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Peace by Piece:

The Effect of the 2012 FARC Negotiations on Homicide in Colombia

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The Colombian conflict is one of the longest-running and most complex civil wars in modern times, characterized by the presence of many different armed actors. Although the conflict is still active, progress has been made in the past decades. This thesis examines how the onset of the 2012 peace negotiations between the Colombian government and the FARC guerrilla affected homicide rates across Colombian municipalities. Using a two-way fixed effects difference-in-differences design, it compares historically FARC-exposed municipalities to historically ELN-exposed municipalities before and after the start of negotiations. Guerrilla exposure is classified using conflict events from 1996 to 2005. The results show a statistically significant decline in homicide rates in historically FARC-exposed municipalities, and this finding remains robust across several different checks. The results also show important heterogeneity: the decline in homicide rates is strongest in municipalities with baseline coca cultivation, especially in high-coca municipalities. The effect is also somewhat larger in municipalities with higher baseline fiscal capacity. Overall, the findings suggest that the peace negotiations reduced violence on average, but that the magnitude of this reduction depended on local illicit economies and municipal state capacity.

Keywords: Colombia, FARC, Peace Negotiations, Homicide, Coca Cultivation, State Capacity
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AI Disclosure

For this thesis, AI has been used to generate econometric code for STATA, as well as to help with debugging and correcting syntax. AI has also been used for language purposes, mainly to improve clarity, correct grammar, and help structure the text. Two different generative AI tools have been used for these purposes: ChatGPT and Claude.

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1. Introduction

Over five decades of internal armed conflict have left Colombia with more than 10 million victims in total. With 9 million forced displacements, over 1 million murdered, and 200,000 forced disappearances (Unidad para las Victimas, 2025), the Colombian conflict is one of the longest-running and most devastating civil conflicts in Latin American history. This conflict has been characterized by a complex web of different armed actors, including guerrilla groups, right-wing paramilitary organizations, and drug cartels. Although the conflict is still active, a new phase began in the 2010s when the Colombian government and the Revolutionary Armed Forces of Colombia (FARC) moved toward negotiated peace. This process progressed gradually, starting with renewed peace talks and formal negotiations in 2012, followed by a unilateral ceasefire in 2014 and then finally a peace agreement in 2016.

This thesis asks whether the onset of the 2012 peace negotiations reduced homicide rates in historically FARC-exposed municipalities, and whether this effect varied across municipalities depending on local conditions. It centers its main analysis on the onset of these negotiations in 2012, using this year as the main treatment timing. This choice reflects recent work showing that the peace process unfolded in stages. Some outcomes, including violence-related ones, may therefore have started to shift already during the negotiations period, before both the 2014 ceasefire and the 2016 peace agreement. To identify these effects, the thesis compares municipalities historically exposed to the FARC with municipalities historically exposed to the ELN, another guerrilla group. This comparison builds on the empirical logic in Fajardo-Steinhäuser (2024), who also uses FARC- and ELN-controlled municipalities as treatment and control groups. Because both groups were left-wing guerrilla organizations that operated primarily in rural municipalities in the same period, ELN municipalities provide a plausible comparison group for FARC municipalities. FARC was always the larger of the two, but their structural similarities still make ELN municipalities a credible counterfactual. Crucially for the identification strategy, the ELN did not participate in the peace process.

Municipalities are classified as historically FARC- or ELN-exposed using conflict event data from the UCDP Georeferenced Event Dataset. A municipality is assigned to one of the groups if at least one conflict event associated with the respective organization was recorded during

1996–2005. This period captures the peak of the conflict while ensuring that municipalities are classified based on exposure before the sample period begins, rather than during the period used in the analysis. As a robustness check, the analysis also considers a second sample with a stricter threshold of two events. While the sample classification differs somewhat from Fajardo-Steinhäuser (2024), it follows a minimum-event threshold logic that is also used in other studies of Colombian conflict (Prem et al., 2020; Guerra-Cújar et al., 2024). The analysis focuses on homicide rates per 100,000 inhabitants between the years 2006 and 2025.

The empirical strategy uses a difference-in-differences design, comparing changes in homicide rates in historically FARC-exposed municipalities before and after the start of negotiations in 2012 to corresponding changes in historically ELN-exposed municipalities. The key identifying assumption is that homicide trends in the two groups would have evolved similarly in the absence of the peace negotiations. This assumption is supported by an event-study showing no significant pre-treatment differences, and also by an insignificant placebo test using a fictitious treatment year of 2009. The baseline estimates indicate a statistically significant decline in homicide rates in historically FARC-exposed municipalities after 2012, and these results remain robust over different robustness checks. The analysis further shows that these average effects hide important heterogeneity across municipalities.

While the effects of Colombia's peace process on violence have been studied, less attention has been paid to heterogeneity in those effects. This thesis contributes to the literature on post-conflict violence by showing that the decline in homicide rates after the start of peace negotiations was concentrated in municipalities with certain characteristics. The effects are strongest in municipalities with high baseline coca cultivation. This suggests that the impact of the peace process on violence depended partly on local illicit economies and on the FARC's historical link to coca production. Another heterogeneity finding further indicates that local state capacity may also have shaped the extent to which violence declined. These heterogeneity findings suggest that the local consequences of peacemaking partly depended on pre-existing municipal conditions.

The rest of this paper is structured as follows. Section 2 provides background information and context for the Colombian conflict. Section 3 reviews existing literature on peace, coca cultivation, and state presence. Section 4 describes the data and key variables used in the analysis. Section 5 outlines the empirical strategy, including the heterogeneity specifications and robustness checks. Section 6 presents the results. Section 7 provides a discussion, and Section 8 concludes the thesis.

2. Background

2.1 Armed Conflict and Guerrillas in Colombia

Colombia has a long history of armed conflict and political violence. Much of modern violence has its roots in the mid-20th century, when the two largest parties in the country, the Liberals and the Conservatives, fought each other in a violent period called La Violencia. This conflict raged between 1948 and 1958, and resulted in the death of approximately 200,000 people (Offstein, 2003). The fighting came to a close in 1958, when rules were laid out to prevent the recurrence of the struggles the country had experienced in the past decade. It was decided that the power between the two traditional parties should alternate every four years, under a coalition regime known as Frente Nacional. This regime was in control of Colombia until the 1970s (Bushnell, 1993). Both parties were in agreement that one underlying element of La Violencia was the socioeconomic marginalization of the rural population, and therefore, an agrarian reform program as well as a community action program were released in the first years after La Violencia. The purpose of these reforms was the redistribution of land to the peasants and local development in the countryside. However, the reforms were slow and had limited funding, and in the mid-1960s, several guerrilla groups were formed as an answer to the still present rural-urban inequality in the country (Offstein, 2003).

The largest of the guerrilla movements formed in the aftermath of La Violencia was the Fuerzas Armadas Revolucionarias de Colombia (FARC), a Marxist-Leninist organisation with ties to Colombia's Communist Party. Another, smaller left-wing guerrilla, Ejército de Liberación Nacional (ELN), has roots that can also be traced back to the early years of Frente Nacional. ELN was inspired by the Cuban revolution rather than Soviet politics. While the FARC was found more in the southern part of Colombia, the ELN was active in the north-eastern areas with its initial base in the department of Santander (Offstein, 2003). And while FARC had its roots in the peasants, ELN consisted of students, rural organisers, and religious leaders. In the mid-1980s, both guerrillas opened up new fronts and grew in both numbers and territory, using funds from the growing drug industry in Colombia (Fajardo-Steinhäuser, 2024). During its peak, FARC had

between 16,000 and 20,000 fighters and was present in all regions of Colombia, while ELN had around 4000 to 6000 fighters at its peak (Dube & Vargas, 2013).

