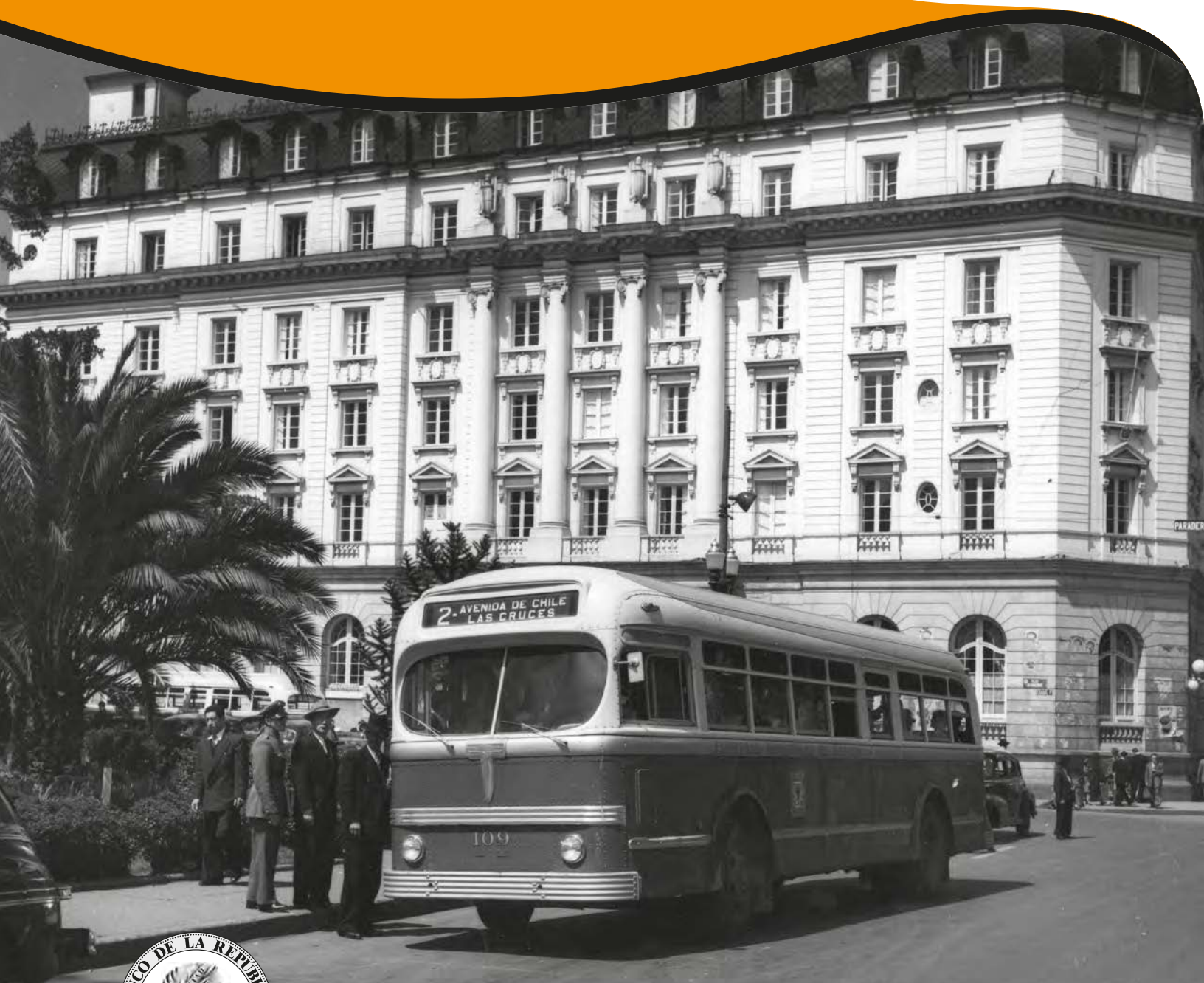


Borradores de ECONOMÍA

Hidden benefits of peace:
The case of sexual violence

By: Ana Maria Diaz
Luz Magdalena Salas
Ana María Tribín-Uribe

No. 1124
2020



Bogotá - Colombia - Bogotá - Colombia - Bogotá - Colombia - Bogotá - Colombia - Bogotá - Colombia - Bogotá - Colombia

Hidden benefits of peace: The case of sexual violence

Ana Maria Diaz* Luz Magdalena Salas** Ana María Tribín-Uribe***

The opinions contained in this document are the sole responsibility of the author and do not commit Banco de la República or its Board of Directors.

Abstract

This paper studies the effect on sexual violence of Colombia's recent peace negotiation between the government and the FARC insurgency. Using a matched-difference-in-differences identification strategy, we find a significant reduction in sexual violence, measured as the count of sexual assaults per 100 thousand inhabitants, two years after the peace process was signed. During conflict, the rate of sexual violence was higher in municipalities with former FARC activity in contrast with municipalities in peace and remained higher immediately after the peace process was signed. However, two years after the signing of the agreement, the incidence of sexual assaults reduced significantly in the former FARC municipalities.

JEL Codes: D72, D74.

Keywords: sexual assaults, demobilization, FARC, Colombia, Peace Process, post-conflict.

*Pontificia Universidad Javeriana, Departamento de Economía, a.diaze@javeriana.edu.co

**Pontificia Universidad Javeriana, Departamento de Economía, salas.luz@javeriana.edu.co

***Banco de la República de Colombia, atribiur@banrep.gov.co

Los Beneficios Ocultos del Proceso de Paz: El Caso de la Violencia Sexual

Ana Maria Diaz^{*} Luz Magdalena Salas^{**} Ana María Tribín-Uribe^{***}

Las opiniones contenidas en el presente documento son responsabilidad exclusiva de los autores y no comprometen al Banco de la República ni a su Junta Directiva.

Resumen

Este artículo estudia el efecto sobre la violencia sexual de la reciente negociación de paz de Colombia entre el gobierno y la insurgencia de las FARC. Usamos el método de diferencia en diferencias emparejadas como estrategia de identificación y encontramos una reducción significativa en la violencia sexual, medida como recuento de agresiones sexuales por cada 100 mil habitantes, dos años después de la firma del proceso de paz. Durante el conflicto, la tasa de violencia sexual fue mayor en los municipios que solían tener actividad armada de las FARC en contraste con los municipios sin presencia de este grupo y se mantuvo alta inmediatamente después de que se firmó el proceso de paz. Sin embargo, dos años después de la firma del acuerdo, la incidencia de agresiones sexuales se redujo significativamente en los antiguos municipios de las FARC.

Códigos JEL: D72, D74.

Palabras Claves: violencia sexual, desmovilización, FARC, Colombia, proceso de paz, post-conflicto.

^{*}Pontificia Universidad Javeriana, Departamento de Economía, a.diaze@javeriana.edu.co

^{**}Pontificia Universidad Javeriana, Departamento de Economía, salas.luz@javeriana.edu.co

^{***}Banco de la República de Colombia, atribiur@banrep.gov.co

1. Introduction

Men have a higher probability of being killed during wartime, specially in the battlefield. While women's deaths, on the other hand, are more related to causes of sexual disease and sexual violence, lack of pregnancy and family planning services (Meier and Hernes, 2006). Literature on armed conflicts generally analyze the implications of war and peace on the general population and forget about crimes that affect women to a greater extent (Henry, 2012). To have a broader understanding of the implications of the armed conflict and the associated peace process on the well being of citizens this paper explore the effects on gender-based violence. The effect of the end of an internal conflict on sexual violence is not straight-forward. It is affected by war motives of the insurgent groups, by the absence of state law and order, by the existence of other criminal groups that are fighting for territorial control, among other factors.

