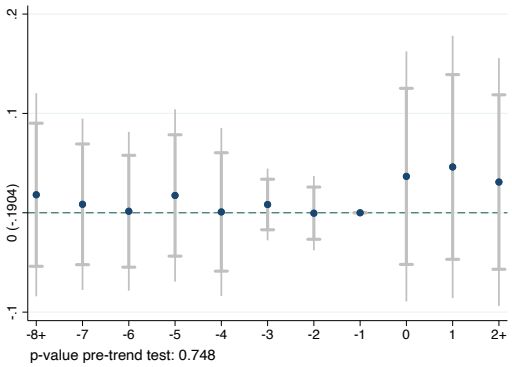
Notes: Figure shows in black estimates of Equation (3) including 95% confidence intervals (based on standard errors clustered at the municipality level) and in blue p-values from a test of joint significance of all pre-treatment coefficients from estimates of Equation (2) following Freyaldenhoven et al. (2021). The Figure uses the index summarizing the different economic indicator variables (nighttime light intensity, GDP per capita (from DANE), share of urban population, agricultural productivity, firm entry and formal employment measures) created following Anderson (2008). The names in the x-axis correspond to the variable dropped from the corresponding index when estimating the results.

Figure B3: Density Test Running Variable – IICA Score

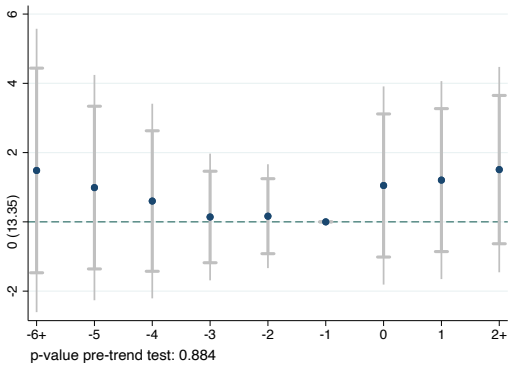


Notes: Density test of the running variable, the IICA score, using local polynomial density estimators as suggested by Cattaneo, Jansson, and Ma (2020). At the bottom of the Figure are the p-values of this test using bias correction or not.

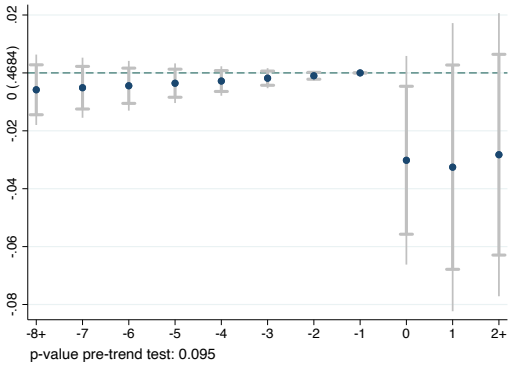
Figure B4: Dynamic Difference-in-Discontinuities Specifications



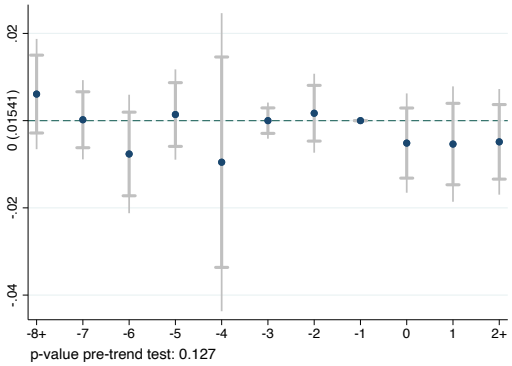
(a) Nighttime Light Intensity (Weighted, Std.)



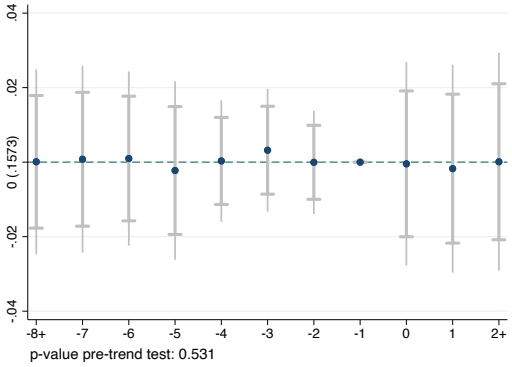
(b) GDP Per Capita (DANE)



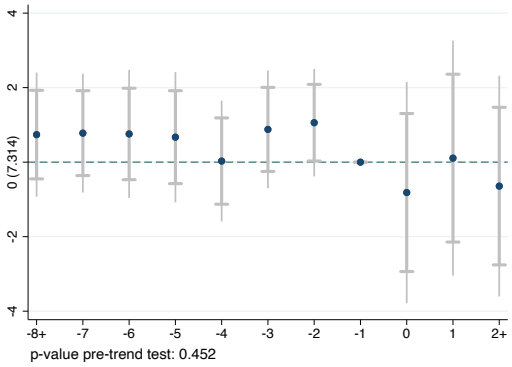
(c) Share Urban Population



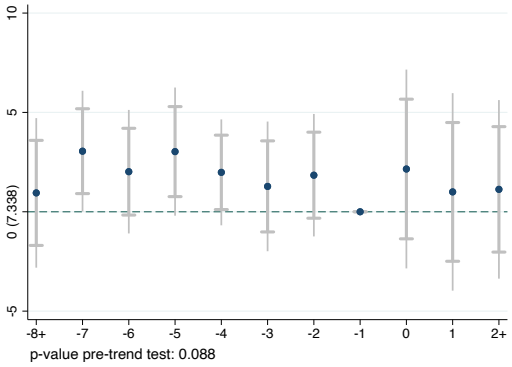
(d) Urban Built-Up



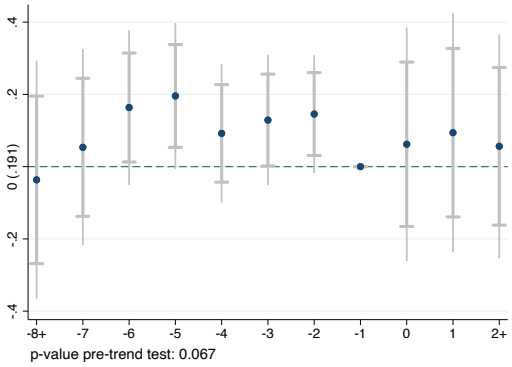
(e) Formal Employment



(f) Firm Entry



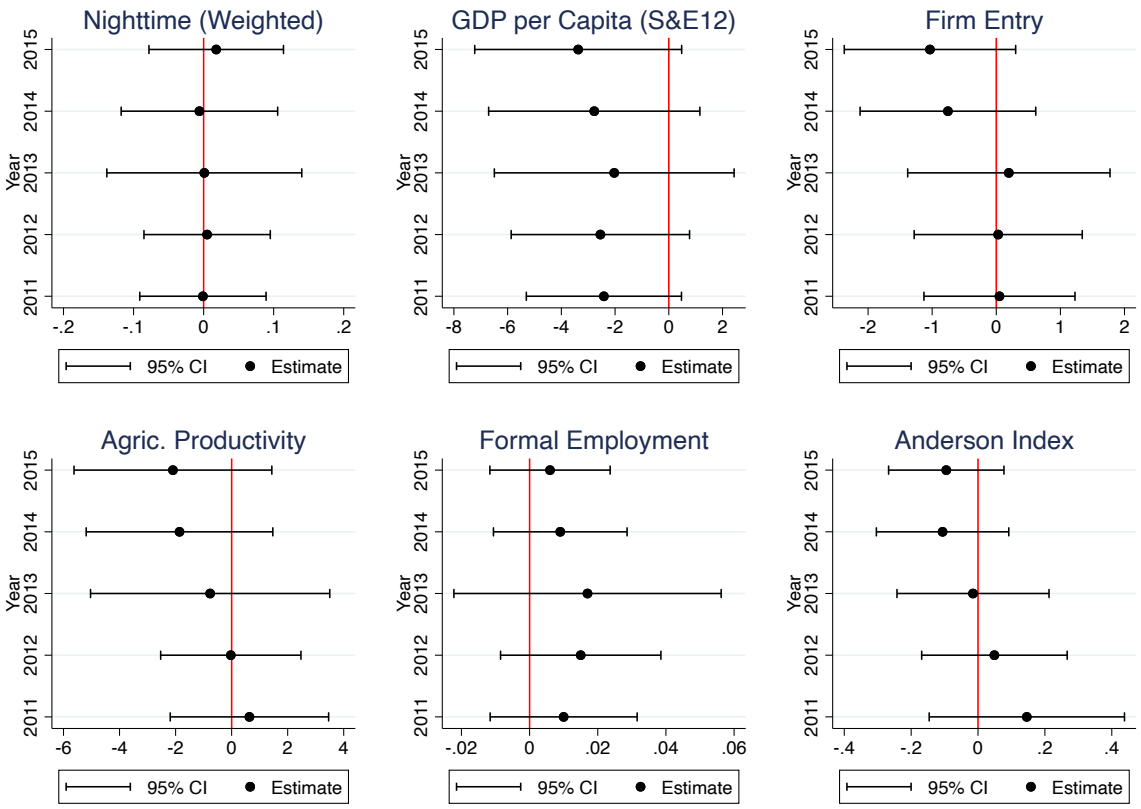
(g) Agricultural Productivity



(h) Anderson Index

Notes: Event study plots from estimating Equation (2), including including 95% confidence intervals (based on standard errors clustered at the municipality level). The index is created following Anderson (2008) and is based on weighted nighttime light intensity, GDP per capita (from DANE), share of urban population, agricultural productivity, firm creation and formal employment.

Figure B5: Difference-in-Discontinuities: Placebo Estimates



Notes: Estimates of Equation (3), including 95% confidence intervals (based on standard errors clustered at the municipality level), using data only from the pre-treatment period (2009-2017, as the ZOMAC program started in 2017). The number in the *y*-axis corresponds to the "placebo" treatment year. Each figure uses a different economic outcome.

Table B2: Difference-in-Discontinuities Analysis: Pre-Treatment Balance Check

Variable	All (1)	Within BW (2)	Bandwidth (3)	Treatment (4)	Control (5)	Difference (6)
Population	38.44	25.38	0.008	23.08	26.64	0.528
Area	1017.6	568.49	0.003	521.4	605.31	0.61
Dist. Capital	81.46	75.24	0.008	73.13	76.35	0.65
Dist. Bogota	321.55	272.2	0.005	265.06	276.69	0.648
Small Credit	0.05	0.05	0.005	0.06	0.05	0.682
Total Credit	0.31	0.32	0.004	0.25	0.4	0.641
Gov. Transfers	0.07	0.05	0.006	0.06	0.05	0.873
Savings Capac.	32.91	30.46	0.009	30.02	30.66	0.777
Fiscal Perf.	62.1	61.56	0.008	62.19	61.28	0.422
Overall Perf.	58.85	58.41	0.009	57.04	59.05	0.272
Mun. Develop.	66.67	68.56	0.008	69.63	68.04	0.332
Conf. 1901/30	0.05	0.07	0.007	0.08	0.07	0.809
Spanish Occup.	0.37	0.25	0.007	0.31	0.21	0.122
Aqueduct	59.55	62.08	0.007	58.6	64.17	0.238
Garbage Coll.	45.77	51.8	0.006	52.58	51.27	0.8
Sewage	42.37	51.57	0.005	50.96	52.01	0.853
PC Expenditure	0.26	0.25	0.005	0.26	0.25	0.095
GINI	0.45	0.46	0.008	0.46	0.46	0.633
MDP	69.46	68.53	0.009	67.78	68.87	0.536
NBI	45.4	41.47	0.009	40.41	41.96	0.527

Notes: All the variables are measured in 2008 (the last period before the panel used in the main analysis) but for the last four variables that are only available for 2005. Conf. 1901/1930 denotes whether the municipality experienced social conflict between 1901-1930. Distance variables are measured in kilometers. MDP is a multidimensional poverty index. Population in 1000s, value of credit in 1.000.000s COP per capita, expenditure per capita in 1.000.000s COP.

C Alternative Mechanisms

The results in Section 5 suggest that a lack of state capacity from both before the peace agreement and a lack of state entry post-ceasefire are the reasons why the large reduction in violence did not translate into economic improvements in FARC municipalities. However, there might be alternative mechanisms that could potentially explain this set of results as well. In this Section, I present evidence on some of these alternative mechanisms that suggest that they are unlikely to be driving the results.

C.1 Migration of Venezuelans

The worsening humanitarian situation in Venezuela due to the authoritarian regimes of Hugo Chávez and Nicolás Maduro has led to large numbers of Venezuelans migrating to Colombia since 2014. The UN estimates that about 1.8 million Venezuelans have migrated to Colombia until 2020. These large inflows from forced migrants could have negative impacts on local labor markets, with Bahar, Ibáñez, and Rozo (2021) showing that larger inflows of Venezuelan migrants reduced the employment of Colombian workers. Thus, if Venezuelan migrants disproportionately located in FARC municipalities, as these were more attractive due to the reduction in violence, then this might explain the lack of economic improvements after the ceasefire.

Looking at Table C1, this does not seem to be the case. The Table shows the number of Venezuelan migrants that obtained a *Permiso Especial de Permanencia* (PEP, a formal temporary migratory status that gives migrants the legal right to work and to access basic public services) and registered in a FARC/ELN municipality in a given year between 2017 and 2019 (first three columns), and the cumulative number of migrants that have registered in a FARC/ELN municipality since 2017 (last three columns). Unfortunately, data on the universe of Venezuelan migrants is unavailable, thus the numbers underestimate the true number of Venezuelan migrants in these municipalities.

The Table shows that, if anything, Venezuelan migrants were significantly more likely to locate in ELN rather than FARC municipalities. This result is unsurprising, as ELN municipalities are much closer to the border with Venezuela than FARC municipalities: ELN municipalities are on average 213kms away from the Venezuelan border, while FARC municipalities are 472kms away, with the difference being significant.

C.2 Coca Production and Eradication

In 2014, during the peace negotiations with the FARC and before the start of the ceasefire, the government announced that, post-agreement, the government would provide farmers with material incentives to switch from growing coca to other crops. Prem, Vargas, and Mejía (2021) show that this policy announcement led to a sharp increase in coca farming in areas suitable for coca production, as farmers expected to benefit from the government's announced substitution program. Thus, an alternative explanation to the baseline results could be that the start of the ceasefire led to a shift of eco-

nomic activity from the legal sector towards coca production in FARC municipalities, which would be largely missed by the set of economic indicators used in Section 4.2. Moreover, it could also be that the government shifted its coca eradication programs towards FARC municipalities, as these were not controlled by an insurgent group anymore, shifting labor from productive activities towards eradication programs.

However, Table C2 suggests that this does not seem to be the case. The first three columns shows results using indicator variables for whether the municipalities were producing coca or whether the government had implemented a coca eradication program in a given municipality, while the following three columns show coca production and eradication per 10.000 HAs of municipality's size. FARC municipalities were not more likely to be growing coca or to have ongoing eradication programs after the start of the ceasefire relative to ELN municipalities. There is also no increase in either of these measures when measured in 10.000 HAs. Thus, it seems like a shift towards coca production and eradication is also not the case of the results.

The actual coca-substitution program (PNIS) that the government announced in 2014 was officially signed into decree in 2017. However, the program has been plagued by logistical and administrative problems, formally starting in 2018/2019 in a smaller magnitude than originally intended. Thus, this program started too late to explain the results. The last two columns of the Table show that i) FARC municipalities (despite not having increased their coca production relative to ELN municipalities) were more likely to be selected for the program in 2019, and ii) also had significantly more beneficiaries of the economic incentives per 10.000 inhabitants than ELN municipalities.

C.3 Credit Constraints

FARC municipalities tend to be mostly rural, distant municipalities, where agriculture plays a big role. Thus, an alternative explanation could be that FARC municipalities could not reap the economic benefits because, despite the large reduction in violence, agricultural farmers were credit constrained and thus could not finance their projects.