The presence of FARC and ELN had major economic, political, and social consequences for Colombian society. They financed their operations mainly with coca cultivation, drug production, kidnapping, and extortion, but were also present in mining and agricultural industries, where they imposed informal production taxes. Both groups relied on these sources of income, but the FARC was more involved in drug production while the ELN derived a greater share of its income from extortion and kidnapping (Offstein, 2003). In territories under guerrilla influence, economic development was hindered, and state authority was undermined. Beyond resource extraction, the guerrillas also shaped local governance. In many communities, they imposed social rules and norms, established parallel justice mechanisms, and assigned tasks to the civilian population, often through coercion (Nino et al., 2023)

2.2 The FARC Peace Process

The most violent period of the Colombian conflict took place in the late 1990s and early 2000s. During this time, several peace agreements were discussed but ultimately failed. In the 2000s, the Colombian government launched a major military campaign against the FARC, leading to the death or capture of many of its central members. This weakened the FARC and helped create the conditions for a renewed peace effort (De Roux & Martínez, 2023). A new phase of the conflict began in 2012, when the government initiated peace negotiations with the FARC. Although exploratory talks had begun earlier, the peace process became public in August 2012 and formal negotiations began in October of the same year (Beittel, 2013). This marked the beginning of a broader peace process that developed in stages over the following years. During this period, the parties reached partial agreements before the final agreement in 2016 (De Roux & Martínez, 2023).

Negotiations continued, and a final peace agreement was signed in June 2016, formally ending over 50 years of armed conflict (De Roux & Martínez, 2023). The agreement required the FARC to exit the drug trafficking industry, disarm, and contribute to peace-building efforts. In return, former FARC members received short-term financial support, and the new FARC political party

was guaranteed seats in Congress for two electoral terms. The government also promised rural development policies, including land redistribution, improved access to credit, and infrastructure investment. 170 municipalities across 16 regions were selected for the Planes de Desarrollo con Enfoque Territorial (PDET), a regional development program. After the agreement, a majority of FARC members demobilized, and the group became a political party that has taken part in all elections since 2018. Some small dissident groups, however, refused to disarm (De Roux & Martínez, 2023).

2.3 Coca Cultivation and Conflict

Coca cultivation and cocaine trafficking have been central to Colombia's conflict economy for decades. The emergence of drug cartels, and later also guerrilla and paramilitary groups, made Colombia one of the world's most violent countries in the 1980s. However, until 1994, Colombia did not grow a significant amount of coca but instead imported coca paste from Peru and Bolivia. This coca paste was then processed and refined in Colombia. But, in 1994, the air-bridge transporting coca paste between Peru and Colombia was disrupted by American and local militaries. This forced Colombia to start domestic cultivation, concentrating the entire cocaine supply chain within Colombia. What had previously been limited to processing and trafficking now also included cultivation. By the year 2000, Colombia had become the world's largest cocaine producer and exporter, controlling nearly 70% of global production (Mejía & Restrepo, 2015).

Coca leaves were grown by farmers in rural, remote areas far from Colombia's larger cities. Farmers sold coca leaves or processed paste to armed groups, including guerrillas and paramilitary organizations, who refined it into cocaine in nearby laboratories and then sold it to international traffickers. Armed groups also taxed farmers directly through a protection fee known as "gramaje," paid in exchange for security services (Mejía & Restrepo, 2015). The FARC was one of the primary armed groups involved in this business. Rather than managing cultivation directly, the FARC acted as a market regulator by controlling transactions between cartels and cultivators. The FARC got the majority of its drug-related revenues from gramaje (Stoelinga, 2024). As a consequence, FARC presence became closely tied to coca suitability (Mejía & Restrepo, 2015).

2.4 State Capacity in Conflict-Affected Areas

The 2016 peace agreement between the Colombian government and the FARC was initially seen as a historic milestone after more than fifty years of conflict. While the ceasefire and disarmament process went smoothly, the second phase of implementation proved to be more difficult. The complexity of the Colombian conflict created multiple challenges. Tackling drug production and coca cultivation, controlling newly emerged armed groups, building state presence, and promoting rural development proved to be a challenge with limited institutional capacity. The Colombian state was not prepared to fill the vacuum in the areas FARC left behind after demobilization. Other armed groups, including ELN, FARC dissidents, and paramilitary successor organizations, quickly moved in to take control over these former FARC territories. In some regions, violence even worsened after demobilization (Piccone, 2019).

These problems that emerged after the agreement reflected a long-term problem of weak state presence in many conflict-affected areas. Fajardo-Steinhäuser (2024) shows that municipalities with historic FARC and ELN presence also score lower on a multitude of different state capacity measures than the rest of the country. State entry has also been lacking after the agreement. The PDET, a rural development program created under the 2016 peace accord, illustrates the limits of post-conflict state entry. This program was created to bring infrastructure, services, and economic opportunity to 170 municipalities affected by conflict. However, implementation has been slow due to political obstacles and delays (Chacón, 2025). By 2021, only 22% of planned funding had been spent (Fajardo-Steinhäuser, 2024). Historically, state presence in conflict-ridden areas in Colombia has been limited by various factors such as corruption, difficulties in reaching rural populations, and the persistent threat from armed groups (Chacón, 2025).

3. Literature Review

3.1 Peace Processes and Violence

Prior research suggests that negotiated peace can reduce violence, but the effects are not always durable. Pettersson et al. (2019) find that 34% of all conflicts between 1989 and 2018 were settled through peace agreements, with 355 agreements signed in total. Licklider (1995) finds that across civil wars after 1945, negotiated settlements were about three times more likely to break down than military victories. One reason for this is that both parties maintained the capacity to resume armed conflict. The *Human Security Report* (2012) further shows that violence can resurface after both ceasefires and peace agreements, although conflicts are often less deadly when violence resumes. Overall, this literature shows that negotiated peace can reduce violence, but the effects are often uncertain and may not last.

Stedman (2008) argues that successful peace implementation depends on more than the signing of an accord. He identifies several conditions for successful implementation and for protecting peace. These include overcoming spoilers who try to disrupt the peace, demobilizing combatants, protecting civilians, and building local capacity for peace. All four conditions proved challenging in the Colombian case, although to varying degrees. Spoilers that threatened the peace remained a problem, as dissident factions, paramilitaries, and criminal organizations moved in to fill the vacuum left by the FARC (Piccone, 2019). Demobilization was mostly successful, though some dissident factions refused to lay down their arms (De Roux & Martínez, 2023). Civilian security proved to be difficult, particularly in remote municipalities (Kroc Institute, 2017; Prem et al., 2022). Building local capacity has also proven difficult (Fajardo-Steinhäuser, 2024; Piccone, 2019), as discussed further in Section 3.3.

Recent work on Colombia suggests that the peace process should not be seen as one single event, but rather as a process with different stages. Perilla et al. (2024) show that conflict-related outcomes may have started to change already during the negotiations phase, before the final agreement was signed. De Roux and Martínez (2023) similarly distinguish between a negotiation phase and a post-agreement phase. They show that even though some indicators responded only after the final agreement, violence declined already during negotiations. Grueso (2022) also

shows that violence declined during the peace talks but rose again in some FARC municipalities after the 2016 agreement. Together, these studies suggest that different outcomes changed at different points in the peace process.

Evidence from Colombia suggests that the peace process did reduce violence, but that these effects did not always last over time or across territories. Fajardo-Steinhäuser (2024) finds large reductions in homicides and other violence measures in FARC municipalities following the 2014 ceasefire. The Kroc Institute (2017) shows that disarmament was achieved in the months immediately following the peace accord. However, the same source also documents some challenges in implementation, especially in maintaining security and longer-term reforms such as rural development. Later work shows that violence increased again in some former FARC territories as other armed groups came to compete for control of illicit economies (Albarracín et al., 2023; Prem et al., 2022). Together, this literature suggests that peacemaking can reduce violence, but that these effects may vary across places and over time.

