

Conflict and Female Leadership: Evidence from Colombia*

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Abstract

This paper examines whether female leadership can reduce violence in the context of the Colombian conflict. To identify the effect, I leverage closely contested local elections between male and female candidates, alongside a novel dataset with the location and gender of guerrilla unit commanders. I find that female leadership has a negative effect on conflict violence that amounts to a 60% reduction in the most demanding specification. I document even larger reductions in violence when both a female mayor and a female guerrilla commander are present, revealing that synergies between female leaders on opposing sides of the conflict further contribute to de-escalation. To understand the reasons behind this reduction in violence, I use text analysis on a novel dataset of campaign statements, revealing that female mayors employ less confrontational language when addressing the conflict. Additionally, I leverage timing of conflict events to show that guerrilla units with female commanders are less likely to retaliate following unilateral attacks. I interpret these patterns as evidence of a gender-based preference for de-escalation. Finally, to study how these preferences translate into lower violence, I build a simple theoretical model to show that gender differences in “negotiation skills” can account for the observed empirical patterns. Testing the model’s predictions and ruling out alternative explanations, I conclude that female leaders consistently opt for de-escalation over violent confrontation whenever possible.

JEL codes: D02, D74, J16, O12.

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Introduction

Armed conflict claims over 50,000 civilian lives each year worldwide (Roser, Hasell, Herre, & Macdonald, 2016), making it one of the most pressing public policy challenges of our time. As conflicts continue to rise in number and intensity (Rohner, 2017), understanding their underlying drivers and consequences has become increasingly urgent. While a substantial body of research has examined the impact of leaders' individual traits on conflict dynamics (Horowitz, Stam, & Ellis, 2015), the influence of leaders' gender on conflict outcomes remains an open question, with no consensus in the literature.¹ This gap persists despite extensive theoretical and empirical work in political science, philosophy, and related fields that highlights gendered differences in belligerence (Goldstein, 2003; Caprioli, 2000; Melander, 2005; Koch & Fulton, 2011) and conflict resolution (Ruddick, 1982; Tickner, 1988; Jaggar, 1990). Ultimately, whether and how female leadership influences conflict outcomes remains an open empirical question.

Although uncommon, anecdotes of how female leaders might influence conflict and its resolution can be found in recent history. On January 24, 2014, the Philippine government, led by Miriam Coronel-Ferrer, reached a truce with the *Moro Islamic Liberation Front*, ending decades of ethnic and religious conflict in the region. Coronel-Ferrer's success in securing an agreement with the rebels garnered international praise and recognition, both in political and academic circles. Her effectiveness derives from her ability to navigate hostilities from both sides: she demonstrated resilience to those who perceived her as weak or easily swayed, while simultaneously conveying empathy towards the concerns of her counterparts.² A similar story unfolded in Guatemala during the 1980s, where indigenous activist Rigoberta Menchú emerged as the most visible symbol of Mayan resistance against dictatorship violence. While she did not engage directly with the dictatorship, Menchú went around the world raising awareness of the atrocities committed against her people, ultimately creating enough pressure for the government to enter peace negotiations. Her efforts to end the conflict earned her the Nobel Peace Prize in 1992, awarded in recognition of her advocacy for indigenous rights and social justice. Supporting these anecdotal examples, a report by the Council on Foreign Relations (O'Reilly, Súilleabhadháin, & Paffenholz, 2022) finds that peace agreements are more likely to be reached and implemented when women are involved in negotiations.

¹(Pinker, 2012) attributes this gap to both the scarcity of women in leadership positions and the historically male-dominated nature of conflict-related domains. The only exception is Dube and Harish (2020), who document the effect of queens on warfare in medieval Europe.

²For instance, when Muslim leaders objected to the term "sex" in "non-discrimination based on sex," she acknowledged their concerns and substituted the term with "gender." (Çuhadar, 2024)

In this paper, I provide systematic empirical evidence on the impact of female leaders on conflict violence by examining their role in the later stages of the Colombian civil conflict. Using municipal mayoral elections closely contested between female and male candidates, I empirically identify the effects of female leadership on the frequency of violent episodes within a municipality.³ I find that the election of a female mayor results in a substantial reduction in attacks by left-wing guerrilla groups. Specifically, a woman's victory leads to 6 fewer attacks per 100,000 inhabitants during the electoral cycle, representing a 60% decline from the average incidence of violence in this period.

I then shift focus to the other side of the conflict, examining the role of female leaders within guerrilla groups. To do so, I construct a novel and unique dataset that captures the structure, spatial distribution, and gender composition of the guerrilla command hierarchy. Using these data, I find that municipalities in areas where the guerrilla unit is led by a female commander experience significantly lower levels of conflict-related violence.

Existing literature in economics and other social sciences suggests that interactions between two female leaders can yield increasing marginal returns in the de-escalation of armed conflict, driven by their mutual preference for less-violent forms of engagement (Tannen, 1994; Goldstein, 2003; Ruddick, 1982; Cameron, 1998; Koch & Fulton, 2011; Caprioli, 2000). I am uniquely able to empirically test this hypothesis by combining the two sources of female leadership described above. My results indicate that the decline in violence is not only larger in magnitude but also more precisely estimated in municipalities where a female mayor was narrowly elected and where a female guerrilla commander operates within the same area.

Next, I investigate *why* female leaders reduce conflict violence when in power. To explore this, I compile an additional (novel) dataset of campaign manifestos for a subset of mayoral candidates. Using unstructured text-analysis techniques, combined with artificial intelligence classification algorithms and topic modeling, I find that female candidates more frequently use words and expressions that indicate a stronger “preference” for de-escalation. In contrast, I find no significant differences when examining their discussions of other key policy areas, such as infrastructure investment.

Turning to female guerrilla commanders, I leverage the high frequency of my conflict dataset to analyze the response of different units to government crackdowns. The results show that units led by female commanders are less likely to retaliate against the civilian population upon being attacked. More precisely, these units are less prone to

³This is not the first paper to identify the effects of female leadership using regression discontinuity designs. Brollo and Troiano (2016) and Chauvin and Tricaud (2024), among others, have used an identical empirical strategy to identify the effect of female leadership on a host of other outcomes.

committing one-sided acts of violence in the months following a government crackdown. I interpret this as evidence of preferences for de-escalation among female guerrilla leaders.

Finally, I investigate *how* these preferences for de-escalation lead to the observed decline in violence. To discipline the analysis, I develop a simple model of interaction between two agents—a “mayor” and a “guerrilla commander”—who compete over a scarce resource. The model hinges on a gender gap in negotiation skills to explain the decline in violence associated with female leadership. I then test the model’s predictions against the data, and show that results are consistent with this explanation.

In particular, I provide evidence that female mayors are more successful in attracting private funds to their governments, a different type of high-stakes negotiation. This aligns with the model’s assumption of a gender gap in negotiation skills. Similarly, I show that the guerrillas’ decision to engage in violence depends on the costs associated with violent actions. Specifically, when the benefit of violence is high—meaning that the associated costs are low—guerrillas are less responsive to mayor’s negotiation efforts, regardless of gender. Finally, I rule out alternative mechanisms, including ideological differences, selection effects, or third-party influences. Together, this evidence supports the notion that female mayors’ negotiation skills played a crucial role in reducing conflict violence in Colombia.

This paper contributes to multiple strands of literature. First, it relates to previous studies of the role of women leaders in conflict. Most closely related is the work by Dube and Harish (2020) where the authors argue that *queendoms* in the European Middle Ages were more likely to be involved in conflicts both because they were attacked more regularly (perception of vulnerability) and because they attacked more often (signaling of strength and labor division within household). My work provides the first contemporary piece of evidence of the role of female leaders in conflict, in a democratic and developing nation with modern institutions. Moreover, and unlike Dube and Harish (2020), I find that female leaders are not actively participating more in conflict and I fail to find evidence of them being perceived as weak by other actors.⁴

This paper is also related to the extensive literature on the causes and consequences of conflict. Recent studies document, among others, the role of ethnicity, government policy, elites and institutions as determinants of conflict, as well as the consequences of

⁴Other related studies of gender and conflict have privileged the analysis of the victimization of women in conflict settings, leaving aside their potential role as leaders. This literature spans multiple disciplines, including economics, political science and sociology. See Guarnieri and Tur-Prats (2023); Caprioli (2000) for two references in the economics literature (amongst others).

conflict on economic development.^{5,6} This paper sets itself apart from previous work by focusing on the differences that arise due to the gender of the local leaders.

Finally, this paper relates to the existing work on female political leadership and their performance while in office (Chattopadhyay & Duflo, 2004; Clots-Figueras, 2012; Beaman, Chattopadhyay, Duflo, Pande, & Topalova, 2009; Iyer, Mani, Mishra, & Topalova, 2012; Brollo & Troiano, 2016; Chauvin & Tricaud, 2024). These papers have tied female success with differential legislation and public goods provision; lower levels of corruption; and higher reporting of gender violence (among others). I contribute to this literature by studying the effects of female leadership on a different outcome. Namely, the incidence of conflict violence. Furthermore, and unlike most of the evidence available, I study the behavior of politicians that were elected in the absence of gender quotas or reserved seats of any kind.

The remainder of this paper proceeds as follows: In the next section I provide some background on the conflict and female leadership in Colombia, together with a description of the main data sources used in this paper. Section 3 details the empirical strategies used, and section 4 presents the main results of the paper. Next, in section 5, I present a series of exercises to validate the empirical strategy used, as well as some robustness checks. In section 6, I study *why* female leaders opt for less violence and show that they display behaviors consistent with preferences for lower levels of violence. I then turn my focus towards explaining *how* female leaders manage to translate these behaviors into lower violence in section 7. To do so, I build a simple theoretical framework to guide my analysis and then show empirical evidence consistent with the models' predictions. Finally, section 8 discusses the conclusions of the paper.

2 Data and empirical setting

Empirically estimating the effect of female leadership on conflict violence requires a setting where leadership is randomly allocated between male and female leaders, and where conflict is both widespread and not the sole factor determining access to leadership roles. Given the disruptive nature of armed conflict, it is challenging to find a context where these conditions are met. In this section, I argue that Colombia

⁵See Blattman and Miguel (2010), Kimbrough, Laughren, and Sheremeta (2017) and Rohner (2017) for three extensive surveys on the economic literature on conflict.

⁶Previous work on the Colombian conflict includes Fergusson, Querubin, Ruiz-Guarin, and Vargas (2019); Acemoglu, Robinson, and Santos (2013); Acemoglu, García-Jimeno, and Robinson (2015); Acemoglu, Fergusson, Robinson, Romero, and Vargas (2020); Prem, Rivera, Romero, and Vargas (2019) on the political roots of conflict; Dube and Vargas (2013) on the responsiveness of violence to macroeconomic variables; Ibáñez and Vélez (2008) on forced displacement; Angrist and Kugler (2008); Mejia and Restrepo (2013) on drug production and traffic.

meets both criteria while, at the same time, allowing me to observe the leadership of different conflict actors—a rare feature in conflict studies. Finally, existing scholarship on the Colombian conflict provides high-quality conflict metrics beginning in the early 1990s, allowing me to carefully identify these effects.

2.1 Conflict and politics in Colombia

Colombia was immersed in an armed conflict between guerrillas, paramilitary groups, and government forces from the late 1940s until 2016. While the nature of the conflict evolved over the decades, by the mid-1990s, illegal actors could broadly be classified into two groups. On one side were left-wing communist guerrillas, whose objective was to overthrow the government. On the other side were right-wing paramilitary groups, which fought for territorial control necessary to continue their illicit activities (Bergquist, Peñaranda, & Sánchez, 2001; Rivera, 2007).⁷ Figure 1 provides a summary of the key events in the Colombian conflict, leading up to its conclusion in 2016 with the demobilization of the FARC, the largest guerrilla group.

Before 1988, Colombia’s institutional design granted national political elites control over the state bureaucracy at all levels and across regions. State governors and municipal mayors were appointed and removed at the discretion of the president’s party. Consequently, these positions remained inaccessible to a broad segment of the population, including those advocating for more progressive agendas. Historically, women were among those significantly underrepresented in the spheres of power, and thus had limited access to political office (Aviel, 1981; Fergusson & Vargas, 2013). It was only after 1988 that local elections were implemented in Colombian municipalities, and not until 1991 when the party system was modified in a way that allowed for non-traditional (local) political movements to contest for power.

Colombian mayors Local elections in Colombia are held every four years in a multi-party system, with no possibility of reelection. Mayors serve as the highest authority in a municipality, overseeing tasks such as preparing and executing municipal budgets, raising local taxes, supervising public works projects, and acting as a liaison between their community and higher levels of government. Although their official authority over public order and security is limited—since they do not control national police

⁷The Colombian conflict has been extensively examined, as in the work by Safford and Palacios (2002) and Palacios (2012). There is a consensus that the roots of the guerrilla movements can be traced back to the government’s neglect of the central highlands in Colombia, coupled with the prevalence of anti-imperialist and communist ideologies during the Cold War in Latin America. In contrast, the emergence of paramilitary groups is closely tied to the surge in cocaine trafficking and the entanglement of the landed and political elites with drug trafficking organizations.

or military forces—mayors often play a critical role in coordinating with higher-level authorities to maintain security, as they are frequently the only visible representation of the state in many areas. Figure 2 summarizes the key aspects of the relationships between all the actors in the Colombian conflict.

Conflict data

The main source of data on conflict violence is an updated version of the dataset compiled by Restrepo, Spagat, and Vargas (2003), updated until 2018 by the *Universidad del Rosario*. This dataset offers daily counts of violent events in each Colombian municipality between 1984 and 2018. The events are categorized based on reports from the local NGO *CINEP* (Centro de Investigación y Educación Popular), which draws on local and national media as sources for their reports.^{8,9}

Each violent event in the dataset is classified as either a one-sided attack—an uncontested one-sided episode of violence like a shooting or a kidnap—or a clash, which denotes a violent confrontation between different actors. Importantly, one-sided attacks that distill a response from the attacked side are coded as clashes. The data also includes the incident’s date, the municipality(ies) affected, the identity of the group(s) involved (e.g., guerrillas, paramilitaries, or state forces), as well as the count of casualties, injuries, and captures resulting from each event. Given the ongoing nature of this conflict, there is no information on the side who initiated a clash. In cases involving multiple actors, all parties involved are identified.

2.2 Women in Politics

In a context of elite capture and low representativeness, women emerged as political outsiders, advocating for peace and championing the rights of less privileged segments of the population (Capote Díaz, 2012; Herrera & Pertuz Bedoya, 2015). While still relatively few, the proportion of female local mayors in Colombia doubled between 1997 and 2015. By 2015, one in every four mayoral seats was occupied by a woman, and female candidates placed in the top two positions in nearly half of the mayoral elections that year.¹⁰ Figure 3 illustrates the share of local elections in which a female

⁸CINEP used 1984 as a starting point for their first report – written in 1996 – due to a lack of reliable violence data before that year. The dataset extends to 2018. As discussed earlier, the conflict formally concluded in 2016 following the FARC’s demobilization.

⁹The series of reports is titled “*Noche y Niebla*”, and is available online at <https://www.nocheyniebla.org>. An example of these reports can be seen in Appendix Figure A1.

¹⁰The underrepresentation of women is prevalent across political institutions, with women comprising only 20% of Congress members and 17% of state deputies in 2019 (U.N., 2020). There was

candidate participated or won between 1997 and 2015.

The path to public office for these female politicians often began with grassroots work and peace advocacy. Many of these activists had to engage with armed actors in non-violent ways to negotiate conflict resolutions for their communities.¹¹ Through the recognition they gained from their activism, many of these women reached political power. A notable example of this journey is Gloria Cuartas, elected as the mayor of Apartadó in 1994.¹² Since the late 1980s, Cuartas had been a highly regarded local activist. Her work as a housing councilor for conflict victims in Apartadó allowed her to actively oppose the actions of armed groups in the region, making her a beacon for her community. In 1994, due to her activism, she was chosen to run for mayor as part of a coalition of “minor” political parties. During her tenure, the “Comunidad de Paz de Apartadó” (Apartadó Peace Community) was founded (Mosquera, 2000). This community group was created to help its members mitigate the negative consequences of violence by fostering solidarity and mutual aid within the municipality, attracting international attention and support, and organizing cooperative activities such as agricultural training programs.

Another example of female leadership that eventually gained national recognition through a sustained peace effort is that of Aída Avella. Born in 1949, Avella initially pursued a degree in psychology before becoming actively involved in the Ministry of Education workers’ union. She gained prominence for her leadership within the Patriotic Union (UP) party, primarily focused on peace and human rights advocacy. Avella’s unwavering commitment to peace and marginalized communities led to her election to the Bogotá City Council in 1992 and 1994. However, in May 1996, she was forced to flee the country after surviving an assassination attempt by paramilitary groups (Melo-Moreno, 2018). Aída Avella has since returned to Colombian politics and is currently serving her second consecutive term as a Senator.

Electoral data

To measure the participation of women in local politics, I gathered data on local elections in Colombia spanning from 1997 to 2016, sourced from the National Registry

only one woman on the government’s peace-talk negotiation committee.

¹¹For example, some activists assisted their communities in dealing with guerrillas by acting as intermediaries between them and international organizations (e.g., IRC) to secure the release of hostages. See [this](#) article by the BBC titled “Piedad C’ordoba, a controversial Colombian senator known for her role in the release of FARC hostages, dies at 68.”

¹²Apartadó is a strategically positioned municipality in northwestern Colombia, located along the corridor linking the Pacific Ocean and the Caribbean. This area serves as a primary route for illegal activities, including drug and arms trafficking, and has been a site of violent conflict involving various armed groups since the 1980s. See Appendix Figure A2 for a visual reference.

Office (*Registraduría General de la República*). The duration of local politicians' terms was inconsistent prior to 2003, with mandates lasting 2 years between 1992 and 1994, and 3 years between 1994 and 2003. Starting in 2003, terms have been standardized at 4 years. The availability of electoral data determines the starting point for my sample period. This is because the National Registry did not maintain a comprehensive record of local election results before 1997—only the total vote count and votes for the elected candidate were documented.

I use data from 6 electoral cycles, starting in 1997 and concluding in 2015 after the FARC demobilization. This dataset includes the vote count for each candidate, in addition to their complete legal names, gender, party and coalition affiliations.

2.3 Women in the guerrillas

Among the numerous guerrilla groups that have existed in Colombia since the 1960s, the largest and most influential was the *Fuerzas Armadas Revolucionarias de Colombia - FARC*.¹³ Originally created and led by two men, this guerrilla group exhibited a significant gender imbalance within its ranks, with only a small number of women ever reaching the rank of *Front Commander* (Criselda Lobo, personal communication, February 10, 2021).^{14,15} Despite this, existing research has shown that the FARC's "gender practices" were relatively progressive compared to those of other armed organizations. For instance, the FARC implemented a tenure system based entirely on ideological commitment and proven dedication to their cause, with no consideration of gender as a criterion for promotion (Barrios Sabogal & Richter, 2019).¹⁶ Additionally, the guerrilla organization explicitly advocated for the role of women as peacemakers and community leaders. To illustrate this, Appendix Section F presents excerpts from FARC leaders' statements, highlighting the significance of women in peace-building efforts and female leadership in general.

However, life in the guerrilla ranks posed particular challenges for women, contributing

¹³The FARC was first created in 1963 in the Andean region of central Colombia. Over the next 40 years, it expanded its presence across the entire country, reaching over 70% of the municipalities and enlisting over 21,000 combatants at the height of its strength (Osorio, Mohamed, Pavon, & Brewer-Osorio, 2019). The group demobilized in 2016 after a successful peace process with the government.

¹⁴Women are estimated to make up 30% of FARC combatants (Gutiérrez Sanín, 2004; Universidad Nacional de Colombia, 2017). Although this reflects a gender imbalance, it represents an unusually high share of female combatants for an illegal armed group.

¹⁵The hierarchical structure of the FARC, illustrating its internal administrative organization, can be found in Appendix Section C, figure C1.

¹⁶This approach sharply contrasts with paramilitary groups, where gender-focused agendas were absent, and their identity was rooted in masculinity, brutality, and emotional toughness, to the extent that gender-based violence became a frequent method for instilling terror among local communities (Cruz & Olarte, 2021; Wirtz et al., 2014).

to the scarcity of female leaders within the FARC (Richani, 2013). Among the unique hardships women encountered, one of the most commonly cited was the incompatibility between motherhood and guerrilla life. Women were actively discouraged from having children while in the guerrilla, and those who wished to start a family faced a difficult choice between “handing over” their child to someone outside the militia, or desertion (Criselda Lobo, personal communication, February 10, 2021; Stanski (2006)). The latter meant becoming targets for the organization. These challenges underscore the complexity of women’s roles within the FARC and explain the scarcity of female leaders in its ranks.

Following their demobilization, the political party established by the FARC, also known as FARC (*Fuerza Alternativa Revolucionaria del Común*), was granted five seats in the Senate for the 2018-22 electoral cycle. After an internal deliberation process, the party selected senators Criselda Lobo and Victoria Sandino due to their influence within the organization, their extensive experience, and their wealth of knowledge. Among the unsuccessful candidates was Erika Montero, who held the distinction of being the sole female member of the *Estado Mayor* and another influential woman within the guerrilla.¹⁷ Montero was a seasoned combatant who ascended to the leadership of the north-western block of the guerrillas in the early 2000s, following a brief period of incarceration on charges of terrorism and rebellion.