However, this seems unlikely to be the case. First, De Roux and Martínez (2021) show using detailed data from the largest public bank serving rural producers in Colombia (the Banco Agrario) and a similar identification strategy as here, that the number of business loans increases in FARC municipalities after the peace agreement (but not after the start of the ceasefire). Table C3 shows a similar pattern. It shows the value of credit given by two large credit-providing institutions focused on rural agricultural projects, the Banco Agrario and FINAGRO, to agricultural producers of different sizes. As is the case in De Roux and Martínez (2021), credit to small agricultural producers (those most likely to be credit constrained) increased significantly after the signing of the peace agreement (but not after the start of the ceasefire). Thus, it seems like credit constraints were eased for those more likely suffering from them in FARC municipalities after the peace agreement was ratified.

C.4 Corruption

Another concern could be that the government did set aside funds to help FARC municipalities but due to corruption at the local level, the funds were diverted to corrupt politicians or spent in non-productive investments. There are two pieces of evidence to suggest that this is not the case. First, as shown in Table 7, government transfers did not increase significantly after the start of the ceasefire in FARC municipalities (even if taken at face value, the coefficient suggests an increase of only 2000 COP per person in FARC municipalities, less than half a dollar). Thus, it is unlikely that there were more funds to steal to begin with. Second, in Table C4 I analyze whether cases of corruption (from the General Attorney's Office, first two columns) or disciplinary actions against local government officials (from the national watchdog agency, the Procuraduría General de la Nación, last four columns) increased in FARC municipalities after the ceasefire. Panel A shows the results per 10.000 inhabitants, while Panel B shows the results using a dummy for whether a case was opened in a given municipality. While these are only imperfect measures of corruption, they do show that neither corruption cases nor disciplinary actions increased in FARC municipalities after the ceasefire, regardless of whether one looks at the total cases (columns 2 and 6) or at more disaggregated offenses (including monetary offenses in column 3). Thus, it is unlikely that the lack of economic benefits post-ceasefire is simply due to funds being stolen, or corruption more in general.

C.5 Shift Towards Education

An alternative mechanism could be that the end of the FARC allowed young individuals to go back to school and pursue an education now that they did not need to worry about the conflict or work for the FARC. This would mean that these young individuals shifted from working in productive activities to getting an education in the short-run, potentially explaining the observed lack of economic improvements.

The results in Table C5 suggest that this does not seem to be the case. It shows that the number of first-year students in higher education programs (a measure of entry to higher education) in FARC municipalities did not increase significantly more than in ELN municipalities after the start of the ceasefire, regardless of the type of educational program considered (technical education programs, bachelors programs or post-graduate programs). There is also no significant change in the number of higher education institutions in FARC municipalities, so it does not seem like a shift from production toward education is driving the results.

C.6 Productive Land Tied-Up in Land Restitution Processes

Disputes over land ownership have been at the center of the armed conflict in Colombia. For example, López-Uribe and Torres (2017) show that the historical dispossession of peasants' lands by landlords between 1914 and 1946 is associated with FARC

presence in the early stages of the conflict (1974-1985). Recognizing this, and as a first signal of its willingness to achieve peace, the government signed in 2011 the "Victims and Land Restitution Law", which provided the legal framework for conflict victims to obtain assistance and reparations from the government, and a mechanism for victims to recover the lands they had lost during the conflict.

Yet another reason for the results could be that FARC municipalities could not benefit economically because the productive land in those municipalities was either stolen by the FARC and inaccessible to farmers, or tied up in the courts set up to handle land restitution processes. If this were the case, it would be expected to see large increases in land restitution claims and cases in court in FARC municipalities after the start of the ceasefire. The land restitution process proceeds in three stages: first, a person or group of people presents a land restitution claim to the government unit in charge of the land restitution process (UAEGRTD). The UAEGRTD then decides whether to bring the case to the land restitution courts or not, in the second stage. Lastly, the court decides whether to restitute the land or not. The process has been criticized for its slowness: until 2019, out of the 120.000+ submitted land restitution requests, less than 10% had been resolved (see *Deutsche Welle, 2019*).

However, these hypotheses do not seem to be supported by the data. Table C6 shows the results of estimating Equation (1) on measures related to the land restitution process. The first three columns correspond to the first step in the restitute process, and show the number of requests, people and plots involved in claims brought forward to the UAEGRTD. Columns 4 and 5 show the number of requests solved and denied by the land restitution courts. The last three columns show the number of beneficiaries, plots and the total plot size of the claims approved by the courts. If anything, it seems like, relative to ELN municipalities, there have been less land restitution claims presented and resolved in FARC municipalities after the start of the ceasefire (columns 1-4), regardless of whether one measures these in per capita terms (Panel A) or not (Panel B), although the coefficients are insignificant. When looking at the requests that have been approved by the courts, the coefficients on the number of beneficiaries, plots returned, or total area restituted are mostly negative and insignificant (columns 6-8). Thus, this alternative explanation seems unlikely to be behind the results.

C.7 Beliefs About the Peace Agreement

The Democracy Observatory (Observatorio de la Democracia) at the Universidad de los Andes has been conducting surveys in Colombia as part of the broader AmericasBarometer initiative since 2004. Broadly speaking, these surveys aim to study the attitudes, experiences, values and beliefs of people across the Americas about their political institutions. While the survey contains a set of questions that are asked in every country and across time, it also includes country-specific questions. Most of the questions specific to Colombia are related to the armed conflict and the peace agreement with the FARC. On top of the AmericasBarometer surveys, the Democracy Observa-

tory has conducted three surveys focused on areas affected by the armed conflict, in 2013, 2015 and 2017. The data as well as the survey instruments can be found *here*.

I combine the data from all the AmericasBarometer and the special conflict-areas surveys since 2011 to shed light on the opinions and beliefs of citizens of FARC municipalities towards the peace agreement. One concern could be that these areas did not experience economic improvements because their residents did not believe in the peace agreement or they thought the situation was not going to change and therefore avoided making any economic investments. While these data can be useful for these purposes, it is worth emphasizing that they have clear limitations. For each survey wave, only between 35 to 103 municipalities are surveyed, with on average (median) 58 (36) individuals surveyed per municipality-year pair. Among FARC (ELN) municipalities, 70 out of 216 (10 out of 41) are surveyed at least once between 2011 and 2019, with 35 (9) being surveyed at most twice. While the data are meant to be representative at the municipality level, it is clear that there are limitations in terms of geographical coverage. On the other hand, these are the only surveys representative at the municipality level that are 1) conducted regularly and 2) outside the main cities of the country, and thus can provide a useful snapshot of the opinions and beliefs of people in FARC municipalities. Given the restricted sample of surveyed ELN municipalities, I will focus mostly on FARC municipalities and the rest of the country.

Did residents of FARC municipalities believe that the peace agreement was going to be beneficial? First, in 2017, 2018 and 2019, people were asked whether the implementation of the peace agreement was going to improve the economic situation of their municipality, on a scale from 1 ("strongly disagree") to 7 ("strongly agree"). The share agreeing with this statement (score of 5 or above) in FARC municipalities has been constantly rising over time, from 44% in 2017 to 47% in 2018 to 51% in 2019. The same pattern holds when asked whether it would improve the security situation in their municipality (going from 46% in 2017 to 56% in 2019) and access to land for farmers (57% in 2017 to 64% in 2019). Second, even in 2013, residents of FARC municipalities were 12% more likely than people in the rest of the country to say that they believed that the end of the FARC would bring economic benefits to their municipalities. Third, when asked in 2019 if they agreed with statements saying that two key parts of the peace agreement (the PDET program and the additional seats in congress for conflict-affected areas) would benefit people like them, 59% and 66% of respondents agreed, higher shares than in the rest of the country. Thus, this suggests that residents of FARC municipalities believed that the peace agreement would be beneficial for them, becoming more optimistic over time about the value of the agreement.

Were residents of FARC municipalities in favor of the agreement? The answer is yes. First, residents of FARC municipalities have always been more likely to believe that the best way to end the armed conflict with guerrilla groups was through negoti-

ations rather than military action. Before (after) the start of the ceasefire, 65% (78%) of citizens in FARC municipalities believed this to be the best option, compared with 57% (72%) in the rest of the country. This also holds for the year 2011, before it was leaked that the government was negotiating with the FARC. Second, the 2016 plebiscite on the final peace agreement received 50,3% of votes in favor in FARC municipalities (i.e. would have passed), while in the rest of the country it was rejected, receiving only 49,5% of votes in favor. Third, since 2013 the surveys have included a question asking citizens how supportive they are of a/the peace agreement (both before and after the actual agreement was completed), and the majority of citizens in FARC municipalities have agreed with the idea of an agreement or the actual agreement in all years but one, with their support above that in the rest of the country in 5 out of 7 years for which data exist.[25] Moreover, the share in support of the agreement in FARC municipalities has been steadily increasing since 2016. The majority of people in FARC municipalities have believed (both before and after ceasefire) that it is possible for people to forgive and reconcile with former FARC fighters, higher than in the rest of the country.

There was also broad support for different components of the peace agreement. In 2019, people were asked what percentage of people in their municipality they believed supported the implementation of the peace agreement and the Rural Reform, a key part of the agreement. In FARC municipalities, 66% of respondents stated that they believed that at least half of their municipality supported the implementation of the Rural Reform, while 73% believed the same to be true for the implementation of the full peace agreement, both higher than in the rest of the country. Panel A of Table C7 shows that, in general, citizens of FARC municipalities were more likely to agree with key elements of the peace agreement relative to people in the rest of the country. The majority of citizens in FARC municipalities agree with most of these components, and unpopular components fare significantly better in FARC municipalities relative to the rest of the country. Interestingly, row 12 shows that, compared to citizens in other municipalities, the proposal to make changes to the original agreement after the plebiscite was rejected was less popular in FARC municipalities. Moreover, between 2013 and 2015, when asked for their level of support to hypothetical policies similar to the ones in the actual agreement (such as penalty reductions, political participation, and so on), people in FARC municipalities were significantly more likely to support these than people in the rest of the country, although the overall level of support was low.

Did residents of FARC municipalities understand the agreement? One concern with the evidence so far is that it could be that people in FARC municipalities did not know the details of the peace agreement and thus these answers reflect a lack of understanding of what was agreed. However, this seems unlikely to be the case. Panel B of Table C7 shows the proportion of citizens in FARC/rest of the country municipal-

[25] Across all years, 56% of citizens in FARC municipalities and 51% in the rest of the country have been supportive of the peace agreement. Before (after) the start of the ceasefire, these numbers were 59% and 55% (56% and 50%), respectively.

ities that correctly answered three different questions regarding the peace agreement: whether their municipality has been designated as a PDET municipality, whether creating 16 seats for conflict-affected areas was part of the peace agreement, and what the maximum amount of years a FARC member could be sentenced to jail under the peace agreement is (8 years). Citizens in FARC municipalities are significantly more likely to get these questions right compared to citizens in the rest of the country, and the overall rate of correct answers is high. Moreover, Table C8 shows that, while surveyed and non-surveyed FARC municipalities are not identical (non-surveyed ones tend to be smaller, more rural and slightly poorer), they are fairly similar.

Overall, the results in this Section show that citizens in FARC municipalities 1) supported the peace agreement and its key components, 2) believed that the peace agreement was going to benefit them and their municipalities (also economically), and 3) were knowledgeable regarding the content of the peace agreement, in general more so than citizens in the rest of the country. Thus, uncertainty around, opposition against, or lack of trust in the peace agreement seem unlikely to be reasons why FARC municipalities did not benefit economically from the peace agreement.

Table C1: Venezuelan Migrants with Permits – Extensive Margin, Events in Over 60% of Years

	Flow			**Stock**		
	FARC	ELN	p-value Diff.	FARC	ELN	p-value Diff.
Year	(1)	(2)	(3)	(4)	(5)	(6)
2017	1.41	2.02		1.41	2.02	
2018	17.51	29.29		18.9	31.27	
2019	1.78	1.92		20.41	32.17	
All Years	6.9	11.08	0.088	13.57	21.82	0.014

Notes: Venezuelan migrants per 10.000 inhabitants. The first three columns show the number of Venezuelan migrants who received a special permit to live and work in Colombia (PEP) and registered in a given municipality and year (flow), while the last three columns show the total number of Venezuelan migrants with the permit that have registered in a given municipality over time.

Table C2: DiD Analysis – Alternative Mechanisms – Coca Production & Eradication: Extensive Margin, Events in Over 60% of Years

	Indicator Variables			Per 10.000 HAs			PNIS Program	
	Coca Production	Manual Erad.	Total Erad.	Coca Production	Manual Erad.	Total Erad.	Participating	Beneficiaries
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ceasefire × FARC	–0.042	–0.009	0.009	0.721	0.197	–0.000		
	(0.039)	(0.044)	(0.037)	(0.550)	(0.337)	(0.336)		
FARC							0.152***	118.918***
							(0.036)	(26.961)
Treated Munic.	216	216	216	216	216	216	216	216
Control Munic.	41	41	41	41	41	41	41	41
Mean Dep. Var.	0.323	0.320	0.364	0.559	0.474	1.135		
Observations	2,827	2,827	2,827	2,827	2,827	2,827	257	257
R Squared	0.857	0.628	0.696	0.639	0.264	0.382	0.024	0.019

Notes: Standard errors clustered at the municipality level. For the first six columns, includes municipality and year fixed effects. Considers only years from 2009 and before 2020. The last two columns consider only 2019, after PNIS started. Mean Dep. Var.: Mean of the dependent variable in the pre-intervention period for municipalities in the sample (FARC and ELN). Defines the post period as 2015. Coca production, manual and total eradication are per 10.000 hectares. Beneficiaries is the number of PNIS beneficiaries previously working harvesting coca per 10.000 inhabitants.

Table C3: DiD Analysis – Alternative Mechanisms – Credit to Agricultural Producers: Extensive Margin, Events in Over 60% of Years

	FINAGRO Value of Credit				Banco Agrario Value of Credit			
	Small	Medium	Large	Total Credit	Small	Medium	Large	Total Credit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ceasefire × FARC	0.000	0.008	0.027	0.035	0.007	0.008	0.028	0.043
	(0.008)	(0.008)	(0.036)	(0.040)	(0.009)	(0.007)	(0.037)	(0.040)
Agreement × FARC	0.032**	0.007	0.002	0.041	0.029*	0.001	–0.014	0.016
	(0.015)	(0.011)	(0.032)	(0.045)	(0.017)	(0.012)	(0.032)	(0.045)
Treated Munic.	216	216	216	216	216	216	216	216
Control Munic.	41	41	41	41	41	41	41	41
Mean Dep. Var.	0.127	0.095	0.056	0.278	0.110	0.088	0.045	0.244
Observations	2,313	2,313	2,313	2,313	2,827	2,827	2,827	2,827
R Squared	0.876	0.823	0.671	0.721	0.775	0.749	0.545	0.603

Notes: Standard errors clustered at the municipality level. Includes municipality and year fixed effects. Considers only years from 2009 and before 2020. Mean Dep. Var.: Mean of the dependent variable in the pre-intervention period for municipalities in the sample (FARC and ELN). Defines the post-ceasefire period as 2015 and 2016, and the post-agreement period as the years from 2017. Value of credit to small, medium and large agricultural producers, in COP million per capita, from two different credit-giving organizations, FINAGRO and the Banco Agrario.