Evidence suggests that sexual violence is used as a weapon of war (Alison, 2007; Denov, 2006; Meger, 2015; Wood, 2006, 2009a). Meger (2011) and Theidon (2008) argue that the systematic rape of women is frequent during war, and usually perpetrated by illegal armed groups against civilians. However, another strand of the literature show that members of the state armed forces play an important role in perpetrating sexual violence, where an overwhelming majority of victims are women (Cohen and Nordås, 2015; Leiby, 2009). This is the case of Peru, where some communities experienced an increase in sexual abuse after the government installed military bases to protect civilians from guerrilla attacks (Theidon, 2004).

Post-conflict studies show that the situation of women in terms of security does not improve after the end of the war and, in some cases, remains the same. Partly because gender violence is imparted by both illegal and legal armed groups. In particular, a substitution effect in terms of sexual assaults could emerge, from one actor, commonly non-state armed, to another actor (Davies et al., 2016). Olujić (1998) studied the Yugoslavian peace process and concluded that sexual and gender-based violence was also present in peaceful times. Furthermore, Davies et al. (2016) examined the Mindanao, Philippines, peace process and highlighted that victims of sexual assault faced barriers to report such cases and to participate in the peace process, which may resulted in women being continuously targeted for sexual violence during peace. Moreover, using the Sexual Violence in Armed Conflict (SVAC) dataset, Cohen and Nordås (2014) also found that reporting of sexual violence continued during post-conflict periods, and sometimes

at very high levels.¹ However, if women suffered from sexual abuse during periods of war imparted specially by non-legal armed groups, when conflict ends, this type of violence decreased (Wood, 2014). Another possibility is the militarization of daily life after conflict. Theidon (2008), for example, found, after carrying out in-depth interviews with demobilized combatants in Colombia, that there was a process of militarization of daily activities which increased domestic-violence and sexual assaults.

In this paper, we test the effects of the end-of-conflict on sexual violence by exploiting the exogenous variation of the peace agreement between the Colombian government and the insurgent group. Indeed, the 52-year armed conflict between the Revolutionary Armed Forces of Colombia (FARC) and the government officially ended with a peace treaty in 2016. During conflict, guerrilla armed-groups constantly exerted sexual violence (Memoria-Historica, 2018). According to Econometria (2019), 15,687 individuals were victims of sexual violence in Colombia in the context of the armed conflict, the majority were women and girls. The perpetrators were not only the FARC army. Many victims were sexually assaulted by other guerrilla armies, self-defense groups, and even allegations of military abuse have also been documented.

In other contexts, the postwar effects have been studied for different outcomes such as political participation (Blattman, 2009; Tripp, 2015), employment (Braun and Mahmoud, 2014), health (Bundervoet et al., 2009; Camacho, 2008; Ghobarah et al., 2004), reconstruction and reintegration (Annan et al., 2011; Blattman and Annan, 2008; Humphreys and Weinstein, 2007; Lambourne, 2004), poverty (Brück (2001)), deforestation (Prem et al., 2020), and killings of social leaders (Prem et al., 2018) , among others. However, there is limited evidence about the situation of women after war, especially regarding gender-based violence (Jones et al., 2005), which has been mainly studied in the context of war (Alcorn, 2014; Buss, 2014; Heineman, 2011; Meger, 2011; Palermo and Peterman, 2011; Theidon, 2008, 2004). In this paper, we add to the literature by studying sexual-violence in a post-conflict scenario. Specifically, we exploit the recent Colombian peace agreement as natural experiment to explore changes in sexual violence after 5 decades of conflict.

We observe changes in the incidence of reported sexual abuse before and after the signing of the peace agreement between the Colombian government and the armed group FARC using a *matched-difference-in-difference* approach. We test the following hypothesis:

¹The SVAC database covers 129 conflicts, 625 armed actors, during the 1989-2009 period.

Hypothesis 1: FARC were perpetrators of sexual violence, or their presence was associated with an increased risk of committing sexual assault by other individuals or other actors. Then, municipalities with former guerrilla presence exhibit a decrease in sexual violence after the peace agreement, holding everything else fixed.

Hypothesis 2: FARC did not use sexual violence as one strategy of war, then the incidence of sexual violence in municipalities with former guerrilla presence remains at the same level, suggesting that gendered-violence is rooted in the society as a result of collateral consequences of the internal conflict.

Hypothesis 3: FARC were not perpetrators of sexual violence and could even deter sexual assaults where they had territorial control. The end of conflict leads to an increase in the number of sexual violent acts by other groups, because there is no longer confrontation with FARC.

Our results show a significant reduction in sexual violence, measured as the count of reported-sexual assaults per 100 thousand inhabitants, two years after the peace process was signed. During conflict, the rate of reported-sexual violence was higher in municipalities with former FARC activity in contrast with municipalities in peace and remained higher immediately after the peace process. However, two years after the peace agreement, the incidence of sexual assaults reduced significantly in the former FARC municipalities. Also, territories with FARC attacks experienced high rates of sexual violence in reference to municipalities without them. This difference remains constant one year after the demobilization of FARC, and two years later decreases. These results provide support for *hypothesis 1*, in which sexual assaults could be observed as a hidden benefit of peace.

Our paper is organized as follows. The next section provides a background of the Colombian Armed Conflict, while section 3 presents the data. We then present our results, and the final section concludes.

2. Background

Since the 1960s Colombia has endured a prolonged internal armed conflict fought between the government of Colombia, self-defense groups and various left-wing guerilla groups. According to [Memoria-Historica \(2013\)](#), there were nearly nine million victims

of the internal conflict which represents approximately 20% of the Colombian population. From these, over 215,000 have been civilian casualties and 46,813 have been victims in combat (Ubillos-Landa et al., 2019).²

The Colombian Government and the left-wing FARC, began negotiations to end the five decades-long conflict on August 2012. In November of 2012, FARC declared a unilateral ceasefire that ended two months later. In July of 2014, a series of attacks from FARC put the peace process in its highest tension and in November the Colombian government suspended the peace process. One month later, the guerrilla group announced an indefinite ceasefire until August of 2016, when the final agreement of the peace process reached its final stage and started a bilateral ceasefire. The 24th of November of 2016, the Colombian government and the FARC signed the Final Accord for the Termination of the Conflict and the Construction of a Stable and Durable Peace. After the agreement, the FARC concentrated its estimated 7,000 troops in 26 designated Temporary Normalization Zones (PTNs). Seven months later, the guerrilla started the disarmament process under the supervision of international organizations.³

The agreement contains six points: (1) A Comprehensive Rural Reform; (2) Political Participation; (3) Ending the Conflict; (4) Solution to Illicit Drugs; (5) Victims of the Conflict; and (6) Implementation, Verification, and Endorsement. ⁴ One key distinguishing feature of the process was the inclusion of a gender perspective (Cespedes-Baez and Jaramillo Ruiz, 2018).⁵ The peace agreement stated that women's political participation will be ensured through a gender-based approach. Moreover, it included the creation of a special team on sexual violence within the Investigation and Accusation Unit, after recognizing the pervasive nature of sexual violence against women in conflict. This perspective also allowed the introduction of an explicit amnesty ban for this crime made by the coalition of women's rights NGOs and activist (Cespedes-Baez and Jaramillo Ruiz, 2018).

