Conflict and Small-Scale Investment: Evidence from Colombia Peace Agreement

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Abstract: The long-run effects of conflict on agricultural production depend crucially on how conflict affects farm investment. We use the Colombian peace agreement to estimate how the reduction of violent conflict affects farmer investment decisions. Starting in 2012, the government of Colombia engaged in a peace process that ended with the demobilization of the country's biggest non-state armed group, which we exploit in a difference-in-differences approach. In areas where the armed group was initially present, the end of conflict led to a more than twofold increase in farm investment, as farmers moved production from annual to perennial crops. We find no evidence that investment came at the expense of short-term consumption, and was likely financed by debt. Finally, we find evidence for substantial positive spillovers of the reduction of violence on investment in nearby areas without armed group presence, suggesting that the peace accord had relatively broad geographic impact. Our results suggest that decreased investment may be an important mechanism through which armed conflict inhibits agricultural development and points to a potentially large peace dividend.

Keywords: Conflict, Colombia, Peace, Agricultural production, Investment.

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1 Introduction

Agricultural productivity crucially depends on farm investment, but farmers will only make investments if they have investment security that allow them to reap the returns (Demsetz, 1964, Acemoglu et al., 2001, Goldstein and Udry, 2008, Besley and Ghatak, 2010, Galiani and Schargrodski, 2010). Civil conflict has the potential to severely undermine the security of investment rights, as armed groups often expropriate output and assets from local populations, either to fund their operations or to impose a new social order (Arjona, 2016, Azam and Hoeffler, 2002, Engel and Ibanez, 2007). Furthermore, violence between armed groups and the state can lead to the destruction of capital, jeopardizing returns from investment (Blattman and Miguel, 2010, Collier, 1999, Ibanez and Moya, 2010, Justino and Verwimp, 2013). Scholars have therefore hypothesized that civil conflict decreases investment in agriculture and other sectors (Blattman and Miguel, 2010, Collier, 1999).

However, in some settings, armed groups perform state-like governing functions (Sanchez De La Sierra, 2020, Cunningham and Loyle, 2021, Arjona et al., 2015). For instance, in the Iraq war, in some cases, civilians perceived IS rebels as a fairer and more effective actors for governance than the local state (Revkin, 2021). In Nepal's civil war, the Maoist rebels created courts that evaluated property and domestic crimes, providing secure property rights for the local population (Loyle, 2021). If non-state armed groups are effective at protecting investment rights, their demobilization could create a vacuum that, if not filled by the state, may decrease investment.

This paper estimates how the end of conflict between FARC, the country's largest non-state armed group, and the Colombian government affects investment by household-led farms - one of the most ubiquitous commercial enterprises in developing countries. We exploit a natural experiment created by the recent peace agreement between the two actors. Negotiations began in 2012 and continued until a comprehensive peace agreement was reached in 2016. The peace process led to a large decrease in conflict violence due to a bilateral ceasefire in 2014, and ultimately to widespread demobilization of FARC fighters.

Our empirical analysis uses data from the Encuesta Longitudinal de Colombia (ELCA), a panel survey of 4,700 rural households conducted in 2010, 2013, and 2016. We use a difference-in-differences approach where treated villages are defined by the reported presence of armed groups by village leaders during the baseline survey in 2010. The post-treatment period is

defined as 2016 when ceasefires were in effect and an agreement was reached in the middle of the year. Our primary outcome of interest is the amount of investment in household farms, arguably the most important businesses in the rural areas affected by the Colombian conflict.

We begin by confirming that areas with baseline FARC presence experienced a large decrease in conflict violence between 2013 and 2016, relative to areas where the FARC was not present. We then show that this decrease in conflict was accompanied by a twofold increase in farm investment. This investment partly manifests itself as a switch from annual to perennial crops. These results are consistent with the hypothesis that the end of conflict with the FARC led to a decrease in expropriation of land and a resulting expansion of farmers' time horizons. We find no evidence that investment came at the expense of short-term consumption, suggesting that farmers were able to access capital after the peace accord. We also find evidence for positive spatial spillovers: farm investment also increased in areas that were near former FARC strongholds but had no direct FARC presence.

Our results contribute to the literature on agriculture in conflict-affected areas. Previous research has shown that civil conflict can affect agricultural production decisions in a variety of ways. Adelaja and George (2019) found that exposure to the Boko Haram conflict in Nigeria decreased agricultural output by decreasing labor supply but did not affect agricultural productivity. (Nillesen, 2007) found that exposure to violence in the Burundi civil war decreased farmers′ probability of growing coffee. Several other studies found that conflict induces agricultural households to switch their asset portfolios towards assets that are more mobile and easier to conceal (Engel and Ibanez, 2007, Grun, 2003, Verpoorten, 2009). Our study is most closely related to that of Arias et al. (2019), who compared contiguous Colombian districts with different exposure to armed group presence and conflict violence before peace accord. They found that households in areas where armed groups are present tend to engage in less profitable activities that have short-term yields and require less upfront investment. We extend this work to a setting with a natural experiment - the peace agreement between the government of Colombia and the FARC - which allows us to estimate the effect of changes in the conflict environment on changes in investment.

Our paper also contributes to the broader literature on civil conflict and investment. Much of that literature has focused on the behavior of large multinational firms, often involved in mining or other resource extraction. Guidolin and Ferrara (2007) found that the end of conflict in Angola decreased the stock market valuations of firms involved in the Angolan diamond

mining sector, suggesting that investors preferred the conflict environment. Other papers that investigated the effect of conflict on foreign direct investment, have found mixed results. For instance, Barry (2018) finds that conflict deters multinational firms from entering a market but does not affect their decision to continue already established operations. Christensen and Wirtschafler (2020) find that the effect varies with geographical proximity to conflict hot zones: investment decreases in areas affected by conflict violence but increases in the surrounding areas that are not directly exposed to fighting.

Our results suggest that the end of conflict with an armed group can have large positive effects on investment by small farms. A possible explanation for the difference between our results and the earlier literature on investment by multinational firms is that conflict can affect investment through two offsetting channels: by decreasing of investment security through expropriation of land and by decreasing the state's capacity to regulate businesses. Small farms are less likely to benefit from the regulation channel, as they are less strongly regulated to begin with, but bear the full cost of insecure investment. Our results raise the possibility that the demobilization of armed groups can create a considerable peace dividend driven by local small-scale investment.

2 Background

2.1 The Colombian Conflict

Colombia has suffered from the longest civil war in Latin America. The conflict started with the founding of the guerrilla group FARC (Fuerzas Revolucionarias Armadas de Colombia in Spanish) in 1962 and the guerrilla group ELN (Ejercito de Liberacion Nacional in Spanish) in 1963. In the beginning, the insurrection was localized and the guerrilla groups did not have the political or military power to disrupt the country as a whole. By the late 1980s and early 1990s the guerrillas began to use funds from drug trafficking, illegal mining and extortion to gain control of large regions of the country, especially in rural areas (Sanchez and Formisano, 2003, Rangel, 2003, Reyes, 2016). In the mid-1990s, in response to the increased presence of the guerrillas, some residents created paramilitary groups that were consolidated in 1997 with the creation of the AUC (Autodefensas Unidas de Colombia in Spanish). For two decades, Colombia faced a war with these three non-state armed groups until the demobilization of AUC in 2006 and the peace process with the FARC in 2016.

During the war, the FARC was present in all regions of the country with between 10,000 to 20,000 fighters active on more than seventy fronts (Verdad Abierta, 2015). At the beginning of the peace process, the FARC controlled 242 districts, representing 23% of the total districts of the country and 12% of the total population (LasdosOrillas, 2015). The presence of armed groups undermined the power of the state and limited the development of a well-diversified economy (Montenegro and Posada, 1994, Villa et al., 2014). FARC imposed the planting of coca or extraction of rents through road and extortion (CNMH, 2016). The presence of the FARC had an enormous impact on economic and social life. Extortion, kidnapping, and the assassination of civilians and politicians were rampant in FARC-affected areas, creating a drag on economic activities, as illustrated by the following testimony:

> "I was in my car with my wife and my child leaving my farm, two armed soldiers appeared in the road and they identified themselves as members of FARC (...) the soldiers informed me that they were kidnapping me and ask to my family 50 million pesos (USD 20,000) to free me (...) We did not have the money and my family had to borrow it (...) I was kidnapped during one week until they got the money" Testimony of a victim in 2009 (JEP, 2019)

In many cases, the FARC went beyond economic extraction and tried to create governance in the local communities. They created rules about social behavior, economic behavior, forms of cooperation and justice mechanisms.

> "When the guerrilla arrived (...) at the beginning they organized the community with multiple meetings. They designated multiple tasks to the population. In some places they imposed justice and norms" Arjona (2008a)

> "People here had to follow their rules. Nobody wanted to do it, but the pressure was so high and their armies so powerful that we had to accept it" Arjona (2008b)

In our sample, 44% of the villages with historic presence of non-state armed groups reported being affected by extortion and 78% reported that they lived under rules imposed by the armed group.

2.2 The Peace Process

The period between 2007 and 2010 was a turning point in the civil conflict when the government of Alvaro Uribe Velez invested in defense and increased offensive operations against the FARC (Vargas and Godoy, 2013). The military progress against the group enabled the next president, Juan Manuel Santos, to initiate peace negotiations in 2012. The negotiations mainly took place in Cuba and lasted 4 years. During the first two years of the peace process, sporadic attacks undermined the negotiations, until the FARC implemented a unilateral ceasefire at the end of 2013. This ceasefire was violated various times until the 20th of December, 2014, when the government and the FARC agreed to a bilateral ceasefire. As a result, the country experienced a substantial reduction in violence, as FARC offensive activities decreased by an astonishing 98% (CERAC, 2016). In 2016, both parties reached a peace settlement that included four cornerstones: Rural development, political participation, limiting illicit drugs, and victims' reparations (Mesa de Conversaciones, 2018).

In the final stage of the peace agreement, in late 2016, the fighters gave up their arms. FARC stopped violent incursions and the national government promised to support the demobilized soldiers in their transition to a peaceful society. Moreover, the national government promised to develop a national Plan to create a "New Rural Colombia", where the state would invest in rural areas (Mesa de Conversaciones, 2018). Specifically, the final document focused on providing public infrastructure to rural regions, giving subsidies and loans, providing technical support, and providing a regulatory framework for avoiding expropriation of land. However, the investment promised in the agreement was delayed in the first years of the post-agreement period. KROC (2017) showed that none of the national plans with a focus on rural investment were initiated by 2017, and only limited investment had occurred by 2020 (KROC, 2021).

3 Data

The data used in this paper come from a longitudinal survey conducted by the University of los Andes in 2010, 2013 and 2016 called Encuesta Longitudinal de Colombia (ELCA). ELCA collected data from a panel of 4,700 households living in 16 rural randomly selected municipalities[2] in 9 different states in Colombia. The location of the municipalities is given in map A.1. We restrict our sample to households observed in all three periods to maintain a balanced panel, which left us with a panel of 7,351 observations. To avoid the possibility spillover effects in our primary analysis, we first restrict the sample to observations with direct effect of FARC presence in a village and where no village had FARC presence. At the end we use a sample of 4,795 observations. [3]

3.1 Conflict Exposure

One of the central questions in conflict research is how to measure exposure to conflict. In this paper, we define conflict exposure as the presence of the armed group in a village, which the ELCA survey elicits through a question to village leaders. We designate households as exposed to the conflict at baseline if the leader of their village reported the presence of an armed group in any year between 2006 and 2010. Since villages are on average between 1,500 and 3,000 people, we are reasonably confident that village leaders are aware of the presence of the guerilla group. In case the village leader might miss the group's presence in any one year, we aggregate over several years of observations to ensure our treatment indicator captures most affected villages despite the potential for underreporting.

The two main reasons to use this variable for exposure to conflict are the possibilities to get information at village level and to capture patterns that are not clear with violence. Leaders' reports have village information, which give more detail and exposure variance than other sources of data such as reports from governmental agencies, which focus their unit of analysis in the municipality. Furthermore, the leaders' report also allows us to capture the observations where villages have presence, but the violent behavior might be low or come from another source. Most of the indexes that the Colombian government used to classify guerrilla presence only took into account violent behavior or casualties reported for the fights. These indexes

[2]It is important to clarify for future references that in Colombia municipality is a larger unit than village but less than state.