Table C4: DiD Analysis – Alternative Mechanisms – Corruption: Extensive Margin, Events in Over 60% of Years

	Corruption Cases		**Disciplinary Actions**			
	Public Administrators	Total Offenses	Economic Offenses	Local Gov. Officials	Serious Offenses	Total Offenses
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Per 10.000 People						
Ceasefire × FARC	–0.014	–0.004	0.012	0.027	–0.016	–0.011
	(0.030)	(0.030)	(0.017)	(0.046)	(0.069)	(0.070)
Treated Munic.	216	216	216	216	216	216
Control Munic.	41	41	41	41	41	41
Mean Dep. Var.	0.037	0.039	0.039	0.214	0.471	0.500
Observations	2,827	2,827	2,827	2,827	2,827	2,827
R Squared	0.146	0.148	0.093	0.152	0.216	0.239
Panel B. Dummy						
Ceasefire × FARC	–0.008	0.004	–0.000	0.021	0.040	0.043
	(0.028)	(0.029)	(0.016)	(0.035)	(0.044)	(0.045)
Treated Munic.	216	216	216	216	216	216
Control Munic.	41	41	41	41	41	41
Mean Dep. Var.	0.079	0.086	0.061	0.242	0.442	0.457
Observations	2,827	2,827	2,827	2,827	2,827	2,827
R Squared	0.293	0.293	0.135	0.230	0.330	0.332

Notes: Standard errors clustered at the municipality level. Includes municipality and year fixed effects. Considers only years from 2009 and before 2020 Mean Dep. Var.: Mean of the dependent variable in the pre-intervention period for municipalities in the sample (FARC and ELN). Outcome variables in Panel A are per 10.000 inhabitants, while those in Panel B are dummies. Data on corruption cases come from the General Attorney's Office while that on disciplinary actions come from the national watchdog agency (Procuraduria General de la Nacion).

Table C5: DiD Analysis – Alternative Mechanisms – Higher Education: Extensive Margin, Events in Over 60% of Years

	Number of	**First-Year Students**		
	Learning Inst.	Technical	University	Post Grad
	(1)	(2)	(3)	(4)
Ceasefire × FARC	0.151	–0.061	1.766	–0.027
	(0.129)	(1.485)	(1.650)	(0.105)
Treated Munic.	216	216	216	216
Control Munic.	41	41	41	41
Mean Dep. Var.	0.867	6.638	6.939	0.084
Observations	2,827	2,827	2,827	2,827
R Squared	0.435	0.472	0.803	0.385

Notes: Standard errors clustered at the municipality level. Includes municipality and year fixed effects. Considers only years from 2009 and before 2020. Mean Dep. Var.: Mean of the dependent variable in the pre-intervention period for municipalities in the sample (FARC and ELN). Defines the post period as 2015. Educational variables are per 10.000 inhabitants, and come from the Ministry of Education. Technical is the sum of students in technical and technological educational programs. University is the sum of students in undergraduate programs. Post grad is the sum of students enrolled in masters', specializations or PhD programs. First column shows the number of higher learning institutions in the municipality.

Table C6: DiD Analysis – Alternative Mechanisms – Land Restitution: Extensive Margin, Events in Over 60% of Years

	Land Restitution Requests			**Court Decision**		**Restitutions**		
	Requests	Benefic.	Plots	Solved	Denied	Benefic.	Plots	Size Plots
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Per Capita								
Ceasefire × FARC	–3.378	–1.665	–2.397	–0.113	–0.056	0.247	–0.082	–0.235
	(2.451)	(1.782)	(2.211)	(0.428)	(0.040)	(1.016)	(0.268)	(0.179)
Treated Munic.	216	216	216	216	216	216	216	216
Control Munic.	41	41	41	41	41	41	41	41
Mean Dep. Var.	21.309	16.004	19.136	0.500	0.020	1.033	0.344	0.206
Observations	2,313	2,313	2,313	2,056	2,056	2,056	2,056	2,056
R Squared	0.566	0.618	0.585	0.472	0.273	0.475	0.478	0.472
Panel B. Total								
Ceasefire × FARC	–5.707	–3.623	–4.190	–0.925	–0.170	–1.123	–0.471	–14.032
	(4.622)	(3.524)	(4.027)	(0.964)	(0.108)	(2.538)	(0.631)	(11.959)
Treated Munic.	216	216	216	216	216	216	216	216
Control Munic.	41	41	41	41	41	41	41	41
Mean Dep. Var.	38.137	29.154	34.364	1.157	0.032	2.920	0.860	30.783
Observations	2,313	2,313	2,313	2,056	2,056	2,056	2,056	2,056
R Squared	0.528	0.520	0.541	0.521	0.412	0.516	0.549	0.590

Notes: Standard errors clustered at the municipality level. Includes municipality and year fixed effects. Considers only years from 2011 (for first three columns) or 2012 (remaining columns) and before 2020. Mean Dep. Var.: Mean of the dependent variable in the pre-intervention period for municipalities in the sample (FARC and ELN). Outcome variables in Panel A are in either 10.000 inhabitants (first seven columns) or in 10.000 of HAs (last column), while those in Panel B are in totals. Data come from the Unit of Land Restitution.

Table C7: Support and Knowledge of Peace Agreement

	FARC (1)	Rest Country (2)	p-value (3)	N Obs. (4)
Panel A. Support of Agreement's Components				
1. Former FARC members form a political party	3.654	3.431	0	7240
2. Former FARC members run in elections	3.203	3.124	0.56	2927
3. Would accept results if FARC member wins	61.6	45.2	0	3880
4. 16 add. seats for most-affected municipalities	69.1	66	0.03	5116
5. Redistribution of land to poor farmers	81.4	81.6	0.94	2778
6. Concentration of FARC members in certain areas	34.7	30.9	0.27	1394
7. Crop substitution programs in municipality	83.4	85.2	0.39	1341
8. No jail for demobilized foot soldiers	24.8	19.8	0	2739
9. 5–8 years in jail for confessed atrocious crimes	57.6	55.4	0.53	1416
10. Over 8 years in jail for not confessed crimes	71.7	72.2	0.86	1411
11. PDET in most affected regions	76	72.8	0.05	3187
12. Changes to original agreement	45.9	46.7	0.64	4631
Panel B. Knowledge of Agreement				
1. Is this municipality a PDET?	68.4	56.8	0	1751
2. Is creation of 16 seats part of agreement?	71.7	67	0.02	2092
3. What is the max. jail penalty for FARC member?	27.4	18.3	0	1646

Notes: Each row corresponds to a different component of the peace agreement. Columns 1 and 2 show the number of respondents in FARC and rest of the country municipalities that in general agree with a given component (indicated by a score higher than 5 in a 1-7 Likert-scaled question) or on a 1-10 scale in Panel A, and the number of respondents that correctly answered general questions regarding the peace agreement in Panel B. The third column shows the p-value of the difference between columns 1 and 2 (using robust standard errors). The fourth column shows the number respondents.

Table C8: Comparison Surveyed vs. Non-Surveyed Municipalities (Population Weighted): Extensive Margin, Events in Over 60% of Years

	FARC Municipalities			p-value
	All	Not Surveyed	Surveyed	Difference
Variable	(1)	(2)	(3)	(4)
Population	25.39	19.13	38.47	0
Urban Population	0.41	0.38	0.47	0
Area	1842.32	1498	2560.5	0.04
Distance Capital	77.75	76.26	79.30	0.70
Distance Bogota	334.58	272.10	399.42	0
Gov. Transfers	0.02	0.03	0.01	0
Savings Capac.	35.90	36.34	35.41	0.61
%Exp. in Investment	86.75	86.87	86.62	0.74
Fiscal Perf.	60.11	60.38	59.84	0.48
Overall Perf.	58.11	62.45	53.59	0
Mun. Develop.	50.36	51.04	49.66	0.35
Conflict 1901/30	0.20	0.17	0.25	0.13
Spanish Occup.	0.30	0.25	0.34	0.15
PC Expenditure	0.25	0.25	0.23	0.19
GINI	0.46	0.46	0.46	0.04
MDP	67.75	66.52	69.01	0.27
NBI	44.02	40.72	47.45	0.01
# of Municipalities	216	146	70	

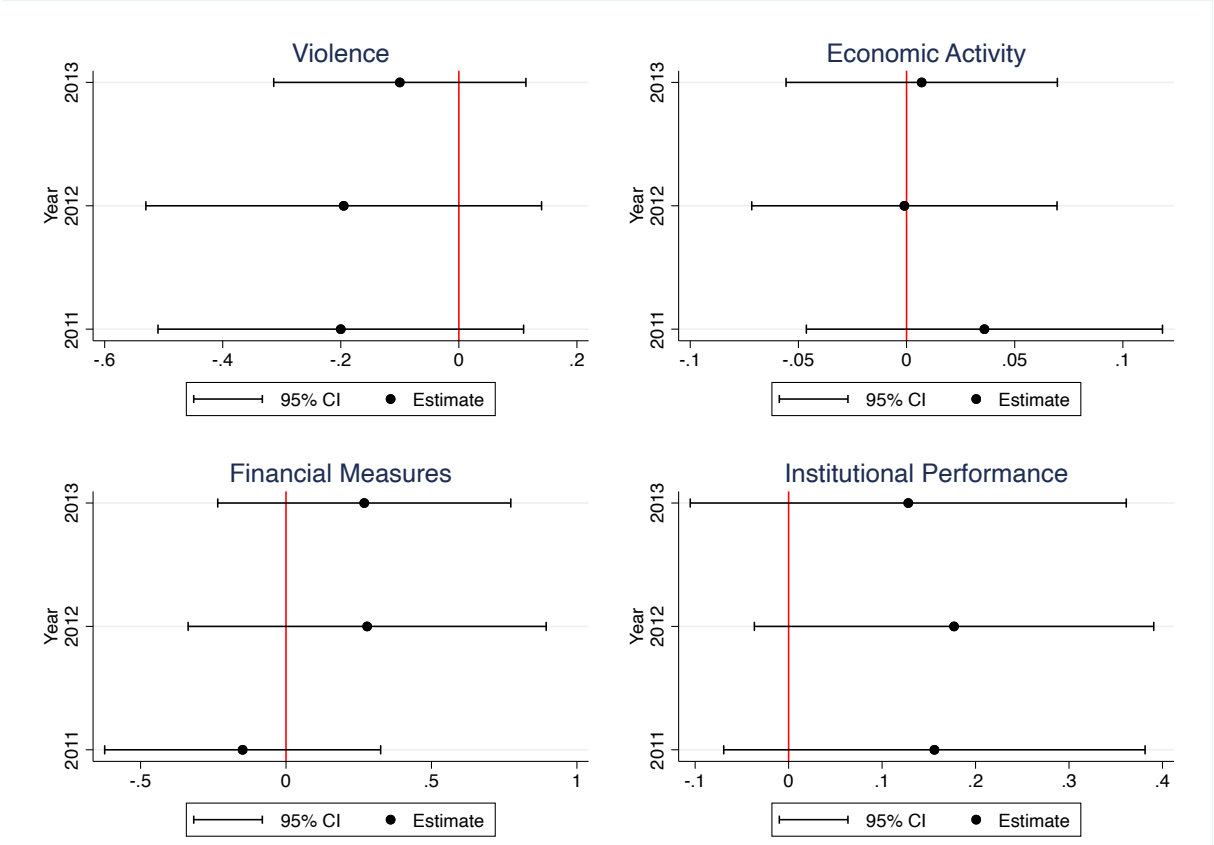
Notes: All the variables are measured in 2008 (the last period before the panel used in the main analysis) but for the last five variables that are only available for 2005 and 2016. Conf. 1901/1930 denotes whether the municipality experienced social conflict between 1901-1930. Distance variables are measured in kilometers. MDP is a multidimensional poverty index. Population in 1000s, expenditure per capita in 1.000.000s COP. The fourth column shows the p-value of the difference between surveyed and non-surveyed FARC municipalities.

D Additional Robustness Checks

In this Section, I present results of additional robustness checks to the baseline results. For brevity, I focus only on the results for the main (Anderson) index for violence, economic activity and the two indices based on the state capacity measures.

Figure D1 shows the results for the four main (Anderson) indices of a placebo exercise. In the exercise, I use data only from the pre-ceasefire period, 2009-2014, and run the usual diff-in-diff regression assigning the treatment to be 2011, 2012, or 2013 (so that there are always at least two pre-treatment and post-treatment periods). For all the placebo treatments, the coefficients are insignificant, ruling out anticipation problems.

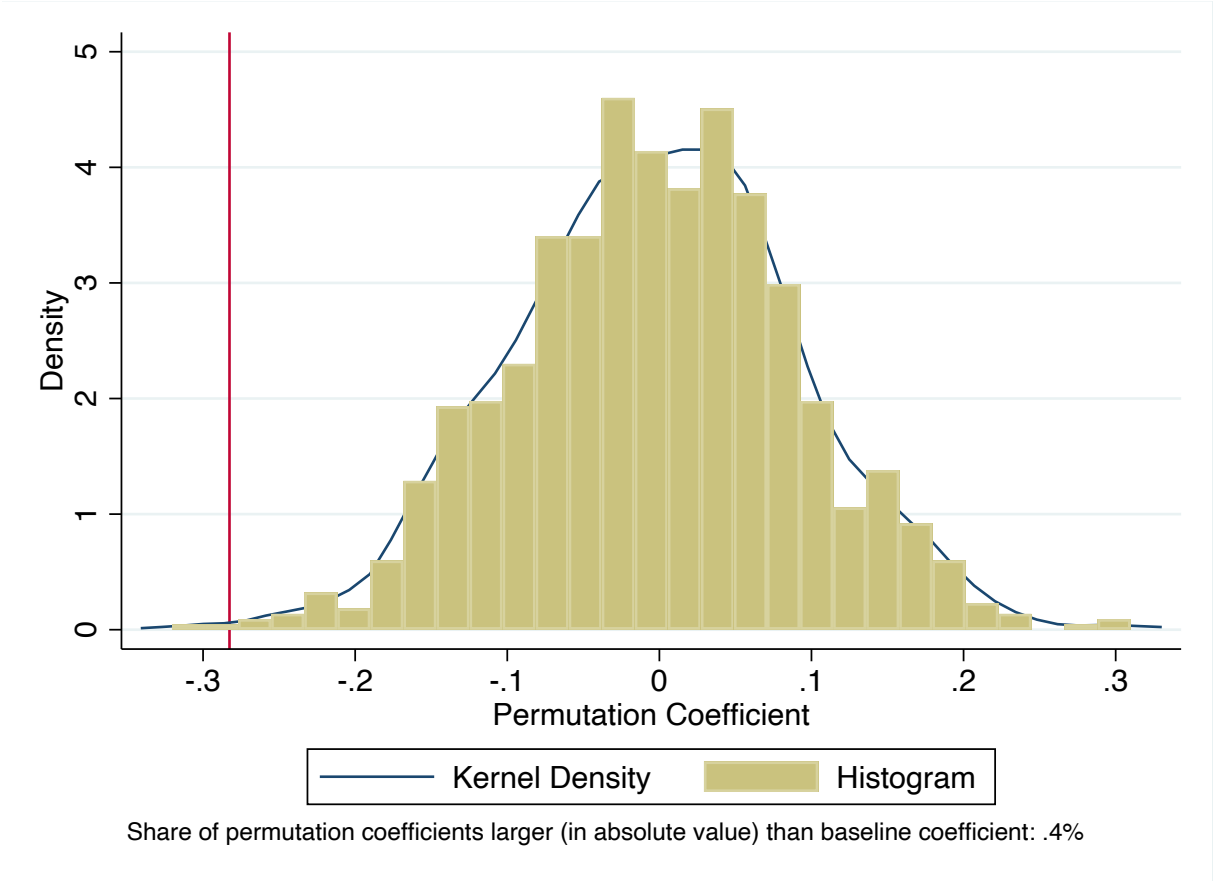
Figure D1: Placebo Treatment – Extensive Margin



Notes: Estimates of Equation (1), including 95% confidence intervals (based on standard errors clustered at the municipality level), using data only from the pre-treatment period (2009-2014). The number in the y-axis corresponds to the "placebo" treatment year. All figures use indices created following Anderson (2008). The top left Figure uses the index based on the different violence variables. The top right Figure uses the index based on weighted nighttime light intensity, GDP per capita (from DANE), share of urban population and agricultural productivity measures. The bottom left Figure uses the index based on financial measures of local institutions, while the bottom right Figure is based on measures of the overall performance of local institutions.

In Figure D2, I assess how likely it is to observe the significant and large negative violence results by chance, in a type of permutation test. [26] More specifically, I randomly assign all municipalities in Colombia (but for those I classified as both FARC *and* ELN, which I excluded from my original analysis) to a treatment and control group, each containing the same number of municipalities as the original treatment and control groups. I then estimate the usual diff-in-diff regression on the Anderson violence index. The Figure displays the distribution of coefficients from this exercise, with 1000 repetitions. Only in 4 out of the 1000 repetitions do I get a coefficient larger in magnitude than the original one, suggesting that this is not simply a chance event.