During the Colombian conflict all armed groups – State military forces, self-defense and guerrilla groups – sexually abused or exploited women (Memoria-Historica, 2018). According to the United Nations, Colombia internal war left more than 24.576 registered

²For a detail explanation in Colombian conflict see for example (Torres and Palau, 2006) and (Palacios, 2019)

³For a detail explanation about the peace process in Colombia see Rettberg (2014), Flores and Vargas (2018), Cespedes-Baez and Jaramillo Ruiz (2018), Mendes et al. (2019), Diaz (2018), among others.

⁴See Phelan (2019) for a detailed description of all the points of the agreement.

⁵See <https://verdadabierta.com/wp-content/uploads/2018/07/CONPES-3931.pdf>

victims of sexual violence⁶. A survey by Oxfam/Casa de la Mujer in 2009 depicted the situation of sexual violence across the country, and found that in 22 percent of the cases the perpetrator was an armed actor. Only nine out of 100 women victims of these crimes reported the crime to the authorities, indicating that the magnitude of the problem is substantially larger than what is found in the figures. The number and types of sexual violence also varied by armed group (Oxfam, 2009). Sexual assaults not only act against civilians, but also against other female combatants. According to (Memoria-Historica, 2018) all armed groups have perpetrated sexual violence.⁷ The report argues that illegal armed groups exerted social control over the territories by establishing a "moral order of inhabitants" based on principles of authoritarianism, male domination, and exacerbated violence against individuals with non-hegemonic gender and sexual identities. Women, in particular, were targeted by armed groups for a wide range of reasons, but Memoria-Historica (2018) highlights two: (a) as a way of exhibiting the dominance of armed actors through a pedagogy of violence that promotes punishment, correction and terror among populations; and (b) as punishment to humiliate and, psychologically and morally, defeat the victims and detractors.

3. Data

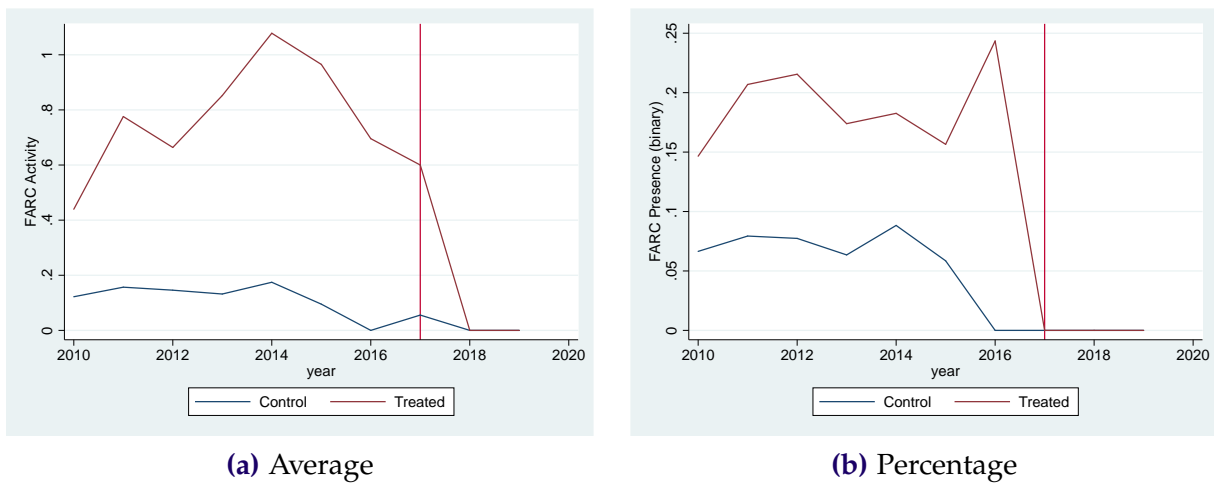
We use three sources of data for our analysis for the period 2016-2019: (1) The Violent Presence of Armed Actors in Colombia Database (ViPAA); (2) daily Police reports of sexual assaults by municipality; and (3) municipal attributes from the CEDE municipal panel. For the presence of FARC, and other armed actors, we use the Violent Presence of Armed Actors in Colombia Database (ViPAA). Osorio et al. (2019) claims that the data contained in ViPAA indicates the violent presence of armed actors at the municipality-year level. It reflects the incidents of human right violations from the *Noche y Niebla*. Unfortunately, it does not necessarily reflect cases in which armed actors are present in a territory but refrain from exercising violence. Such municipalities correspond to areas where armed actors are hegemonic or have monopolistic control. In consequence, our

⁶See <https://www.un.org/sexualviolenceinconflict/es/paises/colombia/>

⁷The Historical Memory Center is a public establishment of the national order with legal status, its own patrimony and administrative and financial autonomy, created by the Law 1448 of 2011, whose objective is the reception, recovery, conservation, compilation and analysis of all documentary material, oral testimonies and by any other means, related to the violations that occurred during the Colombian internal armed conflict.

analysis focuses on municipalities with violent presence of FARC. Figure 1 shows the number of armed activity from FARC (panel (a)) and the percentage of municipalities with any type of armed activity. Our variable of FARC presence is a binary variable, equal to one if the municipality had at least one incident of human right violation that involved FARC in 2016.⁸ According to this definition, 115 municipalities were treated and 1008 were in the control group.

Figure 1. FARC Violent Presence

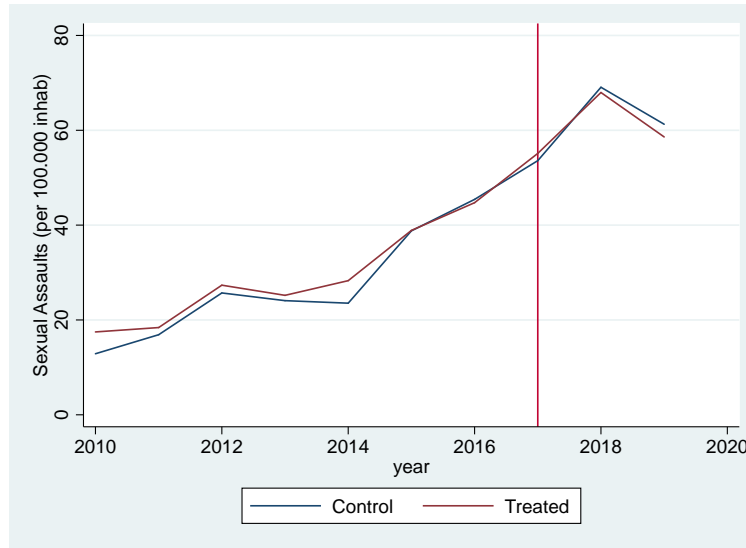


We use public micro-data from the Police Department which includes information regarding the type of crime committed, date, and municipality. The database reports sexual assaults that were filed at a police station (in a definition of sexual violence provided by Wood (2009b), this type of acts includes rape, sexual torture and mutilation, sexual slavery, enforced prostitution, enforced sterilization, and forced pregnancy)⁹. Figure 2 compares the evolution of the sexual violence for the treated and control municipalities. It depicts the progression of the rate of sexual assaults per 100 thousand inhabitants. According to the graph, there are not important differences between treated and control municipalities along all the period of analysis for this crime rate.