These case studies show how the women who rose to leadership positions in Colombia, whether in government or within the FARC, shared a set of traits and experiences that set them apart from their male counterparts. In the case of FARC leaders like Sandino, education and ideological commitment played a central role, while government figures such as Cuartas and Avella demonstrated a strong dedication to human rights and peace advocacy.

Data on the territorial organization and female leadership in the *FARC*

To study the role of female leadership in the guerrilla and estimate its effect on violence, I compiled a novel and unique dataset of the administrative and spatial distribution of the FARC across time. I digitized a series of maps constructed by Medina-Gallego (2011) and the local NGO “Verdad Abierta” (*Verdad Abierta*, 2021), which allow me

¹⁷Sandino holds a bachelor’s degree in journalism, a highly unusual qualification within the guerrilla ranks. Although Lobo did not pursue any post-secondary education, the mere completion of her school years placed her in a more prepared position than many of her fellow soldiers. This came as a result of the limited formal schooling available within the FARC ranks (Universidad Nacional de Colombia, 2017). For additional information about these three women, please refer to Appendix Section D for a concise biography.

to geolocate each *Block* and *Front* of the guerrilla, as well as its area of influence.¹⁸ Figure 4 showcases the spatial distribution and geographical boundaries of the different units constituting the FARC, as documented by *Verdad Abierta*. There, Blocks are color-coded, with bright areas indicating a stronger presence of the respective unit. Fronts are depicted as black dots scattered throughout the Colombian territory. As is noticeable in Figure 4, and delineated in Appendix Section C, Blocks are larger entities encompassing multiple distinct Fronts.

I complement these data with information on the gender of the command structure of each guerrilla unit, for at least one point during the sample period. To compile this data, I use a combination of sources, including news articles, intelligence reports, and qualitative interviews, which allows me to ascertain the actual identities or aliases of individuals who held leadership positions within each Block or a Front during this time frame. This data allows me to determine whether a unit had a female leader at any point during the period analyzed. The nature of the data makes it impossible to track the exact duration of each leader’s tenure, as well as exact period during which each unit was active. Therefore, I construct different measures of exposure and conduct different exercises to bound the results. I come back to this point in later sections. For an exhaustive overview of the sources used for each specific unit, please refer to the [Online Appendix](#) accompanying this paper.

3 Empirical Strategy and Descriptive Statistics

3.1 Empirical Strategy

3.2 Regression Discontinuity

To examine the connection between female political leadership and conflict incidence in Colombia, I leverage instances where a woman was elected as mayor in a municipality. To mitigate the potential bias that could arise from a straightforward comparison of the number of violent attacks in municipalities where a woman won versus those where a man did, I employ a Regression Discontinuity Design. In particular, I take advantage of the victory of a female mayoral candidate in an election closely contested against a male.¹⁹ The underlying identification assumption is that, conditional on the voting

¹⁸Verdad Abierta is a digital-press founded in 2007 by the “Fundación Ideas para la Paz—FIP”, with a primary objective of “reconstructing, preserving, and disseminating the historical and judicial truth about the Colombian armed conflict.” For more information, visit www.verdadabierta.com.

¹⁹For examples of other studies employing a similar empirical strategy in contexts akin to this one, please refer to Brollo and Troiano (2016) and Fergusson et al. (2019).

margin for the winning candidate, the outcome of the election is as good as random. Thus, these close elections allow me to identify and estimate the unbiased effect of female leadership on conflict. To validate the previous assumption, and in order to address the common concerns about RDD's, section 5 presents a battery of tests that allow me to argue that the characteristics of both the municipality and the elected official are not correlated with the outcome of the elections.

The baseline design considers only municipalities where both a female and a male candidate occupy the top two positions in the mayoral race. Focusing on these elections, let $X_{i,p}$ be the vote share in favor of the female candidate, computed as the percentage of votes cast for the woman out of the total votes for the top two candidates. To ease the interpretation of the magnitude of the bandwidths computed below, I center the vote share at 0 (this does not impact the results). I define the treatment as $F_{i,p} = 1$ whenever $X_{i,p} > 0$, and focus on the set of races where the absolute value of $X_{i,p}$ is smaller than a bandwidth h . To choose the value of h I follow Calonico, Cattaneo, Farrell, and Titiunik (2019) and present in my baseline specification the bias-corrected and robust optimal bandwidth. Equation (1) shows the main empirical specification used to identify the effect of female political leadership on conflict violence.

$$y_{i,p} = \alpha + \gamma F_{i,p} + f(X_{i,p}) + \varepsilon_{i,p} \quad (1)$$

$y_{i,p}$ represents the outcome for municipality i in electoral period p , γ is the coefficient of interest and $\varepsilon_{i,p}$ is an idiosyncratic error term. In the baseline specifications, $y_{i,p}$ is the number of one-sided violent attacks (by actor) normalized by population and period length. I show the robustness of the results to all of these different normalizations in Section 5. Finally, $f(X_{i,p})$ represents a polynomial of the vote share, which is linear on both sides of the discontinuity in the baseline specification. I show the robustness of the results to these decisions in Table 2 and Appendix Table B5.

3.3 Differences-in-differences

To estimate the effect of female guerrilla leadership on conflict violence, I compare municipalities where the local guerrilla unit had a female commander with those where it did not, taking advantage of the high-frequency of the data. The basic estimating equation takes the following form:

$$y_{i,t} = \alpha_t + \alpha_s + \beta FC_{i,t} + Z_{i,t}\Gamma + \varepsilon_{i,t} \quad (2)$$

where the unit of observation is a municipality i in year t . As in equation (1), $y_{i,t}$ is the number of violent episodes (by violent actor) normalized by population, but in this case aggregated by year. $FC_{i,t}$ is an indicator that equals one whenever the guerrilla unit that makes presence in a municipality-year has a female commander, zero otherwise. The coefficient of interest, β , captures the relationship between female guerrilla leadership and conflict violence. Finally, $Z_{i,t}$ is a vector of municipality-level covariates (that can vary or not in time), α_t and α_s are year and state fixed effects respectively, and $\varepsilon_{i,p}$ is an idiosyncratic error term clustered at the commander level. The inclusion of year fixed effects aims to capture those determinants of conflict that are common for the whole country and can vary in time (e.g., the president in office, the price of cocaine). Similarly, the state fixed effects capture all those conflict determinants that have been examined in the literature, are common to a state, and do not vary in time (I come back to this point in Section 5).

To robustly define $FC_{i,t}$, I follow two complementary approaches: firstly, I define a municipality as being under the influence of a female-led FARC unit if the unit that made presence in the region had a female leader at any point during the sample period.²⁰ This I define as the “stability” approach, and I expect it to bias the results downwards. Secondly, and in contrast, I assume that the presence of a female-led FARC unit only lasts for the year in which I observe the activity of the female leader. For the same municipality and unit, any other year is considered to be under a non-female FARC leader if I observe the unit being active, and assume there is no FARC presence if I don’t observe the unit. This I define as the “visibility” approach.²¹ Although this approach is more restrictive, it allows me to compare municipalities that had both a male and a female led unit at some point during the sample period.

3.4 Descriptive statistics

Figure 5 shows the spatial distribution of guerrilla attacks and municipalities with female mayors during the sample period. In terms of violence, the main pattern that emerges is a concentration of events in three main areas: the north-west strategic corridor between the Caribbean and the Pacific Ocean; the eastern frontier with Venezuela; and the Andean region in the southwest. Appendix Figure A3 shows a similar distribution of paramilitary attacks, suggesting that these two armed factions contested over the same territories. Regarding female electoral success, and unlike violence, the figure

²⁰This is a sensible approach when considering blocks as the unit of analysis, as they are larger entities that had largely stable reach and line of command during the sample period, and a more restrictive assumption when studying fronts.

²¹Figure A4 illustrates the change in time of the fronts that made presence in the central Andean region between 2002 and 2010.

shows no signs of spatial concentration. This fact will be confirmed in the empirical analysis.

Table 1 presents the summary statistics for the main variables used in the analysis. A detailed description of each variable and its source is presented in Appendix Table B1. Overall, the unit of observation is the municipality per electoral period of which there are 1,045 and 7 respectively between 1997 and 2016. A municipality in the sample received on average 3 attacks per year and per 100,000 inhabitants and saw the government forces run 2 operatives against illegal actors. Paramilitaries seem to not have been involved in clashes (neither with the guerrillas nor the state forces), while the latter's activity is mainly driven by the national army (85% of the state forces' actions are carried by the army). Guerrilla attacks produce on average 5.7 casualties per 100,000 inhabitants in an electoral cycle, twice as many as those generated by the paramilitary armies.

In terms of electoral outcomes and candidate characteristics, women won in 44% of the races where they came in the top 2 spots, and run as candidates for traditional parties 44% of the times.²² As for the municipalities in the sample, they typically have around 37,000 residents, with roughly half of these inhabitants residing in rural areas. Furthermore, two out of every five were originally indigenous settlements during the colonial era; and approximately one in every four intersects with illicit smuggling routes. On average, these municipalities are located about 75 kilometers away from their respective state capitals. Finally, there are, on average, 76 ongoing corruption investigations against local officials in these municipalities.²³

4 Main results: female leadership and violence

4.1 Municipal mayors - RDD results

To evaluate the effect of female leadership on conflict violence, I begin by estimating Equation (1) using as outcomes various measures of conflict violence. These results are presented in Table 2. In particular, I use the yearly average number of one-sided attacks per 100,000 inhabitants and per electoral cycle as the dependent variable in columns 1-6, an indicator of experiencing any attack in column 7, and an indicator of civilian casualties in column 8. Columns 2-4 include different sets of controls and fixed effects, while column 5 allows for a second-degree polynomial of the vote share

²²Only 2% of the times (≈ 20 races) female candidates run under left-wing parties or coalitions.

²³As discussed below, these are all characteristics that have been found to correlate with conflict intensity in Colombia and, therefore, that I include in my main estimations.

at both sides of the discontinuity, and column 6 does not impose any restriction on the polynomial degree on either side. Panel A uses guerrilla attacks as outcomes, while panel B focuses on paramilitary attacks. In all panels and regressions I follow Calonico et al. (2019) and present in my baseline specification the bias-corrected and robust optimal bandwidth. Figure 6 shows the graphical representation of the result in column 4 of panel A (after standardization).

Across columns and panels, the first pattern to highlight is the robust negative effect of the (narrow) victory of a female candidate for mayor on the (normalized) number of guerrilla attacks. In the baseline specification (column 4), the decline in violence amounts to 66% of the average conflict incidence or, put another way, 1.3 attacks less per year and 100,000 inhabitants. This stands in contrast to the null-effect on paramilitary violence, which is consistently smaller in magnitude (ranges between one-fourth and two-thirds of the effect on guerrilla violence) and non-statistically different from zero across columns (I come back to this in Section 7).

Previous research on the Colombian conflict has found connections between certain municipal characteristics like inequality or historical state presence and violence. To ensure that the result found in column 1 is not masking the correlation between one of these characteristics and conflict violence, I expand the model defined in Equation (1) by including different sets of control variables in columns 2-4. In particular, column 2 introduces economic development and government revenue measures from 1993 and 1996 respectively (the closest pre-sample points in time available in each case). Column 3 further includes historical indicators of state presence. Finally, column 4 adds year fixed effects.²⁴ The results across the four columns show that the baseline effect remains stable in terms significance and magnitude (around 60% of the average conflict incidence) after including these controls. These findings provide additional evidence against the presence of an unaccounted-for municipal characteristic that could confound the baseline effect.

Columns 7 and 8 explore alternative measures of conflict victimization, yielding similar results. Column 7 explores the extensive margin of the effect and shows that the election of a female candidate reduces the probability of enduring a guerrilla attack during the electoral cycle by 80%, compared to the average likelihood of an attack. Likewise, in column 8 I use as dependent variable the probability of civilian casualties in guerrilla attacks in the municipality during the electoral cycle. Here, I observe an 84% reduction in this probability following the election of a female mayor.²⁵ Overall,

²⁴All control variables vary smoothly around the threshold, as discussed in the following section (Table 5). The controls included in each column are detailed in the footnote of Table 2. See Appendix Table B1 for variable sources.

²⁵Both variables are indicators constructed from the main violence dataset. Sample averages are

these two columns show that the effect found on the normalized number of attacks is not spuriously determined by the conflict metric used, but rather that it represents a broader trend in conflict victimization.²⁶

As a way of benchmarking the magnitude of the effects documented in this subsection, Miguel, Satyanath, and Sergenti (2004) find that a negative economic shock of five percentage points to GDP (10 times the yearly average economic growth in their sample) doubles the likelihood of conflict. In my most comparable specification in column 7, where the outcomes are defined more closely, I find that the victory of a female candidate for mayor reduces the likelihood of conflict by 80%, which is in the same order of magnitude as the authors' findings. Another way to benchmarking the magnitude of the effect is by comparing the reduction in the number of attacks to the average number of attacks in municipalities were men narrowly won. In this case, 1.31 fewer attacks (per year and 100,000 inhabitants) amounts to a reduction equal to 90% of the average number of attacks in municipalities where a man narrowly defeated a female candidate. Overall, the results in Table 2 show that female electoral success had a negative effect on conflict incidence in Colombian municipalities.

4.2 Female leadership in the guerrilla

Next, I turn my attention towards the relationship between female guerrilla commanders and the level of conflict violence. On the one hand, estimating this relationship will allow me to test whether the effects documented in Table 2 extend beyond politicians and manifest themselves in other types of organizations. Therefore, this can be understood as an exercise on the external validity of said effects. On the other hand, by estimating this relationship I am already showing that the effect documented in the previous subsection can not be attributed exclusively to unobserved characteristics of politicians given that, if that was the case, there would be no empirical relationship between female guerrilla leadership and violence.

I study this relationship in Table 3, where I estimate Equation (2) using the number of guerrilla attacks per 100,000 inhabitants and per year. It is important to note that due to the non-random assignment of female leaders across guerrilla units, the coefficients in the table are not identified. In the table, columns 1 and 2 focus on FARC blocks included in Table 2.

²⁶A source of concern regarding the measurement of violent attacks is the possibility that they mostly consist of anti-personnel mines explosions. Given that this type of weapon remain active for long periods of time, this would imply that the reduction in attacks is only capturing a reduction in the number of mines *activated* and not a reduction in the number of those *planted*. Appendix table B2 estimates the effect on the number of anti-personnel mines, with null results. The baseline results are identical when controlling for the number of mine-related events in the municipality.

as the units of study, while columns 3 and 4 center on fronts. Columns 1 and 3 use the “stability” definition to measure the presence of FARC units (and leaders), while columns 2 and 4 follow the “visibility” assumption. Finally, all regressions in Table 3 include year and state fixed effects, as well as commander-year clustered standard errors. The results in the table show that municipalities under the jurisdiction of a female-led FARC unit experienced fewer armed attacks, regardless of the definition or type of unit considered (albeit, more imprecisely measured in column 1). In terms of magnitude, the presence of a female-led guerrilla unit is correlated with a reduction of between 1.2 and 1.4 attacks per year per 100,000 inhabitants, which is equivalent to approximately 50-60% of the average incidence of violence in the sample. This magnitude is comparable to the effect that the narrow election of a female mayor has over conflict violence documented above.

4.3 Interaction between female leaders

The results in the previous two subsections suggest that synergies between female leaders may amplify the impact on conflict violence, a prediction also supported by existing evidence in related fields. For instance, research in linguistics has shown that women employ different, less confrontational communication strategies when interacting with each other compared to those they use with men (Tannen, 1994).²⁷ Similarly, while the economics literature has rarely examined interactions between women in informal settings (Anderson, 2022), laboratory evidence suggests that women perform cognitive tasks better when teamed up with other women (Gneezy, Niederle, & Rustichini, 2003). Thus, studying female leaders in the Colombian guerrillas contributes valuable evidence on gendered interactions in informal—i.e., non-sanctioned—settings, and deepens our understanding of female leadership on conflict violence.

I test these ideas in two different ways in Table 4. In columns 1 through 4, I estimate the RDD model defined in Equation (1), dividing the sample of contested races between municipalities where the local guerrilla unit was female-led (columns 1 and 3) and those where it was not (columns 2 and 4). Columns 1 and 2 use blocks as the FARC unit of interest, while columns 3 and 4 use fronts. For all columns, I use the “stability” definition of presence, and leave the corresponding regressions using the alternative assumption for the Appendix section B. The results across these columns reveal that the effect of female (political) leadership on violence is both larger in magnitude and more statistically significant when considering municipalities under the influence of female-led guerrilla units. In columns 5 and 6, I estimate Equation (2), adding an indicator of whether the mayor is a woman and an interaction between this variable

²⁷For a comprehensive review of the related literature, see Cameron (1998).

and the indicator for a female guerrilla commander. The results align with those in the previous columns, once again showing a negative and significant correlation between the interaction term and the number of guerrilla attacks.

Taken together, the results presented in Table 4 are both remarkable and straightforward: violence decreased more in municipalities under the influence of a guerrilla unit with a high-ranking female commander, regardless of the exact definition of unit or female leadership. They show that the interactions between female leaders created synergies that contributed to a further decline in violence, ranging from 100% to 240% of the sample average. Although these results are somewhat imprecisely measured, they suggest that the combined effect of female leaders on both sides contributed to a de-escalation of conflict that exceeded the impact of each leader individually.

5 Validation of the empirical design

The validity of the key findings discussed in Section 4 hinge on several assumptions regarding the data and the choices made during model estimation. In this section, I show how the critical assumptions required for an RDD to be valid hold in this setting. In addition, I show how each decision concerning the sample, data manipulation, and choice of model parameters has no significant influence over the results, and how the latter are robust to different values and definitions. Overall, this section provides reassurance that the effects documented above are in fact capturing a causal relationship between female leadership and conflict violence.

5.1 Balance on observable characteristics

One initial concern regarding the regression discontinuity strategy described above is the possibility of a correlation between the victory of a female candidate and an unconsidered municipal trait. This characteristic might simultaneously favor women winning closely contested races and reduce conflict levels. To tackle this concern, estimate Equation (1) using as outcomes multiple observable municipal characteristics both time-invariant and time-varying, and fail to find any significant relationship between having a female mayor and any of these traits. Results are presented in Table 5.²⁸

²⁸All regressions use the optimal bandwidth estimated in the baseline specification (Table 2, column 4). Appendix Table B3 shows the corresponding estimation allowing for the computation of the optimal bandwidth in each regression separately. The results are identical in terms of significance and magnitude of the coefficients.

Panel A shows the balance on time varying characteristics. These include the average income, expenditures, and payroll costs of the municipality. Similarly, when examining election-related variables, I find no differences in terms of turnout, local council size, and partisan concentration.

Panel B, in turn, looks for and fails to find differences in time-invariant characteristics such as physical (e.g., area, altitude, ruggedness and soil quality) and historical ones (such as presence of indigenous groups or Spaniards in the colonial period, instances of land conflict in the first half of the 20th century or the presence of latifundia in 1960). Finally, panel C shows the similarity across groups in time-varying characteristics measured before the sample period such as population size, inequality, poverty and rurality indexes, tax revenue and credit from the central government.

In sum, the municipalities where a female candidate narrowly won or lost a mayoral election are comparable in terms of observable characteristics. This, in turn, validates the empirical strategy used in this study to identify the effect that having a female mayor had over the incidence of armed conflict in Colombian municipalities.

5.2 Testing RD assumptions

To further support the argument above, I look for evidence of manipulation of the electoral results in the sample of races under consideration. If candidates somehow anticipated that elections were going to be closely contested, they could have had incentives to influence the outcomes through means like fraud or vote buying to secure their victory. This, in turn, would undermine the assumption that election outcomes were “as good as random” when the margin of victory for the elected candidate was narrow.

Following (McCrory, 2008), I show the distribution of the running variable across the sample in Figure 7. As observed, there are no discontinuities around the threshold, which indicates that the candidates were not able to anticipate the outcome of these narrow elections beforehand. Taken together, these two exercises show that there are no confounding variables that can explain the victory of female candidates.

A recent discussion in the literature has pointed out that using close elections as quasi-random experiments is problematic in certain contexts where democracy may not be as robust as traditionally assumed (Eggers, Fowler, Hainmueller, Hall, & Snyder Jr, 2015). Importantly, the validity of a close election hinges on the assumption that no actor, whether political or armed, can manipulate the outcome to favor their preferred

choice.²⁹ To address this concern, I estimate the model defined by Equation (1) using as outcome the number of attacks carried out by each armed actor in the year immediately preceding the elections. The results of this placebo exercise are presented in Appendix Table B6. Overall, there is no statistically significant relationship between the margin of victory and the number of attacks carried out by either the guerrillas or the paramilitaries in the year preceding the election. In the same spirit, Appendix figure A5 shows the results of the estimation of Equation (1) using alternative cutoffs on the running variable as placebo exercises. The results, once more, show no effect at these alternative cutoff points. Taken together, these exercises suggest that the results in Table 2 are not driven by the behavior of the armed actors in the period leading up to the election or by spurious data patterns.