3.2 Coca Cultivation and Violence

Illegal commodities, such as coca, are often associated with violence. Mejía and Restrepo (2015) argue that since illegal markets are not protected by the state, armed groups can step in and provide contract enforcement and protection instead, which is typically done through violence. This creates a demand for violence to keep the illegal economy running, which has no equivalent in legal markets. Mejía and Restrepo (2015) also show that increases in external demand for Colombian cocaine, so-called “cocaine booms”, led to higher homicide rates specifically in municipalities with high coca suitability. Booms in legal commodities such as cocoa, sugar cane, and palm oil, on the other hand, had no such effect. This suggests it is the illegality of cocaine that drives the relationship between coca and violence, rather than other factors such as weak state presence or resource booms more generally.

Angrist and Kugler (2008) exploit the disruption of the air bridge between Peru and Colombia, as described in section 2.3. They document large increases in violence in rural coca-producing areas, but find no comparable effect in urban municipalities. The increase in violence was also concentrated in departments with a strong pre-existing guerrilla presence. This supports the view that coca cultivation can contribute to conflict by providing financial resources to armed groups,

with the FARC in particular benefiting from taxing the coca industry. Dube and Vargas (2013) find similar results but at the municipality level, although they use civil war incidents rather than mortality. They also show that the relationship between coca and violence is not driven by broader commodity price shocks. Stoelinga (2024) builds on this by showing that coca can affect violence in two opposite ways. On the one hand, higher farm income from coca can reduce violence by pulling labour away from armed groups and into farm work instead. On the other hand, coca can give higher returns to territorial control, which increases competition between armed groups and can therefore raise violence. Guerrilla groups, in particular, move into areas where the gains from territorial control are higher. This suggests that coca does not automatically increase violence, but violence increases when armed groups compete for control over coca-producing areas.

3.3 State Capacity and the Durability of Peace

A state's capacity to raise revenue, provide public goods, and maintain order can have effects on conflict and violence. State capacity could therefore shape whether peace leads to lasting or temporary reductions in violence. Fearon and Laitin (2003) argue that conflict is more likely where the state is weak, poor, and less able to control its territory effectively. Besley and Persson (2010) argue, in a similar manner, that a state with weak fiscal capacity has limited ability to enforce order and provide services. This is especially relevant in post-conflict settings. When an armed group withdraws or demobilizes, the durability of peace depends partly on whether the state can step in and replace the armed group. In places where local institutions are weak, this is less likely to happen. As a result, violence may continue even if the peace is successful, because the state fails to maintain security. In the context of the Colombian conflict, this suggests that reductions in violence could be weaker in municipalities with lower state capacity.

This thesis examines whether there are heterogeneous peace effects by state capacity using the Índice de Desempeño Fiscal (IDF) as a proxy for local state capacity. IDF is an index that measures municipal fiscal performance, including indicators such as revenue generation, spending, and debt management. Although this is not a perfect proxy for state capacity, fiscal capacity is likely to capture more than revenue performance alone. Besley and Persson (2014) argue that different dimensions of state capacity are closely related and tend to reinforce one

another. This implies that municipalities with a low IDF score are often also weaker in other state capacity dimensions, including the ability to provide security and public goods. This makes the IDF score a useful, though imperfect, proxy for local state capacity. In the Colombian case, municipalities with weak fiscal performance are also likely to be less able to sustain state presence in remote areas affected by the conflict. If state capacity matters for the durability of peace, violence reductions should therefore be smaller in municipalities with lower IDF scores.

4. Data

This section describes the data sources, sample period, and main variables used in the analysis. The unit of observation is the municipality-year. The main panel covers the period 2006 to 2025, which provides several years of data both before and after the start of the peace negotiations in 2012.

4.1 Variables

The main outcome variable is the municipal homicide rate, measured as homicides per 100,000 inhabitants per year. Homicide data are drawn from the Policía Nacional de Colombia and accessed via Datos Abiertos Colombia. The data show individual incidents and are hence collapsed to the municipality-year level for analysis. Population data are taken from DANE municipal population data. Additional violence variables were considered at an early stage of the thesis, but inconsistencies in reporting and coverage over time made them less suitable for the analysis.

The treatment definition is based on historical guerrilla presence at the municipal level. This is identified using data from the Uppsala Conflict Data Program's Georeferenced Event Dataset (UCDP GED). Historically FARC-exposed municipalities make up the treatment group, while historically ELN-exposed municipalities serve as the control group. The main treatment timing is the onset of peace negotiations in 2012. The treatment period begins in 2012, so the treatment indicator is constructed by interacting a binary indicator for historical FARC exposure with an indicator for the post-2012 period.

Two variables are used to examine the heterogeneity effects of the peace process on homicide rates: coca cultivation and fiscal capacity. Both are measured using pre-treatment data to reduce endogeneity concerns. Coca cultivation data come from the UNODC Sistema Integrado de Monitoreo de Cultivos Ilícitos (SIMCI), accessed via Datos Abiertos Colombia through the Ministerio de Justicia. The data report annual estimates in hectares at the municipality level. Fiscal capacity is measured using the Índice de Desempeño Fiscal (IDF), also published annually

at the municipality level by the Departamento Nacional de Planeación (DNP). The IDF is used as a proxy for local state capacity.

The analysis also uses the Índice de Necesidades Básicas Insatisfechas (NBI), published by DANE. NBI is a measure of deprivation that captures different dimensions such as housing quality, overcrowding, access to basic services, and school attendance. In this thesis, it is used as a proxy for local socioeconomic development.

4.2 Descriptive Statistics

Table 1 reports descriptive statistics for historically ELN-exposed and historically FARC-exposed municipalities in Sample 1, as defined in Section 5.1. For time-varying variables, values are measured in 2006, which is the first year of the panel. Coca cultivation and fiscal capacity are measured using their baseline definitions as averages over 2003-2005, while NBI is measured in 2005. The table also reports group means and p-values for differences in means across the two groups.

***Table 1**: Descriptive Statistics, Sample 1*

	ELN mean	FARC mean	Difference	p-value
Homicide rate (2006)	39.62	50.96	-11.34	0.145
Population (2006)	33641.33	48883.70	-15242.37	0.330
Coca hectares	62.66	45.49	17.17	0.331
IDF score	55.45	55.76	-0.31	0.740
NBI score	45.98	46.43	-0.45	0.877

Municipality-level baseline table.

Homicide rate and population are measured in 2006. Coca cultivation and IDF are measured as 2003–2005 averages. NBI is measured in 2005. Guerrilla exposure is based on UCDP GED events from 1996–2005.

Number of municipalities: ELN = 60, FARC = 264, Total = 324.

Source: Author's calculations using Policía Nacional de Colombia, DANE, UNODC-SIMCI, DNP, and UCDP GED data.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 1 shows that historically FARC- and ELN-exposed municipalities are mostly similar in the baseline characteristics reported here. Mean homicide rates are somewhat higher in FARC municipalities, while baseline coca cultivation is somewhat higher in ELN municipalities, but neither difference is statistically significant. Differences in population, IDF, and NBI are also small and statistically insignificant. Overall, the table suggests that the two groups are fairly similar in baseline characteristics.

5. Empirical Strategy

This section describes the empirical strategy used to estimate how the onset of peace negotiations in 2012 affected municipal homicide rates in historically FARC-exposed municipalities relative to historically ELN-exposed municipalities. First, the construction of the analysis sample is described. Second, the baseline difference-in-differences design is presented, followed by the event-study specification, the heterogeneity analysis, and the robustness checks.