⁸We also use former violent attacks over the period of 2010-2016. In this case 333 municipalities were treated and 790 control. There are several papers that followed the same strategy to define FARC presence, some examples are Acemoglu et al. (2013); CH et al. (2018); Prem et al. (2018)

⁹[Link to the micro-data](#)

Figure 2. Sexual Assaults (rate per 100.000 inhabitants)



We include in the analysis information from the CEDE’s municipal panel. This panel collects administrative data and constructs a wide range of yearly municipal attributes (see [Acevedo and Bornacelly \(2014\)](#)). We use total population, percentage of the population that live in rural areas, distance to the closest market, altitude, government index, transfers from the national government to municipalities in order to cover education and health expenses, and some measures of fiscal performance. Table 1 presents the mean differences for both the outcome variables and for the control variables in the *matched-difference-in-difference*. Treated and control municipalities had in 2016, on average, similar rates of sexual assaults, domestic violence and homicide rates. Treated municipalities had more presence of other armed groups, lower government and finance index.

Table 1. Mean Differences 2016

Variable	N	(1) 1 Mean/SE	N	(2) 0 Mean/SE	T-test Difference (1)-(2)
Sexual Assaults (per 100.000 inhab)	115	44.73 (3.17)	1007	45.42 (1.07)	-0.69
Domestic Violence (per 100.000 inhab)	115	106.64 (9.10)	1007	107.40 (3.33)	-0.76
Homicide Rate	115	25.78 (3.06)	1007	23.10 (0.85)	2.68
Total Population (thou)	115	6.61 (2.29)	1007	4.09 (0.86)	2.52
Presence of other armed groups	115	0.26 (0.04)	1008	0.09 (0.01)	0.18***
Rural Index	115	0.55 (0.02)	1007	0.56 (0.01)	-0.01
Distance to market	115	66.73 (7.07)	1007	68.97 (3.31)	-2.24
ALtitude	115	1023.59 (76.78)	1007	1153.83 (37.41)	-130.24
Goverment Index	114	62.63 (0.89)	987	64.54 (0.30)	-1.91**
SPG total (ln)	115	23.03 (0.11)	1007	22.76 (0.03)	0.27**
Finance Index	114	-2666.50 (1714.02)	987	-314.95 (386.30)	-2351.54*

Notes: The value displayed for t-tests are the differences in the means across the groups.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

4. Findings

Our empirical strategy exploits both the peace agreement between the Colombian government and the Revolutionary Armed Forces of Colombia, FARC, and the spatial distribution of FARC across municipalities the year prior to the demobilization. The agreement was signed on August 24, 2016, and endorsed by Congress on December 1st, 2016. The demobilization process started that day. To test for changes in the sexual violence driven by the demobilization of FARC insurgency we estimated the following *difference-in-difference* model:

$$Y_{it} = \alpha_0 + \alpha_1 FARC_i + \alpha_2 POST_t + \alpha_3 FARC_i x POST_t + X_{it} + \epsilon_{it} \quad (1)$$

Where Y_{it} is the rate of reported sexual assaults (per 100 thousand inhabitants) in municipalities i , $FARC_i$ is the presence of FARC across Colombian municipalities and $POST_t$ is a binary variable equal zero for pre-agreement period (2016) and it is equal to one for post-agreement (2017-2019). X_{it} are municipal attributes that change in time such as population, presence of other armed groups, homicide rate, and some economic attributes. Our parameter of interest is α_3 which captures the change in sexual violence before and after the peace agreement in municipalities with and without FARC activity. The sign and magnitude of this coefficient might provide evidence supporting one of the hypothesis mentioned in the introduction.

Hypothesis 1: FARC were perpetrators of sexual violence, or their presence was associated with an increased risk of committing sexual assaults by other individuals. Therefore, their demobilization could be associated with a negative α_3 , implying a decrease in sexual assaults.

Hypothesis 2: FARC did not use sexual violence as one strategy of war, then the incidence of sexual violence in municipalities with former guerilla presence remains at the same level, and thus α_3 will be zero.

Hypothesis 3: FARC were not perpetrators of sexual violence and their presence deter sexual assaults. The end of conflict leads to an increase in the number of sexual violent acts, implying a positive α_3 .

We compare the results from all Colombian municipalities to a restricted sample of municipalities whose propensity score belongs to the intersection of the propensity score

of treated and controls. This is a *matched-difference-in-difference* method. We estimated the propensity score (i.e., the probability of having FARC activity given the set of control variables $Pr[D_i = 1|X_i] = \Phi h(X_i)$) for the pre-agreement period (2016) using a probit model and calculated the common support as the minimum propensity of the treated and the maximum of the control. The balancing property holds, which implies that imposing common support in the estimation of DID might reduce plausible bias in the estimation.

Although the rate of reported sexual assaults did not change the year after the peace agreement in municipalities formerly controlled by FARC, it did decrease two years after. Table 2 shows the results for rate of sexual violence measured as the count of sexual assaults per 100 thousand inhabitants. The coefficient of interest is non statistically different from zero for the sample 2016-2017, implying that rates of sexual violence were higher in municipalities with former FARC activity and remained higher after the peace process. For example, in column (2) of the matched-sample for the period 2016-2017, the rate of sexual assaults, net of the effect of other attributes, was on average 45.73 in 2016 in municipalities without FARC activity and it increased to 54.18 in 2017; while the rate of sexual assaults in municipalities with FARC presence went from 61.73 to 65.62 cases per 100 thousand inhabitants in the same comparison period. The last four columns present the results of estimating the same model but now we include the interaction for 2018 and 2019 with the treatment dummy, instead of 2017, in order to estimate longer run effects. The results suggest that sexual violence started a decline in 2018, but the real turning point is observed in 2019, when the rates of sexual assaults decreased in 13.11 attacks per thousand inhabitants, this corresponds to a reduction of 20 percent, providing support of *hypothesis 1*

Table 2. Sexual Assaults (per 100.000 inhabitants)

	2016-2017				2016-2019			
	Total Sample		Matched Sample		Total Sample		Matched Sample	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Post 2017	8.17*** (1.25)	8.15*** (1.25)	8.37*** (1.28)	8.45*** (1.29)	8.17*** (1.25)	8.15*** (1.25)	8.37*** (1.28)	8.41*** (1.29)
Farc (2016)=1	16.61*** (5.07)	16.04*** (5.26)	15.60*** (5.30)	16.00*** (5.30)	16.61*** (5.07)	15.86*** (5.27)	15.60*** (5.30)	15.85*** (5.38)
Post 2017 × Farc (2016)	2.45 (3.85)	2.14 (3.81)	4.16 (3.99)	3.89 (4.24)	2.45 (3.85)	2.22 (3.80)	4.16 (3.99)	4.08 (4.10)
Post 2018 × Farc (2016)					-5.76 (5.22)	-6.06 (5.28)	-3.03 (5.57)	-3.85 (5.74)
Post 2019 × Farc (2016)					-12.95** (5.02)	-13.04** (5.15)	-12.20** (5.49)	-13.11** (5.52)
Constant	45.42*** (1.07)	45.21*** (1.10)	46.27*** (1.09)	45.73*** (1.13)	51.22*** (1.23)	50.99*** (1.24)	52.14*** (1.24)	51.78*** (1.27)
R Squared	.018	.019	.018	.023	.046	.047	.049	.05
N	2068	2068	2002	2002	4136	4136	4004	4004
Common Trend F Test	1.1	1.1	1.2	1.2	1.1	1.1	1.2	1.3
P value	.37	.36	.3	.29	.37	.34	.3	.28

Note: *** p<0.01, ** p<0.05, * p<0.1. Column (1) presents the results without covariates, while column (2) includes population, presence of other armed actors, homicide rate, rural index, and municipal finance index. The last four columns also include indicators variables for years. Standard errors are clustered at the municipal level.