[3]We found no evidence that attrition is correlated with FARC presence or farm investment in our data; details in Appendix E. We also run our specification using the full dataset and find no difference in our results.

might underreport presence in communities where FARC control the territory, but government agencies are not capable to report the source of murders, or where there are not fights because they are within some guerrilla's strongholds.

Still, we check if the sample in FARC controlled areas is different with our presence classification than with an external source such as the minister of defense indexes. Table A.1 shows that there is no significant difference in violent and economic characteristics of the regions that we explore in this research. Moreover, Table A.1 also shows that regions that we classified as FARC-controlled areas are 88% more likely to be classified as controlled areas by the minister of defense data. We also show in figures A.1 and A.2 that municipalities whose leaders reported the presence of armed groups had high levels of violent activity from the FARC or they are close to those who have high presence of the armed group. Another concern with this approach is that village leaders were not asked to report which armed group is present in their village. There are several other armed groups active in the country, including organized crime groups and the leftist ELN, which was not part of the peace process. If village leaders mistake members of any of these groups for FARC guerrillas, the exposure variable may be mismeasured. We explore this possibility in appendix A, where table A.1 shows that ELN activity is not common in FARC controlled areas, this is true for the ELCA sample and the population sample. To show this fact explicitly, Appendix A.2 shows maps of violent activity of ELN and organized crime groups. The maps show that ELN was not active in the villages sampled in the ELCA survey, and organized crime only had a weak presence in some villages sampled in the north of the country. These results suggest that it is unlikely that our results are affected by large-scale misidentification of armed groups by village leaders.

We use two village-level measures of violent activity derived from the ELCA survey. The first is an indicator variable for whether the village leader reported murders in the village in the previous year.[4] The second is an indicator for whether the village leader reported extortion and kidnappings in the village in the previous year.[5] The villages in our sample are small, with an average population of around two thousand, suggesting that murders and kidnappings are likely rare events about which the village leaders would be well-informed

[4]The question asks "During the last year, were murders and killings part of the village problems?"
[5]The question asks "During the last year, were extorsions and kidnappings part of the village problems?"

3.2 Investment

Our primary outcome of interest is investment by households in their farm. Specifically, we use a household's total farm investment in the last 3 years. To ensure that our results are robust to functional form assumptions, we present two types of regressions: ones that use the level of investment (in pesos) as the outcome, and ones that use an Inverse Hyperbolic Sine Transformation (IHS) of investment. IHS transformation has two important advantages: (1) The transformation allows us to interpret the regression coefficient as a percentage change, similar to logarithmic transformation (2) IHS transformation mitigates the effect of outliers without sacrificing observations of value 0.

We also explore the type of investment by considering the proportion of land that households dedicate to perennial and annual crops.[6] Perennial crops involve significant initial investment and often do not produce in the first year. In Colombia, these are largely tree-based crops such as banana, coffee, and oil palm, as well as sugarcane. Conversely, annual crops produce within a single season, and in Colombia include maize and horticultural row crops.[7]

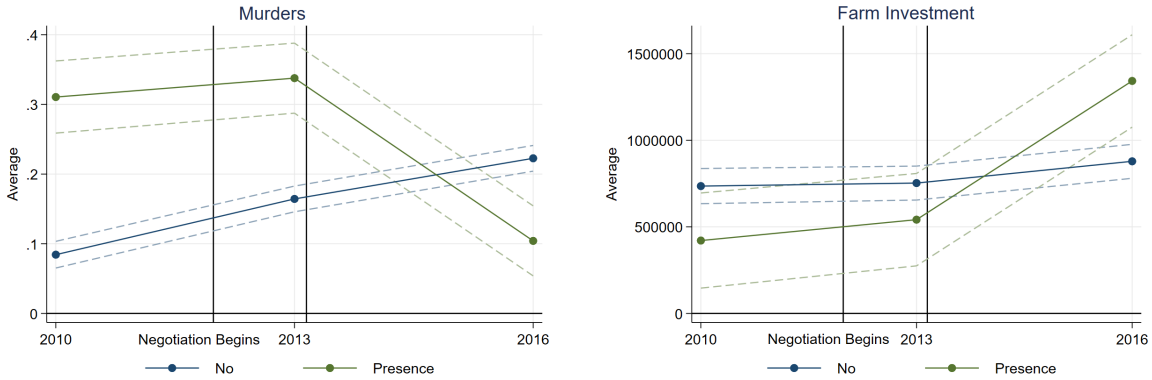
4 Descriptive Statistics

We begin by showing that the peace process had an effect on village-level violence. The left panel of Figure 1 plots the time-trend of the probability that a village had a murder in villages with and without FARC presence at baseline. The graph shows that violence decreased in FARC-affected areas after 2013, consistent with the timing of the bilateral ceasefire that began in 2014. The right panel of Figure 1 plots the average level of investment in villages with/without baseline FARC presence. Notably, investment in the two groups of villages followed parallel trends between 2010 and 2013. After the ceasefire, investment increased substantially in FARC-affected villages, consistent with a positive effect of peace on investment.

[6] To avoid extreme outliers in our sample we use a winsorized transformation of 1% in the upper tail of the distribution for variables related to investment such as: Level of Investment, farm's size and different use of lands in levels

[7] The survey also elicits the area "mixed" land, used to simultaneously grow perennial and annual crops. We count this area as part of the annual crop since it allows for an annual harvest

Figure 1. Violence and Investment Trends



Notes: The left graph shows the trend in villages with historic presence (Treatment) and villages with no historic presence and no neighbors with presence(No-Control Group) of the average of a dummy variable that accounts for murders in the villages. The right graph shows the level of investment in Colombian pesos.

We next present summary statistics of household, farm, and village characteristics in the treatment and comparison groups. We expect the groups to be different at baseline if their characteristics are affected by the presence of the armed group. Thus we also compare the groups at endline in 2016, when the conflict constraint is removed and we would expect them to be more similar.

The results of these comparisons are shown in Table 1 compares the characteristics of treatment and comparison group in the baseline years (2010 and 2013), before the peace agreement, and the difference after the peace agreement (2016). Tests for balance suggest that households in both groups had similar levels of wealth[8] and consumption in initial years. However, treatment households had lower dietary diversity and larger household size. The second panel of Table 1 reports the difference in farm characteristics. Tests show that farms in the treatment group had significantly less investment, They also had more land allocated to short term and permanent crops, and less land to pasture and fallow areas. Farms in the two groups are of approximately equal size and have similar tenancy arrangements.

Finally, we compare characteristics associated with exposure to conflict. Balance tests in the third panel of table 1 show that villages in the treatment group have a higher likelihood of experiencing murders (17 pp higher, significant at p<5%) and kidnappings (15 pp higher, significant at p<10%). These findings confirm that the treatment assignment correctly classified groups into villages with higher and lower exposure to conflict.

[8]Wealth in this paper is calculated with a index created by ELCA that assigns a standardized score based on the value of the household's asset

Note that the baseline differences in household and farm characteristics between the groups may simply reflect an effect of the conflict environment. For example, FARC-affected households may have a greater risk of land expropriation and thus invest less and favor a different crop portfolio. In order to assess whether the groups are different with respect to longer-term characteristics other than the effect of conflict, we also compare their characteristics in 2016, after the ceasefire had taken effect.

Column (6) in table 1 shows that the differences between the groups are indeed substantially smaller after the end of conflict. The differences in dietary diversity and household size are smaller and no longer statistically significant. The same is true for the difference in murders and kidnappings, which suggests that the peace agreement substantially reduced conflict exposure in the FARC-affected villages. The difference in farm investment is still statistically significant but now has the opposite sign - farms in previously FARC-affected villages show more investment than farms in unaffected villages. This is consistent with a catch-up effect in which farmers try to quickly increase their capital stock once the conflict constraint has been removed.

The only remaining differences are in pasture and permanent crops, suggesting some differences in the long-term agricultural environment. These differences could affect our estimates if farms with different levels of these variables are on non-parallel time trends or subject to different unobservable shocks. We address this concern in two ways in the next section. First, we show that the treatment and comparison groups were on parallel time trends with respect to farm investment in the pre-treatment period (between 2010 and 2013). Second, we conduct regressions that control for the interaction between time fixed effects and a wide range of observed baseline characteristics. These regressions allow for unobserved time-varying shocks that are correlated with baseline characteristics. This approach does not substantially change our estimates of the effect of the peace agreement on farm investment, which suggests that this type of unobserved shock is not a major source of bias in our analysis.

Table 1. Balance Table

	Balance Analysis 2010 & 2013			Balance Analysis 2016		
	(1) Control	(2) FARC	(3) FARC v Control	(4) Control	(5) FARC	(6) FARC v Control
Household Characteristics						
Monthly Consumption	415	448	33	575	538	-36
	(355)	(375)	(29)	(406)	(332)	(36)
Wealth Measure (Assets)	-0.16	-0.46	-0.30	0.18	-0.04	-0.22
	(2.52)	(1.83)	(0.21)	(1.50)	(1.33)	(0.20)
Dietary Diversity Index (DDI)	0.67	0.64	-0.03	0.69	0.68	-0.01
	(0.15)	(0.16)	(0.02)	(0.15)	(0.15)	(0.02)
Household's Size	4.56	5.25	0.69**	4.13	4.37	0.23
	(1.91)	(2.27)	(0.24)	(1.86)	(2.14)	(0.23)
Farm Characteristics						
Investment on Farm (Pesos)	802	512	-290**	1,063	1,677	614**
	(2,244)	(1,688)	(117)	(3,003)	(3,701)	(290)
Farm's Size	2.89	2.86	-0.2	3.13	2.83	-0.30
	(4.32)	(5.04)	(0.36)	(4.86)	(4.81)	(0.51)
Permanent Crops (% of Farm's Size)	0.15	0.26	0.11**	0.18	0.42	0.24***
	(0.27)	(0.32)	(0.03)	(0.30)	(0.38)	(0.06)
Short Term Crops (% of Farm's Size)	0.23	0.37	0.15***	0.16	0.18	0.02
	(0.36)	(0.38)	(0.05)	(0.27)	(0.32)	(0.03)
Pasture (% of Farm's Size)	0.33	0.08	-0.24***	0.36	0.04	-0.31***
	(0.38)	(0.20)	(0.03)	(0.38)	(0.15)	(0.03)
Fallow Land (% of Farm's Size)	0.15	0.10	-0.05*	0.18	0.16	-0.02
	(0.61)	(0.19)	(0.03)	(0.30)	(0.26)	(0.02)
Ownership	0.74	0.71	-0.03	0.80	0.85	0.05
	(0.44)	(0.45)	(0.04)	(0.40)	(0.36)	(0.04)
Leasing	0.27	0.29	0.02	0.30	0.23	-0.07
	(0.44)	(0.46)	(0.05)	(0.46)	(0.42)	(0.05)
Illegal	0.12	0.10	-0.02	0.04	0.05	0.01
	(0.33)	(0.30)	(0.02)	(0.19)	(0.22)	(0.018)
Village Characteristics and Violence						
Murders	0.13	0.30	0.17**	0.22	0.11	-0.11
	(0.33)	(0.46)	(0.08)	(0.42)	(0.31)	(0.08)
Kidnappings	0.02	0.17	0.15*	0.18	0.16	-0.02
	(0.13)	(0.38)	(0.08)	(0.39)	(0.37)	(0.09)
Bad Infrastructure	0.69	0.74	0.05	0.69	0.61	-0.07
	(0.46)	(0.44)	(0.11)	(0.46)	(0.49)	(0.13)
Observations	2,850	259	3,109	1,499	187	1,686

Notes: Column (1) shows the average of the control group for the periods 2010 and 2013. Columns (2) showcases the average of the treated group. Column (3) shows the difference between the two groups. Columns (4), (5) & (6) repeat the analysis of the first three columns with the sample of the 2016 survey. The variables murders, kidnappings and bad infrastructure are dummy variables in village level. The variables monthly consumption and investment on farm are in thousands. Standard errors are clustered at the village level. The p value significance is shown as: *** 0.01, **0.05 , *0.1.