I further demonstrate the validity of the RD design by considering the possibility that political actors manipulate the result of local elections. In such a case, then both the drop in violence and the “closeness” of the election would be capturing the same underlying phenomenon. Namely, the capture of the municipalities’ political institutions by an interest group. Although it is not directly observable, it is possible to approximate this “capture” using the results of local legislative elections. In essence, the argument is that political actors who aim to benefit from influencing the outcome of mayoral elections would have the same incentives to manipulate the results of local legislative elections. Political parties would only be able to accurately predict and influence the result of a mayoral election whenever they have a strong signal of their electoral strength such as the results of the elections for local legislative. Thus, although imperfectly, the results of City Council elections serve as proxies for the manipulation of the mayoral election results. To test for this possibility, I use data on the political affiliation of Council members in each municipality between 1992 and 2015 to measure the extent of electoral competition in each municipality. Panel A of Table 5 shows that there is no statistical difference in the extent of partisan concentration in Councils between municipalities with and without a female mayor, defined as a Herfindahl-Hirschman concentration index of the number of votes or seats received by a party.

5.3 Robustness

This subsection demonstrates the robustness of the baseline results presented in Section 4. I begin by examining the sensitivity of the regression discontinuity estimate

²⁹There is no consensus in the literature as of what a “strong democracy” is. I follow (Barber, 2003) and assume that a strong democracy, in terms of elections, is one where they are not influenced or controlled by any type of actor (i.e., “fair”).

(i.e., Table 2, column 4) to the choice of bandwidth. Figure 8 plots the (standardized) estimated effect and corresponding confidence intervals for various bandwidths, ranging from half to double the optimal one. The figure shows that the effects remain robust to the choice of bandwidth (in a close vicinity), and only losing significance and precision when using considerably small values.

Event Study One additional exercise, motivated by the discussion on sampling and bandwidth choice, is to estimate equation (1) using an “infinite” bandwidth. Put simply, this is equivalent to estimating the effect of female political leadership on conflict violence in an event-study framework. To do so, I estimate (2) replacing the $FC_{i,t}$ indicator with an indicator for a female mayor $F_{i,t}$. I present the results of this alternative empirical strategy in two complementary ways: in Figure 9, I follow dynamic event-study approach in which a municipality is considered “treated” from the moment a female mayor assumes office until she leaves it. These estimates include year and municipality fixed effects (two-way fixed effects) and control for the partisan affiliation of the top two contenders in the race. Appendix Table B4 shows the corresponding differences-in-differences estimations, using various measures of conflict and incorporating different sets of controls as an additional robustness measure. There, the $F_{i,t}$ equals one for a municipality with a female mayor during her period in office, 0 otherwise. Overall, the results in Figure 9 and Table B4 indicate that the effect of female political leadership on conflict violence documented in the previous section cannot be attributed to the identification strategy given the persistent negative and significative estimate.

Next, I shift my focus to the definition of the dependent variable. In the previous section, I used the yearly average number of attacks per 100,000 inhabitants during an electoral cycle as the dependent variable, an assumption that I relax in Table 6. Column 1 of uses the inverse hyperbolic sine transformation of the dependent variable, resulting in minimal changes (if any, the estimated effect is even more substantial, representing a 75% reduction from the sample average). Columns 2 and 3 delve deeper into this point by using the number of attacks and the number of attacks per 100,000 inhabitants as the dependent variables, respectively. Once again, the effect remains consistently negative and statistically significant across all columns, with comparable magnitudes.

The baseline RDD specification encompasses all elections and violent events spanning from 1997 (marking the earliest fully recorded election) to 2016 (the year of the FARC’s demobilization). However, it’s important to note that peace negotiations between the government and the FARC had already commenced in 2014. To show that the main

effect observed in Table 2 is not driven by the period during which peace talks were underway, I extend and restrict the sample period in columns 4 and 5 of Table 6, considering years up to and including 2018 and 2014, respectively. In both cases, the effect’s magnitude remains stable, although it loses some statistical significance. Finally, to mitigate the potential impact of exceptionally violent municipalities, I exclude the top 5% most violent municipalities from the sample in column 6. As before, this does not yield significant changes in terms of effect magnitude or significance.

Finally, I test the robustness of the results to the inclusion of fixed effects at different levels of geographical variation. Table B7 shows how the results hold even when including region or state fixed effects (columns 1, 2, 4, and 5), and when including FARC-block fixed effects (columns 3 and 6). The results are consistent with the baseline specification, showing a negative and significant drop in the number of guerrilla attacks, and a null effect on paramilitary violence.

6 Gender differences in “choosing peace”

Having established that female leaders in Colombia contribute to a reduction in conflict-related violence, this section explores why they do so. I begin by analyzing the language female mayors use during their campaigns, utilizing a novel dataset of campaign manifestos alongside advanced text-analysis techniques. This analysis reveals differences in the choice of words female candidates address armed conflict with. Next, I leverage high-frequency conflict data to show that units led by female commanders are less likely to retaliate following attacks by national government forces compared to those led by men. Together, these findings suggest that the reduction in violence is driven by female leaders’ preferences for de-escalation

6.1 Campaign discourse and preferences for conflict de-escalation

Elucidating the preferences of elected officials is a challenging task, particularly when the individuals in question are no longer part of the public sphere.³⁰ To address this challenge, I put together a novel database encompassing all available campaign manifestos proposed by elected mayors in Colombia between 2003 and 2015. A campaign manifesto is a document in which each candidate running for a public office outlines their proposed government program, enabling voters to make informed decisions.

³⁰This challenge is particularly acute when considering individuals who held public office decades ago since, even in the case when they are reachable, their preferences towards certain issues (e.g., peace) are likely to have changed.

Starting in 2001, the Colombian electoral court encouraged “elected candidates” to submit these programs for archival. However, it only became mandatory after 2015. Consequently, the collection and preservation of these documents for the sample period of this study predominantly relied on private initiatives, resulting in an incomplete sample. Thus, I leveraged the efforts of the *Escuela Superior de Administración Pública (ESAP)* and web scraped all the programs they had collected for period studied. In total, my sample comprises 1,162 distinct programs (approximately 20% of the entire universe of elections), out of which 10% belong to female mayors, and are roughly evenly distributed across the time frame.

Originally, these government programs were designed to assist voters in making more informed decisions during elections. Therefore, it was up to the candidates to decide the type and extent of information they included in their programs. However, this led to a lack of uniformity in terms of both format and content across programs. As a result, applying state-of-the-art machine learning techniques to them becomes unfeasible, given this lack of structure.³¹ To address this, I relied on an unstructured text-mining algorithm that allows me to assess the relative frequency of “relevant” words in each document, and identify the most recurrent themes within each candidate’s program. Appendix section G provides further details on the text mining process, as well as an example of these government programs. In addition, Figure G2 shows the most common words found in government programs of both female and male candidates. It is worth noting that there is no noticeable difference in the most frequently used terms across genders. This suggests that both female and male candidates try to engage with the same electorate by adopting similar campaign strategies. Thus, one can make the claim that any differences found here are not the result of voters’ preferences, but instead a reflection of those of the candidates.

I use text-mining tools in two distinct yet complementary approaches. First, I employ a supervised classification method to categorize all the terms extracted from the programs into various groups, with a primary focus on identifying terms related to peace and those associated with armed conflict. Second, I utilize a keyword-based approach where I supply sets of keywords to the algorithm, which then searches for these terms within the collection of documents. The algorithm then produces a measure of the relative-frequency of each set within each program. These sets of keywords are grouped into categories created with the aid of AI tools. In both instances, the complete set of documents undergoes preprocessing, which involves the removal of special characters, common and uninformative words, as well as stemming.³² Appendix section G shows

³¹For instance, while certain candidates opted only for itemized lists detailing their prioritized matters, others included their CVs, contextual background on crucial issues, and detailed strategies for addressing said issues.

³²The stemming process is of particular significance due to the presence of gendered nouns in

the complete list of keywords used in the keyword-based approach, as well as the results of the supervised classification method when identifying mentions of “peace” and “infrastructure”.

Table 7 presents the results of estimating the conditional correlation between the mayor’s gender and the relative usage of different types of words, following both approaches. Across all columns, the dependent variable is the count of words found in each program that pertain to specific subjects. Columns (1) - (4) use the output of the supervised “word classification” to construct the dependent variables, while columns (5) - (9) use the “keywords” outcome as input for the dependent variables. Finally, all regressions control for the total length of the document and include a full set of electoral-cycle (i.e., year) and state fixed effects.³³

The results, though not causally identified, suggest a gender gap in the type of language used. Columns 1 and 2 indicate that female mayors use relatively more peaceful language than their male counterparts, while still acknowledging the presence of internal conflict. In other words, their emphasis on non-violent resolutions does not detract from their recognition of illegal armed actors as a serious concern in their communities. Columns 3 and 4 test for “infrastructure” and “sports-related” terms as placebos, showing that the increased use of peace-related language by female mayors does not reflect a broader difference in language choice.

Columns 5 through 9 confirm this finding using the alternative approach described above. Moreover, column 6 includes only those programs that make a mention of the armed conflict and, even within that subset of documents, those belonging to female candidates exhibit a higher likelihood of including peace-related terms. Once again, the lack of differences in the usage of conflict, infrastructure or sports-related words underscores the absence of any overarching gender-based disparity in the composition of these programs.

Two aspects of the previous results that are worth highlighting at this point. On the one hand, they resemble the findings by (Chattopadhyay & Duflo, 2004) in as much as they suggest that female politicians have different preferences than their male counterparts. The fact that these differences manifest themselves exclusively on the issue of violence follows from the fact that public order was the most influential issue in the Colombian context during the sample period. It is worth noting that, by 2016, more than 8 million people or 16% of the population had been directly affected by Spanish.

³³Table B8 shows the results when using the logarithm of the word count + 1 (panel A) and the inverse hyperbolic sine transformation of the count (Panel B) as dependent variables. The results are identical in terms of sign and significance.

the conflict.³⁴ Thus, it follows that issues related to peace and security were the most salient ones both during the campaigns and the subsequent administrations.

On the other hand, the results in Table 7 stand in contrast with those in (Dube & Harish, 2020). There, queenly rule is found to cause more belligerency, both because polities are more attacked when queens are younger and because they are more likely to engage once they are married. Besides the differences in the type of conflicts studied in both cases, the institutional setting is also different. Crucially, the fact that female mayors in Colombia are elected and not monarchs implies that they face a different set of incentives both when campaigning and when holding office (e.g., reelection, impeachment). Furthermore, they are selected from a different pool of individuals (i.e., politicians and not monarchical elites). These two crucial differences explain why the results in both papers are not only different but also not necessarily contradictory.

The limitations stemming from both the structure and the sample of the government programs prevent me from drawing stronger conclusions from the exercises conducted in this subsection. However, the results in Table 7 strongly indicate significant differences in the emphasis placed on potentially de-escalating the ongoing armed conflict between female and male mayors. Additionally, the lack of differences on the emphasis put on other policy-relevant topics suggests that, from the voters perspective, the government platforms were otherwise similar.

6.2 Retaliation by the guerrillas

To approximate the preferences of guerrilla commanders regarding violence de-escalation, I analyze the timing of the actions undertaken by the units under their command. Given the lack of reliable data capturing the individual stances of these leaders on peace and conflict matters, I assume that the behavior of the units in response to “crackdowns” by national government forces serves as a reflection of the commanders’ proclivity to de-escalate tensions. Specifically, I examine the frequency of guerrilla-led violent actions—both one-sided attacks and two-sided clashes—as a response to government crackdowns carried out by the national army and police forces in the preceding month.

The results of this analysis are presented in Table 8. There, I estimate an OLS model where the dependent variable is the monthly number of guerrilla one-sided attacks (columns 1 and 2) or clashes involving guerrillas (columns 3 and 4). The key indepen-

³⁴The figures correspond to the latest estimates by the Truth Commission, in collaboration with the national statistical authorities, the special peace court, and the Human Rights Data Analysis Group (HRDAG). The report cited is Acero et al. (2022).

dent variables include the number of army (columns 1 and 3) or police (columns 2 and 4) crackdowns conducted in the preceding month, an indicator of whether the guerrilla commander is a woman, and an interaction term between these two variables. The results reveal two noteworthy patterns. First, guerrilla units retaliate in response to government operations, irrespective of the commanders' gender. This indicates that female guerrilla leaders remain strategic actors who maximize their objectives, despite potentially lower propensities for violence. Second, female guerrilla commanders tend to respond with less violence following government crackdowns compared to their male counterparts. This suggests that, when presented with the opportunity, female leaders opt for lower levels of retaliatory violence than male commanders.

In sum, this section presents evidence supporting the notion that female leaders in Colombia tend to choose lower levels of violence when possible. For political leaders, the availability of detailed data on campaign platforms allows me to study gender differences in the way leaders refer to armed conflict, revealing that female candidates employ a relatively more peaceful vocabulary. For guerrilla commanders, I examine their responses to government crackdowns, finding that female leaders are less likely to react with violence when targeted by such operations. I interpret these findings as evidence of a gender gap in preferences for de-escalation, which underlie the observed decline in violence. In the next section, I explore the mechanisms by which these preferences may foster higher levels of peace..

7 Mechanisms - Gender gaps in negotiation skills

So far, I have documented how female leadership contributed to a decline in conflict violence in Colombia during the late 1990s and early 2000s. Additionally, I provided evidence suggesting that this effect stems from a gender gap in preferences for conflict de-escalation, present both for political leaders and guerrilla commanders. In this section, I examine the mechanisms by which this gap in preferences leads to a reduction in the number of violent episodes in municipalities, addressing the question of *how* female leaders reduce conflict. To do so, I take two complementary approaches. I develop a simple theoretical model that leverages gender differences in negotiation skills to rationalize the empirical patterns observed and to guide subsequent analysis, testing the model's predictions against my data. Second, I investigate alternative explanations—such as differences in ideology, selection effects, or third-party involvement—and find no supporting evidence for these mechanisms. Taken together, these findings suggest that female leaders' negotiation skills are the primary mechanism through which their preferences for de-escalation impact conflict violence.

7.1 Female negotiation skills

The experiences of recognized female leaders in peace processes, such as Miriam Coronel-Ferrer and Rigoberta Menchú, underscore how negotiation skills driven by a genuine quest for peace can yield success in high-stakes conflicts. Coronel-Ferrer's and Menchú's achievements illustrate the effectiveness of a less confrontational style, especially when working to de-escalate tensions.³⁵ Existing evidence in the economics literature support these notions. For example, the work by Exley, Niederle, and Vesterlund (2020) and Niederle and Vesterlund (2007) documents the presence of gender-based differences in negotiation outcomes, where women are generally more willing to compromise and adopt non-aggressive tactics. These differences can even play to women's advantage, as perceptions of them being less demanding often lead to favorable negotiation outcomes (Castillo, Petrie, Torero, & Vesterlund, 2013). In the Colombian context, these skills take on added significance, especially for female leaders who are often outside the traditional political class. As the state's sole representative in many rural and isolated areas, mayors must adapt to demanding roles, managing everything from lobbying for state resources to mediating local disputes. Additionally, they maintain delicate relations with local guerrilla units, many of whom have roots in the community (Safford & Palacios, 2002). In such conditions, the ability to foster trust and de-escalate tensions becomes not only a strategic asset but a crucial factor in community stability.

Although interactions between illegal actors and local governments in Colombia are legally prohibited, historical evidence suggests that such exchanges have nonetheless taken place.³⁶ Importantly, the negotiation skills that female mayors employ to navigate these complex interactions likely extend to other high-stakes relationships and may also impact outcomes, like community building, which are observable and where I can empirically test for gender gaps.

The Objective Function of Guerrillas: A crucial aspect to consider is the guerrillas' objective function, which has been extensively documented in the literature.³⁷ While the motivations for guerrilla violence evolved over time, the consensus is that their overarching goal remained constant: to overthrow the political elite and replace

³⁵For more on Coronel-Ferrer's experience, see this [interview with the UN](#) interview with the UN. Additional information on Rigoberta Menchú's work can be found in her [Nobel Prize profile](#) from the Nobel academy.

³⁶See, for example, [this](#) news piece on the capture of Medellín's former defense secretary for brokering a peace deal with the local gangs. In [this](#) other episode, the mayor's sibling was the local guerrilla commander which raised concerns about their closeness.

³⁷The prominence of guerrilla groups in Colombian public discourse has led to a substantial body of academic work on the subject. See (Brittain, 2010; Cook, 2011; Leech, 2011; Lehoczki & Ayala Castiblanco, 2024) for detailed discussions of the guerrillas' objectives and means.

it with a “government of the people”. To fund their fight, guerrillas engaged in activities such as extortion, kidnapping, and other forms of organized crime, actions which alienated much of the Colombian public. Still, as Gutiérrez Sanín (2004) notes, “...the guerrillas exhibit behaviors that can’t be justified under a purely for-profit framework...” underscoring that their goals extended beyond simple economic gain.

To provide empirical support for these arguments, Appendix Table B9 shows the correlation between the frequency of guerrilla attacks and various municipal characteristics, including physical attributes (e.g., altitude, soil quality), time-invariant factors (measured before the sample period—e.g., inequality and rurality indices), and conflict-related factors like the extent of coca cultivation. These results reinforce previous findings that poverty and inequality are primary drivers of guerrilla violence, even after accounting for the presence of coca cultivation.

Finally, Appendix section F includes a series of statements drawn from the groups’ constitutional documents that highlight the centrality of land reform in their struggle. These texts also show how the FARC viewed the peasantry as a core group of supporters and, thus, *ceteris-paribus* would not harm them. Taken together, these pieces of evidence serve as a basis for the model developed in the following section, which relies on the guerrillas’ need for resources and their disposition to avoid violence (against the peasants) whenever possible.

7.2 Model

In this subsection, I develop a simple theoretical framework to guide my analysis of the mechanisms at play. In the model, two leaders negotiate the division of a fixed amount of resources. One agent (the guerrilla commander) leverages the threat of violence as a negotiation tool, while the other (the mayor) relies on her commitment to maximize her groups’ expected gains. In equilibrium, the model predicts that female mayors will avoid violence more frequently than males, that synergies will arise between female leaders, and that violence will occur on the equilibrium path. The details of the derivation are included in Appendix section E.

7.2.1 Elements of the model

Consider the interaction between two groups, the Guerrillas (G) and the Peasants (P). In period 2, the Guerrillas can exert violence on the peasants in order to extract rents from them. Violence V is a function of the investment in violence (e.g., arms, soldiers, training) that G makes in period 1, $V(I)$. Violence is increasing in the level of

investment, with decreasing returns: $V'(I) > 0$ and $V''(I) < 0$. Investment is costly, with a convex cost function: $c(I)$, $c'(I) > 0$, $c''(I) > 0$. Let the total rents available for extraction be denoted by Y , and the fraction paid to the guerrillas denoted by τY . Finally, let $X(I)$ represent the influence of the guerrillas on a territory, and assume $X'(I) > 0$. For a given municipality, the influence of the guerrilla will depend on the level of investment (e.g., recruitment, mobilization).³⁸ The problem of the guerrillas can be summarized as:

$$\max_{\{I\}} \quad \tau Y X(I) - c(I) \quad (3)$$

The peasants have to decide whether to pay or not the extortion made by the guerrilla in period 2. Whenever they don't pay they have to face the level of violence consistent with the investments that the guerrilla made in the previous period. If they pay, there is still a chance of experiencing violence (trembling hand), which will be a function of how effective the peasants' leader j is at maintaining peace. Let p_j be the probability with which the leader of the peasants upholds peace. The problem of the peasants can be written as:

$$\max_{\{\pi, \not{\pi}\}} \quad \mathbb{I}_\pi [p_j(1 - \tau)Y + (1 - p_j)(Y - V(I))] + \mathbb{I}_{\not{\pi}} [(Y - V(I))] \quad (4)$$

where π and $\not{\pi}$ stand for "pay" and "not pay" respectively. We assume $j \in \{w, m\}$, with $p_w \geq p_m$. Finally, there is a period 1 where the the leader of both groups come together and negotiate on the level of investment G makes, I .

Optimal τ : G anticipates the problem of the peasants (complete and perfect information) and chooses the maximum level of extortion τ possible given the threat of violence it can create via investment. From equation (3), it follows that $\tau^* = \frac{V(I)}{Y}$. Note that the optimal level of "taxation" does not depend on the gender of either of the two leaders.