5.1 Sample Construction

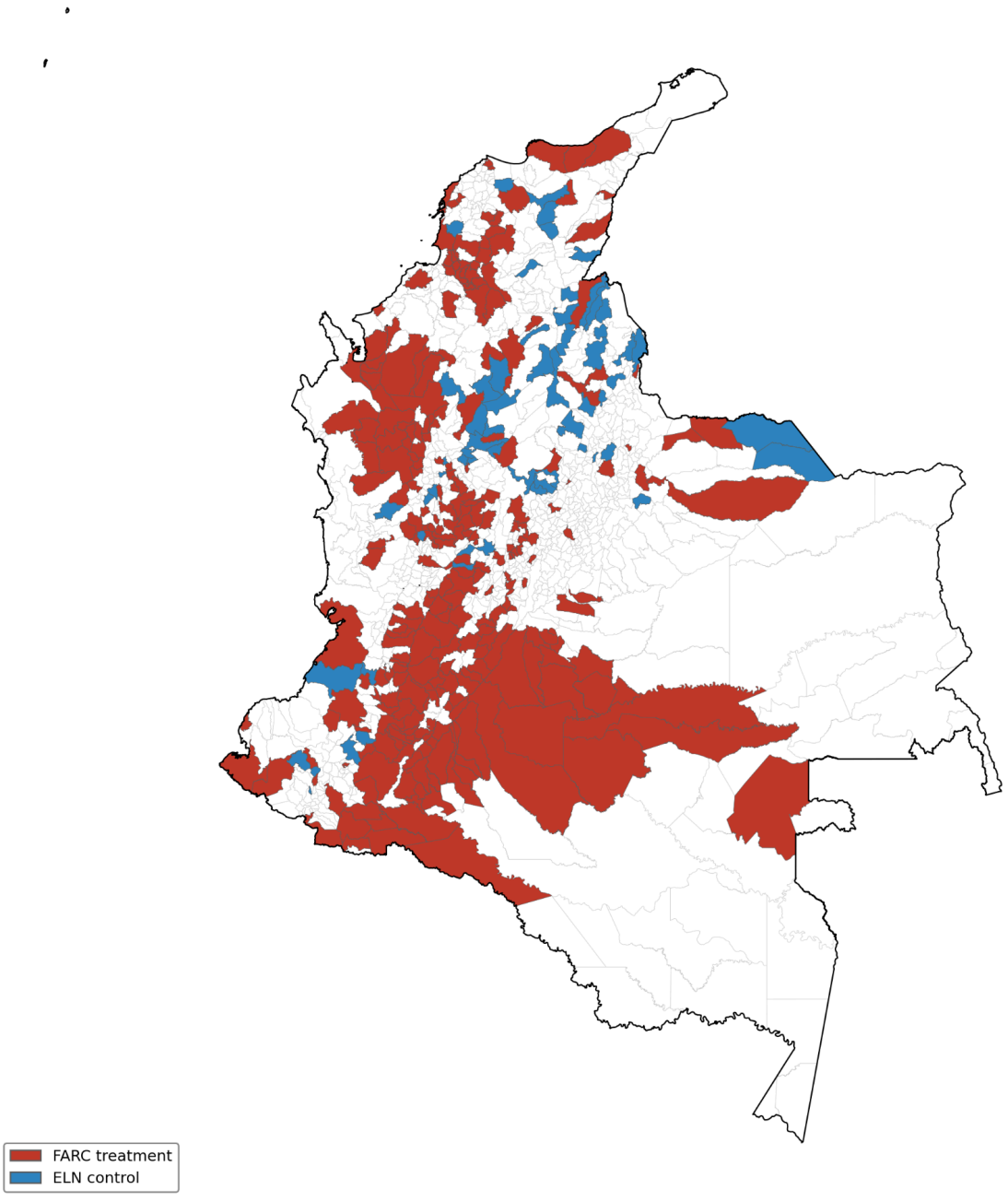
The sample used in the analysis consists of Colombian municipalities with documented historical presence of either FARC or ELN. Conflict event data come from the Uppsala Conflict Data Program's Georeferenced Event Dataset (UCDP GED) and are restricted to the period 1996-2005. This window captures an intense phase of the conflict. It also ensures that sample classification is based on pre-sample exposure and does not overlap with the estimation period.

Identifying guerrilla presence is difficult, because armed groups did not only exercise control through observed violence. They also used intimidation, coercion, and informal governance as means of control. Nevertheless, conflict events are widely treated as a strong indicator of armed group presence (Fajardo-Steinhäuser, 2024). A municipality is assigned to the FARC group if it had at least one UCDP conflict event in which the FARC appeared as a primary actor during 1996–2005. A municipality is similarly assigned to the ELN group under the equivalent condition. Municipalities with the presence of both groups are excluded from the sample in order to keep a clean distinction between treatment and control municipalities. Municipality names are matched to official Colombian administrative codes using the DIVIPOLA register. Some manual corrections are made where place names diverge from official names.

The baseline sample, referred to as Sample 1, requires at least one conflict event and includes 264 FARC municipalities and 60 ELN municipalities. As a stricter alternative, Sample 2 requires at least two events, yielding 151 FARC municipalities and 20 ELN municipalities. This more restrictive sample is used to test whether the main results are sensitive to how guerrilla exposure is defined. See Appendix Table A1 for sample sizes and the number of excluded overlap

municipalities. Figure 1 shows the geographic distribution of municipalities included in the main sample.

***Figure 1**: Map of Sample 1 Municipalities*



Source: Author's rendering of UCDP GED conflict event data (1996–2005), matched to geoBoundaries Colombia ADM2 municipal boundary data.

5.2 Identification Strategy

To estimate the effect of the peace process on municipal homicide rates, this thesis uses a two-way fixed effects (TWFE) difference-in-differences design. The strategy compares changes in homicide rates in historically FARC-exposed municipalities to changes in historically ELN-exposed municipalities after 2012. The identifying assumption is that, in the absence of the peace process, homicide trends in the two groups would have evolved similarly.

The baseline estimating equation is:

$$Y_{it} = \alpha_i + \lambda_t + \beta\left(FARC_i \times Post_t\right) + \varepsilon_{it}$$

where Y_{it} denotes the homicide rate per 100,000 inhabitants in municipality i in year t. Municipality fixed effects, α_i, absorb time-invariant differences across municipalities, while year fixed effects, λ_t, absorb shocks common to all municipalities in a given year. $FARC_i$ is an indicator equal to one for municipalities classified as FARC-exposed, and $Post_t$ is an indicator equal to one for years from 2012 onwards. The coefficient of interest, β, captures the average difference in the change in homicide rates between FARC-exposed and ELN-exposed municipalities after the start of the peace negotiations. Standard errors are clustered at the municipality level.

The baseline specification uses 2012 as the first post-treatment year. As discussed in Section 3.1, this timing is motivated by recent work showing that the Colombian peace process unfolded in stages and that violence-related outcomes may have started to shift during negotiations rather than only after the 2014 ceasefire or the 2016 agreement.

5.3 Event-Study Specification and Identifying Assumptions

The validity of the difference-in-differences design relies on the parallel trends assumption. In this case, that historically FARC-exposed and historically ELN-exposed municipalities would have followed similar homicide trajectories in the absence of the peace process. To test this assumption, an event-study specification is estimated where the single post-treatment indicator is

replaced by separate interactions for each year. The last pre-treatment year, 2011, is used as the omitted reference category.

$$Y_{it} = \alpha_i + \lambda_t + \sum_{\tau \neq 2011} \beta_\tau \left(FARC_i \times 1[t = \tau] \right) + \varepsilon_{it}$$

where the interaction terms show how homicide rates in historically FARC-exposed municipalities changed relative to historically ELN-exposed municipalities in each year before and after the start of negotiations. In order for the parallel trends assumption to hold, the coefficients for the pre-treatment years should be close to zero and statistically insignificant.

5.4 Heterogeneity Analysis

The average effect from the baseline specification may not reflect differences across municipalities. Historically FARC-exposed municipalities differed in ways that may have shaped how the peace process affected local homicide rates. This thesis studies two different dimensions: coca cultivation and fiscal capacity. First, the FARC's armed presence was often intertwined with coca cultivation through taxation of growers, control of trafficking routes, and the enforcement of local order. If the peace process disrupted this, reductions in violence would likely be larger in municipalities where coca cultivation was more prevalent. Second, even if negotiations weakened FARC-related violence, the size of that reduction may have depended on whether the state was capable of filling the vacuum left behind. Municipalities with stronger fiscal capacity are more likely to sustain state presence and public service provision, and may therefore see larger reductions in violence.