5 Empirical Strategy and Results

We estimate the effect of the end of conflict with the FARC in a difference-in-differences setting that compares villages with and without baseline FARC presence, before and after the peace agreement. Specifically, we estimate equation (1):

$$Y_{vit} = \alpha + \beta_2 FARC_v \times POST_t + \beta_3 H_i \times POST_t + \theta_i + \gamma_t + \epsilon_{vit} \quad (1)$$

where Y_{vit} is the outcome of interest, and $Post_t$ represents the post-treatment period 2016. The indicator variable $FARC_v$ takes the value of 1 if the individual was in a village where the FARC was present in at least one year between 2006 and 2010. The vector H_i represents household characteristics in the pre-treatment year 2010. Last, θ_i is a household fixed effect, γ_t is a time fixed effect, and standard errors are clustered at the village level.

The coefficient of interest is β_2, which captures the effect of the peace under the assumptions of the difference-in-differences estimator. We begin by estimating the direct effect of FARC presence in a village by comparing villages with FARC presence (the treatment group) to villages in municipalities where no village had FARC presence (the pure comparison group). This sample restriction allows us to avoid spillover effects from FARC presence in nearby villages, which we explicitly estimate later in Section 6.

We first explore whether the peace process had a measurable effect on conflict violence. Table 2 shows estimates of the difference-in-difference regression in Equation 1 using indicators of murders and kidnappings in the village as the outcome. Column 1 shows that villages in previously FARC-affected areas experienced a substantial decrease in the probability of a murder between 2013 and 2016, relative to villages with no FARC presence. The estimated 25 pp decrease in the probability of experiencing murders is large and statistically significant. The table also shows that the peace process led to a 18 pp reduction in the probability of kidnappings, though this estimate is not statistically significant at conventional levels. These estimates confirm the results of previous studies showing that the peace process led to a large reduction in conflict with the FARC after the implementation of the 2014 ceasefire (CERAC, 2016).

Table 2. Violence Change

	(1) Murders	(2) Kidnappings
FARC * POST	-0.25**	-0.18
	(0.11)	(0.12)
POST	0.61	0.13
	(0.54)	(0.32)
Constant	-0.09	-0.19
	(0.22)	(0.12)
Control Mean	0.13	0.02
Households (Observations)	4795	4795
Villages	130	130
R^2	0.400	0.461
Adjusted R^2	0.382	0.445

Notes: Columns (1) & (2) show the effect of treatment interacted with the post-period on the probability to experience murder and kidnappings in the villages. All the estimates include households fixed effects, controls of the logarithm of consumption, the wealth and the number of people per household at baseline interacted with the fixed effect of time. Standard errors are clustered at village level. The p value significance is shown like: *** 0.01, **0.05 , *0.1.

We next estimate the effect of the peace process on farm investment. Table 3 presents estimates of equation 1 using farm investment as the outcome. Columns 1-3 use the inverse hyperbolic sine transformation of investment while columns 4-6 use the level of investment. The estimates show that households in FARC-affected villages dramatically increased their farm investment between 2013 and 2016, relative to households in unaffected villages. The point estimates in the IHS transformed regressions in columns 1-3 suggest that the increase in investment made by FARC-affected households was approximately two fold larger than the increase made by unaffected ones. The estimates in the untransformed regressions in columns 4-6 show an increase between approximately COP 926,000 and COP 985,000, depending on the specification, which corresponds to between USD 416 USD and USD 422 [9]. This corresponds to a doubling of investment relative to the comparison group mean. Moreover, this increase in investment represents an important fraction of household wealth, accounting for 19% of annual household consumption(COP 411,000 X 12). The estimates are robust to controlling for the interaction between baseline household characteristics and time fixed effects, as well as the interaction between village-level infrastructure characteristics and time fixed effects. The results in table 3 suggest that FARC was not seen as an institution that protects property rights but that its presence acts as a threat to ownership and the ability to reap the profits from investment.

[9]The main estimates are done with nominal values. The use of IHS transformation and the inclusion of the time fixed effect mitigate bias by inflation. However, we tested the same estimates with deflated values in appendix E. We did not find any difference

Only 58% of households registered a positive farm investment in one of the two rounds of 2013 and 2016, which means that approximately 42% of the sample did not make any farm investment over 6 years. One question is whether the observed growth in investment is largely driven by increases at intensive or extensive margin. We explore this hypothesis in the appendix B, where we show evidence for both extensive and intensive margin effects. We also explore in appendix B the effect of zeros, using a tobit regression to estimate equation 1 to account for high volumes of zeros in the outcome.

One might be concerned that these results are only driven by large or wealthy farms that can easily make these investments now that the constraints imposed by conflict are lifted. To explore this, we estimate how the effect varies by farm size in appendix B.2. Table B.2.1 shows that farmers with bigger farms increased investment more than small farms. However, small farms also increased investment substantially.

Table 3. Investment on Farm

	IHS Transformation Investment on Farm			Levels (Thousands) Investment on Farm		
	(1)	(2)	(3)	(4)	(5)	(6)
FARC * POST	1.85***	2.14***	2.19***	926**	931**	985.21**
	(0.56)	(0.54)	(0.53)	(383)	(377)	(351)
POST	-0.30**	3.44	3.61	285**	-2453	-2643
	(0.14)	(3.22)	(3.20)	(115)	(2466)	(2502)
Constant	2.67***	3.16***	3.15***	765***	794***	793***
	(0.05)	(0.13)	(0.13)	(39)	(57)	(58)
Control Mean Investment	796	796	796	796	796	796
Difference at Baseline	308	308	308	308	308	308
Baseline HH controls X Time FE	No	Yes	Yes	No	Yes	Yes
Baseline Infrastructure Controls X Time FE	No	No	Yes	No	No	Yes
HH-year (Observations)	4689	4689	4689	4689	4689	4689
Villages	130	130	130	130	130	130

Notes: In columns (1), (2), and (3), the left-hand side variable is the inverse hypoerbolic sine transformation of farm investment in 1,000s of pesos. In columns (4), (5), and (6), the left-hand side variable is the level of farm investment in 1,000s of pesos. Household controls are: logarithm of consumption, wealth of the household and number of people per household. Infrastructure controls are: household's travel time to village center, and an indicator for whether roads in the village are in bad condition. All regressions include household and time fixed effects. Standard errors are clustered at village level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

5.1 Robustness Tests

We conduct several robustness tests for the identifying assumption of the difference-in-differences model in Table 4. As discussed above, the most restrictive specifications in that table control for the interactions between time fixed effects and a wide range of observed baseline characteristics, including household size, consumption, wealth, and market access (road conditions and distance from village center). These specifications allow for unobserved time-varying shocks that are correlated with the observed baseline characteristics. As stated above, this approach does not substantially change our estimates of the effect of the peace agreement, which suggests that this type of unobserved shock is not a major source of bias in our analysis.

We also directly test for parallel trends in the pre-treatment period by estimating the following equation:

$$Y_{it} = \alpha + \beta_2 FARC_i \times POST_t + \beta_3 Y2013_t \times FARC_i + \beta_4 H_i \times POST_t + \theta_i + \gamma_t + \epsilon_{it} \quad (2)$$

The results of this test are presented in Table 4. The estimates show no statistical evidence that treatment and comparison groups were on non-parallel trends in the pre-treatment period. The point estimate of β_3 suggests a relative upward trend in investment in the treatment group, but this estimate is not statistically significant once we control for the interaction between time fixed effects and baseline characteristics.

Next, we check whether our estimates were affected by either the expansion of coca production or government programs. UNODC (2020) showed that the number of hectares dedicated to coca production increased dramatically during the period of observation. Mejia et al. (2019) show that this increase is partly due to anticipated payments from a coca reduction program that was part of the peace agreement. If farmers in FARC-affected areas invested in coca production to get access to payments from this program, this could affect our estimates. However, this is unlikely to be the case since none of the villages in our sample reported coca production at any point during the period of observation. Appendix A.2.1 confirms this finding with satellite data that identify coca production areas from the UNODC for the period between 2010 and 2016.

A related concern is that our estimates may partly reflect government support to the agricultural sector, instead of the peace accord *per se*. As part of the peace agreement, the national

government promised to develop a National Plan to create a "New Rural Colombia" by investing in rural areas (Mesa de Conversaciones, 2018). Specifically, the final document included provisions for providing public infrastructure, subsidies and loans, as well as technical support to rural areas. However, as noted above in Section 3.1, the investment promised in the agreement was delayed for several years after the agreement took effect – none of the programs for rural investment had been initiated by 2017, and only limited investment had occurred by 2020 (KROC, 2017, 2021). It is therefore unlikely that the estimates above reflect an effect of public investment programs.

Still, we explore this issue by estimating regressions that control for an indicator for whether farmers receive any subsidy or support from the government. The results, shown in columns (1) to (3) of Table 5, show that the inclusion of this control variable does not substantially affect our estimates. We also test if the peace process increased the probability of receiving any aid from the government, by estimating the model described by Equation 1 with indicators for receiving government support as outcomes. The outcome in column (4) of Table 5 is the same indicator for receiving any government support that we used as a control variable in columns 1-3. The outcomes in columns (5) and (6) are indicators for two of the main agricultural programs in the country at the time: 'Restitucion de tierras', and 'ley de victimas'. The results do not provide evidence that access to government programs between 2013 and 2016 was systematically targeted to those areas that were affected by the FARC . Taken together, the results of these robustness tests suggest that it is unlikely that an expansion of government programs to FARC-affected areas is a major source of bias in our analysis.

Table 4. Robustness Test for Parallel Trends

	IHS Transformation Investment on Farm		
	(1)	(2)	(3)
FARC * POST	2.77***	2.61***	2.89***
	(0.55)	(0.54)	(0.41)
POST	0.32	2.07	1.64
	(0.23)	(3.07)	(3.01)
FARC * Y2013$_t$	0.80*	0.58	0.87
	(0.46)	(0.57)	(0.57)
Y2013$_t$	1.10***	-1.39	-1.99
	(0.30)	(3.77)	(3.69)
Constant	1.98***	1.99***	1.98***
	(0.16)	(0.16)	(0.16)
Control Mean Investment	796	796	796
Difference at Baseline	308	308	308
Baseline HH controls X Time FE	No	Yes	Yes
Baseline Infrastructure Controls X Time FE	No	No	Yes
HH-year (Observations)	4689	4689	4689
Villages	130	130	130

Notes: In columns (1), (2), and (3), the left-hand side variable is the inverse hypoerbolic sine transformation of farm investment in 1,000s of pesos. Household controls are: logarithm of consumption, wealth of the household and number of people per household. Infrastructure controls are: household's travel time to village center, and an indicator for whether roads in the village are in bad condition. All regressions include household and time fixed effects. Standard errors are clustered at village level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Table 5. Robustness Test for Effect of Government Support

	IHS Transformation Investment on Farm			Support Programs		
	(1)	(2)	(3)	(4) Any Support	(5) R. Tierras	(6) L. Victimas
FARC * POST	2.14***	2.15***	2.19***	-0.03	0.001	0.003
	(0.53)	(0.53)	(0.53)	(0.06)	(0.001)	(0.002)
POST	-0.80***	3.47	3.63	0.04	0.02	0.00
	(0.18)	(3.20)	(3.18)	(0.27)	(0.01)	(0.01)
Government Support	0.27	0.30	0.29			
	(0.22)	(0.23)	(0.23)			
Constant	2.98***	2.97***	2.97***	0.63***	0.00**	0.00***
	(0.21)	(0.22)	(0.22)	(0.01)	(0.00)	(0.00)
Baseline HH controls X Time FE	No	Yes	Yes	No	Yes	Yes
Baseline Infrastructure Controls X Time FE	No	No	Yes	No	No	Yes
HH-Year (Observations)	4689	4689	4689	4789	4789	4789

Notes: In columns (1), (2), and (3), the left-hand side variable is the inverse hypoerbolic sine transformation of farm investment in 1,000s of pesos. In columns (4), (5), and (6), show probability to receive any support, probability to receive support from "ley de tierras" and probability to receive support from "Ley de Victimas". Household controls are: logarithm of consumption, wealth of the household and number of people per household. Infrastructure controls are: household's travel time to village center, and an indicator for whether roads in the village are in bad condition. All regressions include household and time fixed effects. Standard errors are clustered at village level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

5.2 Crop Mix and Consumption Decisions

We next explore how the peace agreement changed farmers' crop mix – in particular their decision to plant annual versus perennial crops. Panel A of Table 6 reports estimates of Equation 1 using the proportion of area allocated to different crops as the outcome. We find that farmers

in FARC-affected villages increased the area dedicated to perennial crops by 16 percentage points as a result of the peace process. At the same time, they decreased the area dedicated to short term crops by 17 percentage points. We also find a decrease in the area dedicated to pasture by 4 %. All of these estimates are statistically significant at the 5 percentage points level. We find no statistically significant evidence that the peace process affected the total area of productive land. Panel B shows that we also find no evidence that the peace process affected farm size, forest cover or fallow land area.