Nash Bargaining: In the first period, both leaders get together to negotiate over the optimal level of investment that G will make, given that they can anticipate the rent extraction for the next period τ , that they are aware of the possibility of "unexpected" violence, and that the level of violence will be a function of the investment. They do so through a standard Nash Bargain where θ captures the bargaining power of P . After

³⁸The functional form of the payoff function of the guerrillas (i.e., multiplicative) is assumed for simplicity. The results are unaltered when considering an additively separable function.

simple algebra, it follows that the optimal level of investment will be a function of the costs and benefits difference between the unrestricted level of investment and the situation with no investment:

$$\frac{V'(I)}{V(I) - V(0)} = \left(\frac{1-\theta}{\theta}\right) \frac{c'(I) - X'(I)}{c(I) - c(0)} \quad (5)$$

7.3 Model predictions

Gender gap in negotiation skills: The first prediction of the model is that the level of violence will be inversely related to the negotiation skills of female leaders. Although direct negotiations between guerrillas and mayors are inherently unobservable, several measurable outcomes should correlate with the set of skills that would influence their success. Table 9 tests for gender differences in these outcomes. Columns 1-3 draw on survey data from the Latin American Public Opinion Project (LAPOP), a research initiative based at Vanderbilt University, to examine the relationship between social trust, community engagement, and female leadership.³⁹ Column 1 measures trust in neighbors, using an indicator for respondents reporting above-median levels of trust. Column 2 captures participation in local community meetings (e.g., school board or local action board meetings). Column 3 reflects whether respondents tend to rely on local authorities to resolve disputes. In all three cases, results show a strong positive correlation between having a female mayor and each of these outcomes, suggesting that female mayors foster trust and encourage civic engagement within their communities.

To study competitive negotiation outcomes, column 4 estimates equation (1), using the (log) amount of private donations to the municipality as the outcome. The results show that female mayors attract more private funding. Given the competitive nature of these funds, this result shows that female mayors are more successful at negotiating in environments where, as in armed conflict, counterparts might care solely about their own objectives.. Finally, column 5 uses the manifestos data to show that female candidates place greater emphasis on community building than their male counterparts. Together, these results suggest that (1) female mayors prioritize creating a cohesive community and (2) navigate hostile negotiations better.

The cost of violence: The second prediction from the model is that for any given level of available resources (Y), lower costs will result in greater investment in capacity

³⁹The survey has been conducted annually since 2001. While its coverage is not universal, its sample is representative at the national and regional levels, and importantly, it is not biased toward less-violent municipalities. There is no significant correlation between LAPOP's presence in a region and the various violence metrics used in this paper.

for violence. Consequently, female mayors are expected to be less effective at reducing violence in areas where the relative cost of guerrilla investment is low—or, alternatively, where the marginal benefit of such investment is high. To test this prediction, I follow the approach of (Dell, 2015) and geocode data on smuggling routes across Colombia drawing information from two independent sources to minimize measurement error. Specifically, I draw from reports by the national NGO *Fundación Ideas para la Paz* (FIP) and the international NGO *International Crisis Group* (ICG), both of which extensively study the Colombian conflict and illegal drug trafficking.⁴⁰ Appendix figure A6 shows the distribution of these routes across the country. A municipality is defined as being crossed by a smuggling route if it lies along either the routes.

Using these data, I estimate the model specified in Equation (1) separately for municipalities situated along a smuggling route and those that are not.⁴¹ Columns 6 and 7 in Table 9 show that the reduction in violence is significant only in municipalities that do not lie along smuggling routes (column 7). In particular, for municipalities not along a route, the reduction in violence ranges from 55 to 75% of the average guerrilla violence, while the effect for those that do ranges between 9 and 12% of the average level of guerrilla attacks—and is not statistically significant.

These findings confirm the model’s prediction: while guerrilla groups are more willing to de-escalate conflict in negotiations with female leaders, they are less inclined to do so when the relative cost of maintaining influence is low (or, conversely, when the benefit of violence remains high).

Extortion: The final testable prediction from the model arises from the fact that τ^* —the fraction of resources transferred to G —is not a function of the mayor’s gender and should therefore remain unaffected by any negotiations that occur. This suggests that extortion rates should neither increase nor decrease, as female mayors are not giving up control of their municipalities in exchange for a reduction in violence.⁴²

To test this, I estimate Equation (2) with the (normalized) number of reported cases of extortion and threats from armed groups as the outcome variable. The results, presented in columns 8 and 9 of Table 9 respectively, show no significant relationship between the gender of the municipal mayor and these proxy measures of extortion. The lack of a significant effect supports the model’s prediction that female mayors do not compromise municipal autonomy to achieve lower levels of violence.

⁴⁰For more information on the FIP, see [their website](#). The report used is (Cajiao, González, Pardo, & Zapata, 2018). For information on ICG, visit [their website](#). The report used is (IGC, 2017).

⁴¹As a robustness check, I also use the paths of 19th-century gold-smuggling routes as a source of heterogeneity with identical results (provided in the Appendix).

⁴²This is a common prediction in conflict models, where violence typically does not occur along the equilibrium path—a condition that is also not met in this context.

In sum, the empirical findings in this section align with the model's predictions, reinforcing the idea that the reduction in violence operates through a gender-based difference in negotiation skills. The remainder of this section provides evidence against alternative mechanisms to further validate this mechanism.

7.4 Alternative mechanisms

7.4.1 Selection and performance

One explanation that directly challenges idea of a gender gap in negotiation skills is related to the performance of public servants. It suggests that if women were more efficient in their roles as mayors compared to males, they could make significant contributions to the improvement of their communities in various ways. In this scenario, the observed reduction in conflict violence could potentially only be a signal of this broader efficiency, and not related to their preferences. Crucially, this greater efficiency should also manifest in the provision of other public goods and, ultimately, noticed by their constituents.

I examine these issues in Table 10. I begin by exploring the opinion that voters have of their mayors using outcomes drawn from the LAPOP survey. In Column 1, the outcome variable is an indicator of whether the respondent's level of trust in their mayor, a proxy for perceived ability, is higher than the median. Column 2 uses an indicator reflecting whether the respondent perceives their local government as transparent in its management of public funds. The results show no relationship between the voters' perceptions of their mayors and the gender of the latter.

Columns 3 through 6 use as outcomes different observable measures of public policy and public goods provision. The outcomes are chosen to capture different dimensions of public policy. Different outcomes are explored in Appendix Table B11, always with identical results.⁴³ Column 3 uses the share of a municipality's expenses that is invested in public procurement, while Columns 4 and 5 use school enrollment and child mortality rate respectively. Finally, Column 6 uses a measure of land redistribution.⁴⁴ Across all four regressions, the point estimates are both small in magnitude (compared to their means) and not statistically significant. This shows that the public policy decisions made by female mayors did not systematically differ from those made by their male counterparts.

⁴³Additional results are available upon request.

⁴⁴Land redistribution policy falls under the jurisdiction of municipal mayors in Colombia in as much as they are the ones responsible for updating the land cadaster (a necessary first step for the implementation of land distribution policy).

Finally, column 7 tackles the “selection” issue more directly by directly controlling for previous work experience in the regressions.⁴⁵ Although I cannot rule out that other individual characteristics are driving the majority of the effect, the fact that previous experience (perhaps the most relevant trait in this context) does not change the results is reassuring.

The findings in Table 10 emphasize the absence of differences in terms of performance and public policy choices between female and male mayors. They also suggest that the reduction in violence is not a byproduct of the provision of any specific public good or policy. As discussed earlier, Colombian guerrillas were originally rooted ideas of redistribution, equality and state presence in remote areas (Palacios, 2012). Thus, we could expect a reaction from these groups to the provision of specific public goods if they met their preferences.⁴⁶ Once again, the results in Table 10 suggests that this is not the case given the lack of observable differences in other aspects of their roles.

7.4.2 Third parties’ involvement

The finding of fewer guerrilla attacks in female led municipalities may be linked to how other actors respond to the electoral success of a female. For example, the national government might interpret this as a sign of vulnerability and increase the presence of army units in these areas, essentially forcing the guerrillas to retreat. Similarly, the government could show favoritism or penalize female mayors by adjusting the allocation of resources to these municipalities as a way to signal support or neglect. These varying actions could, in turn trigger strategic reactions from guerrilla and paramilitary groups, potentially explaining the main findings in this paper.

I address these potential alternative explanations in Table 11, where I estimate Equation (1) using various observable actions carried out by these third parties as dependent variables. I begin by using the (normalized) number of actions conducted by the national army and the local police as outcomes in columns 1 and 2, respectively. Law enforcement actions are defined as the sum of clashes between the state’s forces and illegal groups, as well as crackdowns on the latter. The distinction between the army and police events lies in the fact that, in Colombia, although both institutions report directly to the national executive, they are independent and belong to different ministers. The results in columns 1 and 2 indicate that there is no relationship between the gender of the elected mayor and the level of activity of either of these state agen-

⁴⁵It is important to note that, unfortunately, there is no further information available on the individual characteristics of local candidates in Colombia. Therefore, the only individual trait I can test for is electoral experience.

⁴⁶One clear example of this is land policy, which has historically been a primary concern for guerrilla groups.

cies. Therefore, we can conclude that the national government is not using violence differently against guerrillas in female-led municipalities.

Columns 4 and 5 of Table 11 delve into the influence of illegal armed actors. In particular, column 3 uses the normalized number of paramilitary actions (i.e., attacks plus clashes) as the dependent variable, and column 4 focuses on the number of clashes involving the guerrillas. Once again, there appears to be no difference in the level of activity exhibited by these groups between municipalities with a female and a male mayor.

Shifting the focus to financial intrusion, columns 5 to 8 examine the effects of having a female mayor on various measures of financial support that municipalities receive from the central government. Columns 5 and 6 use the logarithm of non-automatic and capital transfers by the central government, respectively, as dependent variables. Columns 7 and 8 use the logarithm of the amount of credit granted by the central government to municipalities, and the percentage of a municipality's income derived from central government transfers. The results in these four columns deliver a clear message: there was no bias from the central government, whether in favor or neglect, toward municipalities with female mayors. The coefficients in each regression are both statistically insignificant and economically negligible. Therefore, it is reasonable to conclude that the national government did not make municipalities with female mayors more or less susceptible to attacks by rent-seeking organizations through financial transfers.

Taken together, the results in Table 11 show that the reduction of conflict violence that followed the election of a female mayor was not influenced by the presence and actions of third parties.⁴⁷

7.4.3 Female mayors' ideology and traditional political movements

Another alternative explanation for the main effect is related to the ideological affinity between female leaders and guerrillas. As discussed in Section 2, female politicians in Colombia were mostly outsiders to the political establishment. Therefore, they might have been viewed favorably by guerrillas if the latter saw them as a departure from the political elites they were trying to overthrow. In such a scenario, the reduction in violence following the election of a woman mayor might simply reflect this ideo-

⁴⁷An additional piece of evidence in this direction is presented in Appendix table B10, where I estimate the effect of female political leadership on *neighboring* municipalities. The results show an increase on the number of attacks in surrounding municipalities, which is consistent with the idea that other armed actors are not trying to clear regions at a time from the guerrillas, but instead that the effect comes from the leadership of female mayors.

logical alignment between these female leaders (i.e., outsiders) and the guerrillas (i.e., revolutionaries).

I explore these ideological and political dimensions in Table 12, where I look for heterogeneity of the main effect along different dimensions of ideology and partisanship. I do this by estimating Equation (1) and dividing the sample of municipalities where the mayoral race was decided between female and male candidates along different dimensions in each column. In Panel A of each column, I use the subset of municipalities where, besides having a woman and a man as the top 2 contenders in the election, the condition listed in the header is met. For example, in column 1, I only include municipalities where a right-wing candidate won. Effectively, the point estimate captures the effect of the narrow victory of a *right-wing* female mayor on guerrilla violence. Panel B includes municipalities where the mayoral election was decided between a female and a male candidate, but the condition in the header is not met. In this case, the point estimate in column 1 captures the effect of the narrow victory of a female candidate who is *not right-wing*.

As mentioned above, column 1 divides the sample between places where a right-wing candidate won or not. I follow the ideological classification of Colombia political parties proposed by Fergusson et al. (2019) to identify right-wing parties.⁴⁸ The results show no substantial differences between places where right-wing candidates won or lost except for a slight increase of precision in the latter group.

Having established that the ideological affinity is not driving the main effect, I delve deeper into the role of traditional politics in columns 2 to 4. I define traditional parties as the Liberal and Conservative parties, as they are the only two parties that have been present in the Colombian political landscape since the 19th century. Moreover, between 1958 and 1974 (the period during which the FARC was conceived), these two parties controlled the entire state bureaucracy, alternating presidential appointments to avoid confrontation. In Table 12, column 2 splits the sample between places where the candidate of a traditional party won and those where they did not; column 3 does the same for places where candidates of traditional parties lost and not; and column 4 does so for places where the incumbent belonged to a traditional party or not.⁴⁹ The results show that the decline in guerrilla violence occurred in places where female candidates effectively disrupted the dominance of traditional parties. Column 2 shows that the drop occurred in areas where traditional parties were not elected into power. Column 3 confirms this result by showing that the effect is present in places where

⁴⁸This classification follows the algorithm proposed by (Budge, 2001), using the data from (Keefer, 2012). It is based on the parties' names, slogans and, when not available, on their statutes.

⁴⁹Note that elections might not include candidates from traditional parties and, thus, the sample in columns 2 and 3 are not the complement of one another.

these traditional forces were defeated. Finally, column 4 indicates that the effect is also more significant in municipalities where traditional parties held political power and then lost it. In terms of magnitude, the effect ranges from 63% of the average conflict incidence in column 4 to 114% in column 3. These magnitudes are comparable to the ones found in Table 2.

Traditional parties The results in columns 2 to 4 of Table 12 suggest that the partisan affiliation of female mayors, particularly their connection (or lack thereof) to traditional parties, might provide an explanation for the decrease in guerrilla violence. This could be a consequence of the fact that guerrillas aimed to overthrow traditional political elites as one of their objectives. Consequently, they might have been inclined to favor (i.e., refrain from attacking) politicians who already represented a departure from these traditional groups. However, this would potentially undermine the central finding of this paper given that the effect attributed to female leadership would only be masking the effect of being a political outsider on conflict violence.

To address this concern and demonstrate that this explanation is unlikely to hold, I present Table 13. In this table, I conduct a series of exercises designed to alleviate these doubts. In Column 1, I estimate the model defined by Equation (1) varying the discontinuity dimension, focusing on mayoral races between a candidate affiliated with a traditional party (treated) and one from a different political affiliation (control). The results show that the narrow victory of a mayor from one of the two historical political parties is not significantly correlated with the level of conflict violence experienced by a municipality in Colombia.

In Column 2, I employ a different approach to show that partisanship is not the primary factor driving the baseline effect. Specifically, I estimate the RD model including only the subset of municipalities where the mayoral race was decided between a female and a male candidate, both affiliated with a traditional party. The results indicate that even in this extreme scenario where political continuity is not in question, municipalities with a female mayor experienced a reduction in the number of guerrilla attacks they faced.

Finally, column 3 focuses on the subset of episodes of conflict violence identified as “politically motivated”. These include selective homicides, kidnaps, and killings committed by illegal actors and attributed to their targeting of political figures. The results show a negative effect of female leadership on this type of violence, indicating that even when municipalities are targeted because of their political views, those led by women experience lower levels of violence compared to those with male mayors.

In sum, the results presented in this subsection show that, while ideology did have a

role to play in determining the intensity of the Colombian conflict, it did not confound the drop in violence that followed the election of a female mayor.

8 Conclusion

The role of female leadership in shaping events within an armed conflict has been a relatively overlooked topic in empirical economic studies. This paper addresses this gap by investigating the impact of female leadership in the context of the Colombian conflict from 1997 to 2016. Using data on closely contested mayoral elections between male and female candidates, as well as novel information on the locations and gender of guerrilla commanders, I find that female leadership on either side of the conflict is associated with a significant reduction in the incidence of violence. Additionally, I document the presence of a gender synergy in interactions between female leaders.

To explore the mechanisms behind this result, I use data on campaign statements of local politicians to show that the observed decline in violence stems from a gender gap in preferences for de-escalation. I further leverage the timing of conflict events to show that guerrilla units led by female commanders are less likely to retaliate after crackdowns by national government forces. I interpret this result as additional evidence in the same direction. Finally, I build a theoretical model to guide my analysis of how this gap in preferences translates into reduced violence, showing that a gender gap in negotiation skills explains all the observed data patterns. I test the model's predictions and provide evidence against alternative explanations.

These results seem to support the notion that women in general, and female leaders in particular, tend to be less prone to violence than men. They show that this pattern holds true regardless of the type of leaders or institutions we consider. However, the question that remains is why guerrilla and paramilitary groups react differently to the election of a female mayor. Previous qualitative research on Colombia's armed actors has highlighted a stark contrast in the gender identities of these groups. Paramilitary forces tend to emphasize masculine values, while guerrillas prioritize ideology. This aligns with the gender composition of each group, as only 12% of paramilitary members are female, whereas between 30% and 40% of FARC combatants were women (Salazar, 2019; Vega, 2019). Although these figures should be taken with caution, they suggest that the predominantly male makeup of paramilitary groups might have constrained the actions of female mayors, leaving them with limited room to pursue non-violent alternatives to conflict.

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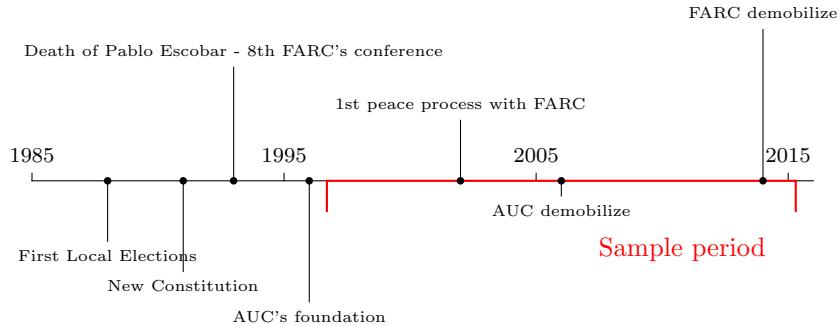
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Figures

Figure 1: Relevant events for the Colombian conflict since 1985



Notes: The figure shows the principal events related to the armed conflict in Colombia, starting in 1985 and ending with the FARC's demobilization in 2016. Two main periods can be identified: 1) Rise of big drug cartels and private armies (1985-1993). 2) Armed confrontation between guerrillas, paramilitaries and the government (1993-2016). The armed conflict formally ended after the FARC demobilization, despite the existence of other (minor) guerrilla groups. Paramilitary groups formally demobilized in 2006, losing their status as conflict actors.

Figure 2: Key aspects of the relationship between conflict actors in Colombia

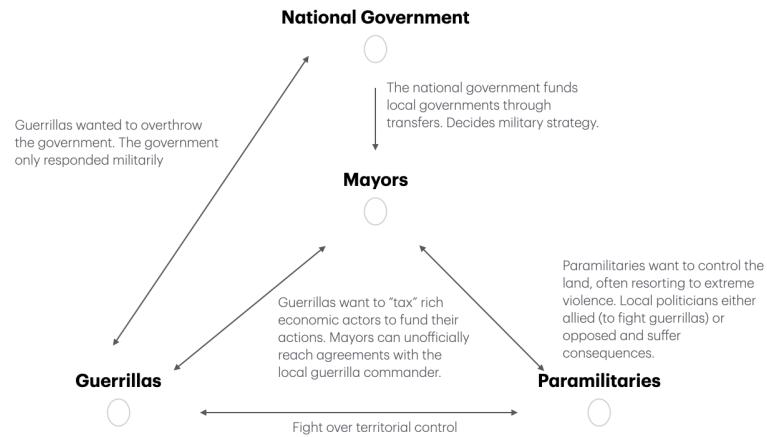
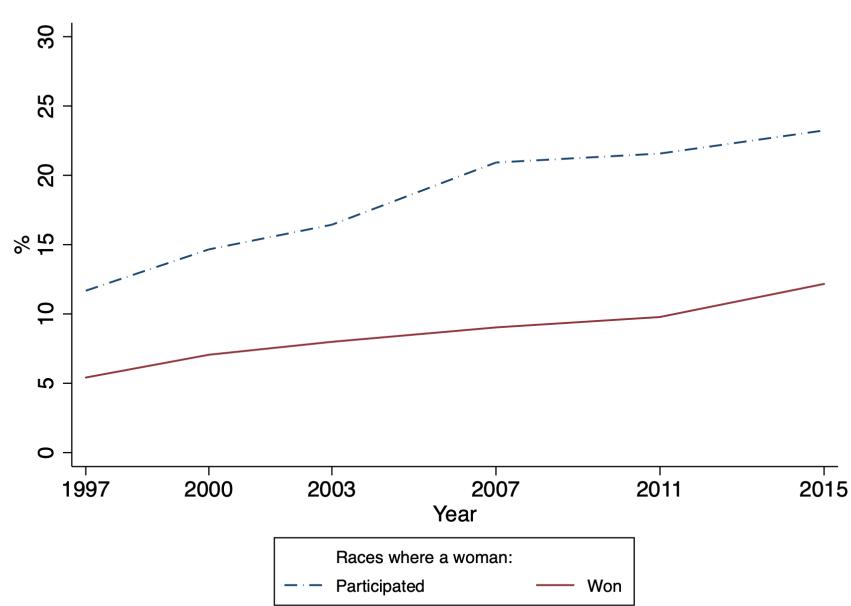
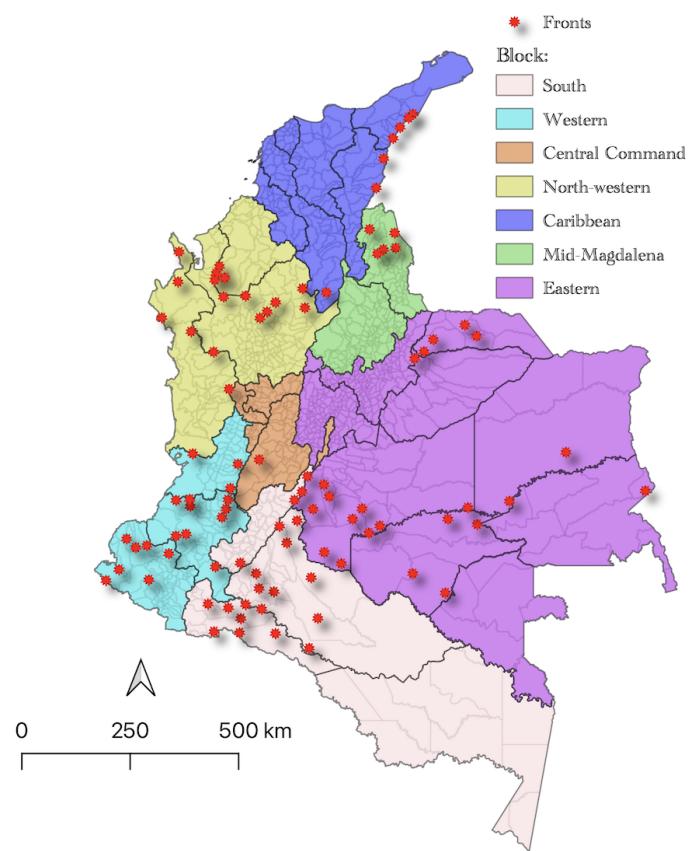


Figure 3: Evolution of female participation and success in local elections. 1997-2015



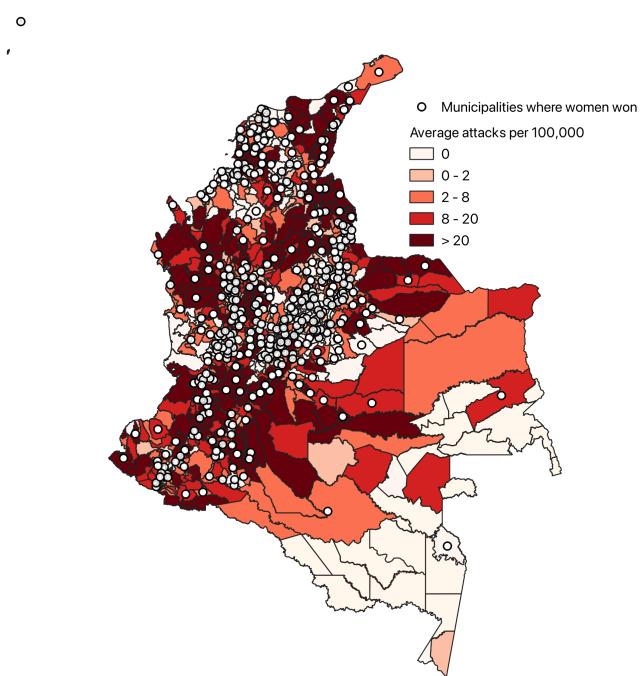
Notes: Percentage of female candidates (dashed line) and mayors (solid line) in each local election during the sample period.