Figure D2: Permutation Test – Extensive Margin



Notes: The Figure shows the distribution of estimates of Equation (1) for the violence (Anderson) index, using 1000 randomly-created treatment and control groups (in the same proportion as in the original groups). The index is created following Anderson (2008) and is based on the violence measures in Table 2. The red line corresponds to the baseline results.

Table D1 shows results of performing different robustness checks to the baseline results, focusing on the four summary indices for brevity. Overall, the results are in line with the baseline ones: regardless of the specification, the effect on violence is significant, large, and negative, while the effect on economic activity is insignificant and precisely-estimated. The state capacity are significant at the 5% level once each,

[26] I focus only on the violence results because the other ones are insignificant.

in different specifications, although when one is positive, the other is negative (and insignificant). Thus, it is unlikely that this shows a problem with those results.

In Panel A, I estimate standard errors that take into account spatial correlation following Conley (1999)[27] and the wild cluster bootstrap t-statistic method suggested by Cameron, Gelbach, and Miller (2008), with the same results. In Panel B, I use the KLK index proposed by Kling, Liebman, and Katz (2007) rather than the Anderson index. In Panel C, I follow Bertrand, Duflo, and Mullainathan (2004) and collapse all the pre- and post-ceasefire periods together to deal with serial correlation. Unsurprisingly, given that my panel is balanced for most of the variables, the coefficients are identical to the baseline ones, and while the SEs increase marginally, the significance of the coefficients remains unchanged. In Panel D, I add several pre-treatment variables (distance to department's capital, size of municipality, measures of poverty and basic needs, and the log population) interacted with the ceasefire dummy, and the results remain basically unchanged. In Panel E, I add municipality-specific time trends rather than year FEs. One of the state capacity indices is significant when doing so. In Panel F, I classify municipalities as FARC/ELN municipalities if the FARC/ELN operated there for a long time *and* were very violent. More specifically, I classify a municipality as FARC (ELN) if it is classified as FARC (ELN) using both the [baseline] intensive and extensive margin measures of presence (ignoring those that are classified as both FARC and ELN), finding qualitatively similar results, if anything an even larger decrease in violence.

An additional concern could be that the results for the main indices are driven by the selection of variables that compose the indices. To allay these concerns, in Figure D3, I show the results of estimating the baseline set of results for each of the four main indices, eliminating each of the component variables individually. I present results for the estimates from Equation (1) in black with 95% CIs, as well as the p-values of the test of joint significance of pre-treatment coefficients i) suggested by Freyaldenhoven et al. (2021) in blue, and ii) suggested by Borusyak, Jaravel, and Spiess (2021) in red. The Figure also shows the baseline set of results for comparison.

For the violence results in Panel A, the diff-in-diff estimates are always significant at the 95% significance level, and very close in magnitude to the baseline results, but when excluding terrorist attacks (slightly larger estimate in magnitude) and threats (marginally insignificant at this level). All the p-values for pre-trends are insignificant. The results for the economic index in Panel B are similar: the coefficients are very close in magnitude to the baseline results. While the p-values are below 0.05, this is entirely driven by the firm entry variable, as shown in the last column. The state capacity indices show a similar pattern: the one composed of financial performance outcomes (Panel C) shows similar results to the baseline index, except when excluding operational costs, where the p-values of the pre-trends are marginally significant. The one

[27] Up to the 25th, 50th and 75th percentile of the distance of municipalities to their department's capital.

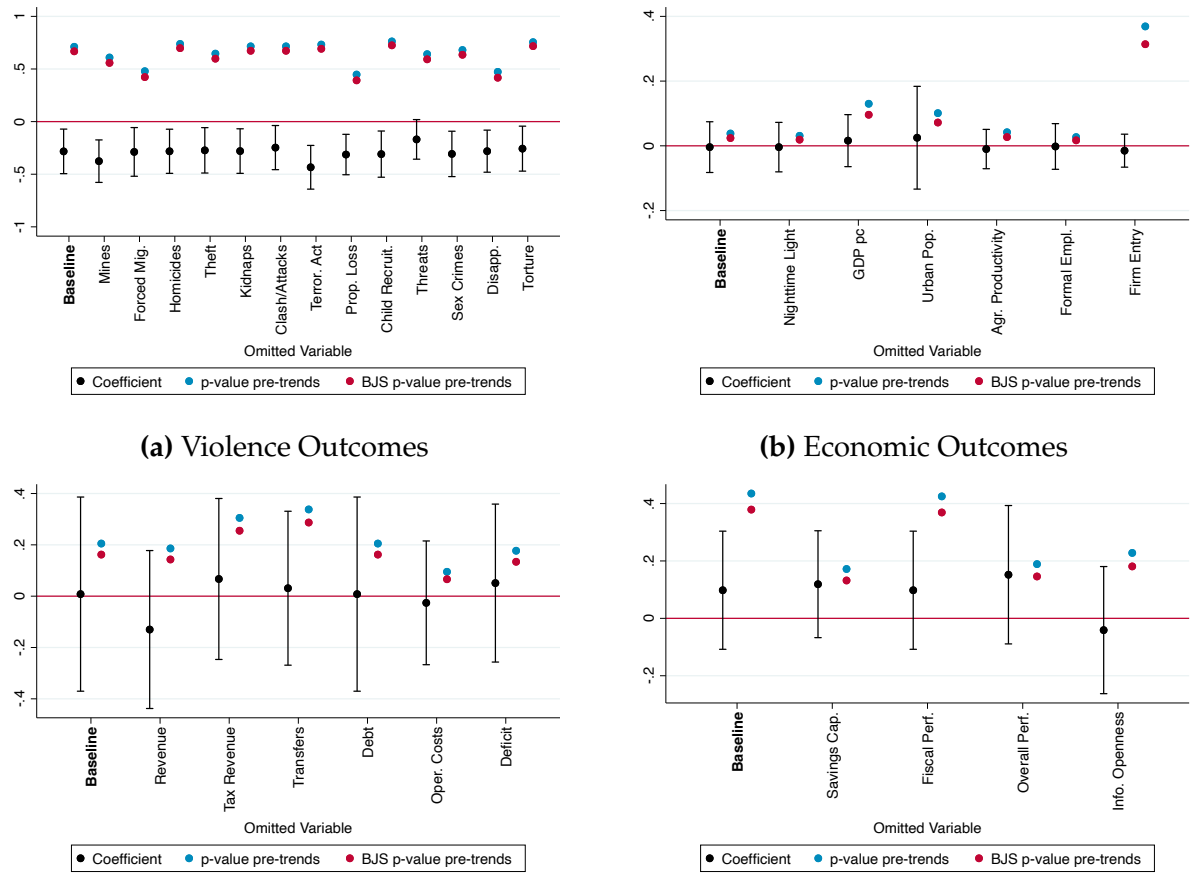
Table D1: Robustness Checks, Baseline Results

	Violence	Economic	State Capacity	
			Fin. Performance	Inst. Quality
	(1)	(2)	(3)	(4)
Panel A. Alt. Inference				
Ceasefire × FARC	–0.283	–0.004	0.008	0.098
Baseline	(0.108)***	(0.040)	(0.193)	(0.105)
Conley Perc. 25	(0.076)***	(0.023)	(0.166)	(0.073)
Conley Perc. 50	(0.082)***	(0.023)	(0.169)	(0.072)
Conley Perc. 75	(0.085)***	(0.022)	(0.175)	(0.082)
Wild Bootstrap p-value	[0.008]***	[0.919]	[0.965]	[0.343]
Observations	2,827	2,827	2,822	2,827
Panel B. Alt. (KLK) Index				
Ceasefire × FARC	–0.487***	–0.011	–0.037	0.210**
	(0.086)	(0.036)	(0.048)	(0.097)
Observations	2,827	2,827	2,822	2,827
Panel C. Collapsing				
Ceasefire × FARC	–0.283*	–0.004	0.005	0.098
	(0.146)	(0.053)	(0.257)	(0.142)
Observations	514	514	514	514
Panel D. Adding Controls				
Ceasefire × FARC	–0.240**	–0.012	0.021	0.077
	(0.112)	(0.037)	(0.231)	(0.106)
Observations	2,827	2,827	2,822	2,827
Panel E. Munic. Trends				
Ceasefire × FARC	–0.331***	–0.057	0.442**	–0.073
	(0.062)	(0.035)	(0.206)	(0.062)
Observations	2,827	2,827	2,822	2,827
Panel F. Alt. Definition				
Ceasefire × FARC	–0.517***	0.021	0.105	0.037
	(0.117)	(0.038)	(0.252)	(0.085)
Observations	2,266	2,266	2,263	2,266

Notes: Results from estimating Equation (1). For Panels B to G, standard errors clustered at the municipality level. Considers only years from 2009 and before 2020. Defines the post period as 2015. The first column uses summary measures based on the different violence variables. The second column uses summary measures based on weighted nighttime light intensity, GDP per capita (from DANE), share of urban population, agricultural productivity, formal employment and firm entry measures. The third column uses summary measures based on financial measures of local institutions, while the last column is based on measures of the overall performance of local institutions. Panel A uses alternative inference approaches, standard errors estimated following Conley (1999), allowing for spatial autocorrelation up to the 25th/50th/75th percentile of the distance to the department's capital, and the wild cluster bootstrap p-values (in squared brackets). Panel B creates the summary indices following the approach suggested by Kling, Liebman & Katz (2008). Panel C follows Bertrand, Duflo & Mullainathan (2004) and collapses all pre- and post-intervention periods together. Panel D adds pre-treatment variables (distance to department's capital, size of municipality, measures of poverty and basic needs, and the log of the municipality's population) interacted with the ceasefire dummy. Panel E includes municipality-specific time trends rather than year fixed effects. Panel F defines a municipality as FARC (ELN) if it is classified as FARC (ELN) using both the baseline intensive and extensive margins of presence.

composed of measures of administrative quality (Panel D) shows that the baseline results are robust to the exclusion of the different component variables. Overall, this shows that the baseline results remain consistent when altering the composition of the index measures.

Figure D3: Robustness of Anderson Indices to Individual Component Variables



(a) Violence Outcomes

(b) Economic Outcomes

(c) SC Financial Performance Outcomes

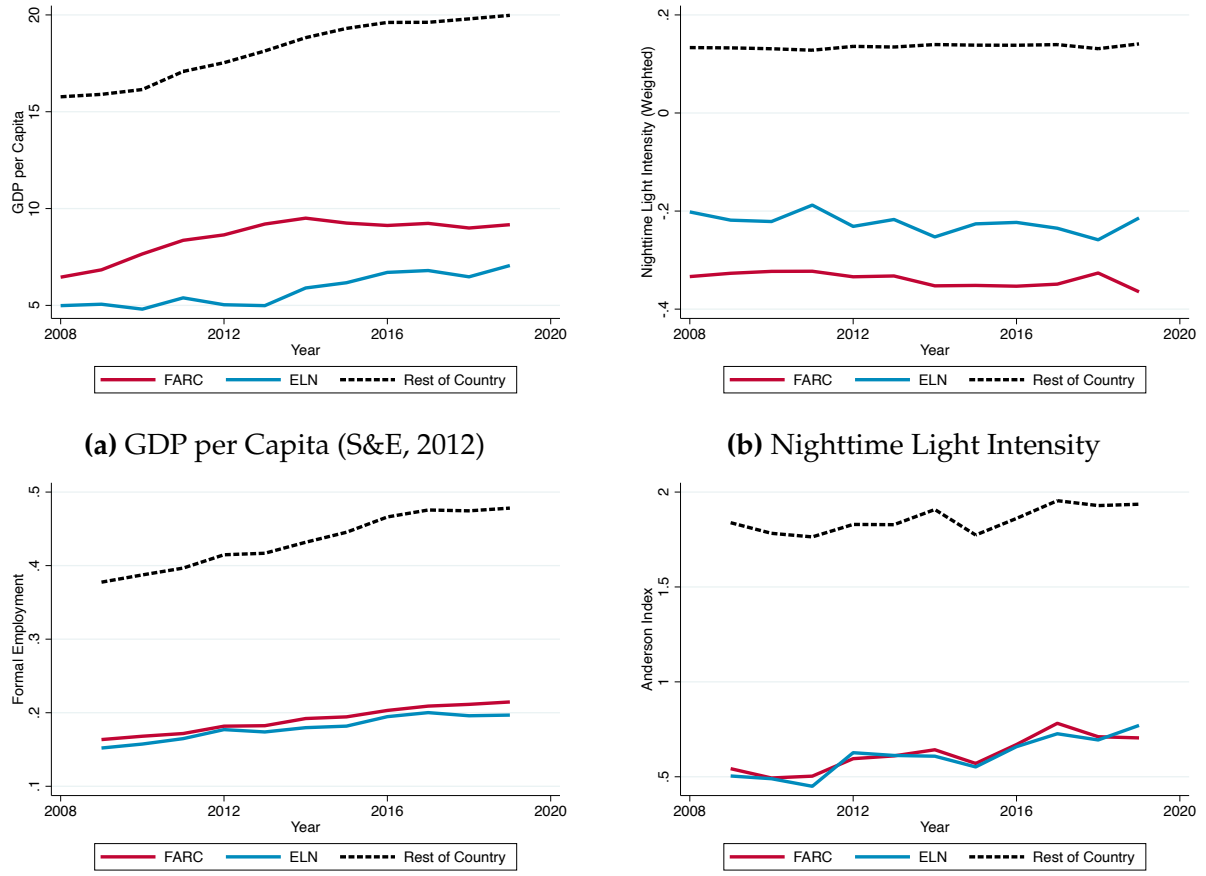
(d) SC Institutional Quality Outcomes

Notes: Figures show in black estimates of Equation (1) including 95% confidence intervals (based on standard errors clustered at the municipality level), in blue p-values from a test of joint significance of all pre-treatment coefficients from estimates of Equation (2) following Freyaldenhoven et al. (2021), and in red p-values from a test of joint significance of all pre-treatment coefficients following Borusyak, Jaravel, and Spiess (2021). All figures use indices created following Anderson (2008). Panel A uses the index based on the different violence variables. Panel B uses the index based on nighttime light intensity, GDP per capita (from DANE), share of urban population, agricultural productivity, firm entry and formal employment measures. Panel C uses the index based on financial measures of local institutions, while Panel D is based on measures of the overall performance of local institutions. The names in the x-axis correspond to the variable dropped from the corresponding index when estimating the results.

Finally, another reason for the lack of significant results in terms of economic improvements in FARC municipalities could be that *both* FARC and ELN municipalities were growing faster than the rest of the country. Rather than FARC municipalities not experiencing economic improvements, these could be masked simply by virtue of the control group growing at a similar pace. However, Figure D4 shows that this is not the

case. Panel A plots the evolution of GDP per capita (estimated following Sánchez Torres and España Eljaiek, 2012), Panel B that of nighttime light intensity, Panel C of formal employment (using PILA data) and Panel D for the Anderson Index of the different economic indicators for FARC (red), ELN (blue) and the remaining municipalities (black).[28] The time series show that 1) FARC and ELN municipalities are much poorer than the rest of the country using all measures, and 2) they have not caught up with the rest of the country since 2008. Thus, the diff-in-diff estimates are not masking economic improvements in FARC and ELN municipalities relative to the rest of the country.