Overall, our results suggest that the peace process allowed households in previously FARC-affected areas to increase the time-horizon of their crop portfolios, exchanging short-term investments in annual crops for higher risk but potentially more profitable investments in permanent crops. These changes are sizable given that they represent almost 1/5 of the farm on average. This suggests that the peace process caused a large change in farmers' perception of the investment environment, leading them to allocate a substantial share of their assets to a longer-term investment strategy. Furthermore, the unchanged allocations to fallow land and forests suggest that the peace process did not increase land clearing and associated deforestation.

Table 7 explores the effect of the peace on household consumption. We find no evidence that the peace process affected total consumption, food consumption, or wealth, as measured by a standardized index of the value of the assets the household has. Our estimates suggest that households were able to increase investment without sacrificing consumption, which suggests that they were not credit constrained.

Table 8 shows how the peace process affected savings and debt. Column (1) shows that the peace did not affect the savings of the households. Column (2) shows that FARC-affected households increased their debt-levels by almost 2 fold as a result of the peace process; this estimate is statistically significant at 5 percentage points. Moreover, we also test the importance of these changes in the economy of the households using two ratios, savings/consumption and investment/consumption. Columns (3) and (4) show that the ratio of savings to consumption did not change with the peace accord but the ratio of debt to consumption increased by more than 4 fold. These results are consistent with the hypothesis that farmers were able to finance new investments by taking on more debt, suggesting that they were not credit constrained after the peace accord. Using the same approach as in table 5, we show in appendix C that none of these results come from an increase in government subsidies to previously FARC-affected areas.

One possible concern about the increase in debt is that the banks might have reduced

constraints on lending to larger commercial farmers more than smaller farms with less equity. We test this hypotheses in the appendix B. We find that the two main sources of debt are banks and supplier's debt. However, farm size does not have any effect on the probability of receiving a loan.

Table 6. Investment Decision

Panel A: Productive Land Use	(1) Perennial Crops	(2) Short Term	(3) Pasture	(4) Cultivated + Pasture
FARC * POST	0.16**	-0.17***	-0.045**	-0.049
	(0.073)	(0.063)	(0.020)	(0.041)
POST	0.268	0.200	-0.309	0.160
	(0.223)	(0.287)	(0.279)	(0.335)
Constant	0.162***	0.214***	0.330***	0.706***
	(0.008)	(0.012)	(0.007)	(0.011)
Control Mean	0.15	0.23	0.33	0.71
HH-Year (Observations)	4427	4427	4427	4427
Panel B: Increase of Land Use	(1) Farm's Size	(2) Forest	(3) Land Not Used	(4) Fallow Land
FARC * POST	-0.209	0.008	0.038	0.051
	(0.402)	(0.009)	(0.039)	(0.040)
POST	0.690	-0.084	-0.109	-0.137
	(2.627)	(0.126)	(0.274)	(0.284)
Constant	3.025***	0.041***	0.120***	0.164***
	(0.082)	(0.003)	(0.011)	(0.012)
Control Mean	2.89	0.04	0.11	0.16
HH-Year (Observations)	4689	4427	4427	4427

Notes: Panel A showcases the effect of the treatment interacted with the post-period on the size of different land use as a percentage of the farm. Short term accounts for mixed crops and annual crops. Pasture presents the area dedicated to livestock and pasture. Cultivated + pasture accounts for the sum of perennial, short and pasture land. Panel B depicts the effect of the treatment interacted with post-period on multiple use of land as a percentage of Farm's Size except for column (1), which shows the variable at levels. Fallow land accounts for the sum of forest and land not used. Household controls are: logarithm of consumption, wealth of the household and number of people per household. All regressions include household and time fixed effects. Standard errors are clustered at village level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Table 7. Effect on Household Consumption

	(1) Consumption	(2) Food Consumption	(3) Welfare Index
FARC * POST	-0.10	-0.08	-0.06
	(0.06)	(0.06)	(0.14)
POST	8.33***	5.89***	-2.29***
	(0.51)	(0.58)	(0.74)
Constant	12.80***	12.26***	-0.20***
	(0.02)	(0.02)	(0.05)
Control Means	411,603	239,724	-0.16
HH-Year (Observations)	4793	4793	4795

Notes: Columns (1), (2) & (3) accounts for the effect of the treatment interacted with post-period on logarithm of consumption, logarithm of food consumption and the Welfare index respectively. Household controls are: logarithm of consumption, wealth of the household and number of people per household. All regressions include household and time fixed effects. Standard errors are clustered at village level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Table 8. Effect on Savings and Debt

	IHS Transformation		As Percentage of Total Consumption	
	(1) Savings	(2) Debt	(3) Savings	(4) Debt
FARC * POST	-0.13	1.86**	0.34	4.65***
	(0.51)	(0.80)	(0.29)	(1.63)
POST	-1.08	4.24	-0.36**	-29.59**
	(3.66)	(5.54)	(0.16)	(11.45)
Constant	-0.60	-20.15***	5.53**	13.28
	(3.55)	(4.35)	(2.66)	(8.04)
Control Mean	17.8	2,777.9	1.64	6.64
HH-Year (Observations)	4795	4795	4793	4793

Notes: Columns (1) & (2) accounts for the effect of the treatment interacted with post-period on the inverse hyperbolic transformation of savings and debt respectively. Columns (3) & (4) show the effect of the treatment on the percentage of total savings and total debt on the monthly consumption. Household controls are: logarithm of consumption, wealth of the household and number of people per household. All regressions include household and time fixed effects. Standard errors are clustered at village level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

6 Spillover Effects

We now analyze whether the peace agreement had spillover effects to areas near FARC-affected villages but that had no direct FARC presence themselves. This analysis ties into the literature on spillover effects of conflict (De Groot, 2010, Murdoch and Sandlre, 2002, Bloem, 2019).

In our context, it is possible that places without direct FARC presence experienced weaker governance by rebels and less imposition of rules and economic activities. The demobilization of the FARC may therefore have had less impact on these areas than on those with direct FARC presence. However, FARC activities such as killings, kidnappings and extortion were not limited to locations under direct FARC control, but often spilled over to neighboring villages, which may have decreased their economic activity.

We estimate spillover effects with the following model, using the full sample of households covered by the ELCA :

$$Y_{it} = \alpha + \beta_2 FARC_i \times POST_t + \beta_3 NEIGH_i \times POST_t + \beta_4 H_i \times POST_t + \theta_i + \gamma_t + \epsilon_{it} \quad (3)$$

The variable $NEIGH_i$ is an indicator for villages that have no direct FARC presence but are located in a municipality where the FARC is present. We refer to this group as the "neighboring" villages and treat it as an indirect treatment group in our difference-in-differences approach. Descriptive statistics for this group, as well as comparisons between the group and the direct treatment and pure comparison groups are presented in Appendix D.

Estimates of the parameters β_1 and β_2 in Equation 3 are presented in Table 9. We find evidence that the peace process had substantial spillover effects. Column 2 shows that villages neighboring FARC-affected villages experienced a 19 percentage point decrease in the probability of kidnappings. This decrease is similar in magnitude to that experienced by the directly affected villages, and we cannot reject the hypothesis that both effects are equal. However, we find no evidence that the neighboring group experienced a decrease in murders, which contrasts with the large decrease experienced by the directly affected group. One possible explanation might be that kidnappings are more likely an income generating mechanism that more easily spills over to neighbouring areas compared to a direct enforcement mechanism like murders.

Column (3) of Table 9 shows evidence for positive spillovers on investment. Investment increased approximately 136 % in the neighboring villages. We cannot reject the hypothesis

that the investment effect is as large in neighboring villages as it is in directly FARC-affected villages. Column (4) shows that farmers in neighboring villages do not change their farm size, in line with our results for villages with direct FARC presence. Column (5) and (6) show that farmers in the neighboring villages also substantially increased the area allocated to permanent crops and decreased the area allocated to short term crops. Overall, these estimates suggest that conflict with the FARC had important spillover effects to nearby areas not under direct FARC control. The end of conflict made farmers in those areas substantially increase their farm investment and increase the time-horizon of their crop portfolios.[10] An extrapolation of our results in the 11 municipalities affected by conflict show that the increase of investment account for almost USD 1,004,400 in the villages directly affected by conflict and USD 6,575,816 in the neighboring villages.[11] Including the effect in the neighboring villages increases the estimates of the peace accord on investment more than 6-fold. Thus, we would substantially underestimate the effect of conflict if we only considered those areas with direct armed group presence.

Table 9. Spillover Effects

	(1) Murders	(2) Kidnappings	(3) Investment	(4) Farm's Size	(5) Perennial	(6) Short
FARC * POST	-0.25**	-0.19	2.08***	-0.18	0.16***	-0.17***
	(0.11)	(0.12)	(0.44)	(0.33)	(0.05)	(0.05)
NEIGH * POST	-0.03	-0.19***	1.36***	-0.07	0.06***	-0.07***
	(0.07)	(0.05)	(0.24)	(0.15)	(0.02)	(0.02)
POST	0.62	0.38	0.15	0.45	-0.15	0.39**
	(0.39)	(0.26)	(2.43)	(1.87)	(0.18)	(0.18)
Constant	-0.04	-0.08	-7.56***	-12.77***	0.28**	0.09
	(0.20)	(0.12)	(1.90)	(2.80)	(0.12)	(0.15)
Control Mean	0.13	0.02	796	2.89	0.15	0.23
Difference	-0.22**	0.00	0.72	-0.11	0.10*	-0.10*
	(0.11)	(0.12)	(0.48)	(0.33)	(0.05)	(0.05)
HH-Year (Observations)	7351	7351	7126	7126	6727	6727
Villages	201	201	201	201	201	201

Notes: Columns (1) & (2) show the effect of both treatments interacted with the post-period on the probability to experience murder and kidnappings in the villages.Columns (3) & (4) show the effect of both treatments interacted with the post-period on the inverse hyperbolic sine transformation of investment on farm in the last three years and farm's size in levels. Column (5) showcases the effect of both treatment interacted with the post-period on the size of the land dedicated to perennial crops as percentage of the farm's size. Household controls are: logarithm of consumption, wealth of the household and number of people per household. All regressions include household and time fixed effects. Standard errors are clustered at village level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

[10] Appendix D.2 tests the parallel trend assumption for the spillover analysis. We find no statistically significant difference in pre-treatment trends between areas with FARC presence, neighboring areas, and comparisonl areas.
[11] Calculations were made with the formula: $HH_s \times \%Agriculture \times \Delta Investment$, where HH_s accounts for the number of household in each village, $\%Agriculture$ is the proportion of households in our sample active in agriculture, which is 56% and $\Delta Investment$ is the effect of the peace agreement on investment, USD 767 for neighboring areas and USD 1,128 for FARC-Affected villages

7 Conclusion

This article uses data from a panel of rural households to evaluate the effect of the Colombian peace agreement on farm investment. To do this, we compare areas with and without prior FARC presence, before and after the peace agreement in a difference-in-differences design. Our estimates suggest that the peace agreement led to a substantial increase in farm investment. Farmers in previously FARC-affected villages increased their farm investment by almost 2 fold compared to farmers in villages without FARC presence. The investment was used to shift the farm's crop portfolio from annual crops to perennial crops. This finding is consistent with previous literature, where farmers usually do not invest in permanent crops in violent areas (Nillesen, 2007, Engel and Ibanez, 2007, Grun, 2003, Verpoorten, 2009, Arias et al., 2019). While the effect was greater for larger farms, increasing an additional 20% per hectare, the effect was also significant for smallholders.

We find no evidence that increased investment came at the expense of consumption. Households sustain their levels of dietary diversity, total consumption and food consumption, but substantially increased their debt levels, which suggests that they were not credit constrained. We also find evidence that the peace process had substantial spillover effects on villages near locations with armed groups. These neighboring villages saw a decrease in kidnappings and murders and experienced a 136% increase in farm investment with no decrease in consumption. Because there are many more neighboring communities than those who had direct armed group presence, this spillover effect is substantial, increasing our estimates of treatment by a factor of 6.5.