Figure 4: Jurisdiction of FARC blocks and location of fronts



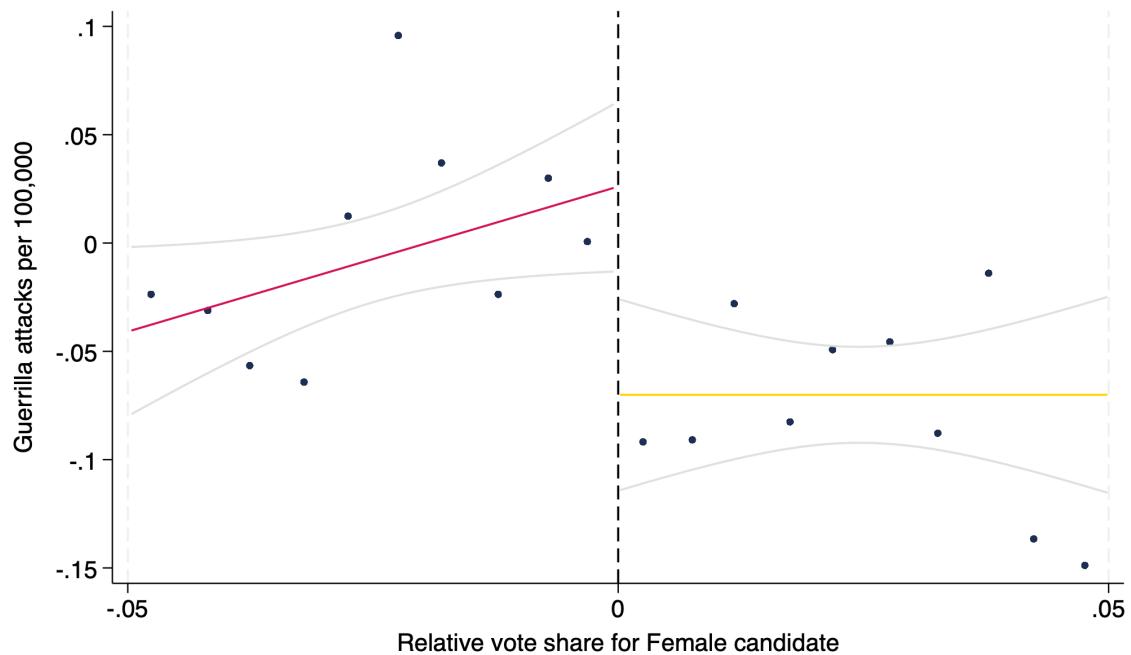
Notes: FARC's administrative division according to *Verdad Abierta* (2021). Blocks are color coded with bright areas indicating a more active presence of the respective unit. Fronts are represented as dots in their most recent location.

Figure 5: Geographical distribution of guerrilla attacks between 1998 and 2016 and female electoral success



Notes: Incidence of guerrilla attacks between 1998 and 2016 color coded. Violence data from (Restrepo et al., 2003) and updated by Universidad del Rosario. Attacks are normalized by year and 100,000 inhabitants. Municipalities identified with a dot are those places where a female mayor was elected between 1998 and 2016.

Figure 6: Baseline effects



Notes: Baseline effects. Non-biased corrected estimators and robust standard errors. Optimal Calonico et al. (2019) bandwidth at each side of the discontinuity. Dependent variable is the average residualized number of guerrilla attacks per year and 100,000 inhabitants.

Figure 7: McCrary test for sorting around the threshold

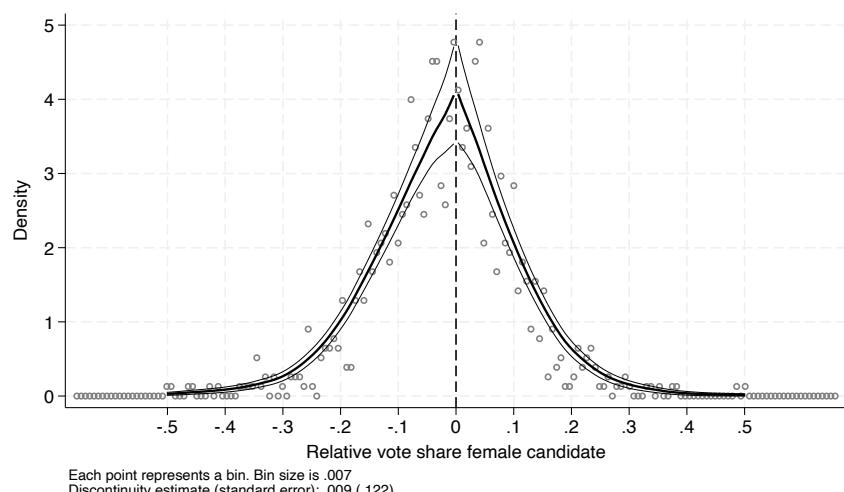
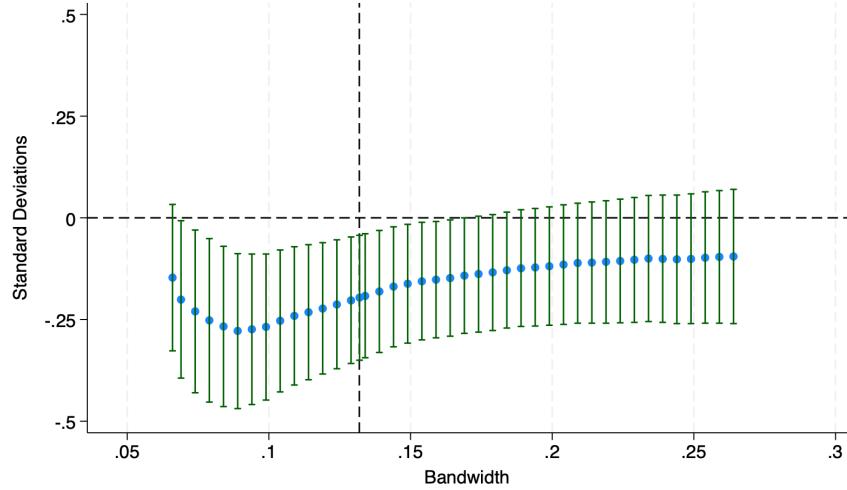
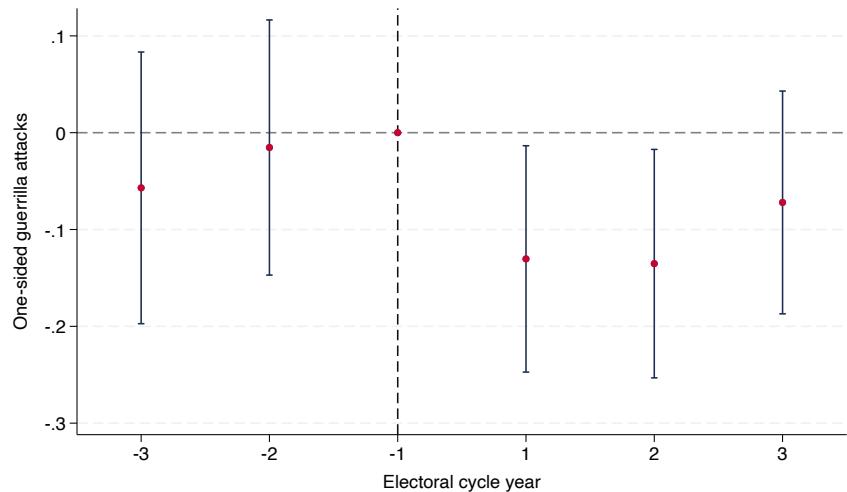


Figure 8: Robustness to different bandwidths



Notes: Point estimate and 95% confidence intervals for different bandwidths, ranging from half the optimal (Calonico et al., 2019) up to double its value. Robust standard errors and optimal biased-corrected estimators in all regressions. Standardized effects. Linear local polynomials on both sides of the discontinuity.

Figure 9: Female mayors' effect on conflict violence - Event study



Notes: Point estimate and 95% confidence intervals. Each coefficient shows the effect of female leadership on the number of one-sided guerrilla acts of violence. Period “-1” corresponds to the year when the elections are held (one year prior the event). All regressions include municipality and year fixed effects, and control for the partisan affiliation of the top two contenders in the race.

Tables

Table 1: Descriptive Statistics of main variables
(Sample: Electoral races where a woman won or came second)

	Mean	Std. Dev	Median	Min	Max
Panel A: Violence outcomes					
<i>Average yearly # of ... per 100,000 inhabitants during government period</i>					
<u>Attacks</u>					
Guerrilla	2.0	6.1	0	0	71
Paramilitary	1.1	4.1	0	0	65
<u>Actions</u>					
Army	1.6	6.8	0	0	119
Police	0.6	2.3	0	0	38
<u>Clashes involving</u>					
Guerrilla	1.4	6.0	0	0	94
Paramilitary	0.1	0.8	0	0	13
Army	1.3	5.7	0	0	94
Police	0.2	1.2	0	0	19
<u>Casualties</u>					
Guerrilla	5.7	29.8	0	0	423
Paramilitary	2.9	17.0	0	0	407
Panel B: Electoral variables					
Vote share	0.481	0.120	0.487	0.0	1.0
% of victories	0.443				
Panel C: Female candidates characteristics					
% of female candidates that represent:					
Traditional parties	0.440				
Right-wing parties	0.128				
Left-wing parties	0.022				
Panel D: Other variables					
Total population	37019	217572	12434	976	6302881
Rurality Index	0.562	0.233	0.597	0.0	1.0
Distance to capital (km)	74.28	51.93	64.39	0	376
Transfers	750.35	865.13	625.99	0	11185
Functionaries investigated*	76.2	651	21.00	0	17813
Indigenous settlement (%)	0.412				
Current smuggling route (%)	0.267				
XIX century smuggling route (%)	0.043				

Notes: 1,045 observations in all panels. Vote share in panel B is percentage of votes for female candidate out of the total votes received by top 2 candidates. Traditional parties in panel C are Liberal and Conservative parties. Ideology in panel C drawn from Fergusson et al. (2019). In panel D, rurality index is the ratio of rural to total population; Distance to capital is linear distance to State's capital city; Transfers corresponds to non-automatic transfers by central government; Functionaries investigated stands for # of civil servants prosecuted by the General Attorney's office for corruption related charges; Indigenous settlement is an indicator of whether municipality was a pre-colonial settlement. Smuggling routes are indicators of whether a municipality is crossed by each type of route. * only 786 observations available.

Table 2: Effect of female electoral success on conflict violence - Baseline results

<i>Dependent variable is:</i>								
	Yearly average # of attacks per 100,000 inhabitants						Attacks indicator	Casualties indicator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Panel A: Guerrilla Violence</i>								
Female mayor	-1.200** (0.571)	-1.426** (0.614)	-1.308** (0.564)	-1.306** (0.602)	-1.768** (0.731)	-1.306** (0.602)	-0.149* (0.077)	-0.141* (0.073)
Observations	1045	1045	946	1045	1045	1045	1045	1045
Mean of dep. var	1.979	1.979	1.979	1.979	1.979	1.979	0.243	0.224
<i>Panel B: Paramilitary Violence</i>								
Female mayor	-0.267 (0.705)	-0.271 (0.736)	-0.384 (0.731)	-0.105 (0.687)	-0.234 (0.707)	-0.105 (0.687)	0.129 (0.161)	0.059 (0.162)
Observations	1045	1045	946	1045	1045	1045	1045	1045
Mean of dep. var	1.069	1.069	1.069	1.069	1.069	1.069	0.200	0.185
Controls:								
Development	X	✓	✓	✓	✓	✓	✓	✓
Historical	X	X	✓	✓	✓	✓	✓	✓
Year Fixed Effects	X	X	X	✓	✓	✓	✓	✓
Degree of polynomial	1	1	1	1	2	Flex	1	1

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Observation is the municipality per electoral period. Optimal Calonico et al. (2019) robust bandwidth and bias-corrected estimators used in all regressions. Each coefficient reports a different regression. Running variable is the share of votes out of the two highest votings for female candidate. Panel A only includes conflict events perpetrated by the guerrillas. Panel B only includes conflict events committed by paramilitary groups. Development controls are: population, % of rural population, GINI, poverty index and urbanization index all measured in 1993; tax income, central government transfers and municipal expenditure, all measured in 1996. Historical controls are: # of public and municipal employees, # of police stations and % of paved roads, all drawn from Acemoglu et al. (2015) and measured in 1995; indicators of indigenous settlement, European settlement during the colonies, historical land conflict and historical violence. All control variables are further defined in appendix Table B1. Descriptive statistics included in Table 1. “Flex” polynomial stands for flexible (different) polynomials on both sides of the discontinuity. Dependent variables in columns 7 and 8 are indicators of whether municipality experienced any attack or conflict related civilian casualty respectively.

Table 3: Female guerrilla leadership and conflict

Dep. var: yearly avg. # of guerrilla attacks (per 100,000 inhabitants)				
	(1)	(2)	(3)	(4)
<i>FARC structure with female influence</i>				
	Block		Front	
Female FARC commander	-0.149 (0.360)	-1.405** (0.622)	-1.319** (0.598)	-1.205** (0.404)
Observations	6007	2175	2175	1023
Mean of dep. var			2.195	
FARC variation:	Stability	Visibility	Stability	Visibility

Notes: Standard errors clustered at the commander-year in parentheses. *** p<0.01, ** p<0.05, * p<0.1. OLS estimations using municipalities \times year as observation in all columns. All regressions include year and region fixed effects. Columns 1 and 3 only use the cross-sectional variation in the presence of FARC structures (i.e., holds the presence of a Block/Front constant over time). Columns 2 and 4 use the time-series variation (i.e., allows the presence of a Block/Front to vary over time). Columns 1 and 2 use blocks as FARC structures, columns 3 and 4 use fronts. FARC structures as defined by (*Verdad Abierta*, 2021) and (Medina-Gallego, 2011)

Table 4: Synergies in the interaction between female leaders

Dep. var: number of one-sided guerrilla attacks (per 100,000 inhabitants and electoral cycle)						
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Estimation:</i>	RD - split sample by gender of commander				OLS - yearly sample	
<i>Gender of commander:</i>	Female	Non female	Female	Non female		
Female mayor	-8.216** (3.884)	1.571 (3.763)	-5.967* (3.056)	-0.652 (6.356)		
Female commander \times female mayor					-0.087** (0.001)	-0.404* (0.063)
FARC unit:	Block	Block	Front	Front	Block	Front
Year Fixed effects:	✓	✓	✓	✓	✓	✓
Municipality Fixed effects:	X	X	X	X	✓	✓
Observations	115	123	67	80	6826	3301
Mean of dep. var	3.819	4.048	2.562	4.526		0.430

Notes: Robust standard errors clustered at the commander level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Columns 1-4 correspond to RD regressions with the baseline sample split according to the gender of the FARC commander in the municipality. Columns 1 and 3 use municipalities where the guerrilla commander was a woman. In columns 1-4: linear local polynomials and optimal Calonico et al. (2019) robust and bias-corrected estimators and bandwidths; running variable is the share of votes out of the two highest votings for female candidate. Yearly two-way fixed effects regressions in columns 5 and 6. Columns 5 and 6 control for (time varying) population. Columns 1, 2 and 5 use blocks as FARC structures, columns 3, 4 and 6 use fronts. FARC structures as defined by (*Verdad Abierta*, 2021) and (Medina-Gallego, 2011). All regressions use the “visibility” definition for FARC presence.

Table 5: Balance on observable characteristics
Optimal Bandwidth

	Mean	Point estimate	Std. Error
<i>Panel A: Time varying characteristics:</i>			
Total income	21411	11173	9929
Total expenditure	24910	16745	14813
Payroll expenses	1636	1104	958
Per capita turnout	.446	-.0142	.0233
Council HHi - votes	.281	.0123	.0231
Council HHi - seats	.32	-.00309	.0274
<i>Panel B: Time invariant characteristics:</i>			
Area (km ²)	749	-473	398
Altitude (masl)	1074	76.4	168
Soil suitability index	2.81	.337	.388
Flatness index	7.65	-.802	1.12
Distance to state capital (km)	74.3	-4.23	10
Distance to Bogotá (km)	315	4.54	41.2
Historical land conflict	.0565	-.0463	.0533
(log) Cadastral value (1960)	9.55	-.276	.25
(log) Latifundia (1960)	.543	.134	.244
Historical land conflict	.0565	-.0463	.0533
Indigenous settlement	.412	-.0378	.102
Spanish occupation	.385	.0213	.091
XIX century smuggling route	.0431	.0532	.0423
Current smuggling route	.267	-.0387	.08
<i>Panel C: Baseline:</i>			
Population	32773	14450	18539
Ethnic pop. > avg.	.284	.0054	.139
Rurality index	.598	.0348	.0494
GINI	.456	.00342	.00791
Unmet Basic Needs index	49.4	1.33	4.92
Total income	5170	5065	5213
Tax revenues	1618	2357	2575
Total expenditure	5710	6690	7784
Government Credit	271	-56.9	135

Notes: all regressions use the optimal (Calonico et al., 2019) bandwidth used in the baseline model (Table 2, column 4). Column 1 shows the sample mean for each variable, Column 2 the (bias-corrected) effect of having a female mayor on each variable. Column 3 shows the robust standard errors. Total income, expenditure and payroll expenses, tax revenue and government credit measured all in millions of Colombian Pesos (COP). Council concentration measured through Herfindahl-Hirschman index computed for the election held simultaneously to the mayor election. Vote/seats concentration defined as the ratio between the number of votes/seats a party receives and the total number of votes/seats in the election. Historical land conflict, indigenous settlement and Spanish occupation are indicators of whenever a municipality experienced the relevant event. Population, rurality and poverty indexes and GINI coefficient measured in 1993. Financial variables in panel C measured in 1996.