Figure D4: Time Series Economic Indicators



(a) GDP per Capita (S&E, 2012)

(b) Nighttime Light Intensity

(c) Formal Employment

(d) Anderson Index

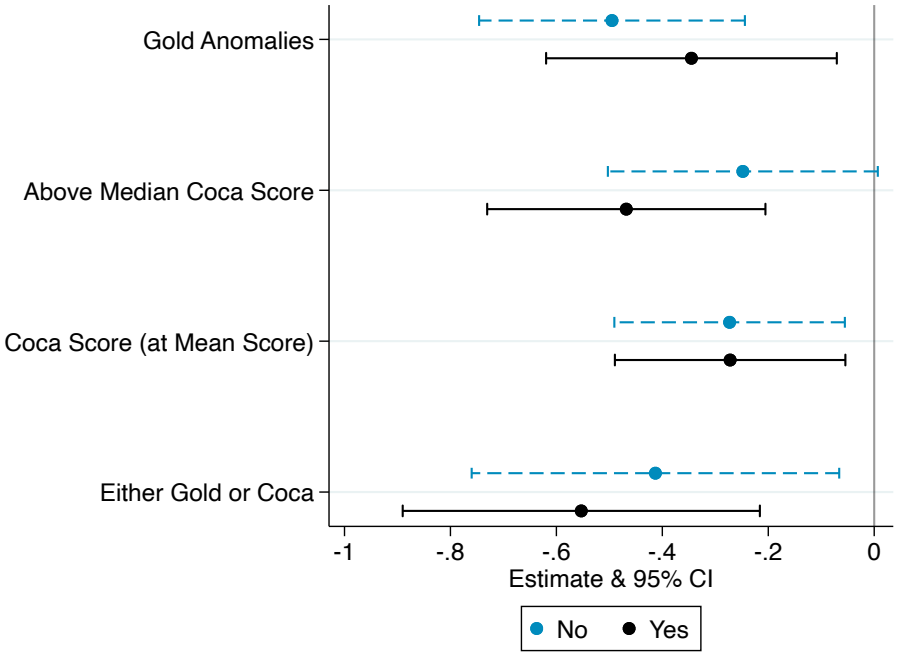
Notes: Panel A shows the evolution of GDP per capita (following Sánchez Torres and España Eljaiek, 2012), Panel B of nighttime light intensity, Panel C of formal employment (using PILA data) and Panel D for the Anderson Index of the different economic indicators for FARC (red), ELN (blue) and the remaining municipalities (black), excluding those municipalities classified as both FARC and ELN.

[28] The latter is standardised each year for comparison purposes.

E Additional Figures

E.1 Violence Results by Likelihood of Gold and Coca Suitability

Figure E1: Violence by Type of Municipality

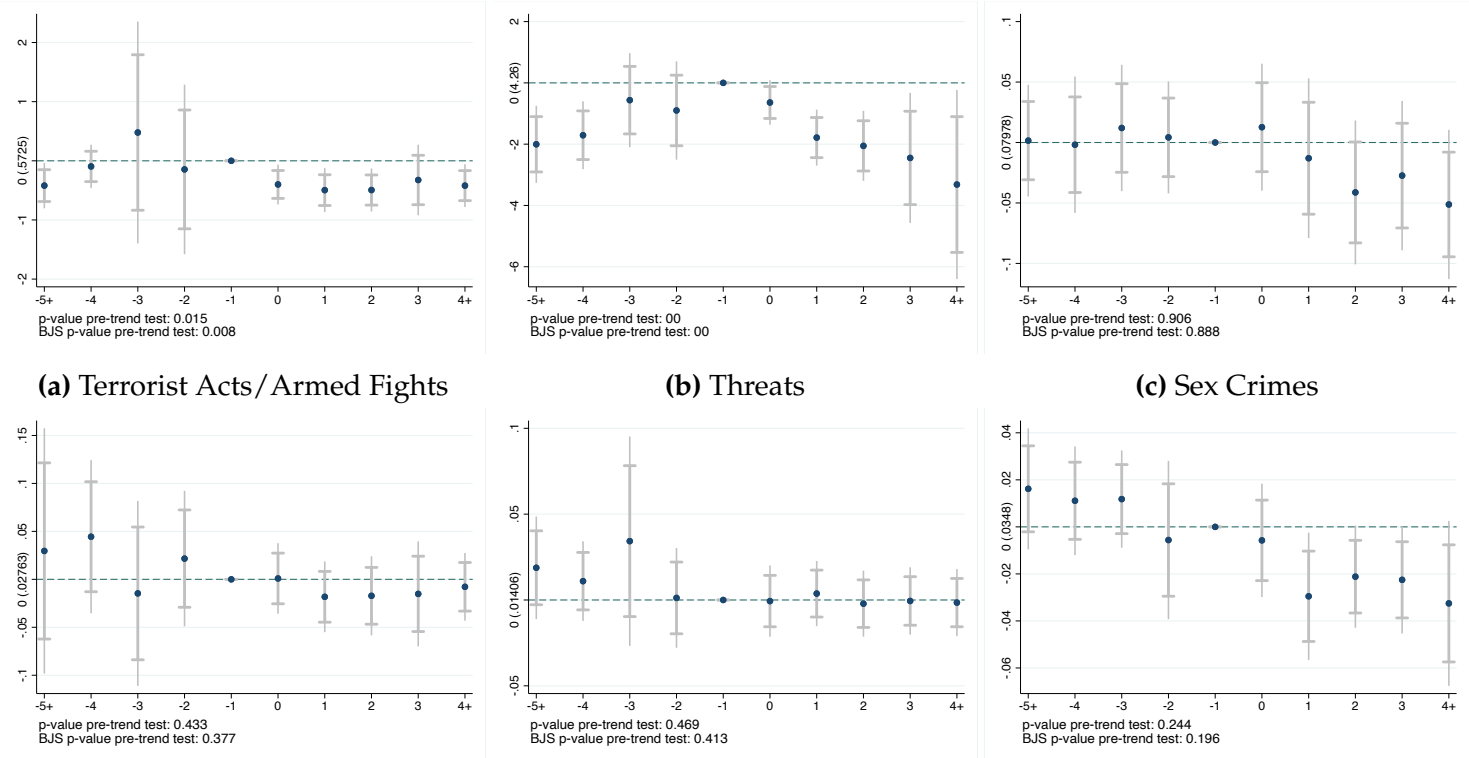


Notes: Coefficients and 95% confidence intervals from estimating Equation (1), including a triple interaction between the post-ceasefire dummy, the presence dummy, and the variable denoting gold presence/coca suitability. The first row uses a dummy for whether the municipality has geochemical anomalies associated with the presence of gold. The second and third rows use the coca suitability index created by Mejia and Restrepo (2013). The second row uses a dummy for whether the municipality is above the median coca suitability score among FARC and ELN municipalities, while the third one uses the continuous score (the coefficient is then evaluate at the mean score). The last row uses a dummy for whether the municipality has gold anomalies or is above the median in terms of coca suitability. The blue coefficients are the main effect for FARC municipalities, while the black coefficients are the sum of the two main effects and the triple interaction term. The dependent variable is the Anderson Index of the violence measures.

E.2 Violence Event Studies

The following Figures show the event-study estimates for each of the different violence measures presented in Section 4.1. Figure E2 shows the results for the measures from the Victims' Unit, while Figure E3 shows the results for the other measures of conflict from different sources. For most of the measures, the pre-treatment coefficients are jointly and individually significant. For those with significant joint tests, these are driven by a single significant year (expected due to the number of coefficients estimated), no trend is apparent, and the sup-t confidence bands cover the zero.

Figure E2: Dynamic Estimation, Extensive Margin, Events in Over 60% of Years, Victims' Unit Measures

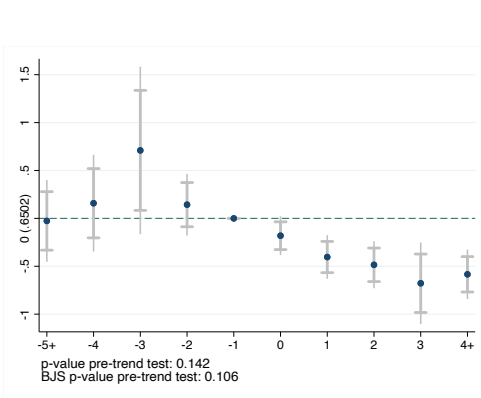


(a) Terrorist Acts/Armed Fights **(b)** Threats **(c)** Sex Crimes

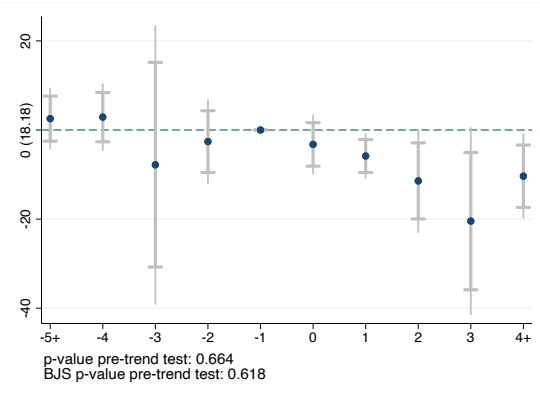
(d) Forced Disappearences **(e)** Torture **(f)** Child Recruitment

Notes: Event study plots from estimating Equation (2) for different violence measures from the Victims' Unit, including including 95% confidence intervals (based on standard errors clustered at the municipality level).

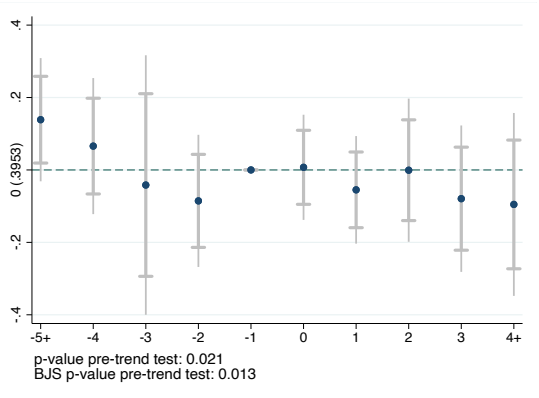
Figure E3: Dynamic Estimation, Extensive Margin, Events in Over 60% of Years, Different Sources



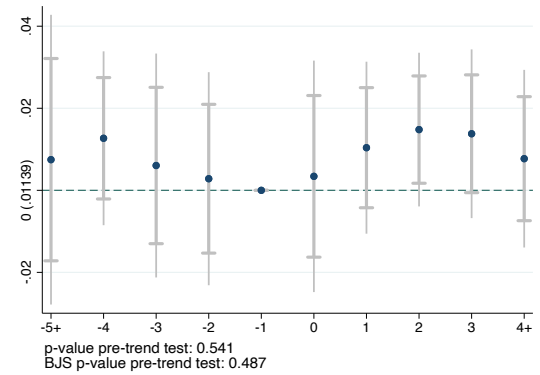
(a) Property Losses (Victims' Unit)



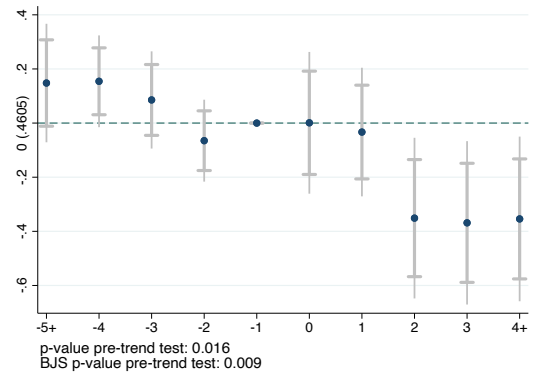
(b) Forced Migration (Victims' Unit)



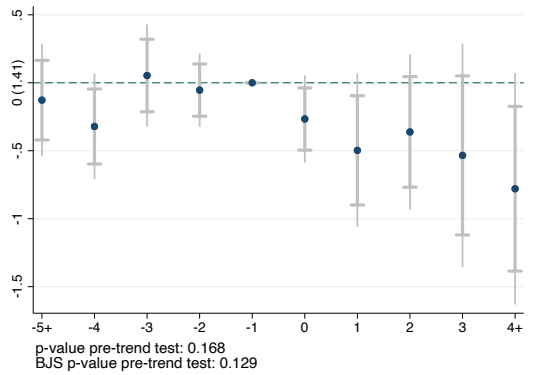
(c) Homicides (Ministry of Defense)



(d) Kidnappings (Ministry of Defense)



(e) Mines (DAIMA)

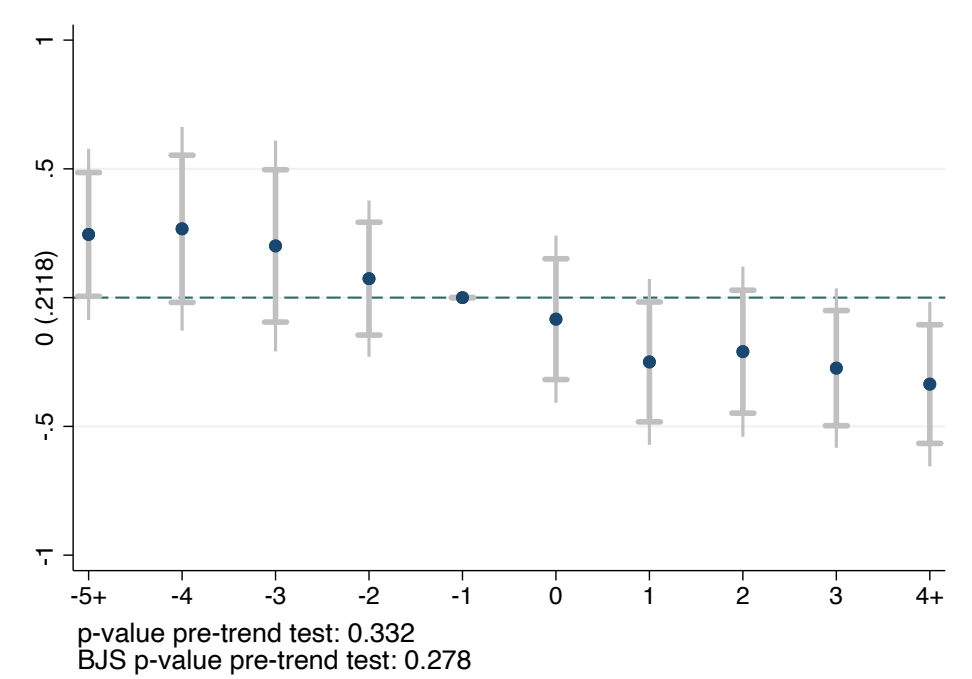


(f) Theft (Ministry of Defense)

Notes: Event study plots from estimating Equation (2) for different violence measures from several sources, including including 95% confidence intervals (based on standard errors clustered at the municipality level).

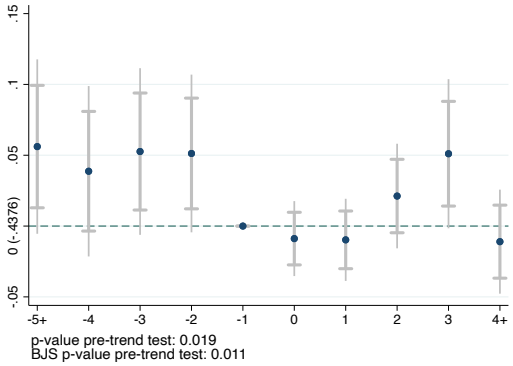
E.3 Alternative Measures of Insurgent Groups' Presence

Figure E4: Violence in FARC Municipalities vs. ELN Municipalities – Intensive Margin, Top 20% Most Violent

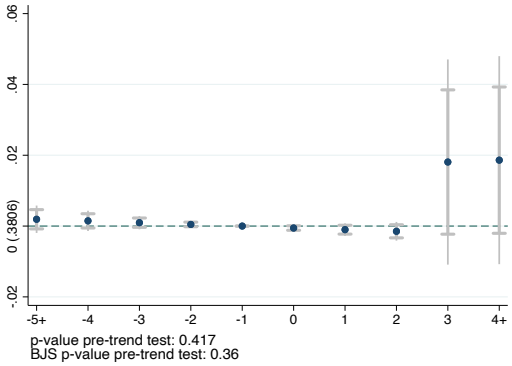


Notes: Event study plots from estimating Equation (2), including including 95% confidence intervals (based on standard errors clustered at the municipality level). The index is created following Anderson (2008) and is based on the violence measures in Table 2.