Overall, our results suggest that the end of conflict with an armed group can have large positive effects on investment by small farms. A possible explanation for the difference between our results and the earlier literature on investment by multinational firms is that conflict can affect investment through two offsetting channels: by increasing the risk of expropriation of assets such as land and output and by decreasing the state's capacity to regulate businesses. Small farms are less likely to benefit from the regulation channel, as they are less strongly regulated to begin with, but bear the full cost of insecure investment rights. Our results suggest that it is very unlikely that farmers perceive the armed group as a secure form of institutionality because households increase investment after the peace. Our results raise the possibility that the demobilization of armed groups can create a considerable peace dividend driven by local

small-scale investment.

In addition, Our results suggest that investment is an important channel through which armed conflict affects economic development, and points to investment as an important component of the peace dividend. We find strong evidence that peace is associated with perceived investment security, and gives smallholders confidence to make long-run investments.

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Appendix

Appendix A: Treatment and Control Robustness Tests

Appendix A.1: Treatment Comparison with the National Government Information

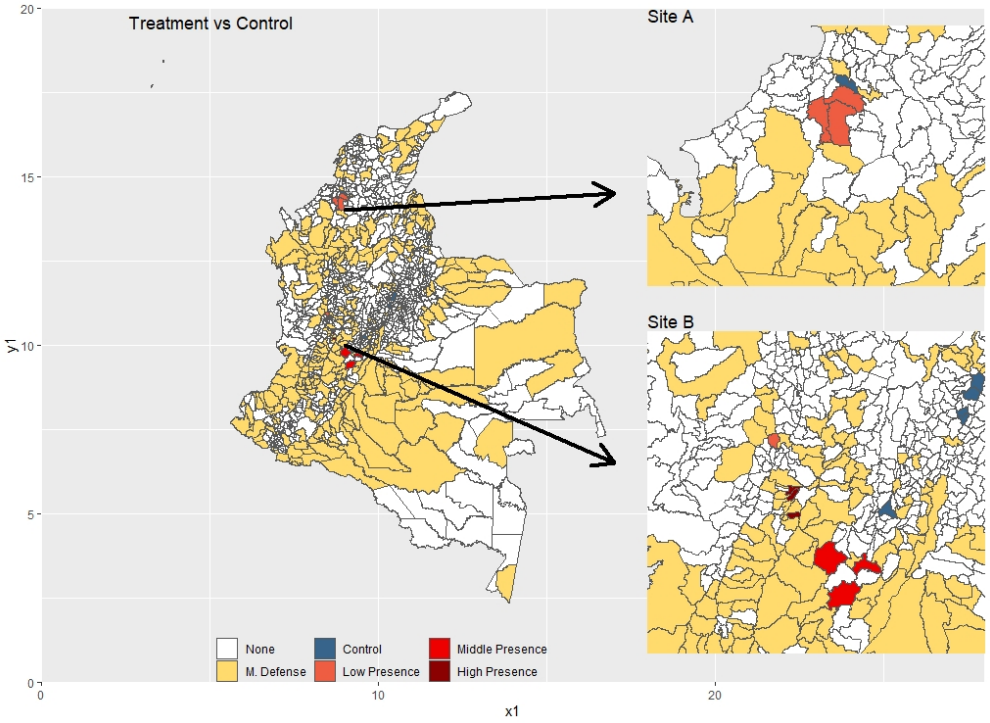
As ELCA protects the identity of the farmers sampled in the survey, we do not have access to the location of the sampled villages. However, we have access to the location of the sampled municipalities. Map A1 shows the location of the villages used in this research and the percentage of villages with armed group presence in each district.. The map shows that our control municipalities are located all over the map. There is one located in the north, one in the south, and most of them are in the middle of the country. The map also shows that the villages with historical presence of the armed group are located all over the map with greater prevalence of high presence in the south of the country. Map A1 also compares the presence reported in the survey with the calculation of FARC governance made by Colombia's ministry of defense. The graph shows that municipalities with a high proportion of villages that reported FARC presence are located in the middle of zones that the ministry of defense identifies as having high presence of FARC. This may suggest that the survey data are consistent with the data of the national government.

Furthermore, we visually validate the reduction of FARC presence in zones close to the surveyed villages to confirm that the event is valid for our empirical strategy. Maps A2 and A3 depict the intensity of FARC presence measured as the number of FARC members captured by the government against the non-state armed group. Map A2 shows that the whole country was affected by the FARC presence in 2010 and the villages sampled in ELCA were not an exception. Map A3 illustrates a reduction of FARC presence in the whole country after the peace accord. Villages sampled by ELCA were also affected by this reduction of presence registered by the ministry of defense as our data suggested in the survey. We also test this visual conclusion taking characteristics of the violence and the economic activity in different regions of Colombia. We compare the regions (provinces) of Colombia where our data suggests FARC presence against data from the Ministry of Defense that identifies regions that minister of Defense accounts with FARC activity [12]. The department of national statistics (DANE in Spanish) reports these data

[12] We classify regions with FARC activity as those that have any murder or capture registered by the minister of defense of Colombia

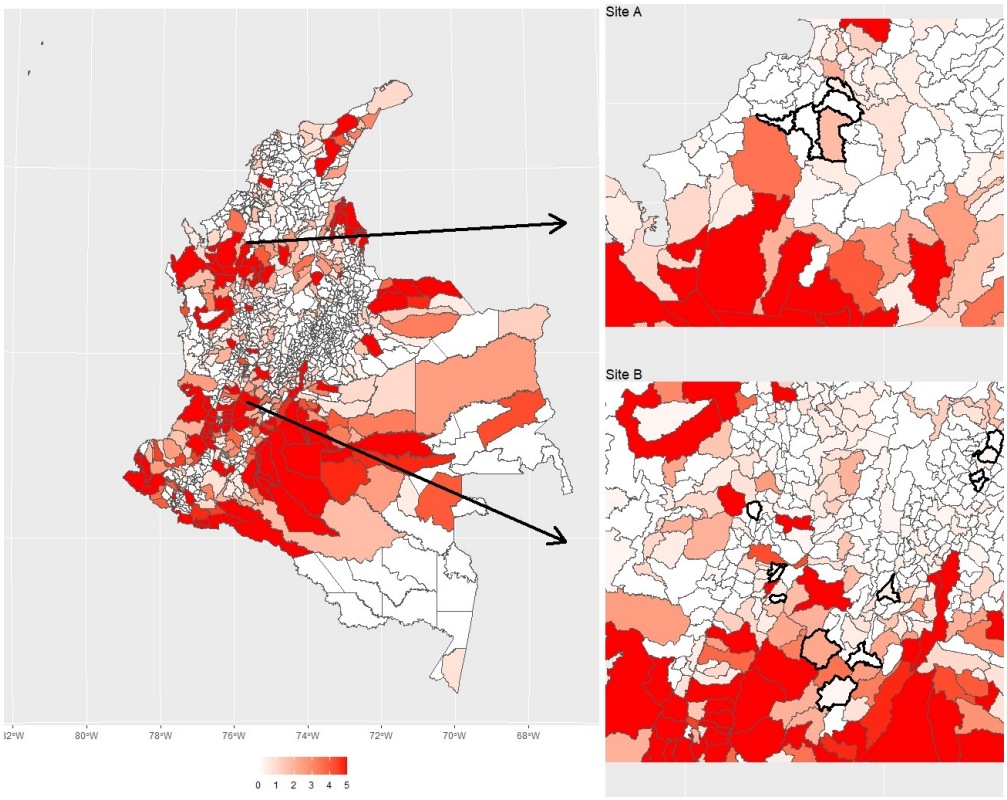
for 100 provinces that have on average 10 municipalities. We use the regional data from DANE in Table A.1 to prove that the regions that we classified as FARC controlled areas do not differ on average from those that are built with the public information. Panel A of table A.1 show that the regions are not statistically different in economic and violent variables. Moreover, in panel B of table A.1 we test if FARC controlled areas claculated with the minister of defence information differ statistically with the ones that we construct with the ELCA sample. The estimation shows that the regions with presence in the ELCA sample are 88% more likely to be classified as FARC controlled areas by the minister of defense index.

Map A.1 Location of the Villages



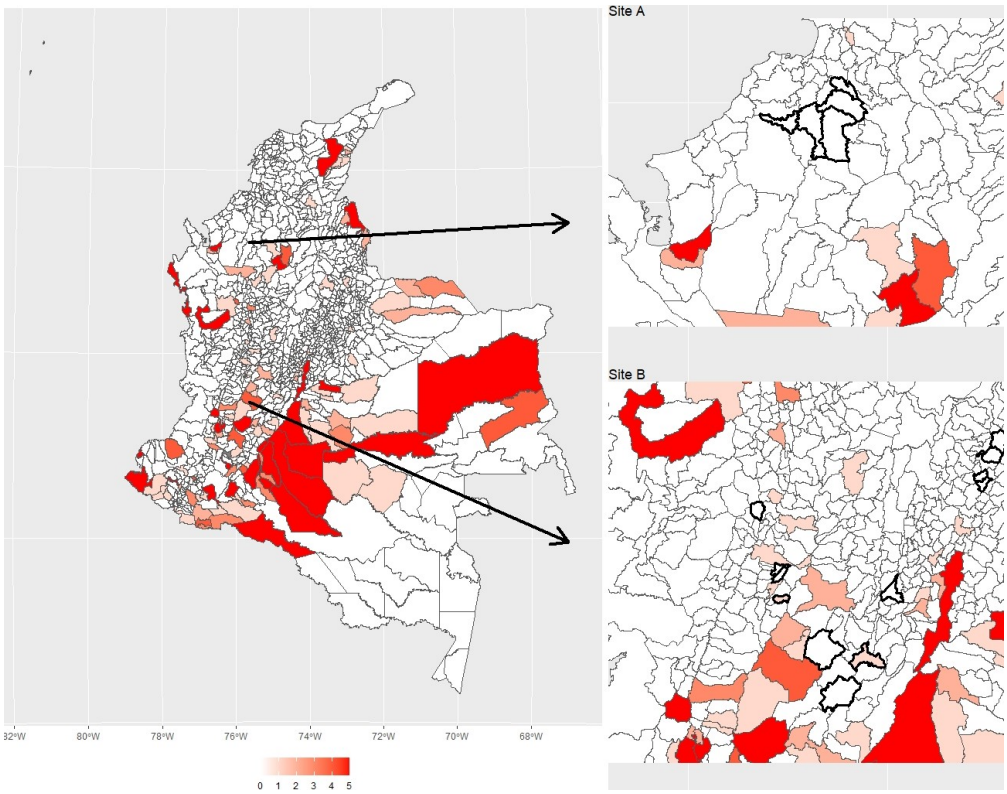
Notes: The yellow color represents areas that the ministry of defence classify as having some level of presence of the armed group in 2010. The colored districts that are not yellow are the ones used in this research. The blue color represents municipalities that have 0% of villages with reported presence, which means that they are the control group.The orange color showcase districts reporting to have 7% villages with presence or less within their territory. The red color represents districts that have between 8% and 21% villages with presence. The dark red color represents districts that have between 21% and 37% villages with presence.

Map A.2 FARC Captures before Cease-Fire (2010-2013)



Notes: The left map represents the intensity of the conflict in Colombia's map. The right maps illustrate the zoom areas in the north and south part of the country. The scale of intensity goes from 0 to 5 as maximum (all values greater than this number are classified as 5), where 0 is represented in white color and 5 in red color. The scale was calculated averaging FARC captures of the 4 years.

Map A.3 FARC Captures At the End of the Peace Process



Notes: The left map represents the intensity of the conflict in Colombia's map. The right maps illustrate the zoom areas in the north and south part of the country. The scale of intensity goes from 0 to 5 as maximum (all values greater than this number are classified as 5), where 0 is represented in white color and 5 in red color. The scale was calculated taking FARC captures on 2016.