Table 6: Robustness of baseline results

<i>Dependent variable is the # of attacks transformed or adjusted by:</i>						
	<u>IHS</u>	<u>Count</u>	<u>Per 100,000</u>	<u>Until 2018</u>	<u>Until 2014</u>	<u>Outliers</u>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Guerrilla Violence</i>						
Female mayor	-0.340** (0.148)	-0.728* (0.393)	-3.032* (1.688)	-0.706* (0.416)	-0.680* (0.395)	-0.817* (0.452)
Observations	1045	1045	1045	1045	1045	993
Mean of dep. var	0.424	1.108	6.251	1.157	1.073	0.794
<i>Panel B: Paramilitary Violence</i>						
Female mayor	-0.090 (0.162)	-0.077 (0.829)	-1.007 (2.315)	0.082 (0.860)	-0.151 (0.810)	0.037 (0.167)
Observations	1045	1045	1045	1045	1045	993
Mean of dep. var	0.348	0.989	3.402	1.066	0.938	0.346

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Observation is the municipality per electoral period. Optimal Calonico et al. (2019) robust bandwidth and bias-corrected estimators used in all regressions. Each coefficient reports a different regression. Running variable is the share of votes out of the two highest votings for female candidate. Panel A only includes conflict attacks carried out by the guerrillas. Panel B only includes conflict attacks committed by paramilitary groups. Column 1 uses the inverse hyperbolic sine transformation of the dependent variable. Column 2 uses the raw count of attacks as dependent variable. Column 3 uses the # of attacks per 100,000 inhabitants (not normalized by # of years). Column 4 extends the sample period up to 2018. Column 5 reduces the sample size up to 2014. Column 6 drops the top 5% most violent municipalities in the sample.

Table 7: Mechanisms: preferences towards peace—Government programs

Dependent variable is the # of words per program that relate to:	Words classification				AI keywords				
	Peace	Violence	Infrastructure	Sports	Peace		Sports		
					(1)	(2)	(3)	(4)	(5)
Female mayor	2.641** (1.200) 1,114	1.114 (1.119) 1,114	-0.749 (1.130) 1,114	-0.128 (0.859) 1,114	2.792** (1.182) 1,114	2.887** (1.205) 1,093	-0.213 (0.268) 1,114	-3.446 (2.615) 1,114	-0.074 (0.745) 1,114
Observations	20,540	14,565	19,828	14,889	21,588	22,004	1,942	60,986	15,631
Mean of dep. var									

Notes: Standard errors clustered at the municipality level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Observation unit is the elected mayor. All regressions control for the total number of words used in the program, and include year and state fixed effects. Columns (1)-(4) use as dependent variable the # of (peace/violence/infrastructure/sports) terms found in each program after classifying the universe of words used in programs. Columns (5)-(9) use as dependent variable the # of (peace/violence/infrastructure/sports) terms found in each program, as defined by an Artificial Intelligence tool. Column (5) uses the total # of peace-related terms in all programs, while column (6) uses the total # of peace related terms found in those programs that make at least one mention to conflict in any terms.

Table 8: Guerrillas' retaliatory actions after armed engagements

Group:	<i>Dependent variable is the monthly number of... actions by the guerrillas</i>			
	One-sided attacks		Two-sided clashes	
	Guerrillas			
	(1)	(2)	(3)	(4)
Female commander	-0.005*	-0.012*	-0.000	-0.005**
	(0.001)	(0.002)	(0.001)	(0.000)
Army actions in (t-1)	0.116***		0.110***	
	(0.001)		(0.001)	
Army in (t-1) × female commander	-0.053*		-0.017*	
	(0.004)		(0.002)	
Police actions in (t-1)		0.427**		0.177*
		(0.017)		(0.015)
Police in (t-1) × female commander		-0.354**		-0.106*
		(0.013)		(0.012)
Observations	91,584	91,584	91,584	91,584
Mean dep. var	0.033		0.023	

Notes: standard errors clustered at the mayor/commander level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Observation is the municipality × month. All regressions include year fixed effects and all baseline controls included in table 2. These are: population, % of rural population, GINI, poverty index and urbanization index all measured in 1993; tax income, central government transfers and municipal expenditure, all measured in 1996; # of public and municipal employees, # of police stations and % of paved roads, all drawn from Acemoglu et al. (2015) and measured in 1995; indicators of indigenous settlement, European settlement during the colonies, historical land conflict and historical violence. All control variables are further defined in appendix Table B1. Descriptive statistics included in Table 1

Table 9: Predictions from the model

Model:	OLS (1)	OLS (2)	OLS (3)	RD (4)	OLS (5)	RD (6)	RD (7)	OLS (8)	OLS (9)
Dependent variable is:									
Trust in others	Participation in community organizations	Local conflict resolution	log(private transfers)	Community mentions (manifestos)	Guerrilla attacks	Guerrilla attacks	Extortion rate	Threats rate	
					-	-			
Female mayor	0.042*** (0.020)	0.127** (0.064)	0.049* (0.026)	1.541*** (0.487)	0.120* (0.066)	0.325 (0.964)	-1.392** (0.650)	-0.467 (0.318)	-9.069 (8.652)
Observations	4504	4597	2952	496	1192	279	766	9832	12034
Mean of dep. var	0.677	0.896	0.539	-5.811	2.025	2.387	1.830	2.906	121.090

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Columns 1-3, 5, 8 and 9 estimate the OLS regression defined in equation (2). Columns 4, 6 and 7 estimate the model defined by equation (1). Columns 1-3 are individual level regressions with data from LAPOP, include municipality and year fixed effects, and control for the gender and education level of the respondent. Standard errors in these columns are clustered at the year \times municipality level. Dependent variables are indicators of: reporting a level of trust in others higher than the sample median, having participated in a community organization in the past year, and resorting to local instances of conflict resolution. Columns 4-9 are municipality level regressions and include year fixed effects. Column 4 uses as outcome the log of the amount of transfers made to the municipality by private entities (investment), and includes all the baseline controls used in column 4 of Table 2. Column 5 uses the manifestos data, and defines the outcome as the share (normalized) number of mentions of local organizations like local action boards or neighborhood associations. Column 6 and 7 estimate the baseline rd model (i.e., column 4 in table 2) splitting the sample between municipalities with and without illegal-traffic routes. Columns 8 and 9 use as dependent variable the number of extortions and personal threats per 100,000 and per year, respectively. All RD models use the optimal Calonico et al. (2019) robust bandwidth and bias-corrected estimators. All outcomes are further defined in appendix Table B1.

Table 10: Selection, performance, and public goods provision

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable is:	<u>Trust in mayor</u>	<u>Perceived transparency</u>	<u>Investment expenses</u>	<u>School enrollment</u>	<u>Child mortality</u>	<u>Land distribution</u>	<u>Guerrilla attacks controlling for previous experience</u>
Female mayor	0.137 (0.088)	0.050 (0.078)	4.451 (3.425)	50.150 (66.511)	4.963 (10.758)	-0.011 (0.053)	-1.339** (0.566)
Observations	3320	1432	918	810	810	1045	1045
Mean of dep. var	0.604	0.367	82.866	916.156	57.076	0.526	1.979

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Individual level regressions in columns 1 and 2. Observation is the municipality per electoral period in the remaining columns. Columns 1 and 2 are OLS regressions with period fixed effects. Optimal Calonico et al. (2019) robust bandwidth and bias-corrected estimators used in columns 3-6. Each coefficient reports a different regression. Running variable is the share of votes out of the two highest votings for female candidate in columns 3-6. Dependent variables are: indicator of whether respondents' trust in their mayor is higher than the median level of trust on a scale from 1 to 10, indicator of whether respondents think local government is transparent in its use of public funds, percentage of total yearly expenses that go to investment, number of students per 100,000 children, number of children under 1 dead each year as per 1,000 alive births, and an indicator of whether municipality redistributed more land than the median municipality. All outcomes are further defined in appendix Table B1.

Table 11: Mechanisms: the influence of third actors

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Violent intrusion</i>				<i>Financial intrusion</i>			
Dependent variable is:	# of actions per 100,000 inhabitants by:	Army	Police	Paramilitary	Clashes involving guerrillas	Gov't transfers	K transfers	Gov't credit	% of income are transfers
Female mayor	0.907 (1.023)	-0.271 (0.214)	-0.273 (0.728)	0.467 (0.921)	0.213 (0.201)	0.222 (0.187)	0.064 (0.218)	-0.269 (0.323)	
Observations	1045	1045	1045	1045	959	997	914	738	
Mean of dep. var	1.635	0.555	1.167	1.448	8.360	10.267	6.138	8.842	

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Observation is the municipality per electoral period. Optimal Calonico et al. (2019) robust bandwidth and bias-corrected estimators used in all regressions. Each coefficient reports a different regression. Running variable is the share of votes out of the two highest votings for female candidate. Dependent variables for columns 1-4 are yearly averages per 100,000 inhabitants. In columns 1-3, actions are the sum of clashes and attacks. In column 6, dependent variable is the logarithm of capital transfers from the central government. All outcomes are further defined in appendix Table B1. Descriptive statistics available in Tables 1.

Table 12: Mechanisms: Heterogeneous effects on the partisan affiliation of female mayors.

Dependent variable is yearly average # of guerrilla attacks per 100,000 inhabitants.				
Heterogeneity dimension :	Victory of right-wing candidate	Candidate from a traditional party:		
		Won	Lost	Incumbent
	(1)	(2)	(3)	(4)
<i>Panel A: Municipalities where dimension = 1.</i>				
Female mayor	-1.112 (0.730)	-0.667 (0.912)	-3.189*** (1.117)	-1.665** (0.779)
Observations	143	460	446	546
Mean of dep. var	0.203	2.626	2.787	2.609
<i>Panel B: Municipalities where dimension = 0.</i>				
Female mayor	-1.102* (0.632)	-1.231** (0.572)	0.335 (0.578)	-0.382 (0.802)
Observations	902	585	599	499
Mean of dep. var	2.260	1.470	1.377	1.289

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Observation is the municipality per electoral period. Optimal Calonico et al. (2019) robust bandwidth and bias-corrected estimators used in all regressions.

Each coefficient reports a different regression. Running variable is the share of votes out of the two highest votings for female candidate. Dependent variables for Panel A are all yearly averages per 100,000 inhabitants. Panel A includes only municipalities that satisfy the condition described in the header of each column. Panel B includes municipalities where said condition is not held. Conditions are: victory of a right-wing candidate (1); victory or defeat of the candidate of a traditional party (2 and 3 respectively); incumbent from traditional party (4). Ideology classifications following (Fergusson et al., 2019). Traditional parties are the Liberal and the Conservative party.

Table 13: Mechanisms: traditional politics and political violence.

	<i>Dep. var: average yearly # of guerrilla attacks per 100,000 inhabitants.</i>			
	“Traditional” close victory	2 “traditional” candidates	Political Violence	Previous fe- male mayor
	(1)	(2)	(3)	(4)
Traditional mayor	-0.086 (0.553)			
Female mayor		-3.365* (1.890)	-0.454** (0.177)	-1.188** (0.570)
Observations	3196	166	1045	1045
Mean of dep. var	2.000	4.572	0.406	1.979

Controls:

Previous mayor’s gender	X	X	X	✓
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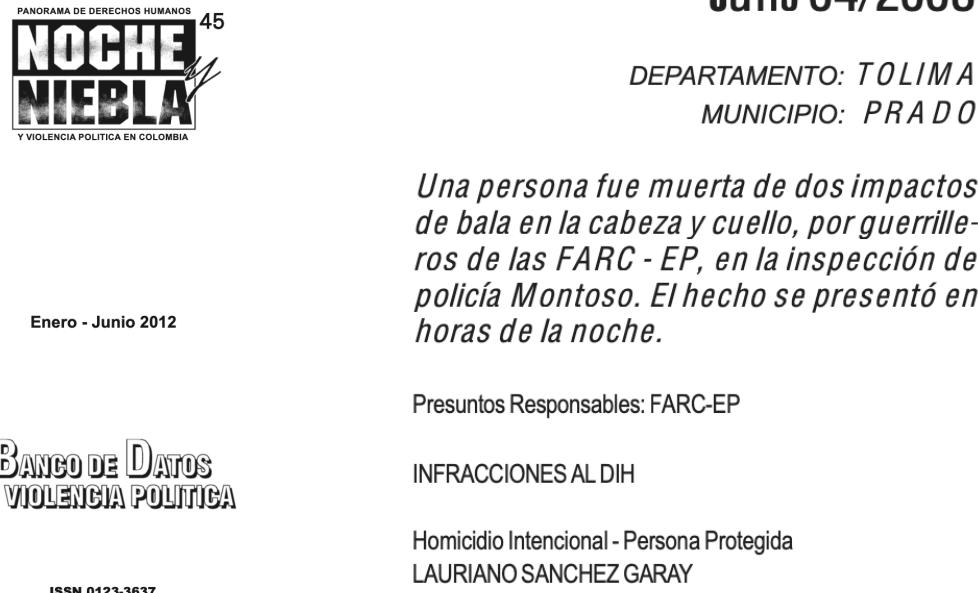
Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Observation is the municipality per electoral period. Optimal Calonico et al. (2019) robust bandwidth and bias-corrected estimators used in all regressions. Each coefficient reports a different regression. Running variable is the share of votes out of the two highest votings for female candidate. Column 1 includes municipalities where the candidate of a traditional party narrowly won or lost regardless of their gender. Column 2 only includes municipalities where the top 2 candidates represented traditional parties. Column 3 only includes attacks explicitly listed as politically motivated by the perpetrator. Column 4 controls for an indicator of whether a municipality had ever had a female elected as mayor before. “Traditional” parties are the Liberal and Conservative.

Appendix

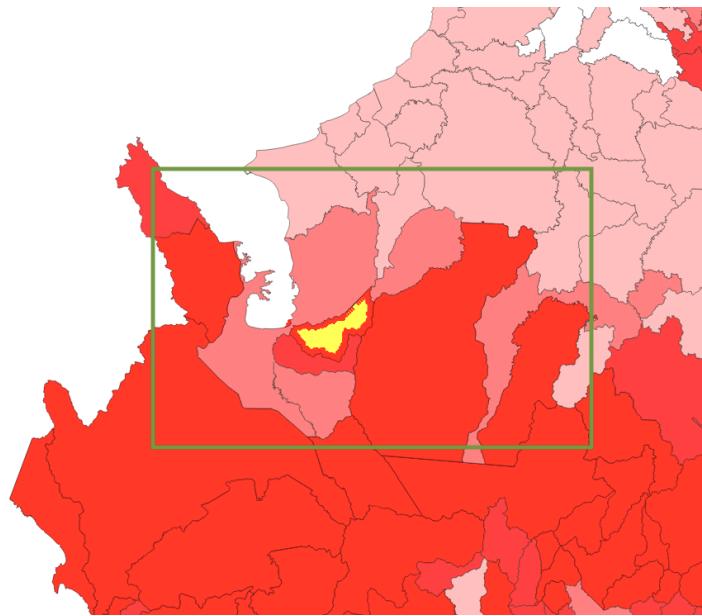
A Figures

Figure A1: Extract from a “Noche y Niebla” report



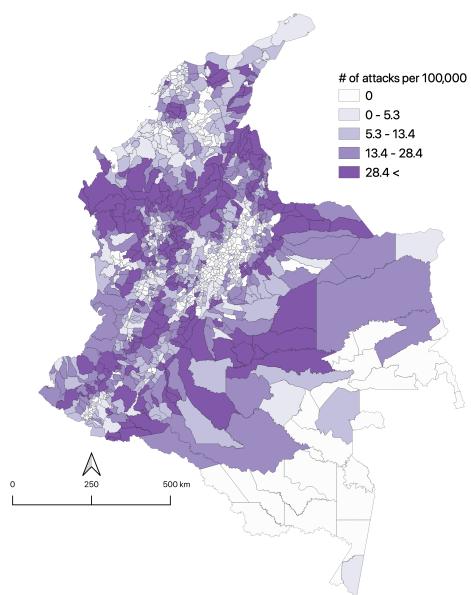
Notes: Left panel shows the cover page of the report recording the events of the second semester of 2003. Right panel shows an actual report of an event. In this case, it documents the decease of a peasant following an attack by the FARC guerrilla to the police station of the municipality.

Figure A2: Geographical location of Apartadó and violence incidence



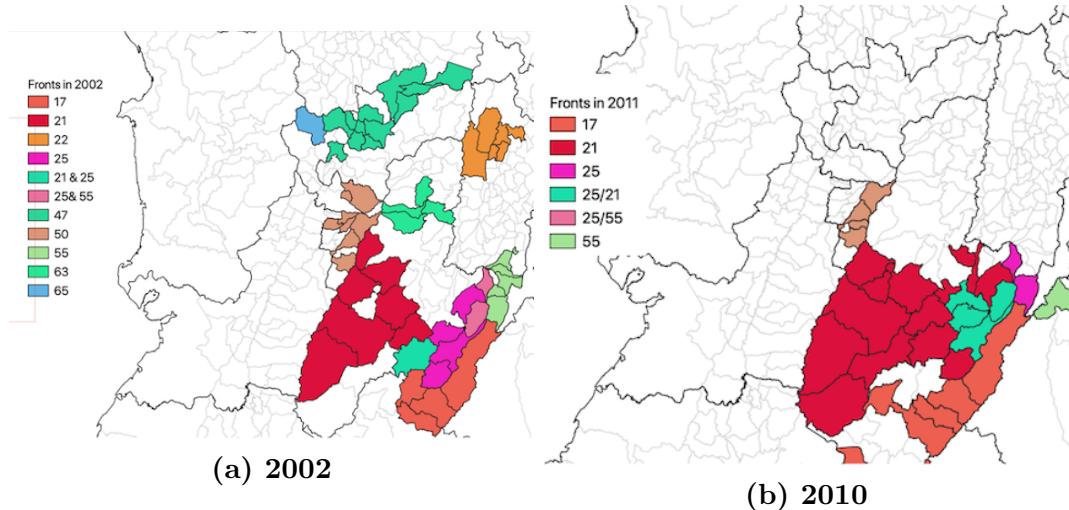
Notes: Close up to the isthmus in the north-west region of Colombia. Apartadó highlighted in yellow. Darker shades of red correspond to higher incidence of violence between 1997 and 2015.

Figure A3: Geographical distribution of paramilitary attacks between 1998 and 2016



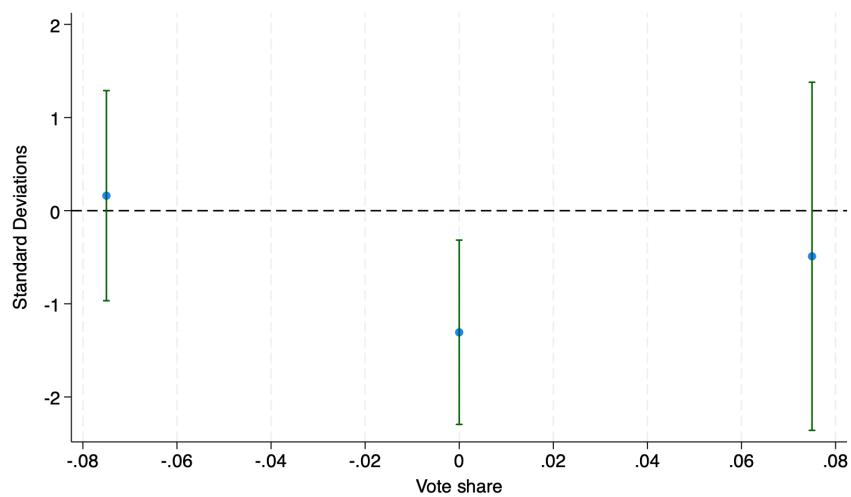
Notes: Incidence of paramilitary attacks between 1998 and 2016 color coded. All data drawn from Restrepo et al. (2003), and normalized by year and 100,000 inhabitants.

Figure A4: Fronts of the Central Joint Command (CCC) in 2002 and 2010



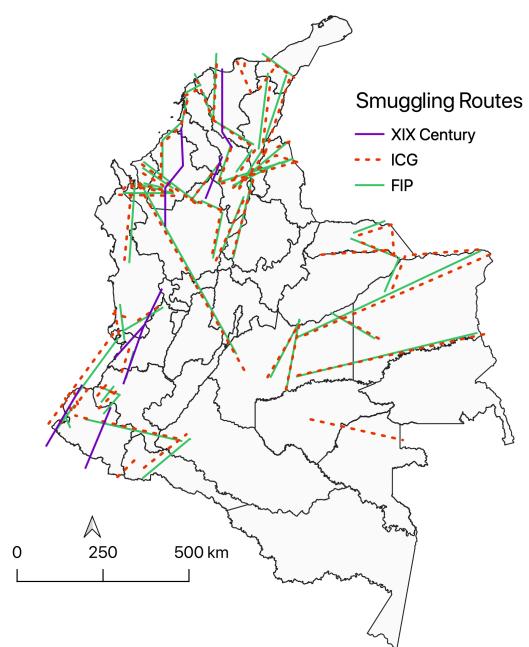
Notes: the figure shows the evolution in time of the location of a series of fronts belonging to the Central Joint Command of the FARC, between 2002 and 2010. The region corresponds to the central Andes mountains, and to the departments of Tolima, Huila, Valle del Cauca, Quindío, Meta and Cundinamarca.

Figure A5: Robustness to alternative cutoffs



Notes: Point estimate and confidence intervals for alternative cutoffs, ranging from -0.075 to 0.075 (approximately a standard deviation of the vote share around the threshold). Robust standard errors, optimal biased-corrected estimators and optimal (Calonico et al., 2019) bandwidth in all regressions. All regressions include year fixed effects. Linear local polynomials on both sides of the discontinuity.