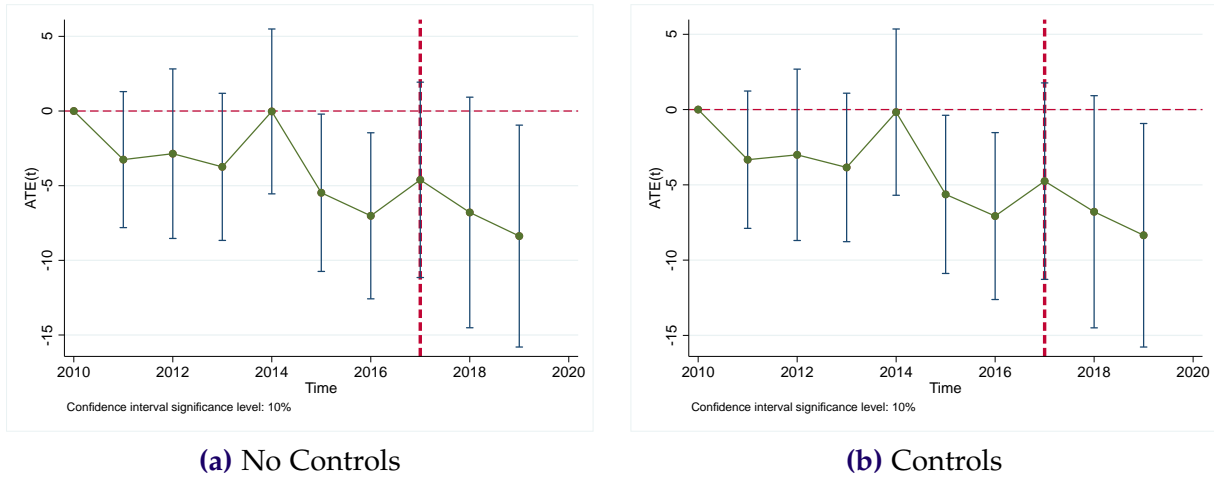
These results can be interpreted as causal if the rate of sexual assaults in the municipalities without FARC activity would have evolved in a similar way to treated units if they had not experienced the FARC demobilization. This common-trends assumption can be tested using the following dynamic model:

$$Y_{it} = \lambda_i + \beta FARC_i + \sum_{j=0}^T \delta_j POST_{t-j} + \sum_{j=0}^T \alpha_j FARC_{i,t-j} x POST_{t-j} + X_{it} + \epsilon_{it} \quad (2)$$

This model allows for a simple test of parallel trends, which can be done by non rejecting the following joint hypothesis: $H_0 : \alpha_j = 0$. Table 2 presents both the parallel trend F statistics and its associated p-value. In all specifications we cannot reject the null hypothesis (Cerulli and Ventura, 2019), suggesting that the trend in treated and controlled municipalities are similar prior to the peace agreement. Figure 3 presents the results of the average treatment effects for each year previous to the peace agreement. The coefficients are not statistically different from zero, providing evidence that points out that municipalities without FARC activity in 2016 provide the appropriate counterfactual of

the trend that municipalities with FARC would have followed if the peace agreement would not have occurred - that is, that the two groups of municipalities would have had common trends.

Figure 3. Parallel Trend Assumption Test (Sample 1)



Results suggest that although the rate of sexual assaults did not change in municipalities with FARC presence immediately after the peace agreement, the perpetration of this type of violent acts started to decrease two years after the implementation of the peace agreement. One possible reason why this is happening is that after the FARC demobilization concentrate in the Territorial Spaces for Training and Reincorporation, other armed groups (legal or illegal) could have taken their place in order to obtain territorial control, and therefore, perpetrate this type of abusive behavior. To explore this, we analyze the effects of the peace agreement on sexual assaults exploiting the heterogeneity in the presence of other (state and non state) armed groups. The presence of other groups comes from the VIPPA database, and it corresponds to violations to human rights that are reported in "Noche y Niebla". Unfortunately, the information is available only for 2016 and 2017, and not until 2019. With that information, We created six indicator variables for the presence of these actors: police, army, self defense groups (includes former paramilitary groups), criminals, ELN, and others (any other armed or criminal group). Table 3 presents the results. Although sexual violence increased in municipalities with presence of FARC and Army, FARC and criminals, FARC and ELN one year after the peace agreement, the coefficients of the triple interaction are not statistically different from zero, showing that the reporting of sexual abuse in those municipalities is not consistently different from the one observed during periods of war.

Table 3. Sexual Assaults Heterogeneous Effects (per 100.000 inhabitants)

	Others	Police	Army	Self Defense	Criminal	ELN
Post 2017	8.99*** (1.45)	8.34*** (1.37)	8.76*** (1.38)	8.65*** (1.37)	8.23*** (1.34)	8.75*** (1.33)
Farc (2016)=1	24.52 (16.28)	15.42** (7.36)	17.38** (8.41)	25.36** (10.50)	13.59** (6.12)	19.43*** (6.16)
Post 2017 × Farc (2016)=1	-10.35 (11.71)	7.51 (6.76)	.88 (8.46)	-.54 (8.96)	-.04 (5.84)	-2.51 (5.55)
Others=1	-2.05 (3.11)	3.09 (4.60)	-1.11 (4.67)	-2.46 (4.14)	-4.69 (5.35)	-2.31 (10.23)
Post 2017 × Others=1	-3.35 (3.70)	.26 (4.70)	-3.82 (5.97)	-1.61 (4.92)	6.86 (6.11)	-6.91 (9.90)
Farc (2016)=1 × Others=1	-9.28 (17.37)	-.77 (10.56)	-2.48 (11.30)	-13.37 (12.43)	14.61 (11.57)	-13.48 (14.27)
Post 2017 × Farc (2016)=1 × Others=1	21.09 (14.97)	-10.58 (11.52)	9.24 (15.68)	-6.56 (15.11)	12.10 (19.26)	31.18 (19.32)
Constant	45.80*** (1.17)	45.66*** (1.15)	45.70*** (1.15)	45.75*** (1.14)	45.84*** (1.14)	45.69*** (1.13)
R Squared	.024	.023	.023	.024	.024	.024
N	2002	2002	2002	2002	2002	2002

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are clustered at the municipal level. All specifications include population, presence of other armed actors, homicide rate, rural index, and municipal finance index.