To examine heterogeneity, the baseline difference-in-differences specification is extended by interacting the treatment effect with pre-treatment municipal characteristics. The estimating equation becomes:

$$Y_{it} = \alpha_i + \lambda_t + \beta \left(FARC_i \times Post_t \right) + \sum_g \delta_g \left(FARC_i \times Post_t \times G_{ig} \right) + \varepsilon_{it}$$

where G_{ig} denotes the relevant baseline group variable for municipality i. Depending on the specification, this may be a single indicator or a set of group indicators. The coefficient β captures the treatment effect for the omitted reference group, while the coefficients δ_g show how the treatment effect differs across groups. All specifications include municipality and year fixed effects, and standard errors are clustered at the municipality level.

In the coca analysis, the group variable is based on baseline coca cultivation, measured as the average number of hectares cultivated over 2003-2005. In one specification, municipalities are divided into a binary split of coca and non-coca municipalities. In the other, they are divided into no-coca, low-coca, and high-coca groups. In the fiscal capacity analysis, the group variable is based on baseline fiscal capacity. This is measured as the average municipal IDF score over 2003-2005, and municipalities are divided into low- and high-IDF groups.

5.5 Robustness Checks

Several robustness checks are conducted to assess the sensitivity of the baseline results. First, a placebo test is conducted by assigning a fake treatment year of 2009 and using only pre-treatment data from 2006–2011. If the baseline results capture a real effect rather than a pre-existing trend, the placebo difference-in-differences coefficient should be statistically insignificant.

Second, the analysis tests an alternative treatment timing of 2015, which is the first full year after the 2014 unilateral ceasefire. The check is motivated by the fact that previous work, particularly Fajardo-Steinhäuser (2024), uses the ceasefire as treatment timing. By re-estimating the model with 2015 as the treatment year, it is possible to assess if the results depend specifically on using 2012 as the treatment year. It also shows if the identifying assumption is as convincing under this alternative timing. If the estimates are similar but the pre-trend evidence becomes weaker, this would support the choice to use 2012 as the preferred timing.

Third, the time period is restricted to 2006-2019. This excludes both the COVID-19 pandemic and the period when FARC dissident groups began to emerge. Both of these could potentially affect violence patterns, potentially contaminating the post-treatment period for the treatment group (Fajardo-Steinhäuser, 2024). It also avoids possible contamination of the control group.

From late 2022, the ELN entered into peace negotiations with the government. A ceasefire followed in August 2023, although it ultimately broke down. These developments could have affected violence patterns in ELN municipalities (Council on Foreign Relations, 2024; Al Jazeera, 2023). Restricting to 2006-2019 therefore provides a cleaner period for evaluating the effect of the peace process.

Fourth, the top 1 percent of municipality-year observations are excluded in order to assess if the baseline estimates are driven by extreme values. The cutoff is set at 176.7 homicides per 100,000 inhabitants, meaning that all observations above this threshold are removed. This check is done in order to make sure that a small number of extreme values are not driving the results. This procedure removes 64 municipality-year observations from Sample 1 and 43 from Sample 2.

Fifth, the baseline specification is re-estimated while allowing the 2005 NBI (Necesidades Básicas Insatisfechas) score to have year-specific effects. The NBI score is used here as a proxy for municipal socioeconomic development. The purpose of this check is to test whether the estimated treatment effect reflects the peace negotiations themselves, rather than different homicide trends related to pre-existing differences in local development. By allowing the effect of baseline NBI to vary over time, the specification examines whether the main result remains once broader development-related time patterns are taken into account.

Finally, potential spillover effects are examined by progressively excluding ELN control municipalities located closest to FARC treatment municipalities. This is done to ensure that ELN municipalities do not contaminate the control group and reduce the estimated treatment effect, which could be a concern if nearby ELN municipalities were also affected by the peace process. To examine this, ELN municipalities are excluded using distance cutoffs based on the 35th, 50th, and 65th percentiles of the distance from each ELN municipality to the nearest FARC municipality. If the estimated treatment effect remains similar across all of these specifications, it would suggest that spillovers to the control group are unlikely to be driving the baseline results.

6. Results

This section presents the estimated effects of the FARC peace negotiation on homicide rates. The main results are shown in Section 6.1, followed by the heterogeneity results in Section 6.2. Finally, a series of robustness checks is presented in Section 6.3.

6.1 Main Results

Table 2 reports the results of the baseline difference-in-differences specification. The effect of the 2012 peace negotiations on municipal homicide rates is shown by the interaction between historical FARC exposure and the post-2012 period.

***Table 2**: Effect of Peace Negotiations on Homicide Rates*

	(1) Sample 1	**(2) Sample 2**
FARC × Post-2012	-10.94***	-19.22***
	(3.137)	(6.383)
Observations	6480	3420

Standard errors in parentheses

Municipality and year fixed effects included.

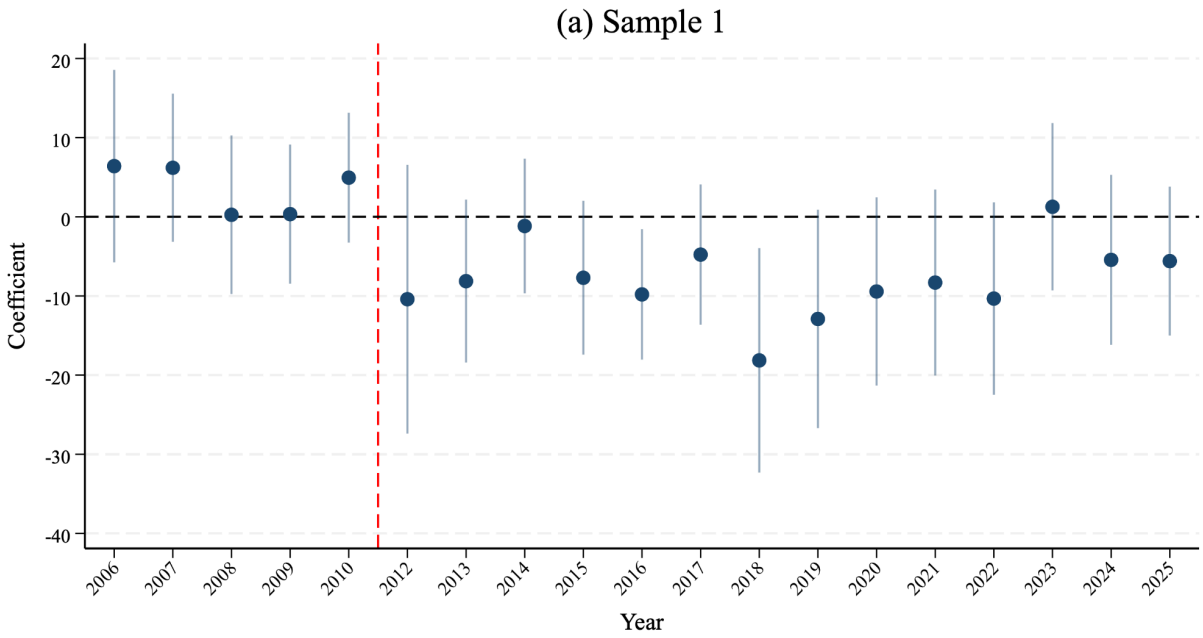
Standard errors clustered at the municipality level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The estimates are negative and statistically significant at the 1 percent level in both samples. In Sample 1, homicide rates fell by about 10.9 per 100,000 inhabitants in historically FARC-exposed municipalities relative to historically ELN-exposed municipalities after 2012. In Sample 2, the corresponding estimate is larger at about 19.2 homicides per 100,000 inhabitants. It is, however, worth noting that this estimate is less precise with a larger standard error, which is expected given the considerably smaller sample size in Sample 2. Overall, the results suggest that the start of negotiations was associated with a substantial reduction in homicide rates in FARC municipalities.

Figure 2 shows the event-study estimates for Sample 1. The corresponding event-study plot for Sample 2 is shown in Appendix Figure A1.