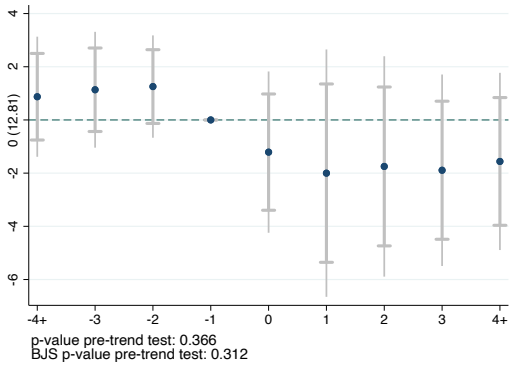
Figure E5: Economic Activity in FARC vs. ELN Municipalities – Intensive Margin, Top 20% Most Violent



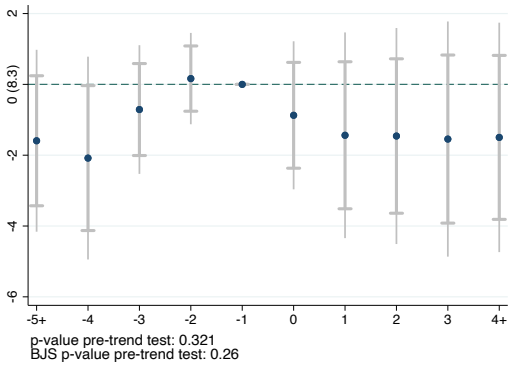
(a) Nighttime Light Weighted



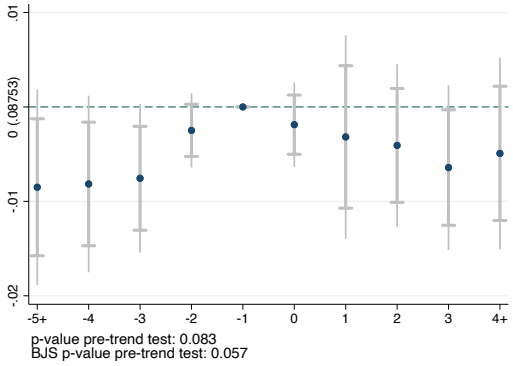
(b) Share Urban Population



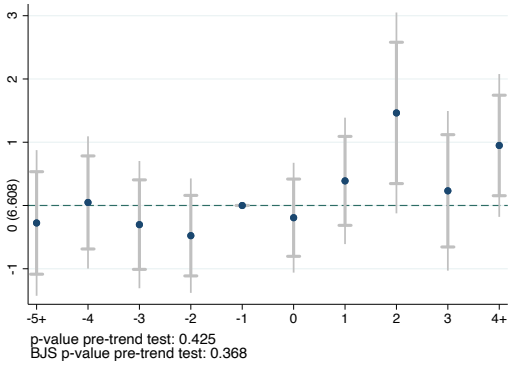
(c) GDP per Capita (DANE)



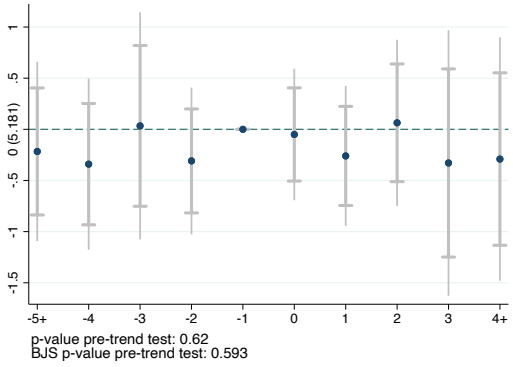
(d) GDP per Capita (S&E12)



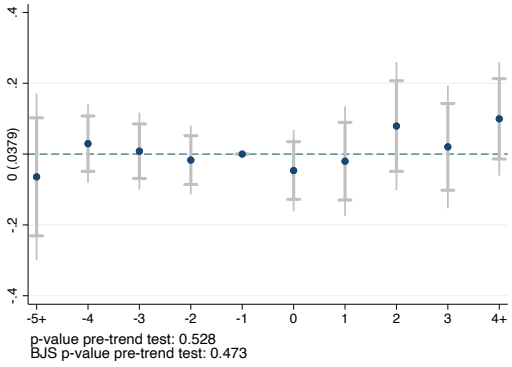
(e) Formal Employment



(f) Firm Entry



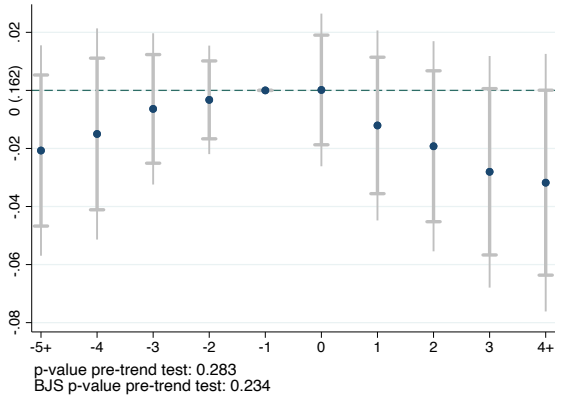
(g) Agricultural Productivity



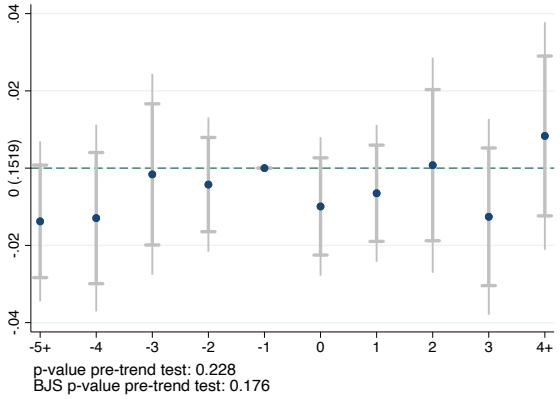
(h) Anderson Index

Notes: Event study plots from estimating Equation (2), including including 95% confidence intervals (based on standard errors clustered at the municipality level). The index is created following Anderson (2008) and is based on weighted nighttime light intensity, GDP per capita (from DANE), share of urban population, agricultural productivity, firm creation and formal employment.

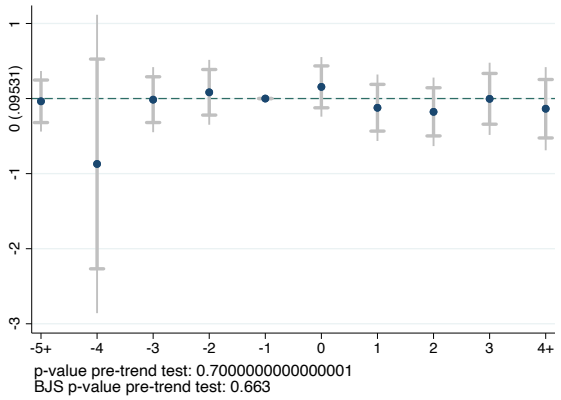
Figure E6: State Capacity Outcomes in FARC vs. ELN Municipalities – Intensive Margin, Top 20% Most Violent



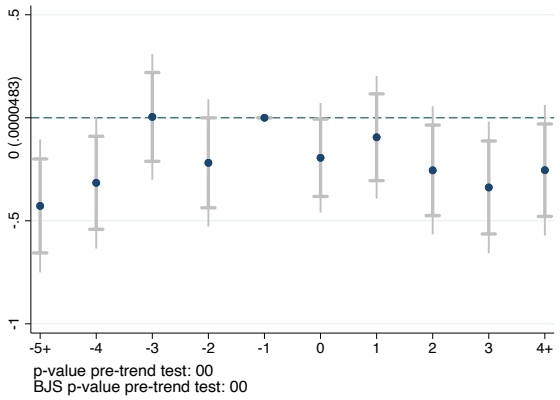
(a) Tax Revenue per Capita



(b) Government Transfers per Capita



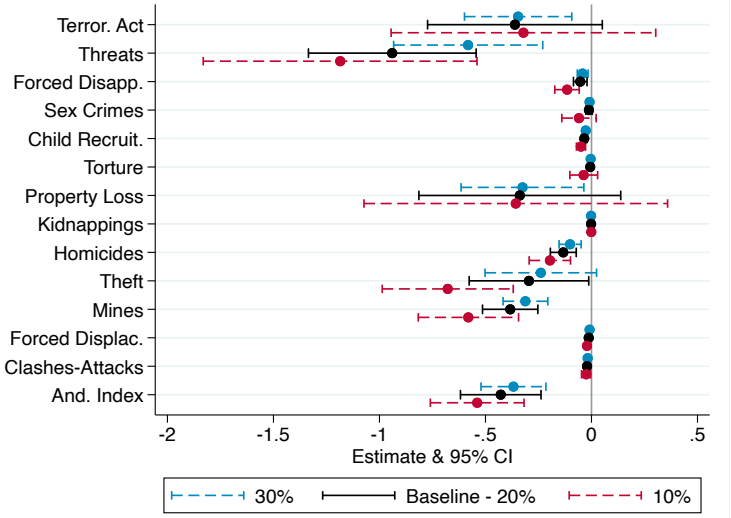
(c) Anderson Financial Perf. Index



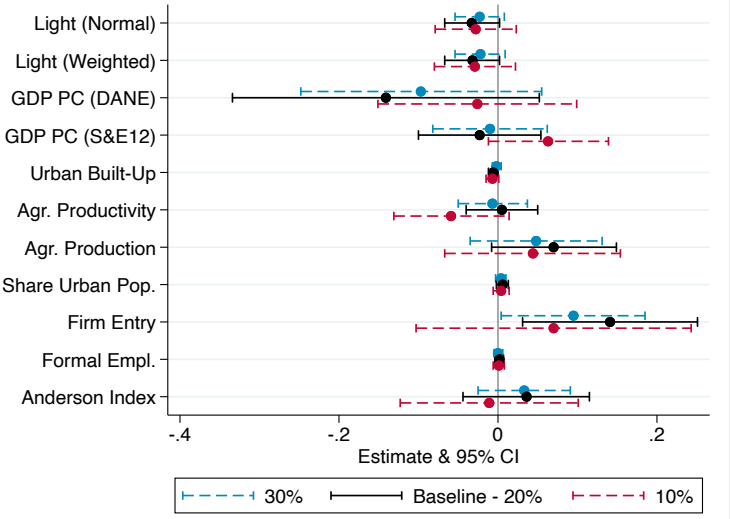
(d) Anderson Inst. Quality Index

Notes: Event study plots from estimating Equation (2) for the different state capacity measures, including including 95% confidence intervals (based on standard errors clustered at the municipality level). The financial performance index uses financial measures of local institutions (e.g. tax revenue, government transfers, expenditures, etc), while the institutional quality index uses measures of the overall performance of local institutions. Both are created following Anderson (2008).

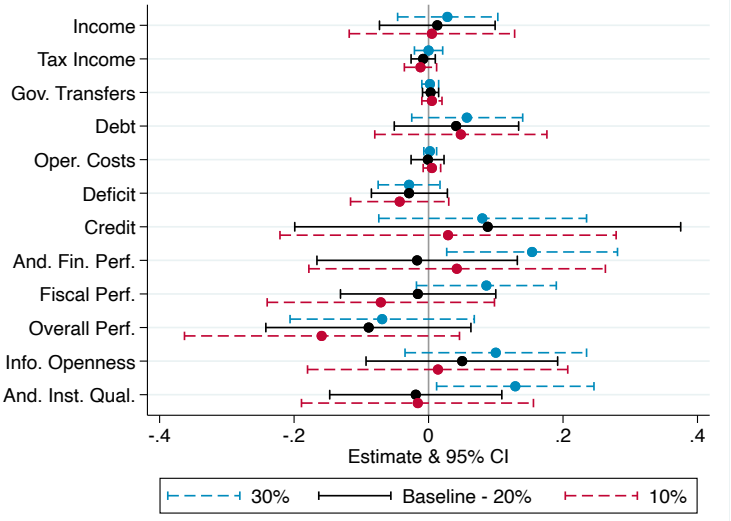
Figure E7: Robustness to Alt. Thresholds of Presence Measures – Intensive Margin



(a) Violence Measures



(b) Economic Indicators



(c) State Capacity Measures

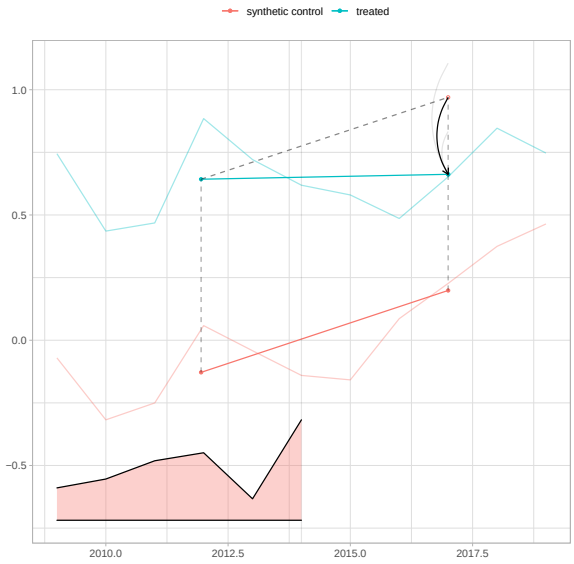
Notes: In Panel A, all variables are in 1000s of inhabitants, except for the migration ones (forced displaced and forced migration) which are measured in per capita terms. In Panel B, the measures of GDP per capita have been standardized for comparability.

E.4 Synthetic Difference-in-Difference Results

Figure E8: Synthetic Difference-in-Difference – Violence Indices

Extensive Margin, Events in Over 60% of Years

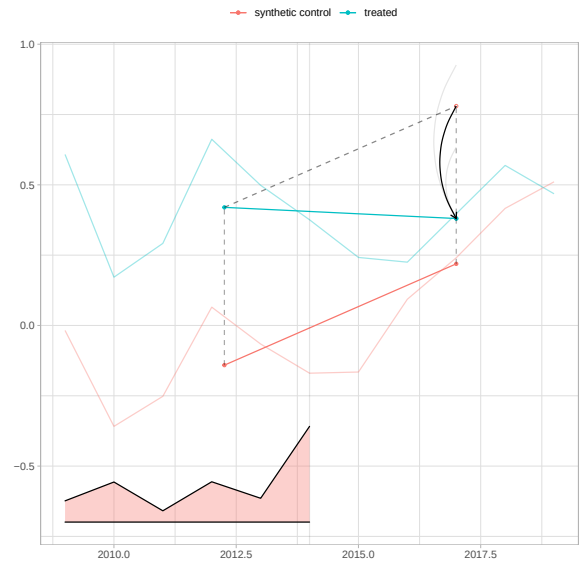
(a) Extensive Margin – KLK Index



(b) Extensive Margin – Anderson Index

Intensive Margin, Top 20% Most Violent

(c) KLK Index

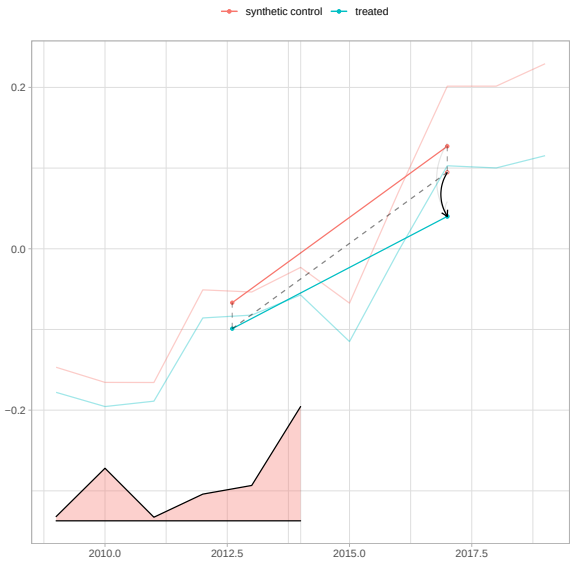


(d) Anderson Index

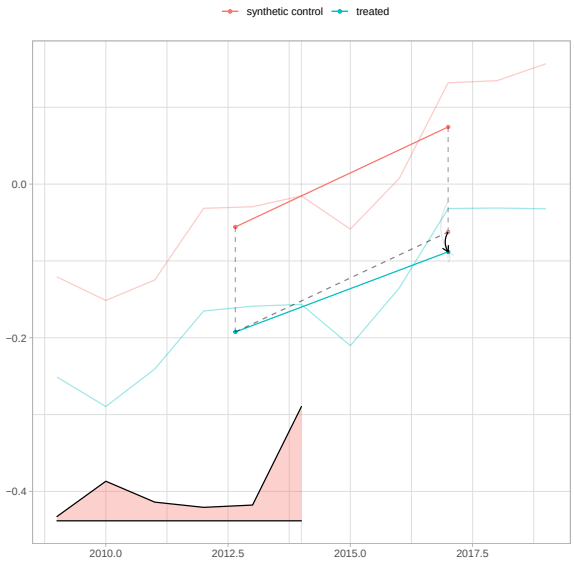
Notes: Event study plots from the synthetic difference-in-difference estimator developed by Arkhangelsky et al. (2021). KLK is a summary index created following Kling, Liebman, and Katz (2007), while Anderson is a summary index created following Anderson (2008). The index is based on the violence measures in Table 2.