Robustness checks

Underreporting

As a result of the demobilization of FARC, civilians might have increased the reporting of the violent acts because they were less afraid to report these crimes to the local authorities. To test this idea, we estimate the same model with other types of criminal activities as outcome variable. In particular, we estimate the effect of the peace agreement on domestic violence among the treated and untreated municipalities. The results are reported in Table 4 and show that the number of cases of domestic violence reported in the year after the demobilization of FARC did not differ among municipalities with FARC and without FARC presence prior to the peace agreement, even after controlling for other covariates.

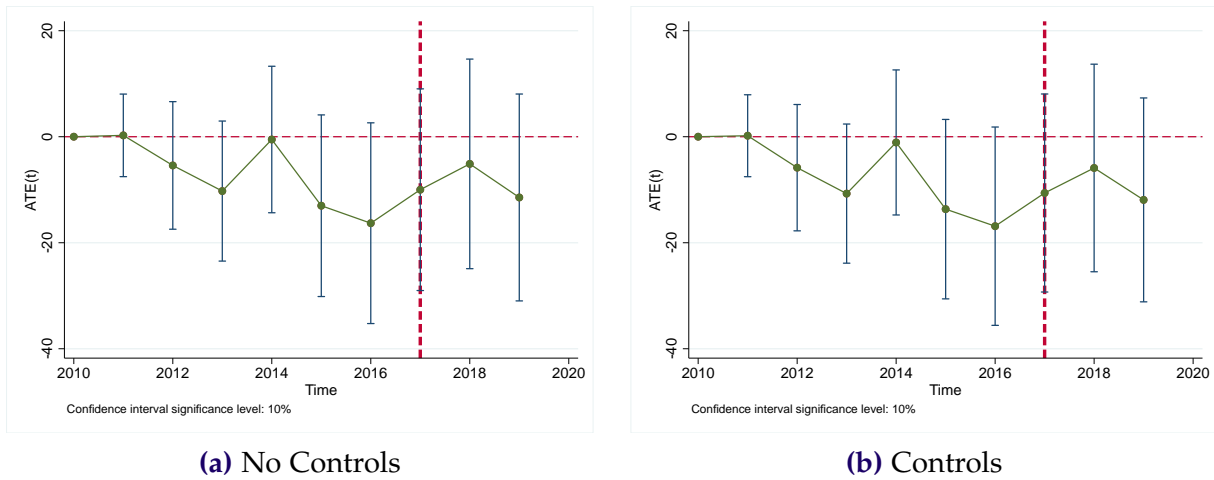
Table 4. Domestic Violence (per 100.000 inhabitants)

	2016-2017				2016-2019			
	Total Sample		Matched Sample		Total Sample		Matched Sample	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Post=1	5.70**	5.33**	5.92**	5.48**	5.70**	5.37**	5.92**	5.48**
	(2.61)	(2.63)	(2.68)	(2.72)	(2.61)	(2.63)	(2.68)	(2.71)
Farc (2016)=1	81.00***	65.53***	85.20***	71.58***	81.00***	65.33***	85.20***	71.92***
	(21.52)	(22.10)	(23.33)	(22.60)	(21.52)	(22.13)	(23.33)	(22.66)
Post 2017 × Farc (2016)=1	-3.79	-5.07	1.76	-.19	-3.79	-4.73	1.76	.11
	(14.01)	(14.02)	(15.68)	(16.03)	(14.01)	(14.05)	(15.68)	(16.19)
Post 2018 × Farc					-11.70	-10.37	-15.65	-13.06
					(13.04)	(15.04)	(14.21)	(15.56)
Post 2019 × Farc					-1.32	1.48	-5.68	-1.57
					(13.34)	(15.32)	(14.13)	(15.62)
Constant	107.40***	104.31***	108.83***	105.59***	104.45***	101.40***	105.74***	103.00***
	(3.33)	(3.28)	(3.37)	(3.44)	(3.30)	(3.26)	(3.34)	(3.41)
R Squared	.015	.036	.016	.035	.015	.04	.015	.038
N	2068	2068	2002	2002	4136	4136	4004	4004
Common Trend F Test	1.1	1.2	1.1	1.2	1.1	1.2	1.1	1.1
P value	.37	.33	.35	.33	.37	.32	.35	.33

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Column (1) presents the results without covariates, while column (2) includes population, presence of other armed actors, homicide rate, rural index, and municipal finance index. The last four columns also include indicators variables for years. Standard errors are clustered at the municipal level.

We also tested for the parallel trends assumption of domestic violence and find that it is not violated (see Figure 4). This provides evidence that the mechanism of a reduction in the reporting of sexual assaults was not a change in the reporting of miss conduct behaviors in the treated municipalities in comparison to the control municipalities after the signing of the peace agreement.

Figure 4. Parallel Trend Assumption Test (Sample 1)



Threats to common trends assumption

Although the outcome variables for treatment and control groups evolved in the same manner previous to the peace agreement, there are some potential violations to the common trends assumption that might bias our coefficients. First, local governments could have implemented several policies after the peace agreement. For instance, besides the peace agreement, local governments could have also taken other steps to reduce sexual violence. Thus, disentangling the peace-agreement effect from other policies requires a control group that reflects the effects of the other policies that treated municipalities enacted.

In particular, the government after the peace agreement created an institutional framework for planning a broad development process in the municipalities most affected by the armed conflict. This program was called Territorial Focused Development Program (PDET in Spanish) and was launched in 170 municipalities. In this context, the reduction in the rate of sexual assaults could have been the result of the implementation of this program and not due to the demobilization. To explore whether this is the case, we include an indicator variable for the 170 municipalities that were exposed to the PDET in column (2) of Table 5, and the results remain unchanged.

Table 5. Other Programs

	Matched Sample	
	(1)	(2)
Post=1	8.37*** (1.28)	8.41*** (1.29)
Farc (2016)=1	15.60*** (5.30)	17.36*** (4.98)
Post=1 × Farc (2016)=1	4.16 (3.99)	3.88 (4.13)
Post 2018 × Farc	-3.03 (5.57)	-3.00 (5.72)
Post 2019 × Farc	-12.20** (5.49)	-12.36** (5.57)
PDET		-9.41*** (2.51)
Constant	52.14*** (1.24)	53.01*** (1.32)
R Squared	.049	.056
N	4004	4004
Common Trend F Test		
P value		

Note: *** p<0.01, ** p<0.05, * p<0.1. Column (1) presents the results without covariates, while column (2) includes population, presence of other armed actors, homicide rate, rural index, and municipal finance index. Standard errors are clustered at the municipal level.

Second, when National Government announced the peace agreement ahead of time, behavior may have changed in response to information about the policy itself. In order to test for this, we estimate the model, but now, the time of change in the policy is the year 2014, in which the government installed the negotiations with FARC. Results, depicted in Table 6, show that even changing both, the date of the intervention and the definition of treatment municipalities, the results on sexual assaults are not statistically different from zero for the period post installation of the negotiations among FARC and the government. This result suggests that the sexual violence did not change before the signing of the peace agreement, and, therefore, the choice of year is valid.