Table A.1 Comparison of FARC controlled areas

Panel A: Average Comparison		
	ELCA Sample	Population
Murders and Captures FARC per 100,000	6.2	7.9
	(6.7)	(12.9)
Murders and Captures ELN per 100,000	0.1	0.3
	(0.2)	(1.0)
GDP Per Capita (COP)	6.7 M	7.3 M
	(2.1)	(3.82)
Ag. GDP Per Capita (COP)	2.13 M	1.81 M
	(1.44)	(1.46)
% Poverty	40.6 %	45.6 %
	(16.05)	(19.80)
Panel B: Regression of Presence		
	Presence of FARC Min. Defence	
	Regions	Municipalities
Presence FARC from ELCA	0.88***	0.46**
	(0.23)	(0.19)
Observations	12	17

Notes: Column (1) shows the average of the zones of Colombia in the ELCA sample classified as FARC-Controlled. Column (2) shows the average of the zones of Colombia in the population sample classified as FARC-Controlled. Both panels use the region sample which groups on average 10 municipalities. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

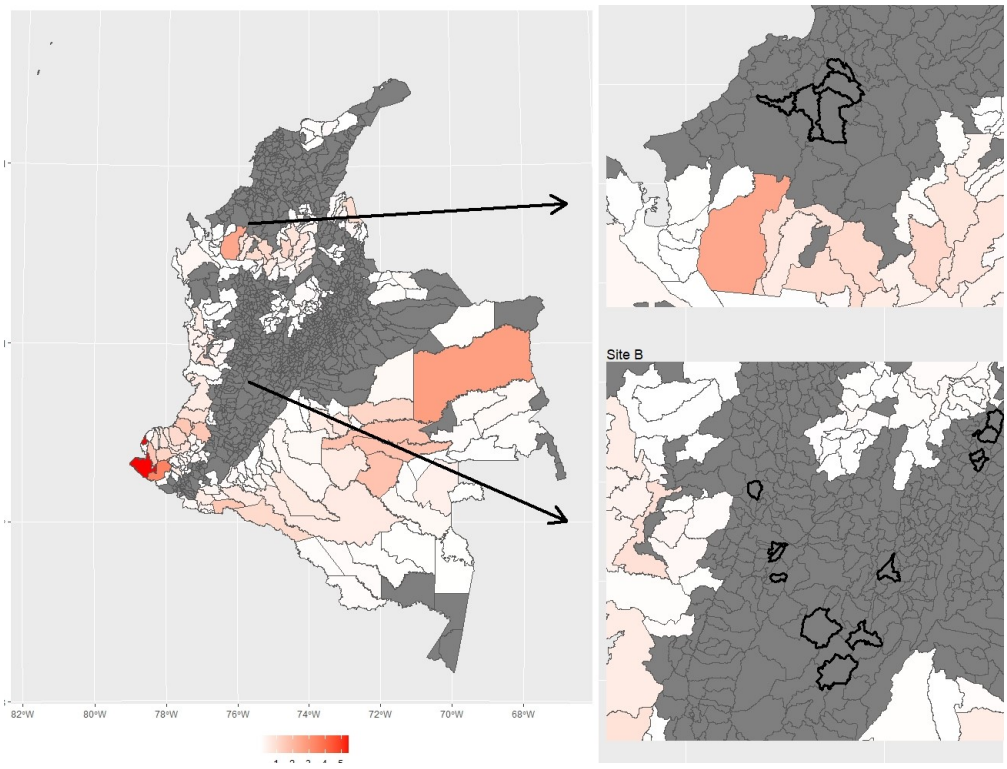
Appendix A.2: Misspecification of Treatment Robustness Test

This appendix includes figures that give insights from additional analysis of the effect of additional factors in the investment decision of farmers. An important influence in the agricultural market in Colombia is the coca production. The rents of this product are driving the investment decision of farmers for decades, where profits led firms to change legal for illegal products (Prem et al., 2018). We check in this appendix the effect of coca in the decision of the farmers with the UNODC satellite data of coca fields in Colombia. The map A.4 shows that villages that the survey sampled do not have illegal crops. These findings suggest that the villages are not influenced by coca production, which gives confidence to think that the decision of the farmers and the market is not influenced by the disruption of this product.

Moreover, the presence of other armed groups may influence the reduction of violence and the constraints that households face. Colombia faced the presence of another armed group during the war, the ELN (Ejercito de Liberacion Nacional). The map A.5 shows the captured members of ELN from 2010 to 2016. It looks that this group does not have any influence during the peace period in the villages studied for this article. Moreover, panel A of Table A.1 confirms that is not common to find ELN presence in FARC controlled areas.

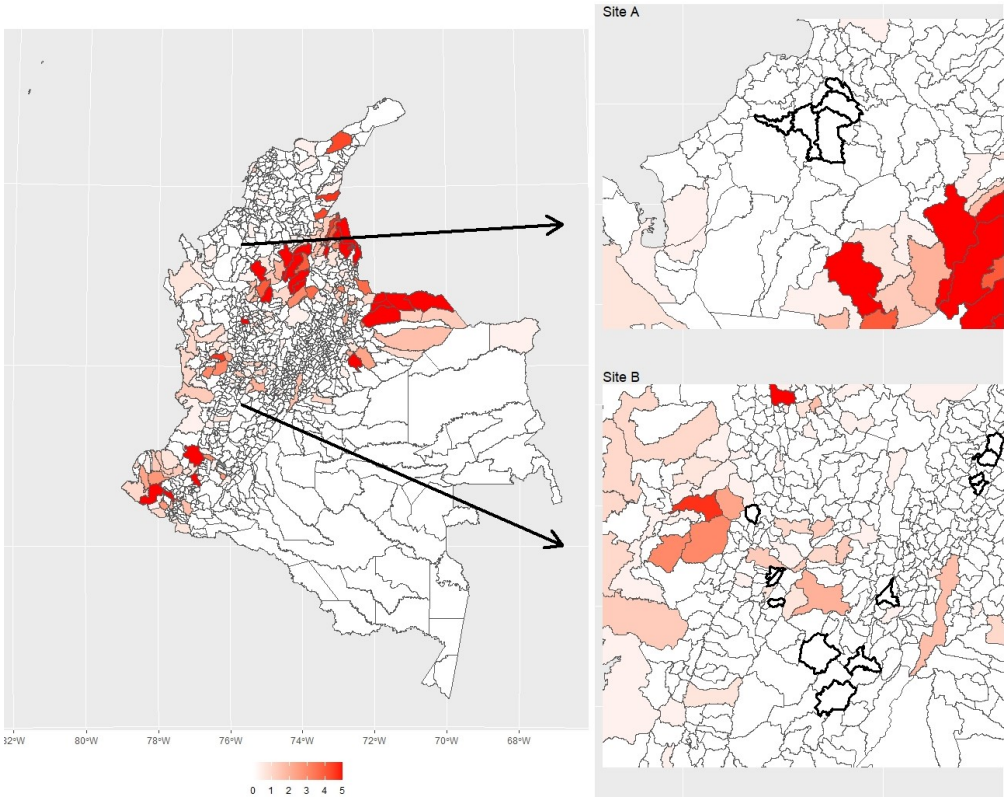
The other influence group in Colombia is organized crime. They are mostly located in the big cities or in the areas with production of coca. The map A.6 shows the incidents that organized crime had in Colombia from 2010 to 2016. It looks that they had some effect in the comparison groups in the north of the country. However, it appears that those groups are not having a significant influence in our results and the previous analysis in the main text showed that the violence increase in comparison groups is little compared with 2013 and it follows a well defined parallel trend.

Map A.4 Coca Production (2010 - 2016)



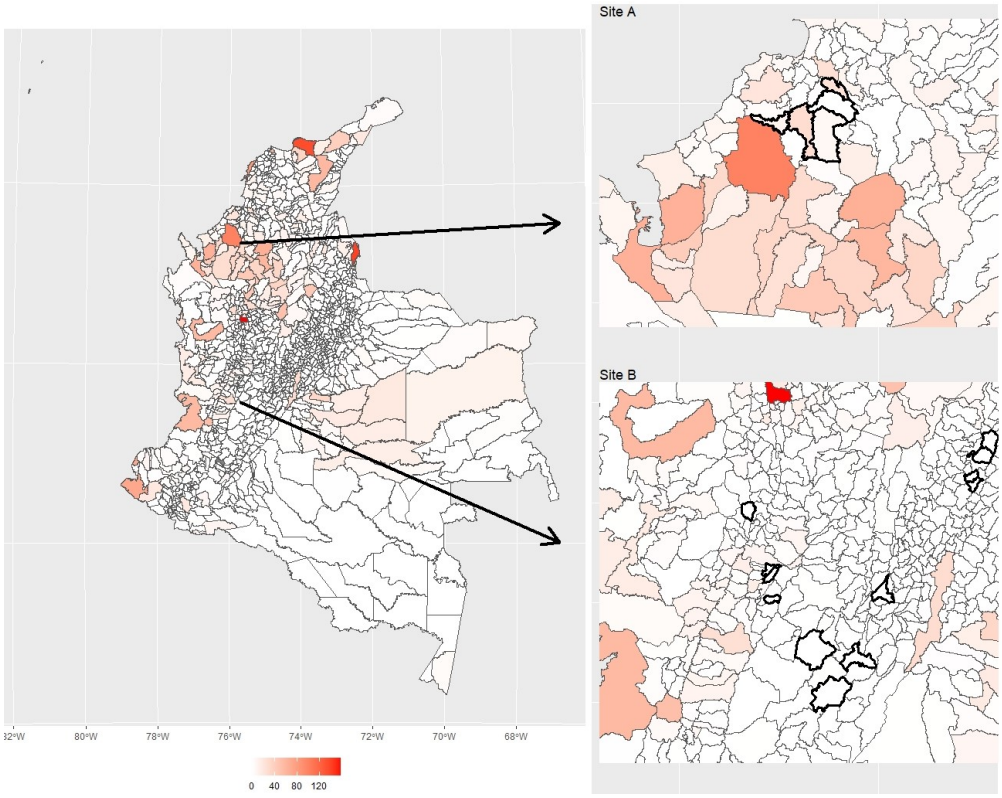
Notes: The left map show the areas in Colombia that UNODC reported to have coca production between 2010 and 2016. The right maps illustrate the zoom areas in the north and south part of the country. The scale of intensity goes from 0.1 hectares to 5 (thousand), where 0 is represented in white color and 5 in red color. Areas in grey color do not report coca production.

Map A.5 ELN Captures (2010-2016)



Notes: The left map represents the intensity of ELN presence in Colombia's map. The right maps illustrate the zoom areas in the north and south part of the country. The scale of intensity goes from 0 to 5, where 0 is represented in white color and 10 in red color. The scale was calculated averaging ELN captures of the years 2010, 2013 and 2016.

Map A.6 Organized Crime (2010 - 2016)



Notes: The left map represents the intensity of organized crime in Colombia's map. The right maps illustrate the zoom areas in the north and south part of the country. The scale of intensity goes from 0 to 300, where 0 is represented in white color and 300 in red color. The intensity scale was calculated averaging all the illegal actions made by organized crime in the years 2010, 2013 and 2016.

Appendix B: Heterogeneous Effect

Appendix B.1:Investment

This appendix includes a table that provides additional detail about the estimates on investment on farms between the intensive and extensive margin. Column (1) and (2) in table B.1 provides evidence that peace agreements increase the probability to invest in farm by 26 pp and increase the investment for those farms that already invested in the previous period by almost 74% without being statistically significant. The test of intensive investment shows that investment decisions came from new investors to the market rather than old ones. However, the estimator power might be affected by the reduction of observations in the intensive analysis Moreover, column (3) provides an additional robustness test using a tobit specification of equation 1, which shows that the estimates are consistent with those of the table 3.

Table B.1 Intensive vs Extensive Analysis

	(1) Extensive Investment	(2) Intensive Investment	(3) Tobit
FARC * POST	0.26***	0.74	1.84***
	(0.07)	(0.56)	(0.37)
POST	0.50	2.17	3.23
	(0.42)	(5.67)	(2.82)
Constant	0.44***	7.24***	-8.80***
	(0.02)	(0.12)	(1.98)
Control Mean	0.27	2,099	796
HH-Year (Observations)	4689	1,668	4689

Notes: Column (1) shows the effect of the treatment on a dummy indicator that takes the value of 1 if the farm invest something and 0 otherwise. Column (2) shows the effect of the treatment on the inverse hyperbolic sine transformation of investment on farm when the investment at baseline was greater than 0. Column (3) shows the effect of treatment on the inverse hyperbolic sine transformation of investment on farm with Tobit specification. Household controls are: logarithm of consumption, wealth of the household and number of people per household. All regressions include household and time fixed effects. Standard errors are clustered at village level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Appendix B.2 : Farm's Size

This appendix includes a table that provides additional detail about the estimates on heterogeneous effects on farm investment. Table B.2 examines the heterogeneity effect of the initial

capital of the farmers, where we interact the treatment with the farm's size at baseline (2013). Column (1) shows that 1 extra Hectare of land in 2013 increased the investment on farms by 20%. Column (2) and (3) depicts that farm's size does not influence the decision to increase permanent crop, but influence the decision to hold short term crops after the peace process, where one additional Hectare increase the decision to hold short term crops by 1% of the land of farm.