Figure E9: Synthetic Difference-in-Difference – Economic Indicators

Extensive Margin, Events in Over 60% of Years

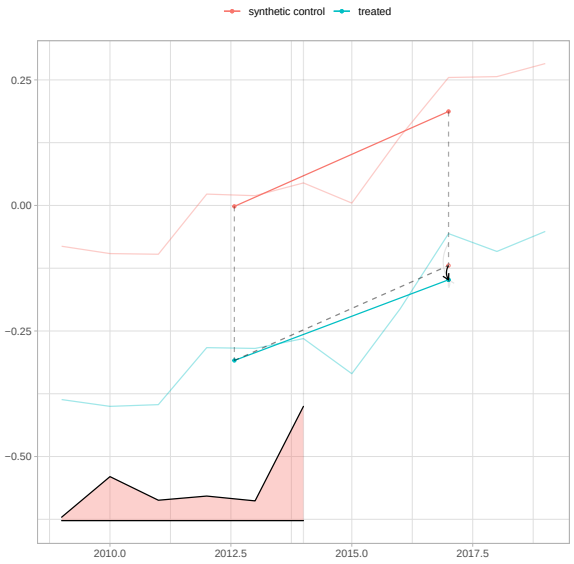


(a) Extensive Margin – KLK Index

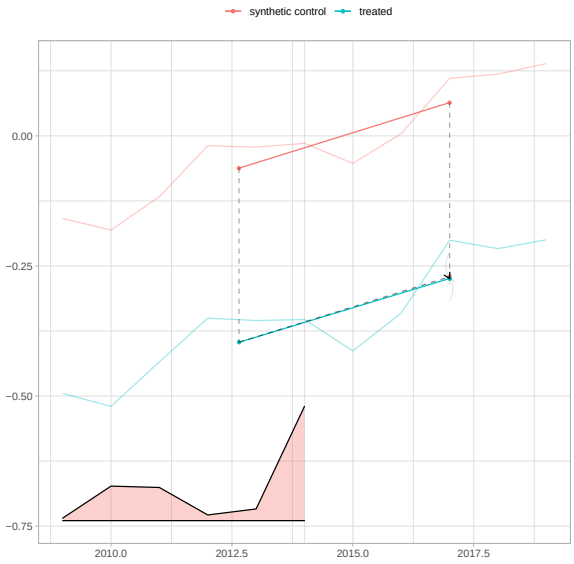


(b) Extensive Margin – Anderson Index

Intensive Margin, Top 20% Most Violent



(c) Intensive Margin – KLK Index



(d) Intensive Margin – Anderson Index

Notes: Event study plots from the synthetic difference-in-difference estimator developed by Arkhangelsky et al. (2021). KLK is a summary index created following Kling, Liebman, and Katz (2007), while Anderson is a summary index created following Anderson (2008). The index is based on weighted nighttime light intensity, GDP per capita (from DANE), share of urban population, agricultural productivity, firm creation and formal employment.

Figure E10: Synthetic Difference-in-Difference – State Capacity Indices

Extensive Margin, Events in Over 60% of Years

(a) KLK Financial Perf. Index **(b)** Anderson Financial Perf.Index **(c)** KLK Inst. Quality Index **(d)** Anderson Inst. Quality Index

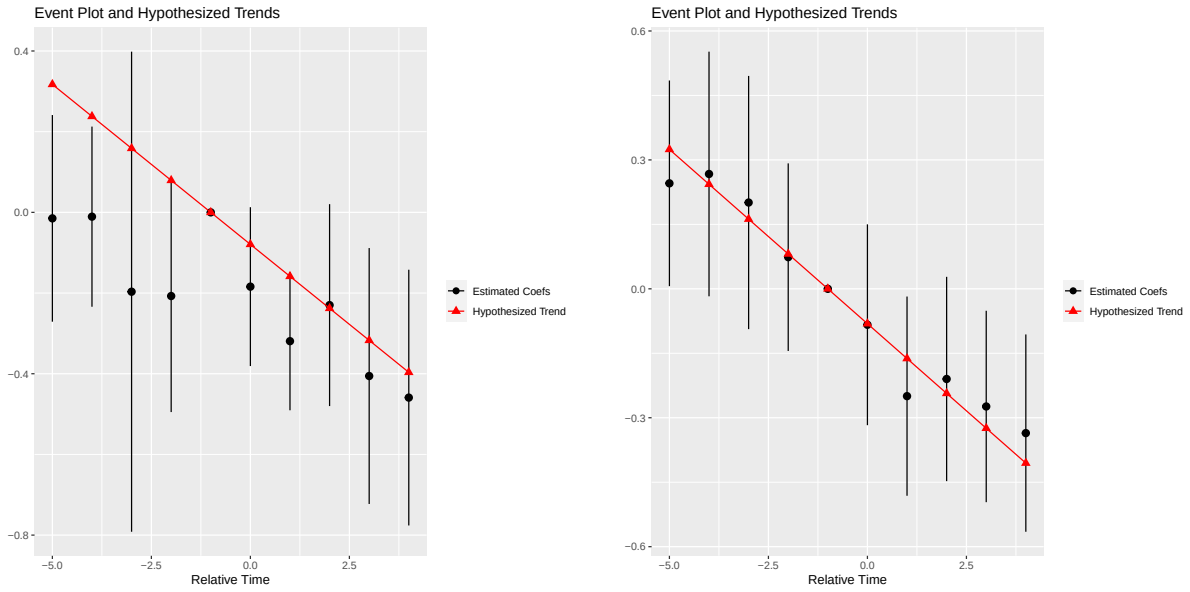
Intensive Margin, Top 20% Most Violent

(e) KLK Financial Perf. Index **(f)** Anderson Financial Perf. Index **(g)** KLK Inst. Quality Index **(h)** Anderson Inst. Quality Index

Notes: Event study plots from the synthetic difference-in-difference estimator developed by Arkhangelsky et al. (2021). KLK is a summary index created following Kling, Liebman, and Katz (2007), while Anderson is a summary index created following Anderson (2008). The financial performance index uses financial measures of local institutions (e.g. tax revenue, government transfers, expenditures, etc), while the administrative quality index uses measures of the overall performance of local institutions.

E.5 Violations of Parallel Trend Assumption

Figure E11: Linear Violation of Parallel Trends Assumption at 80% Power



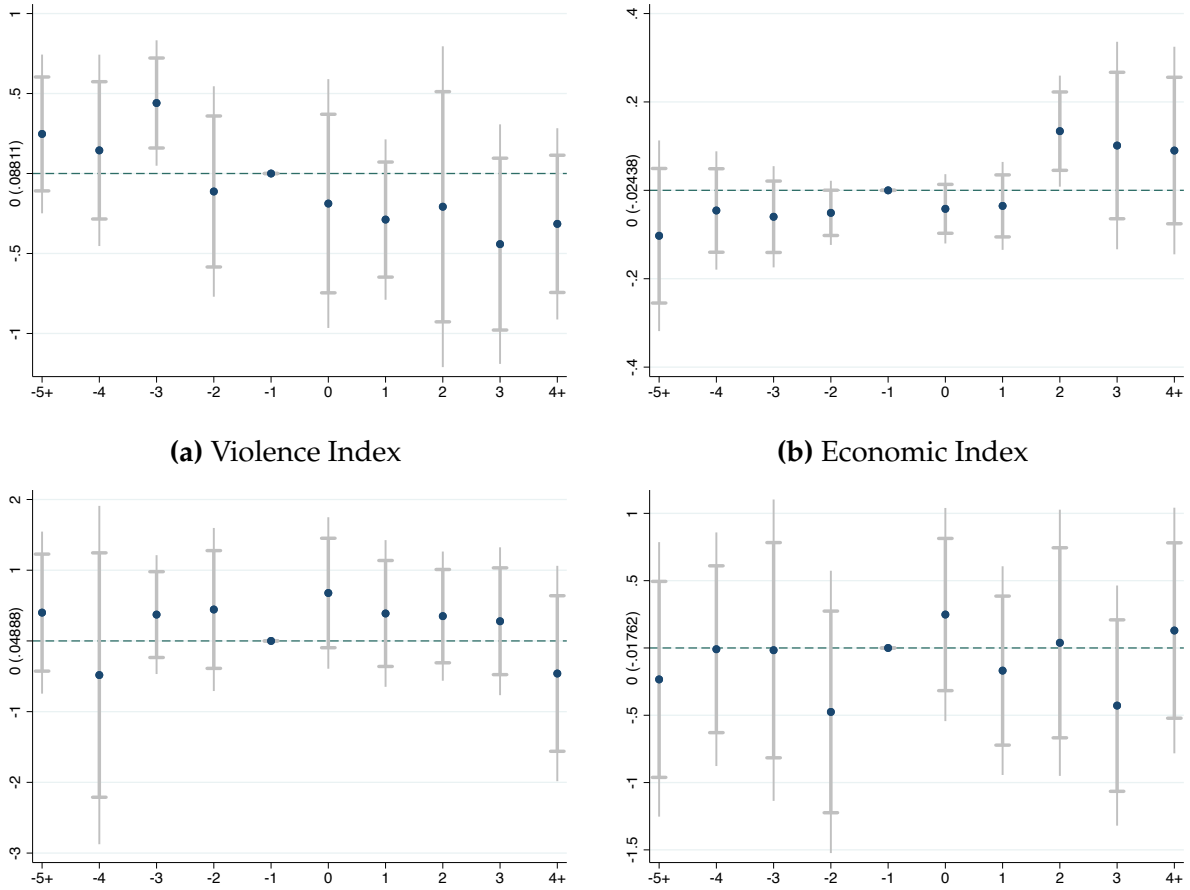
(a) Extensive Margin, Events in Over 60% of Years

(b) Intensive Margin, Top 20% Most Violent

Notes: Event study plots from estimating Equation (2) for the violence (Anderson) index, including including 95% confidence intervals (based on standard errors clustered at the municipality level). The red line is the hypothetical linear violation of the parallel trends assumption that would be detected with 80% power, estimated following Roth (Forthcoming).

E.6 Spatial Spillovers

Figure E12: Event Studies – All Treated Municipalities vs. Control Municipalities Over 60kms From Closest Treated Municipality



(a) Violence Index **(b)** Economic Index

(c) Financial Perf. Index **(d)** Inst. Quality Index

Notes: Event study plots from estimates of Equation (2), including 95% confidence intervals (based on standard errors clustered at the municipality level). All figures use indices created following Anderson (2008). Panel A uses the index based on the different violence variables. Panel B uses the index based on weighted nighttime light intensity, GDP per capita (from DANE), share of urban population and agricultural productivity measures. Panel C uses the index based on financial measures of local institutions, while Panel D is based on measures of the overall performance of local institutions. The treatment group is composed of all treated (FARC) municipalities, and the control group is composed of the control (ELN) municipalities located over 60kms away from the closest treated municipality.

F Additional Tables

F.1 Location of Demobilized FARC/ELN Members

Table F1: Demobilizations by Criminal Organization Over Time – Extensive Margin, Events in Over 60% of Years

	Demobilizations FARC Members				Demobilizations ELN Members			
Year	Rest Country (1)	Treatment (2)	Control (3)	Treat-Control (4)	Rest Country (5)	Treatment (6)	Control (7)	Treat-Control (8)
2005	0.12	0.3	0.03		0.02	0.04	0.05	
2006	0.18	0.61	0.22		0.04	0.06	0.15	
2007	0.2	0.73	0.13		0.06	0.06	0.12	
2008	0.26	1.12	0.12		0.02	0.04	0.13	
2009	0.24	0.95	0.28		0.04	0.06	0.04	
2010	0.23	0.87	0.24		0.04	0.06	0.07	
2011	0.16	0.56	0.05		0.02	0.04	0.04	
2012	0.09	0.41	0.24		0.01	0.01	0.03	
2013	0.11	0.5	0.1		0.02	0.05	0.07	
2014	0.12	0.56	0.13		0.03	0.03	0.07	
2015	0.09	0.45	0.08		0.03	0.05	0.07	
2016	0.05	0.4	0.05		0.04	0.04	0.2	
2017	0.07	0.45	0		0.05	0.07	0.25	
2018	0.01	0.08	0		0.05	0.05	0.21	
2019	0	0.01	0		0.03	0.04	0.06	
Pre-Cease	0.17	0.66	0.15	0	0.03	0.05	0.08	0.017
Post-Cease	0.05	0.28	0.03	0	0.04	0.05	0.16	0.011

Demobilization numbers from President's Office. All measures per 10.000 inhabitants. Columns 4 and 8 show p-values between the treatment and control means.

F.2 Activity by Criminal Group

Table F2: DiD Analysis – Violence Spillovers: Extensive Margin, Events in Over 60% of Years

	Gov. (1)	FARC (2)	ELN (3)	Crim. Bands (4)	FARC Diss. (5)	Paramilitaries (6)	Other (7)	Total (8)
Ceasefire × FARC	–0.154	–0.162***	0.003	0.003	0.031**	0.029	–0.147***	–0.397*
	(0.099)	(0.036)	(0.034)	(0.032)	(0.013)	(0.079)	(0.047)	(0.212)
Mean Sample (Pre)	0.551	0.263	0.036	0.114	0.000	0.230	0.124	1.319
Mean Sample (Post)	0.373	0.113	0.109	0.114	0.043	0.264	0.088	1.104
Observations	2,827	2,827	2,827	2,827	2,827	2,827	2,827	2,827
R Squared	0.361	0.373	0.251	0.209	0.178	0.284	0.264	0.411

Notes: Standard errors clustered at the municipality level. Includes municipality and year fixed effects. Considers only years from 2009 and before 2020. Defines the post period as 2015. Mean Sample (Pre/Post): Mean of the dependent variable in the pre/post-intervention period for municipalities in the sample (FARC and ELN). In each column, the dependent variable is the number of human right violations committed by a given criminal organization per 10.000 inhabitants. Data from Osorio et al. (2019). The total in the last column is the sum across all columns.