Figure A6: Smuggling routes in Colombia



Notes: “ICG” and “FIP” correspond to contemporaneous drug traffic routes. ICG stands for “International Crisis Group”. FIP stands for “Fundación Ideas para la Paz”. Green and red (dashed) lines overlap when in the same region. See section Appendix table B1 for more details on sources used.

B Tables

Table B1: Variables and sources

Variable	Description	Source
Panel A. Dependent variables: Violence		
Attacks (by group)	Average yearly number of attacks during term in office (per 100,000 inhabitants) perpetrated by guerrillas/paramilitaries. Attacks are defined as Restrepo et al. (2003) and correspond to a violent episode that is not an open confrontation between two groups.	Restrepo et al. (2003) and updated until 2018 by Universidad del Rosario.
Total attacks	Sum of attacks by guerrillas and paramilitaries	
Clashes (by group)	Average yearly number of clashes during term in office (per 100,000 inhabitants) involving guerrillas/paramilitaries/army. Clashes are defined as in Restrepo et al. (2003): armed confrontation between two distinct groups.	
Actions (by group)	Sum of attacks and clashes (if by group, attacks perpetrated by and clashes involving the group).	
Police actions/clashes	Average yearly number of actions/clashes during term in office (per 100,000 inhabitants) undertaken by the police against (with) conflict actors.	
Politically motivated (attacks)	Similar definition as above, but only including (attacks) where the main motive is identified as being a political according to Restrepo et al. (2003)	
Combatants demobilization	# of voluntarily demobilized guerrilla and paramilitary members during electoral cycle.	Acevedo and Bornacelly (2014) with data from Ministry of Defense
Panel B. Other dependent variables		
Government Transfers	Income transferred to municipality by national government entities (logarithm of millions of COP).	Acevedo and Bornacelly (2014) with data from National Planning Department (<i>DNP</i>)
Capital Transfers	Capital revenue from national transfers (logarithm of millions of COP).	
Government Credit	Net income provided by Central Government in the form of credit (logarithm of millions of COP).	
Non-Government transfers	Income from transfers by non-government entities (logarithm of millions of COP).	
% of income corresponding to transfers/own resources	Percentage of total income from transfers/own resources.	
% of expenditure in investment	Fraction of total expenditure that corresponds to investment items	

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Table B1 – Variables and sources, continued from previous page

Variable	Description	Source
# of servants prosecuted	Number of top local officials (at the rank of Secretary) prosecuted for corruption by <i>Procuraduría General de la Nación</i> .	General Attorney's Office <i>Procuraduría General de la Nación</i> .
# of students enrolled	Total number of students enrolled in pre-school, primary and high school.	Acevedo and Bornacelly (2014) with data from National Statistical Agency (<i>DANE</i>)
Child Mortality Index	Number of child deceased per 1000 alive births.	Faguet, Sánchez, and Villaveces (2020)
Share of land reallocated	(Hectares of land reallocated / municipality area)	
Potential for land reallocation	(Hectares vacant public land / municipality area)	
Relative Transparency	Indicator of whether local government is considered more transparent than State and National	LAPOP (2018)
Budget meeting attendance	Indicator of whether respondent has attended a meeting to discuss municipalities budget in previous year	
Resources execution	Indicator of whether respondent believes investment resources should be executed by mayor	
Trust in mayor	Trust in a scale from 0 (minimum) to 7 (maximum)	
Panel C. Forcing Variable		
Female candidate vote share	Share of votes received by female candidate out of the total voting for the top 2 candidates. Centered around 0 so that positive values indicate the victory of a woman.	Colombian National Registry Office.
Panel D. Other covariates		
<u>Political & historic</u>		
Partisan affiliation	Party under which the candidate run in the election (main if run for a coalition)	Colombian National Registry Office
Traditional parties	Partido Liberal and Partido Conservador de Colombia.	Colombian National Registry Office
Council HHI index	Herfindahl-Hirschman index of partisan concentration in Council per municipality-electoral cycle	Colombian National Registry Office
Ideology	Classification between right wing and left wing parties by Fergusson et al. (2019) based on party's statutes and/or candidate's campaign program.	Fergusson et al. (2019)
Historical drug routes	Indicator of whether a route used for illegal gold trafficking in the XIX-th century crosses the municipality	Laurent (2008)

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Table B1 – Variables and sources, continued from previous page

Variable	Description	Source
Presence of historic violence	Indicator of the occurrence of historic violence events (1948–1953) in the municipality	Acevedo and Bornacelly (2014).
Historical land conflicts	Indicator of whether the municipality experienced land tenure-related conflicts between 1900–1920.	
Indigenous Settlement	Indicator of whether the municipality was an indigenous settlement before the arrival of the Spaniards	
Spanish Occupation	Indicator of whether the municipality was a Spanish settlement during the Colonial times	
# of municipal employees	Number of people employed by municipality in 1995.	Acemoglu et al. (2015)
Demographic		
Initial population	Number of inhabitants in the municipality in 1993	Acevedo and Bornacelly (2014)
% of urban population	Share of population that lives in the urban municipal head, (km ²)	(2014) with data from DANE
GINI	Estimated GINI coefficient (1993).	
Unmet Basic Needs Index	In 1993	
Geographic covariates		
Area	km ²	Acevedo and Bornacelly (2014) with data from Agustin Codazzi Geographic institute.
Current drug routes	Indicator of whether the municipality is identified by either source to be part of a route allegedly used by illegal armed groups to export drugs and import weapons	Cajiao et al. (2018) and IGC (2017)
Distance to department capital	Straight line distance to the capital of the department in which the municipality is located. (km)	
Index of rurality	(Rural population / total population) in municipality(1993).	Acevedo and Bornacelly (2014) with data from DANE
% of paved roads	Measured in 1995	Acemoglu et al. (2015)
% of dirt roads	Measured in 1995	
Financial covariates		
Tax revenue.	Tax revenue in 1987 (logarithm of millions of COP).	Acevedo and Bornacelly (2014) with data from DNP

Continued on next page

Table B1 – Variables and sources, continued from previous page

Variable	Description	Source
Total expenditure	Municipal expenditure in 1987 (logarithm of millions of COP)	
Transfers from Central Government	Transfers from central government in 1987 (logarithm of millions of COP).	
Panel E. FARC spatial distribution		
Blocks (VA/F&R)	FARC block making presence in a given municipality by source	<i>Verdad Abierta</i> (2021)(VA), Medina-Gallego (2011) (F&R)
Fronts (VA/F&R)	FARC front making presence in a given municipality by source	
Gender of unit commander	Indicator of whether the commander of a FARC unit (block/front) was a woman	News articles, intelligence reports & personal communication with ex-FARC members

Table B2: Personal mines - Robustness

Dep. var: # of anti-personnel mines:	During the electoral cycle			Yearly average per 100,000 inhabitants				
	<u>Events</u>	<u>Casualties</u>	<u>Injuries</u>	<u>Victims</u>	<u>Events</u>	<u>Casualties</u>	<u>Victims</u>	
		(1)	(2)			(4)	(5)	(8)
Female mayor	1.099 (5.070)	-0.042 (0.138)	-0.556 (0.854)	-0.674 (0.898)	-4.590 (35.251)	-0.139 (0.210)	-6.065 (5.251)	-7.074 (5.717)
Observations	1045	1045	1045	1045	1045	1045	1045	1045
Mean of dep. var	8.657	0.333	1.696	2.028	45.328	1.568	7.660	9.228

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Observation is the municipality per electoral period. Optimal Calonico et al. (2019) robust bandwidth and bias-corrected estimators used in all regressions. Each coefficient reports a different regression. Running variable is the share of votes out of the two highest votings for female candidate. All regressions include electoral cycle fixed effects as well as baseline controls. “Victims” is the sum of casualties and injured.

**Table B3: Balance on observable characteristics
Different (optimal) bandwidths**

	Mean	Point estimate	Std. Error
<i>Panel A: Time varying characteristics:</i>			
Total income	21411	8008	8255
Total expenditure	24910	12880	12982
Payroll expenses	1636	847	842
Per capita turnout	.446	-.0143	.0224
Council HHi - votes	.281	.0152	.0237
Council HHi - seats	.32	.000696	.0282
<i>Panel B: Time invariant characteristics:</i>			
Area (km ²)	749	-399	349
Altitude (masl)	1074	106	160
Soil suitability index	2.81	.319	.371
Flatness index	7.65	-.698	1.07
Distance to state capital (km)	74.3	-.542	10.5
Distance to Bogotá (km)	315	.26	37.8
Historical land conflict	.0565	-.0419	.052
(log) Cadastral value (1960)	9.55	-.247	.251
(log) Latifundia (1960)	.543	.197	.257
Historical land conflict	.0565	-.0419	.052
Indigenous settlement	.412	-.0401	.097
Spanish occupation	.385	.0218	.0854
XIX century smuggling route	.0431	.0465	.0381
Current smuggling route	.267	-.0205	.0742
<i>Panel C: Baseline:</i>			
Population	32773	12121	17691
Ethnic pop. > avg.	.284	.0159	.123
Rurality index	.598	.0249	.045
GINI	.456	.00403	.00729
Unmet Basic Needs index	49.4	.806	4.28
Total income	5170	2512	2937
Tax revenues	1618	1027	1239
Total expenditure	5710	2645	3523
Government Credit	271	-.53	66

Notes: all regressions use the optimal (Calonico et al., 2019) bandwidth.

Column 1 shows the sample mean for each variable, Column 2 the (bias-corrected) effect of having a female mayor on each variable. Column 3 shows the robust standard errors. Total income, expenditure and payroll expenses, tax revenue and government credit measured all in millions of Colombian Pesos (COP). Council concentration measured through Herfindahl-Hirschman index computed for the election held simultaneously to the mayor election. Vote/seats concentration defined as the ratio between the number of votes/seats a party receives and the total number of votes/seats in the election. Historical land conflict, indigenous settlement and Spanish occupation are indicators of whenever a municipality experienced the relevant event. Population, rurality and poverty indexes and GINI coefficient measured in 1993. Financial variables in panel C measured in 1996.

Table B4: Female political leadership and conflict violence — Differences in differences

Dep. var: one-sided attacks by guerrillas						
	Count				Indicator	Normalized
	(1)	(2)	(3)	(4)	(5)	(6)
Female mayor	0.002 (0.007)	-0.019*** (0.007)	-0.124*** (0.020)	-0.128*** (0.021)	-0.088*** (0.017)	-0.722*** (0.115)
Observations	36,048	36,048	36,048	36,048	36,048	36,048
R-squared	0.000	0.209	0.212	0.212	0.185	0.089
Mean of dep. var		0.032			0.025	0.179
Controls:	X	X	X	✓	X	X
Fixed Effects :						
Municipality	X	✓	✓	✓	✓	✓
Year	X	✓	✓	✓	✓	✓
State × election	X	X	✓	✓	✓	✓
Party	X	X	✓	✓	✓	✓

Notes: standard errors clustered at the municipality × electoral cycle in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Observation is the municipality per year. Controls are those included in table 2. These are: population, % of rural population, GINI, poverty index and urbanization index all measured in 1993; tax income, central government transfers and municipal expenditure, all measured in 1996; # of public and municipal employees, # of police stations and % of paved roads, all drawn from Acemoglu et al. (2015) and measured in 1995; indicators of indigenous settlement, European settlement during the colonies, historical land conflict and historical violence. All control variables are further defined in appendix Table B1. Descriptive statistics included in Table 1

Table B5: Higher order polynomials - Robustness

Dep. var: yearly avg. # of guerrilla attacks per 100,000 inhabitants				
	(1)	(2)	(3)	(4)
Female mayor	-1.200** (0.571)	-1.636** (0.738)	-1.947** (0.871)	-1.860* (0.952)
Polynomial degree:	1	2	3	4

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Observation is the municipality per electoral period. 1,045 observations in all regressions. Mean of dependent variable is 1.979. Optimal Calonico et al. (2019) robust bandwidth and bias-corrected estimators used in all regressions. Each coefficient reports a different regression. Running variable is the share of votes out of the two highest votings for female candidate.

Table B6: Violence in the year previous to the female victory - Identification

<i>Dependent variable is:</i>							
	Yearly average # of attacks per 100,000 inhabitants				Attacks indicator	Casualties indicator	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Panel A: Guerrilla Violence</i>							
Female mayor	-0.276 (0.222)	-0.340 (0.224)	-0.221 (0.217)	-0.122 (0.223)	-0.300 (0.248)	-0.036 (0.067)	-0.052 (0.061)
Observations	1045	1045	946	946	1045	1045	1045
Mean of dep. var	0.668	0.668	0.668	0.668	0.668	0.148	0.137
<i>Panel B: Paramilitary Violence</i>							
Female mayor	-0.049 (0.171)	-0.091 (0.169)	-0.171 (0.177)	-0.189 (0.185)	-0.235 (0.194)	-0.024 (0.047)	-0.026 (0.045)
Observations	1045	1045	946	946	1045	1045	1045
Mean of dep. var	0.281	0.281	0.281	0.281	0.281	0.080	0.087
Controls:							
Development	X	✓	✓	✓	X	X	X
Historical	X	X	✓	✓	X	X	X
Year Fixed Effects	X	X	X	✓	X	X	X
Degree of polynomial	1	1	1	1	2	1	1

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Observation is the municipality per electoral period. 1,045 observations in all regressions. Optimal Calonico et al. (2019) robust bandwidth and bias-corrected estimators used in all regressions. Each coefficient reports a different regression. Running variable is the share of votes out of the two highest votings for female candidate. Panel A only includes conflict events perpetrated by the guerrillas. Panel B includes conflict events committed by paramilitary groups. Development controls are: population, % of rural population, GINI, poverty index and urbanization index all measured in 1993; tax income, central government transfers and municipal expenditure, all measured in 1987. Historical controls are: # of public and municipal employees, # of police stations and % of paved roads, all drawn from Acemoglu et al. (2015) and measured in 1995; indicators of indigenous settlement, European settlement during the colonies, historical land conflict and historical violence. Dependent variables in columns 6 and 7 are indicators of whether municipality experienced any attack or conflict related civilian casualty respectively.

Table B7: Robustness: geographic fixed effects

<i>Dependent variable is the yearly average # of attacks per 100,000 inhabitants by...</i>						
		Guerrillas		Paramilitaries		
	(1)	(2)	(3)	(4)	(5)	(6)
Female mayor	-2.289*** (0.653)	-2.845*** (0.626)	-1.113*** (0.565)	-0.172 (0.686)	-0.716 (0.681)	-0.157 (0.667)
Controls:						
Baseline controls	✓	✓	✓	✓	✓	✓
Year Fixed Effects	✓	✓	✓	✓	✓	✓
Region Fixed Effects	✓	✗	✗	✓	✗	✗
State Fixed Effects	✗	✓	✗	✗	✓	✗
Block Fixed Effects	✗	✗	✓	✗	✗	✓

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Observation is the municipality per electoral period. 1,045 observations in all regressions. Optimal Calonico et al. (2019) robust bandwidth and bias-corrected estimators used in all regressions. Each coefficient reports a different regression. Running variable is the share of votes out of the two highest voting for female candidate. All regressions include year-fixed effects as well as the baseline set of controls.

Table B8: Robustness: preferences towards peace - logarithms

Dependent variable is the # of words per program that relate to:	Words classification				AI keywords			
	Peace	Conflict	Infrastructure	Sports	Peace		Conflict	Infrastructure
					Unconditional	Conditional		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Log (1 + #)								
Female mayor	0.155** (0.065)	0.099 (0.066)	0.009 (0.057)	0.052 (0.059)	0.155** (0.069)	0.160** (0.065)	-0.043 (0.064)	0.036 (0.044)
Observations	1,114	1,114	1,114	1,114	1,114	1,093	1,114	1,114
Mean of dep. var	2.639	2.289	2.774	2.517	2.692	2.744	0.649	3.832
Panel B: Inverse Hyperbolic Sine (#)								
Female mayor	0.169** (0.074)	0.112 (0.077)	0.012 (0.064)	0.061 (0.068)	0.164** (0.079)	0.171** (0.072)	-0.053 (0.082)	0.041 (0.046)
Observations	1,114	1,114	1,114	1,114	1,114	1,093	1,114	1,114
Mean of dep. var	3.214	2.825	3.383	3.101	3.274	3.337	0.831	4.495
								3.120

Notes: Standard errors clustered at the municipality level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Observation unit is the elected mayor. All regressions control for the total number of words used in the program, and include year and state fixed effects. Columns (1)-(4) use as dependent variable the # of (peace/conflict/infrastructure/sports) terms found in each program after classifying the universe of words used in programs. Columns (5)-(9) use as dependent variable the # of (peace/conflict/infrastructure/sports) terms found in each program, as defined by an Artificial Intelligence tool. Column (5) uses the total # of peace-related terms in all programs, while column (6) uses the total # of peace related terms found in those programs that make at least one mention to conflict in any terms. Panel A uses the logarithm of the total number of terms + 1 as dependent variable. Panel B uses the inverse hyperbolic sine transformation of the total number of terms as dependent variable.

Table B9: Determinants of guerrilla violence - “Kitchen sink” regression

	Dep. var. is the log of the # of guerrilla one-sided attacks during the sample period		
	Guerrilla (1)	Guerrilla (3)	Guerrilla (5)
Area (ha)	4.23e-07*** (1.32e-07)		9.60e-07*** (2.87e-07)
Elevation (masl)	-6.32e-05* (3.32e-05)		-5.67e-05* (3.15e-05)
log Distance to state capital	0.104** (0.0486)		0.0406 (0.0513)
Coffee suitability index	-0.000184*** (4.02e-05)		-0.000174*** (4.01e-05)
Banana suitability index	-5.87e-05 (4.40e-05)		-3.24e-05 (4.44e-05)
Oil palm suitability index	0.000124*** (3.30e-05)		3.88e-05 (3.37e-05)
Smuggling route indicator	0.328*** (0.0799)		0.188** (0.0827)
Population		2.20e-06** (1.04e-06)	8.06e-06*** (1.34e-06)
% of rural population		-0.277 (0.224)	-0.222 (0.212)
Income Gini index		3.864** (1.546)	
Unmet Basic Needs index		0.0174*** (0.00321)	0.0184*** (0.00279)
% of pop in SISBEN		-18.01*** (3.689)	-16.87*** (3.340)
% of private land		0.745*** (0.238)	
Agricultural GDP		-0.261 (0.227)	-0.0638 (0.205)
Per capita gdp		0.0185** (0.00936)	0.0302*** (0.00833)
Ha of coca removed		0.000319* (0.000181)	9.59e-05 (0.000170)
Ha of coca		0.000234*** (6.74e-05)	0.000186*** (6.95e-05)
# of corruption convictions		0.00307* (0.00177)	
% public payroll expenses		0.540 (0.438)	0.125 (0.394)
Land Gini		0.933** (0.392)	
Observations	1,087	726	920
R-squared	0.428	0.529	0.540
Mean of dependent variable	1.46		

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Municipal level regressions. Outcome variable is the total number of one-sided guerrilla attacks during the sample period. Column 1 includes only geographical (constant) characteristics. Column 2 includes time-varying characteristics, measured in 1993 (before the period studied). Column 3 includes all characteristics. Explanatory variables dropped from column 3 are those that, when included, reduce the sample size considerably.