Table B.2 provides evidence that farmers with bigger farms increased investment more than small farms. However, small farms also increased investment substantially, as reflected by the large and statistically significant coefficient associated with the FARC-by-Post variable . Further, We also find evidence that both large and small farms switched production from short term to permanent crops, though the decrease in short term crops is slightly larger for large farms.

Table B.2 Heterogeneous Effect - Initial Capital (2013)

	(1) IHS Transf. Investment	(2) Permanent Crops	(3) Short Term Crops
FARC * POST	1.53**	0.16*	-0.19***
	(0.62)	(0.09)	(0.07)
FARC * POST * Farm's Size at Baseline (2013)	0.20**	0.00	0.01**
	(0.08)	(0.01)	(0.00)
POST	3.07	0.27	0.24
	(3.20)	(0.23)	(0.29)
Constant	3.16***	0.16***	0.21***
	(0.13)	(0.01)	(0.01)
Control Mean	796	0.15	0.23
Farm's Size Control Mean (2013)	3.00	3.00	3.00
HH-Year (Observations)	4683	4421	4421

Notes: Column (1) show the effect of the treatment and the interaction of the farm's size at baseline(2013) with the treatment on the inverse hyperbolic sine transformation of investment on farm. Columns (2) & (3) show the effect of the treatment and the interaction of the farm's size at baseline(2013) with the treatment on the area dedicated to permanent and short term crops as percentage of farm's size. Household controls are: logarithm of consumption, wealth of the household and number of people per household. All regressions include household and time fixed effects. Standard errors are clustered at village level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Appendix B.3: Debt

This appendix includes additional detail about the estimates on the decision of farmers to take on debt. Table B.3 examines the probability of taking a loan from three different resources. Farmers increase the probability to take a loan with banks by 10% - statistically significant at 10% - and increase the probability to use debt from suppliers by 5% - at 10% of significance. Moreover, panel B of table B.3 depicts that the farm's size does not influence the decision to

take debt in any of the possible channels.

Table B.3 Debt Decision

	(1) Bank	(2) Supplier	(3) Informal Debt
FARC * POST	0.10*	0.05*	-0.03
	(0.06)	(0.03)	(0.03)
POST	-0.28	0.05	-0.38
	(0.28)	(0.13)	(0.24)
Constant	-0.75***	-0.09	0.26
	(0.23)	(0.10)	(0.23)
Control Means	0.32	0.05	0.13
HH-Year (Observations)	4795	4795	4795

	(1) Bank	(2) Supplier	(3) Informal Debt
FARC * POST * Farm's Size at Baseline (2013)	-0.01	-0.001	-0.001
	(0.01)	(0.01)	(0.01)
FARC * POST	0.08	0.04	-0.03
	(0.07)	(0.03)	(0.04)
POST * Farm's Size at Baseline (2013)	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
POST	0.31	0.38*	0.11
	(0.34)	(0.20)	(0.30)
Constant	0.37***	0.06***	0.12***
	(0.01)	(0.01)	(0.01)
Control Means	0.32	0.05	0.13
HH-Year (Observations)	4786	4786	4786

Notes: Panel A showcases the effect of the treatment interacted with the post-period on the type of debt taken. Panel B shows the effect of the treatment and the interaction of the farm's size ta baseline (2013) with treatment on the type of debt taken. All regressions include household and time fixed effects. Standard errors are clustered at village level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Appendix C: Government Support Programs

This appendix explores the possibility that government support programs are a potential confounding variable in our estimates of investment as a function of the cessation of conflict. One important cornerstone of the peace agreement was the commitment of additional government support for farmers in their productive activities amid providing reparations to the victims of violence. We already show that this hypothesis was not accomplished for the main estimate in the section 5.1. However, these programs may affect complementary outcomes as land use by programs that assign land to the victims. We test this hypothesis in the other outcomes in the table C.1.

Table C.1 shows that none of the estimators change with the inclusion of the control. These results confirm that the increase of investment happened because the expectation of the households changed and not because the government boosted the investment through agricultural or victims programs.

Table C.1. Complementary Estimates controlling by support programs

Panel A: Violence and Investment

	(1) Murders	(2) Kidnappings	(3) Farm's Size
FARC * POST	-0.25**	-0.18	-0.21
	(0.11)	(0.12)	(0.34)
POST	0.66*	0.37	-4.95*
	(0.38)	(0.29)	(2.57)
SUPPORT	-0.01	-0.00	-0.42***
	(0.01)	(0.01)	(0.15)
HH-Year (Observations)	4795	4795	4689

Panel B: Land Use

	(1) Perennial Crops	(2) Short Term	(3) Pasture	(4) Cultivated + Pasture	(5) Fallow Land
FARC * POST	0.16***	-0.17***	-0.04***	-0.06*	0.05
	(0.05)	(0.05)	(0.02)	(0.03)	(0.03)
POST	-0.08	0.20	-0.15	-0.04	-0.37
	(0.23)	(0.30)	(0.24)	(0.29)	(0.60)
SUPPORT	-0.00	-0.01	-0.03***	-0.05***	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
HH-Year (Observations)	4427	4427	4427	4427	4427

Panel C: Consumption

	(1) Consumption	(2) Food Consumption	(3) Wealth Index
FARC * POST	-0.03	-0.02	-0.14
	(0.05)	(0.06)	(0.10)
POST	8.33***	5.90***	-2.29***
	(0.42)	(0.47)	(0.60)
SUPPORT	0.03	0.05**	-0.00
	(0.02)	(0.02)	(0.03)
HH-Year (Observations)	4793	4793	4795

Notes: Panel A shows the effect of the treatment interacted with the post-period on different violence and investment outcomes. Columns (1)& (2) show the effect of peace interacted with the post-period on the probability of having murders and kidnappings in the villages. Columns (3) shows the effect of treatment interacted with the post-period on the farm's size. Panel B showcases the effect of the treatment interacted with the post-period on the size of different land use as percentage of the farm's size. Short term accounts for mixed crops and annual crops. Pasture presents the area dedicated to livestock and parture. Cultivated + pasture accounts for the sum of perennial, short and pasture land. Fallow land accounts for not used and forest area. columns (1), (2) & (3) in panel C accounts for the effect of the treatment interacted with post-period on logarithm of consumption, logarithm of food consumption and the Dietary diversity index respectively. Household controls are: logarithm of consumption, wealth of the household and number of people per household. All regressions include household and time fixed effects. Standard errors are clustered at village level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Appendix D: Neighbors

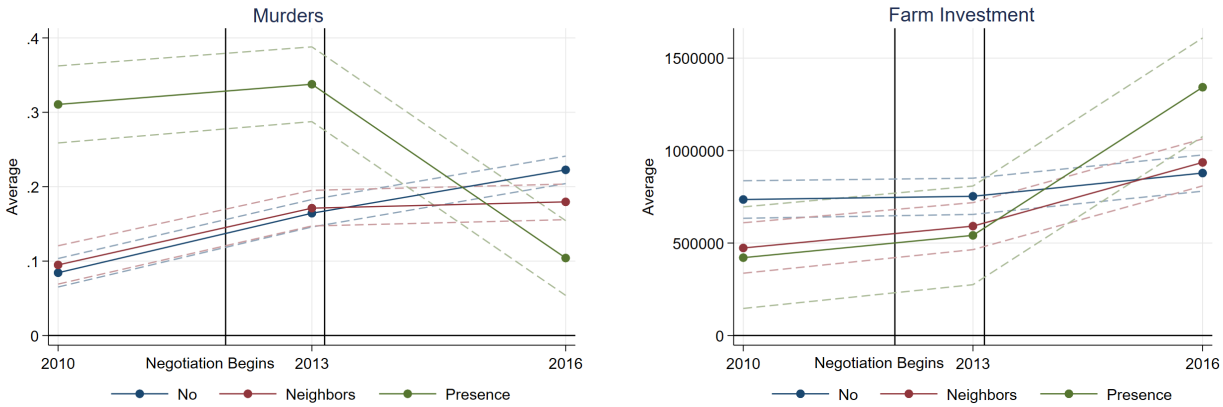
Appendix D.1: Descriptive Variables

This appendix includes tables and figures that give insights from additional analysis of the spillover effect. The figure D.1 shows the variation of murders and farm investment in a graph that includes the trend of neighbors. The observations of those who are located in neighboring villages preserve the parallel trend before 2013, after the ceasefire murders slightly decreased and investment increased at the level of the comparison group.

The table D.1 shows the balance characteristics and test for differences of the main welfare features of the households, some farm characteristics, and some violence characteristics of the village. Tests for balance in the baseline suggest that households are equivalent in most of the wealth measures with some slight difference in household's size with respect to FARC-affected areas and DDI index with respect to comparison areas. As we show in the second panel of table 1, table D.1 also suggest important difference in farm's characteristics with respect to comparison areas that are mitigated after the peace agreement with the same exceptions of permanent and pasture land. The Farm characteristic's panel in table D.1 also suggest minor difference between FARC-affected areas and their neighbors in short term crops and fallow land that disappear in 2016. Moreover, after peace agreement the difference in farm investment and area used in pasture increase between FARC-affected areas and their neighbors.

The third panel of table D.1 presents the difference in violence and infrastructure characteristics. There is not statistical difference between murders, kidnappings or infrastructure status between neighbors and comparison group. However, murders are 18 pp greater in FARC-affected areas than in neighboring areas in the initial years. This difference disappears in 2016, suggesting a decrease in violence with respect to neighboring areas too.

Figure D.1. Violence and Investment



Notes: The left graph shows the trend in treatment, neighbor and control group of the average of a dummy variable that accounts for murders in the villages. The right graph shows the level of investment in Colombian pesos.

Table D.1. Balance Analysis

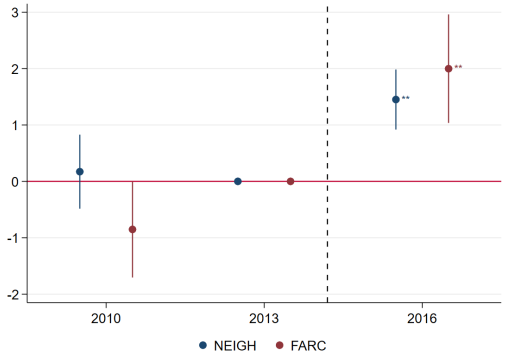
	Balance Analysis 2010 & 2013			Balance Analysis 2016		
	(1) Control	(2) NEIGH V Control	(3) FARC v NEIGH	(4) Control	(5) NEIGH V Control	(6) FARC v NEIGH
Household Characteristics						
Monthly Consumption	411,603	-1,802	28,118	574,575	-15,207	14,353
	(352,355)	(15,629)	(28,118)	(406,524)	(25,155)	(36,847)
Wealth Measure (Assets)	-0.20	0.09	0.05	0.18	-0.06	-0.09
	(2.50)	(0.17)	(0.24)	(1.50)	(0.13)	(0.20)
Dietary Diversity Index (DDI)	0.67	-0.015*	-0.013	0.69	-0.005	0.002
	(0.15)	(0.01)	(0.014)	(0.15)	(0.009)	(0.017)
Household's Size	4.55	0.07	0.45*	4.13	-0.03	0.28
	(1.90)	(0.12)	(0.25)	(1.86)	(0.13)	(0.22)
Farm Characteristics						
Investment on Farm (Pesos)	796	-232**	-63	1,062	-1.20	559**
	(2,227)	(82)	(101)	(3,003)	(150)	(278)
Farm's Size	2.89	-0.44*	-0.04	3.13	-0.50*	0.08
	(4.29)	(0.25)	(0.35)	(4.86)	(0.27)	(0.49)
Permanent Crops (% of Farm's Size)	0.15	0.14***	-0.03	0.18	0.20***	0.05
	(0.27)	(0.02)	(0.03)	(0.30)	(0.03)	(0.06)
Short Term Crops (% of Farm's Size)	0.23	0.05***	0.10**	0.16	-0.02	0.04
	(0.36)	(0.02)	(0.04)	(0.27)	(0.02)	(0.03)
Pasture (% of Farm's Size)	0.33	-0.21***	-0.04	0.36	-0.24***	-0.07**
	(0.38)	(0.03)	(0.03)	(0.38)	(0.03)	(0.026)
Fallow Land(% of Farm's Size)	0.15	-0.05***	-0.031*	0.18	-0.03	0.002
	(0.61)	(0.02)	(0.018)	(0.30)	(0.02)	(0.018)
Ownership	0.74	0.03*	-0.036	0.80	0.02	0.03
	(0.43)	(0.02)	(0.03)	(0.40)	(0.023)	(0.03)
Leasing	0.27	-0.028	-0.01	0.30	-0.01	-0.06
	(0.44)	(0.02)	(0.03)	(0.45)	(0.03)	(0.05)
Illegal	0.12	-0.01	-0.013	0.039	0.013	-0.010
	(0.33)	(0.01)	(0.02)	(0.19)	(0.011)	(0.02)
Village Characteristics and Violence						
Murders	0.12	0.01	0.18**	0.22	-0.04	-0.067
	(0.33)	(0.04)	(0.07)	(0.42)	(0.06)	(0.07)
Kidnappings	0.017	0.02	0.11	0.18	-0.15**	0.10
	(0.13)	(0.02)	(0.07)	(0.39)	(0.05)	(0.08)
Bad Infrastructure	0.69	-0.07	0.11	0.69	-0.06	0.03
	(0.46)	(0.06)	(0.10)	(0.46)	(0.08)	(0.13)
Observations	2,998	4,782	5,552	1,499	2,391	2,776