F.3 Alternative Measures of Insurgent Groups' Presence

Table F3: DiD Violence Analysis: Intensive Margin, Top 20% Most Violent

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A. UARIV	Terror. Act	Threats	Disapp.	Sex Crimes	Child Recruit.	Torture	Prop. Loss
Ceasefire × FARC	–0.361*	–0.940***	–0.053***	–0.012	–0.034***	–0.006**	–0.338
	(0.209)	(0.201)	(0.016)	(0.008)	(0.006)	(0.003)	(0.242)
Treated Munic.	153	153	153	153	153	153	153
Control Munic.	153	153	153	153	153	153	153
Mean Dep. Var.	0.555	2.124	0.087	0.059	0.031	0.012	0.669
Observations	3,366	3,366	3,366	3,366	3,366	3,366	3,366
R Squared	0.273	0.549	0.277	0.547	0.453	0.196	0.362
Panel B. Other	Kidnap.	Homicides	Theft	Mines	Forced Mig.	Clash/Att.	**And. Index**
Ceasefire × FARC	–0.002	–0.133***	–0.295**	–0.383***	–12.996***	–0.021***	–0.428***
	(0.003)	(0.031)	(0.143)	(0.066)	(2.221)	(0.006)	(0.096)
Treated Munic.	153	153	153	153	153	153	153
Control Munic.	153	153	153	153	153	153	153
Mean Dep. Var.	0.013	0.376	0.817	0.370	17.196	0.031	0.134
Observations	3,366	3,366	3,366	3,366	3,366	3,060	3,366
R Squared	0.156	0.537	0.722	0.625	0.482	0.329	0.497

Notes: Results from estimating Equation (1). Standard errors clustered at the municipality level. Includes municipality and year fixed effects. Considers only years from 2009 and before 2020. Mean Dep. Var.: Mean of the dependent variable in the pre-intervention period for municipalities in the sample (FARC and ELN). Defines the post period as 2015. All variables are measures in 1000's of inhabitants. Prop. Loss: Property Loss. Clash/Att.: Number of clashes and attacks between government and paramilitary and guerrilla groups. Panel B shows variables from other data sources, with the first three columns coming from the Ministry of Defense, the fourth from the agency against anti-personnel mines (DAIMA), the fifth from the Victims' Unit, and the sixth from Juan Vargas. And. Index is a summary measure created following Anderson (2008) that summarizes all the different outcomes variables. It is the weighted average of the standardized outcomes, weighted by their inverted covariance matrix.

Table F4: DiD Economic Outcomes: Intensive Margin, Top 20% Most Violent

	Nighttime Light	GDP Per Capita		Urban	Agricultural		Share Urban	Firm	Formal	**Anderson**
		DANE	S&E (2012)	Built Up	Productivity	Production	Population	Entry	Empl.	**Index**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Ceasefire × FARC	–0.032*	–2.498	–0.310	–0.006*	0.062	0.243*	0.006	0.695**	0.002	0.036
	(0.017)	(1.739)	(0.529)	(0.003)	(0.285)	(0.138)	(0.004)	(0.276)	(0.003)	(0.040)
Treated Munic.	153	153	153	153	153	153	153	153	153	153
Control Munic.	153	153	153	153	153	153	153	153	153	153
Mean Dep. Var.	–0.365	11.673	6.416	0.024	4.736	1.480	0.395	5.431	0.082	–0.071
Observations	3,366	2,754	3,362	3,365	3,365	3,366	3,366	3,366	3,366	3,366
R Squared	0.917	0.859	0.859	0.314	0.904	0.883	0.974	0.696	0.956	0.871

Notes: Results from estimating Equation (1). Standard errors clustered at the municipality level. Includes municipality and year fixed effects. Considers only years from 2009 and before 2020. Mean Dep. Var.: Mean of the dependent variable in the pre-intervention period for municipalities in the sample (FARC and ELN). Defines the post period as 2015. Nighttime light intensity defined so that grid cells in the border of multiple municipalities are assigned in proportion to the share of the grid cell in each municipality (weighted). GDP per capita comes from two sources: From DANE (National Department of Statistics) or based on calculations following Sanchez & Espana (2012), both in millions of COP. Agricultural productivity is defined as total tonnes produced of 271 agricultural crops divided by total area cultivated in hectares. Agricultural production is defined as total tonnes produced of 271 agricultural crops per capita. Urban built up is estimated using the Band Ratio for Built-Up Area (BRBA) index developed by Waqar et al. (2012), and measures the average amount of pixels within a municipality that are classified as urban built up based on the BRBA index. Firm entry comes from RUES and is measured per 1000 inhabitants. Formal employment is measured as the average number of individuals paying contributions to healthcare, pension funds and workers' compensations across the year in the municipality per 18-60 years old, from PILA. Anderson Index is a summary measure created following Anderson (2008) that summarizes the weighted nighttime light intensity, GDP per capita (from DANE), share of urban population, agricultural productivity, formal employment and firm entry measures. It is the weighted average of the standardized outcomes, weighted by their inverted covariance matrix.

Table F5: Baseline State Capacity Summary Statistics: Intensive Margin, Top 20% Most Violent

	Mean			p-value of Difference		
Variable	Rest Country (1)	FARC (2)	ELN (3)	Rest-FARC (4)	Rest-ELN (5)	FARC-ELN (6)
1. Total Revenue	747.47	821.5	750.59	0.05	0.93	0.15
2. Tax Revenue	104.33	72.18	72.95	0	0	0.92
3. Gov. Transfers	77.02	94.16	78.43	0.04	0.86	0.04
4. Total Expenditures	788.78	891.34	790.46	0.01	0.96	0.05
5. Operational Exp.	111.66	118.83	98.80	0.28	0.05	0
6. Total Deficit	–41.31	–69.84	–39.86	0.10	0.93	0.09
7. Credit	7.44	4.21	1.75	0.44	0.17	0.58
8. Savings Capacity	0.07	–0.25	–0.07	0	0.06	0.09
9. Fiscal Perf.	0.07	–0.21	–0.11	0	0.02	0.30
10. Overall Perf.	0	–0.05	0	0.54	0.96	0.55
11. Aqueduct Cov.	60.54	53.36	59.95	0.01	0.84	0.10
12. Garbage Collec.	45.52	42.99	46.43	0.39	0.76	0.36
13. Sewage Cov.	41.63	38.02	42.99	0.22	0.65	0.18
14. Info. Openness	0.03	–0.23	–0.01	0	0.45	0.05

Notes: All the variables are measured in 2008 (the last period before the panel used in the main analysis) but for the last variable that is only available from 2010. The financial measures are in per capita terms (in thousand COP), and the performance measures are standardised (by year).

Table F6: DiD State Capacity Analysis: Intensive Margin, Top 20% Most Violent

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A. Financial	Revenue	Tax Revenue	Gov. Transfers	Debt	Oper. Costs	Deficit	And. Fin. Perf.
Ceasefire × FARC	0.013	–0.008	0.003	0.041	–0.001	–0.029	0.085
	(0.044)	(0.009)	(0.006)	(0.047)	(0.012)	(0.029)	(0.138)
Treated Municip.	153	153	153	153	153	153	153
Control Municip.	153	153	153	153	153	153	153
Mean Dependent Var.	1.059	0.106	0.110	1.089	0.138	–0.030	–0.259
Observations	3,362	3,362	3,362	3,362	3,362	3,362	3,362
R Squared	0.720	0.817	0.828	0.707	0.278	0.136	0.177
Panel B. Inst. Quality	Savings Cap.	Fiscal Perf.	Overall Perf.	Info. Openness	And. Inst. Qual.		
Ceasefire × FARC	–0.017	–0.016	–0.089	0.050	–0.019		
	(0.076)	(0.059)	(0.078)	(0.072)	(0.066)		
Treated Municip.	153	153	153	153	153		
Control Municip.	153	153	153	153	153		
Mean Dependent Var.	–0.139	–0.187	–0.061	–0.069	–0.029		
Observations	3,358	3,358	3,366	3,055	3,366		
R Squared	0.497	0.547	0.412	0.404	0.560		

Notes: Results from estimating Equation (1). Standard errors clustered at the municipality level. Includes municipality and year fixed effects. Considers only years from 2009 and before 2020. Mean Dep. Var.: Mean of the dependent variable in the pre-intervention period for municipalities in the sample (FARC and ELN). Defines the post period as 2015. All the financial measures are in million COP per capita terms, and all performance measures are standardised. Transfers are transfers from the central government. Oper. Costs are the municipality's operational costs. Investment measures the share of a municipality's income that is spent on investment. Fiscal Perf. is an index created by the Department of Planning and measures how well the municipality spent its resources. Overall Perf. is also created by the Department of Planning and measures overall performance. Info. Openness is created by the Attorney General and measures how well municipalities report information and implement basic management rules. And. Index is a summary measure created following Anderson (2008) that summarizes all the different outcomes variables. It is the weighted average of the standardized outcomes, weighted by their inverted covariance matrix.

F.4 Synthetic Difference-in-Difference

Table F7: Synthetic DiD Analysis: Extensive Margin, Events in Over 60% of Years

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A. Violence	KLK Index	Anderson Index							
Ceasefire × FARC	–0.5143***	–0.3072***							
	(0.0904)	(0.0695)							
Treated Municipalities	216	216							
Potential Controls	727	727							
Control Municipalities	572	633							
Panel B. Economic	Light Int.	GDP pc (DANE)	Built Up	Agr. Productivity	Share Urban	Firm Entry	Formal Empl.	KLK Index	Anderson Index
Ceasefire × FARC	–0.0071	–1.0999	–0.0020	0.1048	0.0002	–0.2330	–0.0111***	–0.0546***	–0.0258
	(0.0084)	(1.0281)	(0.0014)	(0.1853)	(0.0021)	(0.1818)	(0.0018)	(0.0185)	(0.0202)
Treated Municipalities	216	216	216	216	216	216	216	216	216
Potential Controls	711	711	711	711	711	711	711	727	727
Control Municipalities	610	633	576	632	638	629	625	631	624
Panel C. State Capacity	Revenue	Tax Revenue	Gov. Transfers	Fiscal Perf.	Overall Perf.	KLK Fin. Perf.	KLK Inst. Qual.	And. Fin. Perf.	And. Inst. Qual.
Ceasefire × FARC	–0.1511***	–0.0325***	–0.0143***	–0.0832**	–0.0679	–0.0393	–0.0347	–0.0527	–0.0403
	(0.0423)	(0.0074)	(0.0050)	(0.0380)	(0.0526)	(0.0377)	(0.0877)	(0.0379)	(0.1002)
Treated Municipalities	208	208	208	208	208	216	216	216	216
Potential Controls	707	707	707	707	707	727	727	727	727
Control Municipalities	623	618	590	604	594	582	540	584	504

Notes: Estimated using Arkhangelsky et al. (2021) Synthetic Difference-in-Difference command, synthdid. Standard errors calculated using Jackknife. Considers only years from 2009 and before 2020. Defines the post period as 2015. KLK Index is a measure created following Kling, Liebman & Katz (2007) that summarizes all the different outcomes variables. It is the (standardised) average of the z-scores of all dependent variables. Anderson index is based on Anderson (2008), and follows a similar procedure but attaching less weight to highly correlated variables (which bring relatively less new information to the index).

Table F8: Synthetic DiD Analysis: Intensive Margin, Top 20% Most Violent

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A. Violence	KLK Index	Anderson Index							
Ceasefire × FARC	–0.5963***	–0.3998***							
	(0.0813)	(0.0744)							
Treated Municipalities	153	153							
Potential Controls	774	774							
Control Municipalities	604	665							
Panel B. Economic	Light Int.	GDP pc (DANE)	Built Up	Agr. Productivity	Share Urban	Firm Entry	Formal Empl.	KLK Index	Anderson Index
Ceasefire × FARC	–0.0056	–1.7944	–0.0004	–0.0825	0.0067**	0.3894*	–0.0078***	–0.0283	–0.0033
	(0.0093)	(1.3941)	(0.0011)	(0.1617)	(0.0028)	(0.2013)	(0.0022)	(0.0227)	(0.0236)
Treated Municipalities	151	151	151	151	151	151	151	153	153
Potential Controls	759	759	759	759	759	759	759	774	774
Control Municipalities	639	671	625	675	673	669	665	672	655
Panel C. State Capacity	Revenue	Tax Revenue	Gov. Transfers	Fiscal Perf.	Overall Perf.	KLK Fin. Perf.	KLK Inst. Qual.	And. Fin. Perf.	And. Inst. Qual.
Ceasefire × FARC	–0.1104*	–0.0312***	–0.0139	–0.0238	–0.2529***	–0.1153***	0.0624	–0.1088***	0.0814
	(0.0573)	(0.0098)	(0.0146)	(0.0440)	(0.0582)	(0.0406)	(0.1082)	(0.0412)	(0.1514)
Treated Municipalities	146	146	146	146	146	153	153	153	153
Potential Controls	755	755	755	755	755	774	774	774	774
Control Municipalities	618	667	666	647	631	588	556	591	472

Notes: Estimated using Arkhangelsky et al. (2021) Synthetic Difference-in-Difference command, synthdid. Standard errors calculated using Jackknife. Considers only years from 2009 and before 2020. Defines the post period as 2015. KLK Index is a measure created following Kling, Liebman & Katz (2007) that summarizes all the different outcomes variables. It is the (standardised) average of the z-scores of all dependent variables. Anderson index is based on Anderson (2008), and follows a similar procedure but attaching less weight to highly correlated variables (which bring relatively less new information to the index).

F.5 Violations of Parallel Trend Assumption

Table F9: Slope and Bias of Pre-Trends – Roth (2022)

	Panel A. Extensive Margin, 60%				Panel B. Intensive Margin, 20%			
	Slope	Uncond. Bias	Cond. Bias	Mean Post $\hat{\beta}s$	Slope	Uncond. Bias	Cond. Bias	Mean Post $\hat{\beta}s$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Forced Disappearances	0.021	0.064	0.071	–0.011	0.019	0.056	0.068	–0.012
Forced Displacements	1.722	5.165	5.253	–10.258	1.351	4.054	7.047	–7.86
Property Losses	0.103	0.309	0.306	–0.466	0.174	0.523	0.611	–0.272
Homicides	0.04	0.12	0.197	–0.045	0.029	0.086	0.117	–0.094
Mines	0.045	0.134	0.211	–0.221	0.056	0.167	0.235	–0.306
And. Viol. Measures	0.079	0.238	0.268	–0.32	0.081	0.243	0.417	–0.231
Nighttime Light Int.	0.021	0.063	0.072	–0.018	0.015	0.046	0.056	0.009
GDP per Capita (DANE)	0.443	1.328	1.792	–0.831	0.6	1.8	2.062	–1.362
Urban Built-Up	0.002	0.006	0.007	–0.001	0.002	0.007	0.007	0.001
Agr. Productivity	0.289	0.867	0.792	0.001	0.204	0.612	0.648	–0.173
Agr. Production	0.082	0.246	0.245	0.095	0.087	0.262	0.267	0.148
Share Urban Pop.	0.001	0.004	0.008	–0.001	0.001	0.003	0.006	0.007
Firm Entry	0.295	0.884	1.123	0.21	0.267	0.8	0.947	0.568
Formal Employment	0.003	0.009	0.009	–0.003	0.002	0.007	0.007	–0.004
And. Econ. Measures	0.027	0.08	0.083	–0.004	0.033	0.098	0.102	0.027
Tax Revenue	0.007	0.021	0.023	–0.019	0.009	0.027	0.031	–0.018
And. Fin. Performance	0.186	0.558	0.92	0.052	0.097	0.291	0.376	–0.057
And. Instit. Quality	0.12	0.359	0.388	–0.062	0.091	0.274	0.28	–0.244

Estimated following Roth (2022). Considers only years from 2009 and before 2020. Defines the post period as 2015. Mean Post $\hat{\beta}s$ is the mean of all the post-treatment coefficients. Anderson Index is a summary measure created following Anderson (2008) that summarizes all the different outcomes variables. It is the weighted average of the standardized outcomes, weighted by their inverted covariance matrix. Nighttime light intensity defined so that grid cells in the border of multiple municipalities are assigned in proportion to the share of the grid cell in each municipality (weighted). GDP per capita comes from two sources: From DANE (National Department of Statistics) or based on calculations following Sanchez & Espana (2012), both in millions of COP. Agricultural productivity is defined as total tonnes produced of 271 agricultural crops divided by total area cultivated in hectares. Agricultural production is defined as total tonnes produced of 271 agricultural crops per capita. Urban built up is estimated using the Band Ratio for Built-Up Area (BRBA) index developed by Waqar et al. (2012), and measures the average amount of pixels within a municipality that are classified as urban built up based on the BRBA index. Firm entry comes from RUES and is measured per 1000 inhabitants. Formal employment is measured as the average number of individuals paying contributions to healthcare, pension funds and workers' compensations across the year in the municipality per 18-60 years old, from PILA. And. Fin. Measures and And. Perf. Measures are created using the financial and performance measures of state capacity, as in the main analysis.