***Figure 2**: Event Study Plot - Treatment Timing 2012, Sample 1*



Coefficients are event-study estimates of the baseline specification, relative to the omitted pre-treatment year.

Vertical bars show 95 percent confidence intervals.

The red dashed line marks the omitted year, 2011.

The identifying assumption in the difference-in-differences design is that homicide trends in historically FARC-exposed and historically ELN-exposed municipalities would have evolved similarly in the absence of the peace process. In both samples, the pre-treatment coefficients are jointly insignificant (see Appendix Table A2 for the pre-treatment event-study coefficients for both samples). A joint test fails to reject the null of parallel pre-trends (Sample 1: $p = 0.41$; Sample 2: $p = 0.87$). This supports the parallel trends assumption. After 2012, the coefficients turn negative in both samples, which is consistent with a decline in homicide rates. However, the confidence intervals are wider in Sample 2, because of the smaller sample size. The estimates for Sample 2 should therefore be interpreted with caution, although the overall pattern remains similar across both samples.

6.2 Heterogeneity Results

This section presents the heterogeneity results for coca cultivation and state capacity. This part of the analysis is restricted to Sample 1 in order to have enough observations to ensure meaningful variation across municipalities. The stricter Sample 2 definition leaves a very small ELN control group, which reduces statistical precision and makes it harder to detect meaningful differences. Restricting the heterogeneity analysis to Sample 1 therefore allows for more informative comparisons across municipalities.

6.2.1 Coca Cultivation

Table 3 reports the results of the coca cultivation heterogeneity analysis. Two different specifications are shown. The first is the binary split between coca and non-coca. The second is the low- and high-coca specification, where the municipalities with no coca cultivation serve as the reference group. Coca exposure is defined using average baseline coca cultivation over 2003-2005.

***Table 3**: Effect of Peace Negotiations on Homicide Rates by Coca Cultivation*

	(1) Sample 1	
	Binary	**High/Low Split**
FARC × Post-2012	-8.426***	-8.426***
	(3.185)	(3.185)
FARC × Post-2012 × Coca	-10.38**	
	(4.146)	
FARC × Post-2012 × Low coca		-3.010
		(5.567)
FARC × Post-2012 × High coca		-17.75***
		(5.351)
Observations	6480	6480

Standard errors in parentheses

Municipality and year fixed effects included.

Standard errors clustered at the municipality level.

In column (1), coca presence is defined as average hectares cultivated in 2003–2005 greater than zero. In column (2), the reference group is no-coca municipalities; low and high coca are defined by the median among coca municipalities based on average hectares cultivated in 2003–2005.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The results indicate that the reduction in homicide rates after 2012 was primarily concentrated in coca-growing municipalities. In column 1, the baseline effect for non-coca municipalities is negative and statistically significant. The interaction term for coca municipalities is also negative and statistically significant, implying an additional reduction in homicide rates in coca municipalities relative to non-coca municipalities. Together, the estimates show a total effect of about 18.8 fewer homicides per 100,000 inhabitants in coca municipalities, compared with about 8.4 fewer in non-coca municipalities.

Column 2 shows that this pattern is driven mainly by municipalities with high baseline coca cultivation. The estimated additional effect for low-coca municipalities is small and statistically insignificant. But the corresponding additional effect for high-coca municipalities is large, negative, and statistically significant at the 1 percent level. The total effect is about 26.2 fewer homicides per 100,000 inhabitants in high-coca municipalities, compared to about 8.4 fewer in

no-coca municipalities. Overall, these results suggest that the effect of the peace negotiations was strongest in municipalities where coca cultivation was most prevalent before treatment.

6.2.2 State Capacity (IDF)

Table 4 reports the result of the state capacity heterogeneity analysis, proxied by the IDF index for fiscal capacity. Municipalities are divided into two groups: one with high IDF and one with low. The low IDF municipalities serve as the reference group.

***Table 4**: Effect of Peace Negotiations on Homicide Rates by IDF*

	(1) Sample 1
FARC × Post-2012	-8.234**
	(3.523)
FARC × Post-2012 × High IDF	-5.762*
	(3.176)
Observations	6460

Standard errors in parentheses

Municipality and year fixed effects included.

Standard errors clustered at the municipality level.

Reference group: low IDF municipalities.

IDF baseline is defined as the average of 2003-2005.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The results suggest that the reduction in homicide rates after 2012 was somewhat stronger in municipalities with higher baseline fiscal capacity. The baseline effect for low-IDF municipalities is negative and statistically significant at the 5 percent level. The interaction term for high-IDF municipalities is also negative and statistically significant, but at the 10 percent level. This implies an additional reduction in homicide rates in high-IDF municipalities relative to low-IDF municipalities. Together, the estimates show a total effect of about 14.0 fewer homicides per 100,000 inhabitants in high-IDF municipalities, compared with about 8.2 fewer in low-IDF municipalities. This indicates that the decline in homicide rates was larger in municipalities with stronger initial fiscal capacity. However, the heterogeneity is weaker and less statistically robust than the coca heterogeneity result.

6.3 Robustness Checks

This section shows the results of a series of robustness checks assessing the sensitivity of the baseline results.

6.3.1 Placebo Test

Table 5 reports a placebo test with the treatment year reassigned to 2009, using only pre-treatment data from 2006 to 2011.

***Table 5**: Placebo test with treatment year 2009*

	(1) Sample 1	**(2) Sample 2**
FARC × Placebo post-2009	-2.523	-4.912
	(3.369)	(5.058)
Observations	1944	1026

Standard errors in parentheses

Municipality and year fixed effects included.

Standard errors clustered at the municipality level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The placebo coefficients are negative but statistically insignificant in both samples. This suggests that the main results are unlikely to be driven by differential pre-treatment trends between FARC- and ELN municipalities.

6.3.2 Alternative Treatment Timing

Table 6 shows the results of the baseline specification when re-estimated using 2015 as the treatment year, corresponding to the first full year after the 2014 unilateral ceasefire.

***Table 6**: Effect of Peace Negotiations on Homicide Rates - Alternative Timing Check*

	(1) Sample 1	**(2) Sample 2**
FARC × Post-2015	-8.113***	-8.456**
	(2.272)	(3.804)
Observations	6480	3420

Standard errors in parentheses

Municipality and year fixed effects included.

Standard errors clustered at the municipality level.

Treatment timing corresponds to the first full year after the 2014 unilateral ceasefire.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The estimated coefficients remain negative and statistically significant in both samples when treatment is timed to 2015. However, the parallel-trends evidence is weaker under this alternative timing (Sample 1: p = 0.14; Sample 2: p = 0.19), especially in Sample 2, where some individual pre-treatment coefficients are statistically significant (see Appendix Figure A2 for the event study plots for Sample 2 and Appendix Table A3 for the pre-treatment event-study coefficients). This makes the identifying assumption less convincing, which supports using 2012 as the treatment year in the baseline specification.

6.3.3 Additional Robustness Checks

Table 7 summarizes a set of additional robustness checks. These include restricting the sample period to 2006–2019, excluding the top 1 percent of municipality-year observations, and re-estimating the baseline specification while allowing the NBI score to have year-specific effects. The full estimates for these three specifications are reported in Appendix Tables A4, A5, and A6, respectively.

***Table 7**: Summary of Robustness Checks*

Specification	Sample 1	Sample 2
Baseline	-10.94***	-19.22***
	(3.137)	(6.383)
Restricted window (2006–2019)	-12.15***	-22.02***
	(3.446)	(7.982)
Excluding top 1% of observations	-8.626***	-13.670***
	(2.392)	(4.511)
Baseline NBI × year effects	-11.11***	-18.53***
	(3.135)	(6.329)

Standard errors in parentheses

Municipality and year fixed effects included.

Standard errors clustered at the municipality level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Across all of these specifications, the estimated effect remains negative and statistically significant in both samples. The magnitudes of the estimates are also close to the baseline estimates. This shows that the main findings are robust to these alternative specifications.