Table B10: Spillovers from female political leadership — Differences in differences estimates

	Dep. var: one-sided attacks by guerrillas					
	(1)	(2)	Count	(4)	Indicator	Normalized
	(5)	(6)				
Female mayor	0.002 (0.007)	-0.012** (0.005)	-0.109*** (0.017)	-0.116*** (0.017)	-0.077*** (0.015)	-0.674*** (0.100)
Female mayor in neighboring municipality	0.002 (0.005)	0.013** (0.006)	0.043*** (0.008)	0.060*** (0.008)	0.032*** (0.006)	0.117** (0.058)
Observations	36,048	36,048	36,048	36,048	36,048	36,048
R-squared	0.000	0.209	0.212	0.213	0.185	0.089
Mean dep. var			0.032		0.025	0.179
Controls:	X	X	X	✓	X	X
Fixed Effects :						
Municipality	X	✓	✓	✓	✓	✓
Year	X	✓	✓	✓	✓	✓
State × election	X	X	✓	✓	✓	✓
Party	X	X	✓	✓	✓	✓

Notes: standard errors clustered at the municipality × electoral cycle in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Observation is the municipality per year. Controls are those included in table 2. These are: population, % of rural population, GINI, poverty index and urbanization index all measured in 1993; tax income, central government transfers and municipal expenditure, all measured in 1996; # of public and municipal employees, # of police stations and % of paved roads, all drawn from Acemoglu et al. (2015) and measured in 1995; indicators of indigenous settlement, European settlement during the colonies, historical land conflict and historical violence. All control variables are further defined in appendix Table B1. Descriptive statistics included in Table 1

Table B11: Additional measures of public good provision

	(1)	(2)	(3)	(4)
<i>Panel A: Public goods provision</i>				
Dependent variable is:	# teachers	# schools	% subsidized health	Underweight births
Female mayor	17.083 (68.756)	7.088 (39.962)	-0.003 (0.057)	0.007 (0.005)
Observations	807	740	810	810
Mean of dep. var	1080.581	255.146	0.919	0.071

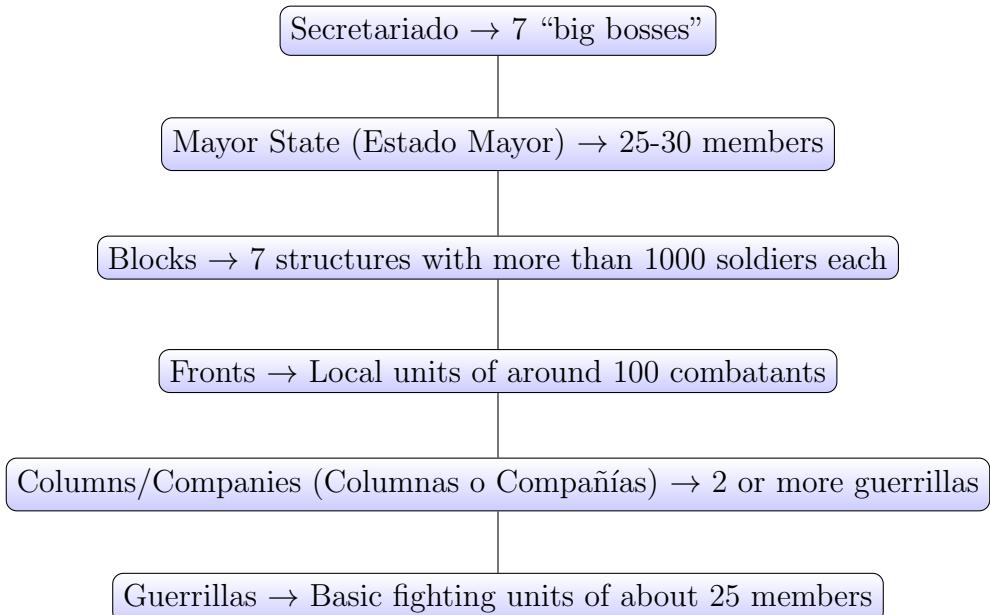
Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Observation is the municipality per electoral period. Optimal Calonico et al. (2019) robust bandwidth and bias-corrected estimators used in all regressions. Each coefficient reports a different regression. Running variable is the share of votes out of the two highest votings for female candidate. Dependent variables are: # of teachers per 100,000 inhabitants, # of schools per 100,000 inhabitants, share of the population who is in the subsidized health regime and ratio of underweight births to total births.

C FARC internal structure

The FARC guerrilla was a centralized organization of national scope, led by a group of 7 individuals known as “*Secretariado*”. These all-male board of directors was always responsible for deciding the nationwide policy of the guerrillas, while delegating the “regional” decisions and strategies to their subordinates. It is worth highlighting that positions in the *Secretariado* were obtained based on a combination of tenure and proven commitment to the organization (Ávila, 2019).

In 1993, the FARC held their 8th guerrilla conference where they decided to divide the Colombian territory into 7 regions, each of which would fall under the jurisdiction of one of the newly created “*Blocks*” (Medina-Gallego, 2011).⁵⁰ Each Block would be further divided into smaller units of a more local scope called “fronts”, which became the main acting unit of the guerrilla. Figure C1 below shows the administrative division of the FARC guerrilla. I follow Medina-Gallego (2011) and *Verdad Abierta* (2021) to geocode and identify the jurisdiction of the 7 FARC blocks and over 60 fronts.⁵¹

Figure C1: FARC’s administrative division



Notes: The figure shows a summarized version of the internal hierarchical structure of the FARC. This paper uses the intermediate “blocks” and “fronts” units for lack of more detailed information about the leadership and location of smaller units.

⁵⁰The number of blocks was defined so that each one was led by a member of the *Secretariado*.

⁵¹I use two different sources given the inaccuracy of these kinds of intelligence data, and show the robustness of my results to the use of either source. The exact number of fronts that existed is contested between different sources.

D Biographies of FARC female leaders

Criselda Lobo

Known amongst her fellow rank members as Sandra Ramírez, Lobo was born in 1964 in the rural area of Sabana de Torres, a municipality located in the northeast region of Colombia close to the frontier with Venezuela. At age 17 she left her family to join the ranks of the FARC where she was eventually assigned to serve as nurse for the Central Joint Command. There, she met alias Manuel Marulanda, one of the founding fathers of the guerrilla who became her sentimental partner for more than 24 years up to his death in 2008. By that moment, Lobo had gained influence within the organization due to both her closeness to the *Secretariado*, but also to her abilities as nurse and communications officer. She was assigned to the first peace delegation sent by the guerrilla to La Habana in 2013 to negotiate with the government of president Juan Manuel Santos, and remained a part of this negotiation team until the final agreement was reached in 2016 (although only occasionally traveling to Cuba). Finally, in 2018 she became one of the 5 ex-FARC members to be elected as Colombian Senators when she filled one of the Congress seats reserved for the organization in the peace agreement.⁵²

Victoria Sandino

Born in the coastal municipality of Tierra Alta, Córdoba in 1975 as Judith Simanca Herrera, Sandino became involved with the communist youth movement while still in high school. In 1993, Sandino received her Bachelor's degree in journalism and immediately joined the guerrilla as a public relations commander for the Central Joint Command. In 2013, Sandino joined the first peace commission from the guerrillas and remained a part of it until the final agreement was signed. Sandino was in charge of the gender equality sub-commission during the peace talks. In 2018 she became one of the first ex-guerrilla members in Congress when she received one of the 5 reserved seats for the Senate. From her position as lawmaker, congresswoman Sandino has fought for women rights, gender equality and ethnic communities vindication.⁵³

Erika Montero

Little is known about Montero's life, other than she was born as Francy María Orrego in 1960 in Santa Rosa de Osos, a little rural municipality located in between the last of the Andes mountains towards the north-west region of Colombia. Montero was a part of the communist youths during the National Front years and eventually joined the FARC ranks in 1978 after turning 18 years old. She spent her early years as a member of the 5th front, until 1986 when she was named the commander of the 34th front. In 2001 she was captured by the army and sentenced for terrorism and rebellion. In 2003 she was released and went back to the front line of combat in the 49th front. Little after she was named commander of the Northwestern block of the FARC, becoming

⁵²Information drawn from an interview with senator Lobo, conducted on February 10th, 2021.

⁵³All information drawn from <https://partidofarc.com.co>

the first (and only woman) to hold such position. In 2015 she became a member of the Mayor State of the guerrilla, once again an unheard of position for a female. In 2018 she run for Congress, but was defeated by her fellow ex-combatants (Lobo and Sandino amongst them) and so she became part of the director's board of the newly founded FARC political party.⁵⁴

⁵⁴All information drawn from <https://wikipedia.org>

E Complete model

Set-up

Consider the interaction between two groups, the Guerrillas (G) and the Peasants (P), that happens along 2 periods. In period 2, the Guerrillas can exert violence on the peasants in order to extract rents from them. Call this violence V and let it be a function of an investment in violence (e.g., arms, soldiers, training) that G makes in period 1, $V(I)$. Violence is increasing in the level of investment, with decreasing returns: $V'(I) > 0$, $V''(I) < 0$. Investment is costly, with a convex cost function: $c(I)$, $c'(I) > 0$, $c''(I) > 0$. Let the total rents available for extraction be denoted by Y , and the fraction paid to the guerrillas denoted by τY . Finally, let $X(I)$ represent the influence of the guerrillas on a territory, and assume $X'(I) > 0$.

The problem of the guerrillas can be summarized as:

$$\max_{\{I\}} \quad \tau Y X(I) - c(I) \quad (\text{E1})$$

The peasants have to decide whether to pay or not the extortions made by the guerrilla in period 2. Whenever they don't pay they have to face the level of violence consistent with the investments that the guerrilla made in the previous period. If they pay, there is still a chance of experiencing violence (trembling hand), which will be a function of how effective the peasants' leader j is at maintaining peace. Let p_j be the probability with which the leader of the peasants upholds peace. The problem of the people can be written as:

$$\max_{\{\pi, \not\pi\}} \quad \mathbb{I}_\pi [p_j(1 - \tau)Y + (1 - p_j)(Y - V(I))] + \mathbb{I}_{\not\pi} [(Y - V(I))] \quad (\text{E2})$$

where π and $\not\pi$ stand for “pay” and “not pay” respectively. We assume $j \in \{w, m\}$, with $p_w \geq p_m$.

Finally, there is a period 1 where the the leader of both groups come together and negotiate on the level of investment G makes, I . The objective function of the guerrillas and peasants yield the first set of predictions from the model: **violence will occur with a lower probability whenever there is a female mayor representing the peasants; guerrillas investment in violence will be an (inverse) function of their cost of investing.**

Optimal τ

G anticipates the problem of the peasants (complete and perfect information) and chooses the maximum level of extortion τ possible given the threat of violence it can create via investment. To do so, G equates the the payoff of the peasants in the case they pay and they don't, yielding:

$$p_j(1 - \tau) + (1 - p_j)(Y - V(I)) = (Y - V(I))$$

Replacing for τ , one finds the optimal level of “taxation” for every combination of investment and rents.

$$\tau^* = \frac{V(I)}{Y} \quad (\text{E3})$$

In the previous expression, note that the optimal level of taxation does not depend on the gender of either of the leaders. This, in turn, yields the second prediction from the model: **the extortion rate in a municipality should not be affected by the gender of the mayor.**

Nash Bargaining

In the first period, both leaders get together to negotiate over the optimal level of investment that G will make, given that they can anticipate the rent extraction for the next period τ , that they are aware of the possibility of “unexpected” violence, and that the level of violence will be a function of the investment. They do so through a Nash Bargain negotiation as follows:

$$\max_{\{I\}} [(1 - p_j)(V(I) - V(0))]^\theta \times [X(0) - X(I) + c(I) - c(0)]^{1-\theta} \quad (\text{E4})$$

where θ is the bargaining power of P . Taking first order conditions with respect to I yields (after taking logs for simplicity) :

$$\frac{\theta(1 - p_j)V'(I)}{(1 - p_j)(V(I) - V(0))} + \frac{(1 - \theta)(c'(I) - X'(I))}{X(0) - X(I) + c(I) - c(0)} = 0 \quad (\text{E5})$$

rearranging yields:

$$\frac{V'(I)}{V(I) - V(0)} = \left(\frac{1 - \theta}{\theta}\right) \frac{c'(I) - X'(I)}{c(I) - c(0)} \quad (\text{E6})$$

Imposing the condition that $X'(I) < c'(I) \forall I$, then there is an interior solution for the level of I that maximizes the Nash Bargaining problem. The existence of an equilibrium level of investment greater than zero yields the third prediction from the model: **in equilibrium, there will be positive levels of violence in a municipality independent of the gender of the leaders.**

F FARC releases

F.1 Statements of the FARC regarding on gender and female leadership

The following are some extracts of two different statements that the FARC guerrilla made available (while still outside of the law), and that were made available by CEDEMA (www.cedema.org). CEDEMA is an organization devoted to the documentation and study of insurgent organizations in Latin America.

“Aparte de considerarla de manera especial por su condición de mujer colombiana que trabaja por la paz, me dirijo a usted por su condición de líder del movimiento de familiares y militares (captivos) ... por cuya libertad ha librado durante años una incansable batalla.”

“Besides holding a special consideration for you due to your role as a Colombian woman that works in search of peace, I address you in your position as (female) representative of (captives) ... for whose liberty you have fought an endless battle.”

Timoleón Jiménez
Comandante del Estado Mayor Central Commander of the Board of Directors
de las FARC-EP
of the FARC-EP
Montañas de Colombia, 3 de marzo de Colombian mountains, March 3rd,
2012.

“Como posición política y de principios, las FARC-EP abogamos por la igualdad de género ... Para nosotros, la mujer es incuestionablemente la garantía de existencia de la sociedad y el alma de la paz.”

“As a political stance, and as a matter of principles, the FARC-EP advocates gender equality ... For us, women are without a doubt both a guarantee of the existence of society and the soul of any peace effort.”

F.2 Statements of the FARC on their goals and objectives

The following statements (also published by the FARC and collected by CEDEMA), belong to the guerrillas' "constitution". They highlight the importance that they gave to an agrarian reform, and to the organization of peasant and workers units and cooperatives.

“La Política Agraria Revolucionaria “The Revolutionary Agrarian Policy is es condición indispensable para elevar an indispensable condition for drasti- verticalmente el nivel de vida material cally raising the material and cultural y cultural de todo el campesinado, li- standard of living for all peasants, free- brarlo del desempleo, el hambre el anal- ing them from unemployment, hunger, fabetismo y las enfermedades...” illiteracy, and diseases...”

*Constitución de las FARC
Montañas de Colombia
Julio 20, 1964*

*FARC’s Constitution.
Colombian mountains.
July 20, 1964*

“Los campesinos e indígenas que “Peasants and Indigenous people who quieran beneficiarse de las medi- wish to benefit from the measures of the das de la Reforma Agraria Revolu- Revolutionary Agrarian Reform should cionaria, deberán organizarse en am- organize into broad CRARs, or Com plios CRAR, o Comité para la Re- mittees for the Revolutionary Agrarian forma Agraria Revolucionaria, que en Reform, which will gradually transform el campo se irán transformando en into organs of the New Popular Power órganos del Nuevo Poder Popular.” in rural areas.”

*FARC
Montañas de Colombia*

*FARC
Colombian mountains*

“La realización de este Programa Agrario Revolucionario dependerá de la alianza obrero-campesina y del Frente Unido de todos los colombianos [sic] en la lucha por el cambio de régimen...”

“The realization of this Revolutionary Agrarian Program will depend on the worker-peasant alliance and the United Front of all Colombians in the struggle for a change of regime.”

*FARC
Montañas de Colombia*

*FARC
Colombian mountains*

G Government programs

G.1 Supervised classification of programs

List of words used to identify peace-related programs

(Spanish:) amnistias, civiles, convivencia, defender, defensa, desarme, desplazada, desplazamiento, desprotegidos, humanitario, indefension, liberacion, marginales, marginalidad, miedo, necesitada, pacifista, pacto, paz, protegiendo, protectora, proteger, reconciliacion, restitucion, salvar, salvo, solidarias, solidaridad, temor, tolerante, victima, vida, vulnerables, vulnerabilidad, vulneracion.

(Translated:) amnesty, civilians, coexistence, to defend, defense, disarmament, displaced, displacement, unprotected, humanitarian, undefended, liberation, marginalized, marginality, fear, in need, peaceful, pacifist, pact, peace, protecting, protector, to protect, reconciliation, restitution, to save, safe, solidarity, fear, tolerant, tolerance, victims, life, vulnerable, vulnerability, violation.

List of words used to identify infrastructure-related programs

(Spanish:) canalizacion, acueducto, aereo, alcantarillado, alumbrado, andenes, carretera, avenida, represa, tunel, estructura, infraestructura, obras, pavimentacion, peatonal, potabilizacion, potable, aeropuerto, alcantarillas, canalizar, electricas, hospitalaria, telecom, telecomunicaciones, energetico, contratistas, vis, iluminado, cofinanciacion.

(Translated:) canalization, aqueduct, aerial, sewerage, lighting, sidewalks, road, avenue, dam, tunnel, structure, infrastructure, works, paving, pedestrian, potabilization, potable, airport, sewers, to channel, electrical, hospital, telecom (Public telecommunications company), telecommunications, energy, contractors, VIS (housing program), illuminated, co-financing.

G.2 Key-words based classification of programs

List of key-words related to peace

(Spanish:) justicia (y) reparacion, paz (y) respeto, unidad, tolerancia, cooperacion, respeto, dialogo, compromiso, violencia, defensa, frente, paz, defender, conflictos, conciliacion, acuerdo, convivencia, alianza, resolucion, solidaridad, perdon, sanacion, armonia, comprension, compasion, diplomacia, mediacion, reconstruccion, disculpa, restitucion, desarme, empatia, posconflicto, tranquilidad, coexistir, coexistencia, acuerdos, negociaciones, dialogos, desescalada, pacificacion, generacion de confianza, respeto mutuo, no violencia, hacer paz, justicia transicional, verdad (y) reconciliacion, conflicto armado, proceso de restitucion, intercambio humanitario, desplazamiento forzoso, estado de indefension, des escalar, reduccion (de) tensiones, medidas preventivas, medidas (de) confianza, medidas (de) distencion, cese (al) fuego, liberacion (de) prisioneros, liberacion (de) secuestrados, politica (de) reconciliacion, confianza mutua, medidas (de) seguridad, grupos marginados, resolucion (de) conflictos, derechos humanos, justicia social, poblacion desplazada, resolucion pacifica, participacion ciudadana.

(Translated:) justice and reparation, peace and respect, unity, tolerance, cooperation, respect, dialogue, commitment, violence, defense, front, peace, to defend, conflicts, concilia-

Figure G2: Most common words (by gender)



Notes: the figure shows a word-cloud with the most common terms found in the government programs of elected mayors in Colombia between 2003 and 2015, by gender of the official.

tion, agreement, coexistence, alliance, resolution, solidarity, forgiveness, healing, harmony, understanding, compassion, diplomacy, mediation, reconstruction, apology, restitution, disarmament, empathy, post-conflict, tranquility, to coexist, coexistence, agreements, negotiations, dialogues, de-escalation, pacification, trust building, mutual respect, non-violence, to make peace, transitional justice, truth and reconciliation, armed conflict, restitution process, humanitarian exchange, forced displacement, state of defenselessness, de-escalation, tension reduction, preventive measures, trust-building measures, de-escalation measures, ceasefire, prisoner release, kidnapped release, reconciliation policy, mutual trust, security measures, marginalized groups, conflict resolution, human rights, social justice, displaced population, peaceful resolution, citizen participation.

List of key-words related to infrastructure

(Spanish:) infraestructura para el deporte, zonas francas, parques industriales, zonas industriales, estrategia, infraestructura, construccion, desarrollo, carreteras, puentes, transporte, puerto, energia, agua, saneamiento, contratacion, presupuesto, mantenimiento, vivienda, planificacion, edificios, ferrocarriles, aeropuerto, electricidad, telecomunicaciones, licitacion, urbanizacion, regulacion, proyectos de inversion, espacio publico, instalaciones deportivas.

(Translated:) sports infrastructure, free trade zones, industrial parks, industrial zones, strategy, infrastructure, construction, development, roads, bridges, transportation, port, energy, water, sanitation, contracting, budget, maintenance, housing, planning, buildings, railways, airport, electricity, telecommunications, bidding, urbanization, regulation, investment projects, public space, sports facilities.

Figure G3: Excerpts of government programs

**PROGRAMA DE GOBIERNO DEL DOCTOR
GABRIEL ANTONIO RIVERA CUETO
CANDIDATO A LA ALCALDIA MUNICIPAL DE
SUAN ATLÁNTICO; PERIODO 2.004 – 2.007**

PERFIL DEL CANDIDATO

PERFIL DEL CANDIDATO
Medico Doctor Gabriel Antonio Rivera Cueto, nació el 24 de febrero de 1.973, en el Municipio de Suan de la trinidad.

ESTUDIOS:

- ESTUDIOS:**

 - Bachiller académico del colegio Bachillerato Mixto de Suan
 - Medico Cirujano Universidad Metropolitana de Barranquilla

EXPERIENCIA

- Medico Cirujano Hospital Metropolitano de Barranquilla.
 - Medico Cirujano Escuela Naval Barranquilla.
 - Medico Cirujano Hospital Niño Jesús
 - Medico Cirujano Batallón Vergara y Velazco
 - Medico Cirujano Unidad Administrativa Centro de Salud de Santa Lucia.
 - Concejal del Municipio de Barranquilla y presidente de esa honorable corporación

CARACTERÍSTICAS:

Su formación científica y social le permite analizar con claridad los problemas del ser humano y de su entorno y decidir con acierto sus soluciones.

Esta característica, sumada a su profundo sentimiento por todas las cosas de la vida junto con la capacidad de tolerancia y servicio a la comunidad, constituyen su principal fortaleza, lo que lo diferencia de los políticos tradicionales.

PROGRAMA DE GOBIERNO:

La postulación de mi nombre a la Alcaldía del Municipio de Suan, surge como respuesta a la necesidad expresada por la ciudadanía de continuar con el desarrollo social y económico emprendida en las administraciones de Voluntad Popular y de construir juntos un Municipio que queremos.

El Municipio que queremos es un Municipio real, auténtico, en plena concordancia con sus necesidades, desde sus presupuestos de ingreso, gastos e inversión. Un Municipio que inevitablemente debe combinar los esfuerzos administrativos y comunidad para alcanzar el desarrollo deseado.

Sin dejar de atender los sectores básicos definidos por la ley, el programa de Gobierno contempla la ejecución de tres ejes estratégicos dirigidos a garantizar el desarrollo económico y social del Municipio de Suan.

(a) Suan

Notes: the figure shows the first page of two government programs for municipalities in the state of Atlantico, for the period 2003-2007. The figure highlights the lack of consistency between the programs, as even two of the same state/period look completely different. In particular, the left panel shows a program that begins with a profile of the candidate, and then redacts his proposals in an essay-type of format. The right panel, in contrast, only lists the proposals in bullet points, even using “sections” to divide between different themes.



(b) Soledad