Table 6. Policy Placebo

	Total Sample		Matched Sample	
	(1)	(2)	(1)	(2)
T PLACEBO=1	15.34*** (1.12)	15.20*** (1.12)	15.55*** (1.15)	15.49*** (1.15)
Farc (2014)=1	9.14*** (2.69)	7.21** (2.92)	8.67*** (2.80)	4.77 (3.01)
T PLACEBO=1 × Farc (2014)=1	1.04 (2.62)	1.00 (2.66)	.81 (2.73)	1.48 (2.79)
Constant	22.84*** (.78)	22.50*** (.79)	23.35*** (.79)	22.77*** (.80)
R Squared	.08	.084	.08	.091
N	2068	2068	2002	2002
Common Trend F Test	.49	.54	.52	.6
P value	.78	.75	.76	.7

Note: *** p<0.01, ** p<0.05, * p<0.1. Column (1) presents the results without covariates, while column (2) includes population, presence of other armed actors, homicide rate, rural index, and municipal finance index.

Another possible threat to the common trend assumption is reverse causality. However, in our context is not a serious problem because the peace agreement was not correlated to previous levels of sexual assaults.

4.1. Changes in the definition of treatment

Now we explore whether the results hold when we change the definition of the treatment to include all the municipalities that suffered a violent act from FARC in the period 2010-2016.¹⁰ Table 7 presents the results for total sample, matched sample, for the period 2016-2017, and 2016-2018, for the variable in levels and in rates. The results are robust to the definition of treated and control municipalities, since they remain unchanged.

¹⁰This is a common definition used in other papers. See Prem et al. (2018) and Prem et al. (2020)

Table 7. Robustness Checks

	2016-2017				2016-2019			
	Total Sample		Matched Sample		Total Sample		Matched Sample	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Post=1	7.88*** (1.47)	7.86*** (1.47)	8.07*** (1.51)	8.11*** (1.51)	7.88*** (1.47)	7.86*** (1.47)	8.07*** (1.51)	8.08*** (1.51)
Farc (2010-2016)=1	3.95* (2.25)	3.19 (2.28)	2.46 (2.31)	1.19 (2.37)	3.95* (2.25)	3.24 (2.28)	2.46 (2.31)	1.81 (2.35)
Post 2017 × Farc (2010-2016)=1	1.49 (2.50)	1.37 (2.51)	1.71 (2.60)	1.67 (2.60)	1.49 (2.50)	1.38 (2.51)	1.71 (2.60)	1.70 (2.60)
Post 2018 × Farc					-.44 (2.95)	-.19 (3.01)	-.29 (3.06)	-.62 (3.12)
Post 2019 × Farc					-5.41* (2.84)	-5.12* (2.91)	-5.93** (2.94)	-6.25** (2.99)
Constant	44.92*** (1.26)	44.78*** (1.27)	46.06*** (1.26)	45.75*** (1.28)	50.94*** (1.43)	50.78*** (1.44)	52.20*** (1.44)	51.97*** (1.46)
R Squared	.015	.016	.015	.018	.045	.046	.047	.048
N	2068	2068	2002	2002	4136	4136	4004	4004
Common Trend F Test	.68	.66	.63	.64	.68	.64	.63	.61
P value	.64	.65	.67	.67	.64	.67	.67	.69

Note: *** p<0.01, ** p<0.05, * p<0.1. Column (1) presents the results without covariates, while column (2) includes population, presence of other armed actors, homicide rate, rural index, and municipal finance index. The last four columns also include indicators variables for years. Standard errors are clustered at the municipal level.

5. Conclusion

Sexual and gender-based violence is increasingly being reported and documented in Colombia. The sexual crime rate went from 13.34 to 68.95 cases per 100,000 inhabitants between 2010 and 2019. In the same period, the homicide rate remained at 25.76 cases per 100,000 inhabitants. Therefore, sexual violence should be considered as a serious public health and human rights problem, in particular, in a conflict and post-conflict context. Unfortunately, it has received less attention in the literature of consequences of conflict.

In this paper we explore the effect of a peace process between the government and an illegal armed group on sexual violence. The literature acknowledges that sexual and gender-based violence perpetrated against women could be used as a weapon of war. Therefore, a peace process like the one recently signed in Colombia should be

a scenario to observe a reduction in these type of crimes. However, there are other reasons why a reduction in this type of crimes are observed. In particular, the evolution of the Colombian internal conflict as well as the differences in the motives of war of all other actors that have been part of the conflict may affect how the criminal activity uphold after one of the armed actors leave the territory. Our analysis shows that sexual violence decreases after the demobilization of former FARC troops, but only two years after the peace agreement took place. We exploited the heterogeneity in the presence of other armed actors across municipalities and did not find supporting evidence for the substitution effect of, state and non-state, armed actors as continuous perpetrators of sexual assaults after war. Instead, our results support the idea that sexual assaults could be abated after an internal conflict as a result of the reconstruction of communities that experienced greatest confrontation between the armed groups and periods of violence.

Colombian Government need to act toward fulfilling the obligations agreed in the peace agreement, and defend the right of the conflict's victims to accountability, truth and reparation.

References

- Acemoglu, Daron, James A. Robinson, and Rafael J. Santos**, "The Monopoly of Violence: Evidence from Colombia," *Journal of the European Economic Association*, 2013, 11 (s1), 5–44.
- Acevedo, Karina Margarita and Iván Bornacelly**, "Panel Municipal del CEDE," Documentos CEDE, Universidad de los Andes - CEDE 2014.
- Alcorn, Ted**, "Responding to sexual violence in armed conflict," *The lancet*, 2014, 383 (9934), 2034–2037.
- Alison, Miranda**, "Wartime sexual violence: women's human rights and questions of masculinity," *Review of International Studies*, 2007, 33 (1), 75–90.
- Annan, Jeannie, Christopher Blattman, Dyan Mazurana, and Khristopher Carlson**, "Civil war, reintegration, and gender in Northern Uganda," *Journal of conflict resolution*, 2011, 55 (6), 877–908.
- Blattman, Christopher**, "From violence to voting: War and political participation in Uganda," *American political Science review*, 2009, pp. 231–247.
- **and Jeannie Annan**, "Child combatants in northern Uganda: Reintegration myths and realities," in "Security and Post-Conflict Reconstruction," Routledge, 2008, pp. 123–145.
- Braun, Sebastian and Toman Omar Mahmoud**, "The employment effects of immigration: evidence from the mass arrival of German expellees in postwar Germany," *The Journal of Economic History*, 2014, pp. 69–108.
- Brück, Tilman**, "Determinants of rural poverty in post-war Mozambique: evidence from a household survey and implications for Government and Donor Policy," 2001.
- Bundervoet, Tom, Philip Verwimp, and Richard Akresh**, "Health and civil war in rural Burundi," *Journal of human Resources*, 2009, 44 (2), 536–563.
- Buss, Doris**, "1 Seeing Sexual Violence in Conflict and Post-Conflict Societies," *Sexual violence in conflict and post-conflict societies: International agendas and African contexts*, 2014, p. 1.