The results are also robust to excluding ELN municipalities located closest to FARC municipalities. Table 8 shows the estimates of progressively excluding the ELN control municipalities located closest to FARC treatment municipalities. The cutoff values are defined by the 35th, 50th, and 65th percentiles among ELN control municipalities.

***Table 8**: Spillover robustness by dropping nearby ELN controls*

	(1) Sample 1			
	Baseline	**≤35th pct**	**≤50th pct**	**≤65th pct**
FARC × Post-2012	-10.94***	-9.670**	-9.940**	-14.17***
	(3.137)	(3.770)	(4.533)	(5.225)
Observations	6480	6060	5880	5700

Standard errors in parentheses

Municipality and year fixed effects included.

Standard errors clustered at the municipality level.

Distance measured from each ELN municipality to the nearest FARC municipality.

Cutoffs based on the 35th, 50th, and 65th percentiles among ELN controls.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The estimated coefficients remain negative and statistically significant across all specifications, with broadly similar magnitudes. This suggests that the baseline results are not driven by contamination of the control group through spillovers.

7. Discussion

The results of this thesis suggest that the start of the 2012 peace negotiations between the Colombian government and the FARC guerrilla was associated with a substantial decline in homicide rates in historically FARC-exposed municipalities. This finding is in line with Fajardo-Steinhäuser (2024), who finds reductions in several violence indicators after the FARC ceasefire. The decline in homicide rates is also robust across the baseline specification and the main robustness checks, suggesting that the result is not driven by any single modeling choice. At the same time, the results also show that there is important variation across municipalities and that the average effect conceals some heterogeneity effects.

The clearest heterogeneity effects can be seen when examining coca cultivation. The decline in homicide was considerably larger in municipalities that have historically been involved with coca cultivation, compared to those that were not. The effect was strongest in municipalities with a high level of coca cultivation. This suggests that the FARC's involvement in the coca industry may have shaped the reduction in violence. This finding is consistent with the peace agreement's explicit requirement that the FARC withdraw from drug trafficking (De Roux & Martínez, 2023) and with existing work showing that the FARC's armed presence was closely tied to the coca industry. In municipalities where coca cultivation was more prevalent, the peace negotiations may have disrupted the violence that was closely tied to the coca economy.

The heterogeneity analysis also suggests that state capacity played a role in the homicide reduction, although the evidence is less strong than in the coca cultivation case. Municipalities that had a higher baseline fiscal capacity experienced somewhat larger declines in homicide rates than municipalities with lower fiscal capacity. This result is in line with the idea that stronger local institutions may have been better at maintaining state presence after the weakening of the FARC. One possible mechanism is that municipalities with stronger fiscal capacity were better able to sustain an institutional presence after the FARC's weakening, limiting renewed violence and other armed actors filling the vacuum. This interpretation is consistent with previous work linking weak state capacity to persistent insecurity (Besley and Persson, 2010, 2014). It is also in line with evidence that violence often resurged where the state failed to replace the FARC (Albarracín et al., 2023; Prem et al., 2022; Fajardo-Steinhäuser, 2024). However, because the

IDF result is less precisely estimated than the coca result, fiscal capacity should be interpreted with more caution.

It is worth noting that coca cultivation and fiscal capacity are largely independent in the sample. The municipalities with baseline coca cultivation are distributed almost evenly across low- and high-IDF groups (see Appendix Table A7 for the full distributions). This suggests that the two heterogeneity dimensions capture distinct mechanisms rather than the same underlying factor. Together, the heterogeneity findings imply that the effect of the 2012 peace negotiations depended on the underlying conditions of the municipalities.

7.1 Limitations

First, the sample construction is based on observed conflict events from the UCDP Georeferenced Event Dataset. While recorded violence is commonly used to classify armed-group presence, it may miss less visible forms of territorial control, such as intimidation, informal taxation, or local governance. Some municipalities may therefore be misclassified or excluded from the sample. In addition, as noted earlier, the stricter Sample 2 definition leaves a very small ELN control group. This reduces statistical precision, so the Sample 2 estimates should be interpreted with more caution, even though they are broadly consistent with the baseline results.

Second, although ELN-exposed municipalities have been used as a control group for FARC-exposed municipalities in previous literature (Fajardo-Steinhäuser, 2024) and even though it is a more credible comparison group than the rest of the country, they are not a perfect counterfactual. The ELN and FARC had important similarities, but they also differed in aspects such as size and territorial reach. The ELN did not participate in the peace negotiations with the FARC, but ELN municipalities may still have been affected by broader changes in the conflict environment. This means that the control group may not be fully unaffected by the peace process, and this should be kept in mind when interpreting the estimates.

The outcome measure also has some limitations, since it only captures the reported violence. Homicide is the most consistently reported violence indicator available and is hence preferable to other violence measures, but it is still based on reported records. In conflict-affected

municipalities, reporting may be incomplete. So, changes in reporting over time could affect the measured homicide rate. If reporting improved after the start of the peace negotiations, the estimated decline in violence could understate the true reduction. Also, any systematic differences in reporting could create measurement error.

Finally, it is worth noting that the discussion of mechanisms is based on indirect evidence rather than direct proof. The heterogeneity results suggest that coca cultivation and fiscal capacity shaped the local response to the peace negotiations, but these variables do not provide direct evidence. The interpretation that coca cultivation and state capacity influenced the effect of the peace process should therefore be seen as suggestive rather than conclusive.

8. Conclusion

This thesis examined whether the start of the 2012 peace negotiations between the Colombian government and the FARC guerrilla affected homicide rates at the municipality level in Colombia. Using a two-way fixed effects difference-in-differences design, this study compared historically FARC-exposed municipalities to historically ELN-exposed municipalities before and after the start of the peace negotiations. Overall, the results show that the onset of negotiations was associated with a statistically significant decline in homicide rates in historically FARC-exposed municipalities. This main finding is supported by the event-study evidence and remains robust across a set of alternative specifications and robustness checks. The results suggest that the beginning of the peace process in 2012, rather than only the 2014 ceasefire or the final 2016 agreement, led to a meaningful reduction in violence. The findings support the view that violence-related outcomes may begin to shift already during negotiations.

The results also show some important heterogeneity results across municipalities. The reduction in violence was strongest in municipalities with baseline coca cultivation, particularly in municipalities with a high level of coca cultivation. This indicates that the local effects of the peace negotiations were closely tied to the FARC's role in the coca industry. The results also show that municipalities with higher baseline fiscal capacity experienced somewhat larger declines in homicide rates, although this pattern is weaker than the coca heterogeneity result. These heterogeneity findings suggest that the effects of peacemaking depended not only on the peace process itself, but also on different pre-existing municipal conditions. This suggests that peacebuilding efforts alone may not be enough, and that they need to be accompanied by other interventions targeting state presence and illicit economies.

Future research could build on these findings in several ways. First, it could examine other forms of violence. This thesis focuses on homicide, but outcomes such as displacement, kidnapping, and injuries may also have responded differently across municipalities. Another important question is whether the decline in homicide translated into broader and more long-term improvements. Longer-run outcomes such as income, education, and youth participation in training or employment may be important channels through which peace affects violence. If peace increases legal economic opportunities, the opportunity cost of participating in violent

activity may rise, potentially leading to reductions in violence over time. Future work could also examine the mechanisms behind the heterogeneity results more directly. For example, it would be useful to examine whether the stronger effects in coca-growing municipalities were due to FARC disengagement from the coca economy or other aspects, such as reduced competition over territory. Finally, the fiscal capacity result raises the question of whether stronger local state capacity can help sustain the local benefits of peace negotiations.