Notes: Column (1) shows the average of the control group for the periods 2010 and 2013. Columns (2) showcases the difference of the neighboring areas with the control group. Column (3) shows the difference between FARC-affected areas and Neighboring areas. Columns (4), (5) & (6) repeat the analysis of the first three columns with the sample of the 2016 survey. The variables murders, kidnappings and bad infrastructure are dummy variables in village level. The variables monthly consumption and investment on farm are in thousands. Standard errors are clustered at the village level. The p value significance is shown as: *** 0.01, **0.05 , *0.1.

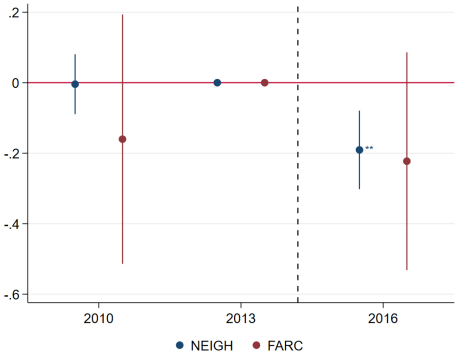
Appendix D.2: Parallel Trend

This sub-appendix includes figures that give insights from additional analysis of the parallel trend combined with the spillover effect. Figure C.2 Shows the graphical representation of the equation 2. All the estimates are compared with respect to 2013 and show a confidence interval at 90%. Dots that include "$**$" represents a difference greater than 5% p value significance. The figure depicts that all the complementary estimates follow a parallel trend in both groups (Neighboring and FARC-affected areas) with respect to control group.

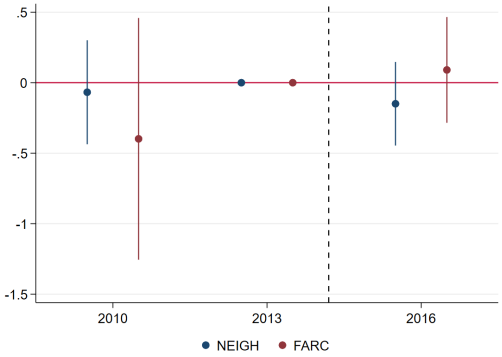
Figure C.2. Parallel Trend Validation 1



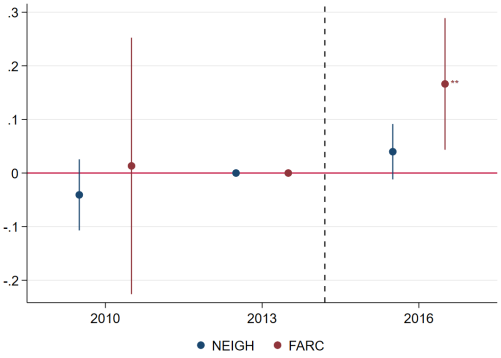
Farm Investment (IHS Transformation)



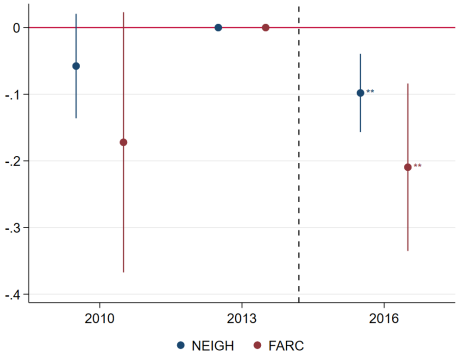
Kidnappings



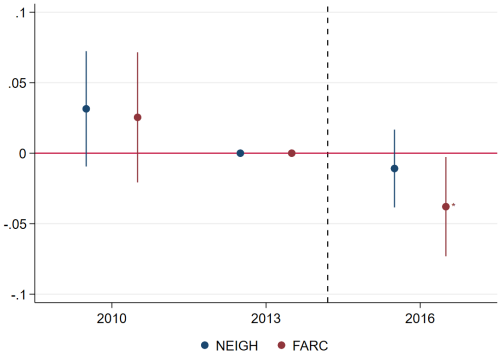
Farm's Size



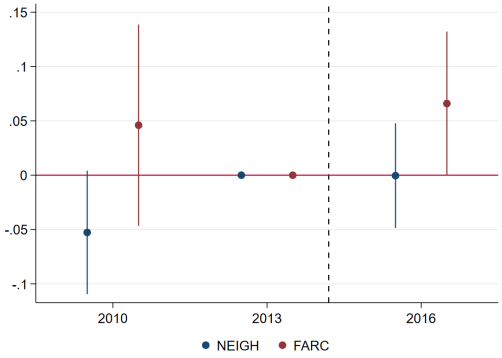
Permanent Crops



Short Term Crops



Pasture



Fallow Land

Appendix E: Full Sample, Attrition Estimates and Deflated Values

This appendix includes tables that give insights from the use of the whole sample, without constraining to a balanced data set as well as the use of deflated values in investment.

Table E.1 and E.2 shows that the main results are not statistically different from those that use the balanced panel. We also did an attrition analysis in table E.3 that tests if the people that leave the village are affected by the treatment(FARC - NEIGH). The results in the table shows that there is no relation between treatment and attrition.

We also show in table E.4 that the use of deflated investment does not affect our main estimates.

Table E.1 Investment on Farm

	IHS Transformation Investment on Farm			Levels (Thousands) Investment on Farm		
	(1)	(2)	(3)	(4)	(5)	(6)
FARC * POST	1.85***	2.08***	2.06***	868.13**	861.60**	839.63**
	(0.58)	(0.54)	(0.65)	(368.82)	(360.40)	(422.08)
POST	-0.35**	4.06	4.01	277.77**	-2596.11	-2544.01
	(0.14)	(3.23)	(3.29)	(112.35)	(2305.33)	(2357.66)
Constant	2.65***	3.11***	3.12***	729.06***	736.50***	752.62***
	(0.06)	(0.14)	(0.14)	(48.31)	(77.02)	(76.99)
HH-year (Observations)	5402	5402	5082	5402	5402	5082
R^2	0.473	0.489	0.480	0.499	0.501	0.493
Adjusted R^2	0.135	0.160	0.162	0.179	0.180	0.183

Notes: In columns (1), (2), and (3), the left-hand side variable is the inverse hypoerbolic sine transformation of farm investment in 1,000s of pesos. In columns (4), (5), and (6), the left-hand side variable is the level of farm investment in 1,000s of pesos. Household controls are: logarithm of consumption, wealth of the household and number of people per household. Infrastructure controls are: household's travel time to village center, and an indicator for whether roads in the village are in bad condition. All regressions include household and time fixed effects. Standard errors are clustered at village level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Table E.2 Investment Decision

Panel A: Productive Land Use				
	(1)	(2)	(3)	(4)
	Perennial Crops	Short Term	Pasture	Cultivated + Pasture
FARC * POST	0.16**	-0.16***	-0.04**	-0.047
	(0.066)	(0.059)	(0.019)	(0.041)
POST	0.278	0.109	-0.209	0.178
	(0.216)	(0.276)	(0.271)	(0.329)
Constant	0.163***	0.217***	0.326***	0.706***
	(0.008)	(0.011)	(0.007)	(0.011)
HH-Year (Observations)	5060	5060	5060	5060
R^2	0.588	0.544	0.701	0.537
Adjusted R^2	0.306	0.232	0.496	0.219

Panel B: Increase of Land Use				
	(1)	(2)	(3)	(4)
	Farm's Size	Forest	Land Not Used	Fallow Land
FARC * POST	-0.050	0.007	0.040	0.052
	(0.456)	(0.008)	(0.038)	(0.038)
POST	0.672	-0.078	-0.013	-0.037
	(2.544)	(0.120)	(0.280)	(0.298)
Constant	3.041***	0.040***	0.118***	0.162***
	(0.101)	(0.003)	(0.010)	(0.011)
Observations	5402	5060	5060	5060
R^2	0.737	0.489	0.414	0.414
Adjusted R^2	0.567	0.140	0.013	0.013

Notes: Panel A showcases the effect of the treatment interacted with the post-period on the size of different land use as a percentage of the farm. Short term accounts for mixed crops and annual crops. Pasture presents the area dedicated to livestock and pasture. Cultivated + pasture accounts for the sum of perennial, short and pasture land. Panel B depicts the effect of the treatment interacted with post-period on multiple use of land as a percentage of Farm's Size except for column (1), which shows the variable at levels. Fallow land accounts for the sum of forest and land not used. Household controls are: logarithm of consumption, wealth of the household and number of people per household. All regressions include household and time fixed effects. Standard errors are clustered at village level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Table E.3 Attrition Analysis

	Attrition	
	(1)	(2)
FARC	0.004	0.005
	(0.026)	(0.026)
NEIGH		-0.003
		(0.022)
Constant	1.123***	1.116***
	(0.165)	(0.139)
Households	1864	2816
R^2	0.002	0.002
Villages	201	201

Notes: Regressions are controlled by logarithm of consumption, wealth of the household and number of people per household, household's travel time to village center, and an indicator for whether roads in the village are in bad condition Standard errors are clustered at village level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Table E.4 Investment on Farm - Constant Pesos-

	IHS Transformation Investment on Farm			Levels (Thousands) Investment on Farm		
	(1)	(2)	(3)	(4)	(5)	(6)
FARC * POST	1.84***	2.11***	2.13***	918.94**	874.99**	885.63**
	(0.55)	(0.53)	(0.55)	(373.92)	(367.79)	(374.76)
POST	-0.24*	3.18	3.22	387.73***	-3547.37	-3561.83
	(0.14)	(3.16)	(3.18)	(115.95)	(2261.91)	(2279.51)
Constant	2.60***	3.04***	3.04***	662.24***	607.46***	607.56***
	(0.05)	(0.13)	(0.13)	(39.69)	(55.05)	(55.43)
Control Mean Investment	796	796	796	796	796	796
Difference at Baseline	308	308	308	308	308	308
Baseline HH controls X Time FE	No	Yes	Yes	No	Yes	Yes
Baseline Infrastructure Controls X Time FE	No	No	Yes	No	No	Yes
HH-year (Observations)	4689	4689	4689	4689	4689	4689
Villages	130	130	130	130	130	130

Notes: In columns (1), (2), and (3), the left-hand side variable is the inverse hypoerbolic sine transformation of farm investment in 1,000s of pesos. In columns (4), (5), and (6), the left-hand side variable is the level of farm investment in 1,000s of pesos. Household controls are: logarithm of consumption, wealth of the household and number of people per household. Infrastructure controls are: household's travel time to village center, and an indicator for whether roads in the village are in bad condition. All regressions include household and time fixed effects. Standard errors are clustered at village level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.