- Camacho, Adriana**, "Stress and birth weight: evidence from terrorist attacks," *American Economic Review*, 2008, 98 (2), 511–15.
- Cerulli, Giovanni and Marco Ventura**, "Estimation of pre- and posttreatment average treatment effects with binary time-varying treatment using Stata," *The Stata Journal*, 2019, 19 (3), 551–565.
- Céspedes-Baez, Lina-Maria and Felipe Jaramillo Ruiz**, "'Peace without women does not go!' Women's struggle for inclusion in Colombia's peace process with the FARC," *Colombia Internacional*, 04 2018, 94, 83–109.
- CH, Rafael, Jacob Shapiro, Abbey Steele, and Juan F. Vargas**, "Endogenous Taxation in Ongoing Internal Conflict: The Case of Colombia," *American Political Science Review*, 2018, 112 (4), 996–1015.
- Cohen, Dara and Ragnhild Nordås**, "Do States Delegate Shameful Violence to Militias? Patterns of Sexual Violence in Recent Armed Conflicts," *Journal of Conflict Resolution*, 04 2015, 59.
- Cohen, Dara Kay and Ragnhild Nordås**, "Sexual violence in armed conflict: Introducing the SVAC dataset, 1989–2009," *Journal of Peace Research*, 2014, 51 (3), 418–428.
- Davies, Sara E, Jacqui True, and Maria Tanyag**, "How women's silence secures the peace: Analysing sexual and gender-based violence in a low-intensity conflict," October 2016.
- Denov, Myriam**, "Wartime Sexual Violence: Assessing a Human Security Response to War-Affected Girls in Sierra Leone," *Security Dialogue - SECUR DIALOGUE*, 09 2006, 37, 319–342.
- Diaz, Fabio Andres**, *Transitional justice and the 'Colombian peace process'* 05
- Econometria**, "Analysis on the role of children in the peace agreements," Technical Report 2019.
- Flores, Thomas E and Juan F Vargas**, "Colombia: Democracy, violence, and the peace-building challenge," *Conflict Management and Peace Science*, 2018, 35 (6), 581–586.
- Ghobarah, Hazem Adam, Paul Huth, and Bruce Russett**, "The post-war public health effects of civil conflict," *Social science & medicine*, 2004, 59 (4), 869–884.

- Heineman, Elizabeth D**, *Sexual violence in conflict zones: From the ancient world to the era of human rights*, University of Pennsylvania Press, 2011.
- Henry, Nicola**, “War and rape: Law, memory and justice,” *War and Rape: Law, Memory and Justice*, 01 2012, pp. 1–172.
- Humphreys, Macartan and Jeremy M Weinstein**, “Demobilization and reintegration,” *Journal of conflict resolution*, 2007, 51 (4), 531–567.
- Jones, Seth G, Jeremy M Wilson, Andrew Rathmell, and K Jack Riley**, *Establishing law and order after conflict*, Rand Corporation, 2005.
- Lambourne, Wendy**, “Post-conflict Peacebuilding: Meeting Human Needs for Justice and Reconciliation, Peace, Conflict and development,” *Issue Four*, 2004.
- Leiby, Michele L.**, “Wartime Sexual Violence in Guatemala and Peru,” *International Studies Quarterly*, 2009, 53 (2), 445–468.
- Meger, Sara**, “Rape in Contemporary Warfare: The Role of Globalization in Wartime Sexual Violence,” *African Conflict Peacebuilding Review*, 04 2011, 1, 100–132.
- , “Toward a Feminist Political Economy of Wartime Sexual Violence,” *International Feminist Journal of Politics*, 2015, 17 (3), 416–434.
- Meier, Patrick and Helga Hernes**, “A Gendered Perspective on the Direct and Indirect Causes of Death in War and Armed Conflicts,” Technical Report, PRIO, Oslo, PRIO Paper 2006.
- Memoria-Historica**, “¡BASTA YA! Colombia: Memorias de guerra y dignidad,” 2013.
- , *La guerra inscrita en el cuerpo. Informe nacional de violencia sexual en el conflicto armado*, Bogota, Colombia: Centro de Memoria Historica, Imprenta Nacional, Bogota, 2018.
- Mendes, Isa, Maíra Siman, and Marta Fernández**, “The Colombian peace negotiations and the invisibility of the ‘no’ vote in the 2016 referendum,” *Peacebuilding*, 2019, 0 (0), 1–23.
- Olujic, Maria B.**, “Embodiment of Terror: Gendered Violence in Peacetime and Wartime in Croatia and Bosnia-Herzegovina,” *Medical Anthropology Quarterly*, 1998, 12 (1), 31–50.

- Osorio, J., M. Mohamed, V. Pavon, and S. Brewer-Osorio**, "Mapping Violent Presence of Armed Actors in Colombia," *Advances in Cartography and GIScience of the ICA*, 2019, 1, 16.
- Oxfam**, "Sexual Violence in Colombia: Instrument of War," Technical Report, Oxfam International 2009.
- Palacios, Marco**, *Violencia publica en Colombia, 1958-2010* 03 2019.
- Palermo, Tia and Amber Peterman**, "Undercounting, overcounting and the longevity of flawed estimates: statistics on sexual violence in conflict," *Bulletin of the World Health Organization*, 2011, 89, 924–925.
- Phelan, Alexandra**, "Engaging Insurgency: The Impact of the 2016 Colombian Peace Agreement on FARC's Political Participation," *Studies in Conflict & Terrorism*, 2019, 42 (9), 836–852.
- Prem, Mounu, Andrés Rivera, Darío Romero, and Juan F Vargas**, "Killing social leaders for territorial control: the unintended consequences of peace," *Available at SSRN 3203065*, 2018.
- , **Santiago Saavedra, and Juan F Vargas**, "End-of-conflict deforestation: Evidence from Colombia's peace agreement," *World Development*, 2020, 129, 104852.
- Rettberg, Angelika**, "Peacebuilding in Colombia: Context and Balance," *SSRN Electronic Journal*, 01 2014.
- Theidon, Kimberly**, "Reconstructing Masculinities: The Disarmament, Demobilization, and Reintegration of Former Combatants in Colombia," *Human Rights Quarterly*, 01 2008, 31, 1–34.
- Theidon, Kimberly S.**, *Entre prójimos: el conflicto armado interno y la política de la reconciliación en el Perú*, Instituto de Estudios Peruanos, Jan 1, 2004 2004.
- Torres, Fabio and María Palau**, "Conflict, Decentralisation and Local Governance in Colombia, 1974-2004," 06 2006.
- Tripp, Aili Mari**, *Women and power in post-conflict Africa*, Cambridge University Press, 2015.

Ubillos-Landa, Silvia, Alicia Puente-Martínez, Gina Arias-Rodríguez, Marcela Gracia-Leiva, and José Luis González-Castro, "Coping Strategies Used by Female Victims of the Colombian Armed Conflict: The Women in the Colombian Conflict (MUCOCO) Program," *SAGE Open*, 2019, 9 (4), 2158244019894072.

Wood, Elisabeth Jean, "Variation in Sexual Violence during War," *Politics & Society*, 2006, 34 (3), 307–342.

– , "Armed Groups and Sexual Violence: When Is Wartime Rape Rare?," *Politics & Society*, 2009, 37 (1), 131–161.

– , "Armed groups and sexual violence: When is wartime rape rare?," *Politics & Society*, 2009, 37 (1), 131–161.

– , "Conflict-related sexual violence and the policy implications of recent research," *International Review of the Red Cross*, 2014, 96 (894), 457–478.