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Appendix

***Table A1**: Sample sizes*

	(1) Sample 1	(2) Sample 2
FARC municipalities	264	151
ELN municipalities	60	20
Overlap municipalities	54	16

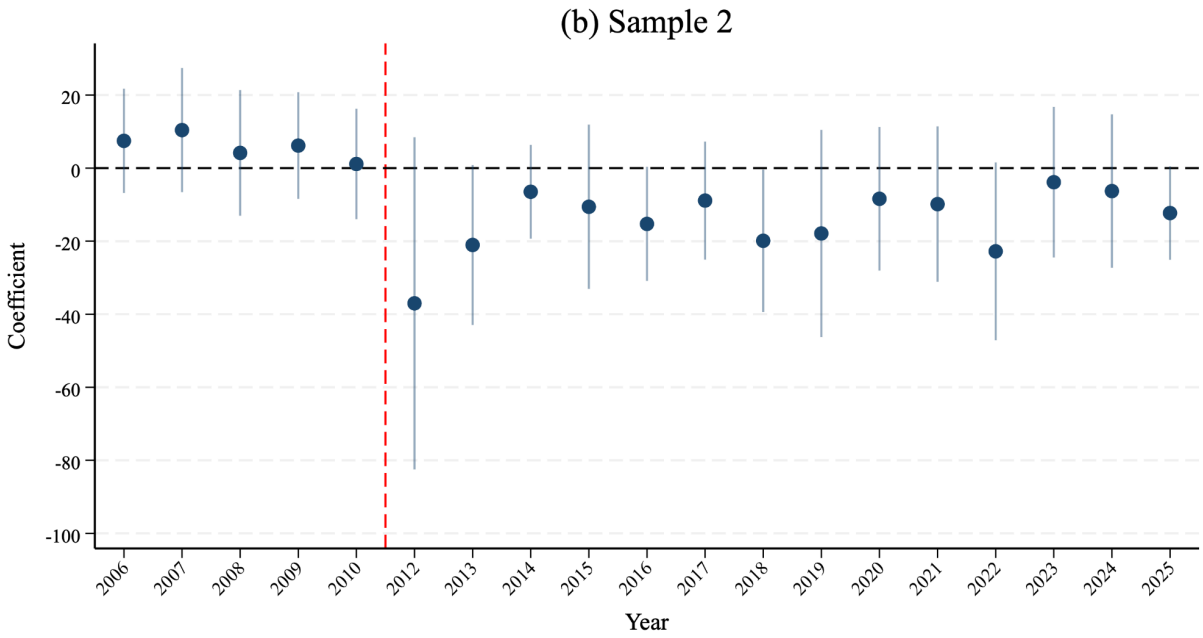
Sample 1 includes municipalities with at least one historical conflict event attributed to FARC or ELN during 1996–2005.

Sample 2 applies a stricter threshold of at least two events.

Municipalities with presence of both groups (overlap municipalities) are excluded.

Author's calculations using UCDP GED data (1996–2005).

***Figure A1**: Event Study Plot - Treatment Timing 2012, Sample 2*



Coefficients are event-study estimates of the baseline specification, relative to the omitted pre-treatment year.

Vertical bars show 95 percent confidence intervals.

The red dashed line marks the omitted year, 2011.

***Table A2**: Pre-Treatment Event-Study Coefficients, Baseline 2012 Timing*

Year	(1) Sample 1	(2) Sample 2
2006	6.40 (6.18)	7.47 (7.23)
2007	6.20 (4.76)	10.41 (8.61)
2008	0.26 (5.09)	4.16 (8.72)
2009	0.34 (4.47)	6.17 (7.39)
2010	4.95 (4.17)	1.13 (7.66)

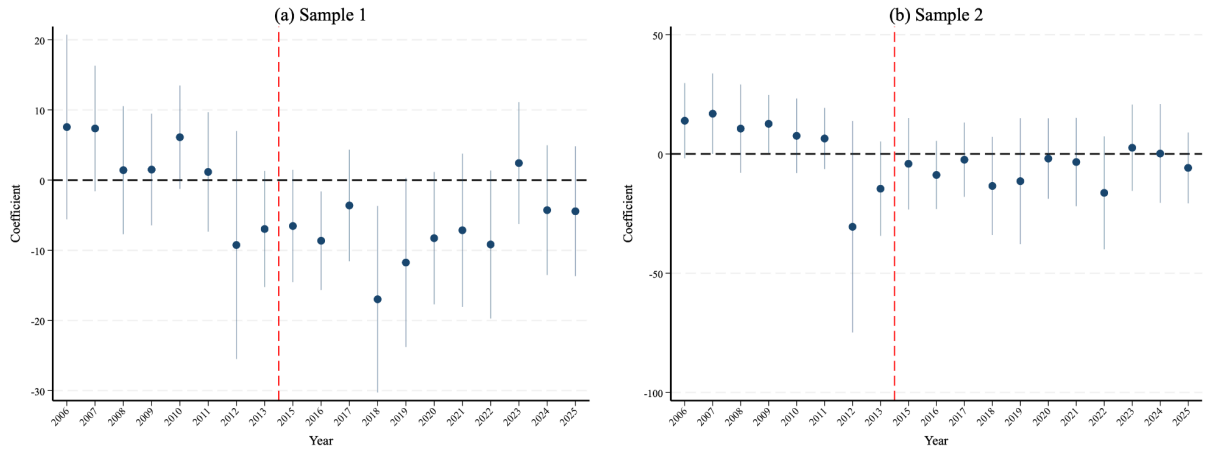
Reported coefficients are pre-treatment event-study estimates from the baseline specification with 2012 as the treatment year.

The omitted reference year is 2011.

Standard errors clustered at the municipality level are shown in parentheses.

* p < 0.10, ** p < 0.05, *** p < 0.01.

***Figure A2**: Event Study Plots - Treatment Timing 2015*



Coefficients are event-study estimates of the baseline specification, relative to the omitted pre-treatment year.

Vertical bars show 95 percent confidence intervals.

The red dashed line marks the omitted year, 2014.

***Table A3**: Pre-Treatment Event-Study Coefficients, Alternative 2015 Timing*

Year	(1) Sample 1	(2) Sample 2
2006	7.57 (6.69)	13.95* (7.97)
2007	7.36 (4.54)	16.89** (8.53)
2008	1.42 (4.64)	10.63 (9.36)
2009	1.50 (4.05)	12.65** (6.15)
2010	6.11 (3.74)	7.61 (7.91)
2011	1.16 (4.32)	6.48 (6.49)
2012	-9.25 (8.26)	-30.54 (22.46)
2013	-6.96* (4.20)	-14.57 (10.03)

Reported coefficients are pre-treatment event-study estimates from the alternative specification with 2015 as the treatment year.

The omitted reference year is 2014.

Standard errors clustered at the municipality level are shown in parentheses.

* p < 0.10, ** p < 0.05, *** p < 0.01.

***Table A4**: Effect of Peace Negotiations on Homicide Rates (restricted 2006-2019)*

	(1) Sample 1	(2) Sample 2
FARC × Post-2012	-12.15***	-22.02***
	(3.446)	(7.982)
Observations	4536	2394

Standard errors in parentheses

Municipality and year fixed effects included.

Standard errors clustered at the municipality level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

***Table A5**: Effect of Peace Negotiations on Homicide Rates (Excluding top 1%)*

	(1) Sample 1	(2) Sample 2
FARC × Post-2012	-8.626***	-13.670***
	(2.392)	(4.511)
Observations	6416	3377

Standard errors in parentheses

Municipality and year fixed effects included.

Standard errors clustered at the municipality level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

***Table A6**: Effect of Peace Negotiations on Homicide Rates Controlling for NBI*

	(1) Sample 1	(2) Sample 2
Baseline NBI × year effects	-11.11***	-18.53***
	(3.135)	(6.329)
Observations	6480	3420

Standard errors in parentheses

Municipality and year fixed effects included.

NBI 2005 interacted with year fixed effects to absorb differential trends by baseline poverty.

Standard errors clustered at the municipality level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

***Table A7**: Distribution of Municipalities Across Fiscal-Capacity Groups by Coca Status*

	Low IDF	High IDF	Total
No Coca	50.42	49.58	100.00
Any Coca	51.16	48.84	100.00

Row percentages based on Sample 1.

Low and high IDF are defined using the baseline IDF split.

Author's calculations using UNODC-SIMCI and DNP data; sample based on UCDP GED data.