Bargaining under Polarization: The Case of Colombian Armed Conflict
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Abstract

The decades-old armed conflict between the government of Colombia and the FARC guerrilla group has been a highly polarized one, as is evident from the intransigent positions of the two parties and the repeated breakdowns of past peacemaking efforts. To account for this longstanding failure to reach an agreement, a distributive bargaining framework is developed in which a measure of polarization is derived from (i) externalities the parties suffer due to a kind of envy, and (ii) penalties the parties impose on their delegated negotiators when concessions are made in the bargaining process. The proposed model posits four negotiation outcome regions, two representing agreement and two representing disagreement (i.e., negotiation breakdown), arising from the interplay of two parameters: the conflict’s polarization level and the ratio of total gross payoff from continuing conflict to the surplus up for negotiation. It follows from this formulation that a necessary condition for a negotiated solution is the adoption of a dual policy that combines political and military strategies in a dissociative manner. This analytical approach is applied theoretically to conflicts in general and specifically to the Colombian conflict, identifying the conditions that explain the success —so far— of the current Peace Process.

Keywords: polarization; Colombian conflict; bargaining theory; Nash demand game
1 Introduction

Peace talks, disarmament discussions (to decommission terrorist groups), political transitions (from dictatorship to democracy) and other negotiation-related processes generally take place in highly polarized environments. The parties involved in these processes often prefer to let them stagnate at a deadlock point or breakdown altogether, implying that they are willing to assume the costs of failing to reach an agreement.

An excellent example of a highly polarized negotiation processes are those that have attempted to settle the internal armed conflict in Colombia, which only recently has shown real signs of coming to a peaceful solution. This decades-long conflict between the guerrillas —mainly the Revolutionary Armed Forces of Colombia (FARC)— and the Colombian government has been highly polarized from the very beginning. This polarization is clearly evident in the many intransigent postures and inconclusive negotiations dating back to the 1960’s.

Yet despite these many processes that have so far led nowhere, studies on the possibilities of an agreement in the Colombia conflict that take a game-theoretic approach are relatively recent. The existing works have generally modelled a possible solution in terms of classical games comparing the economic benefits/costs of either maintaining the conflict or reaching an agreement (Gorbaneff and Jacome, 2000, [13]). Other analyses have examined the circumstances under which Colombian society can continue to survive the conflict and its costs, and the determinants of the transfer that would be required to end the war and reach an agreement with the guerrillas.

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1 A detailed discussion of the literature on game theory models and the Colombian conflict is presented here in Section 7.
(Salazar and Castillo, 2001, [23]; Zuleta et al., 2013, [29]). Although these models describe various characteristics of the conflict, they neither account formally for the polarized environment nor consider the crucial role played by this polarization in the failure of previous peace-making efforts.

There is an abundant literature on bargaining theory based on games that attempts to explain the conditions for a disagreement. Examples of studies addressing the possibility that a negotiation breakdown emerges as an equilibrium include Crawford (1982, [6]), Anderlini and Felli (2001, [1]), Haller and Holden (1995, [14]), and Glazer and Fernández (1991, [12]). But these works, too, all fail to consider the role polarization might play in the breakdown of a bargaining process.

To fill this gap, we propose a distributive negotiation model, a modified version of the classic Nash demand game in which delegated negotiators conduct a bargaining process in a polarized environment. We derive a measure of polarization based on two elements: (i) the negative externality a party suffers when their counterpart obtains a share of the surplus under negotiation, and (ii) the penalty a party imposes on their delegated negotiator as a way of transferring to the negotiator the negative externalities due to the concessions the latter made. Our results indicate that in the case of an agreement, there is a continuum of Pareto efficient negotiating solutions constituting an interval whose minimum and maximum equilibrium shares depend on the penalties incurred by the negotiators. Furthermore, when we explore the conditions under which the agreement is unique and more or less equitable, we will show that such penalties in fact constitute a source of bargaining strength as they lead the negotiator facing a larger penalty to make fewer concessions.

Regarding the condition for the existence of an agreement or disagree-
ment, we demonstrate that although polarization modifies the original Nash demand game, this condition can be restated in terms of the classic comparison between the total payoff from an agreement—a peace treaty, for instance—and the total net (i.e., after externalities) payoff from an ongoing conflict. We also characterize the outcomes of a polarized negotiation using a proposed four-region graph based on the values taken by two parameters: (i) the level of polarization in the conflict, and (ii) the ratio between gross (i.e., before externalities) conflict payoffs and the surplus to be distributed. We further show that under this graphical arrangement there is a non-monotone relationship between each of these parameters and an agreement or a disagreement. We thus identify two agreement regions and two breakdown regions in the graph, a setup that provides a rich analytical framework for the theoretical evaluation of different policies which might achieve a negotiated solution in a polarized conflict.

This analysis leads to two main conclusions. First, a proper evaluation of strategies aimed at resolving a polarized conflict should include as a previous condition the most accurate possible determination of the conflict’s starting point. Crucial to this correct identification of the stalemate region in which the conflict is currently stuck are estimates of both the level of the conflict’s polarization and the relative total gross payoffs in the case of a disagreement. The second conclusion is that a necessary condition for reaching agreement in a polarized conflict is the implementation, ideally by both parties, of a dual policy consisting of a dissociative mixture of a political strategy affecting the degree of polarization (rhetoric or ‘words’) and a military strategy affecting conflict payoffs (‘facts’). Thus, an agreement may be achieved if either (i) moderate rhetoric is combined with aggressive military actions, or (ii) belligerent rhetoric is combined with a rather permissive military strategy.
If this dissociation is not adopted, any policy for attaining a resolution will fail and the conflict will continue.

Our four-region framework is also useful for describing and evaluating peace initiatives adopted in real situations. Here, we apply the framework to the situation in Colombia in order to assess three Colombian government policies for solving the conflict with FARC. Two of them—the Demilitarized Zone plan and the Democratic Security policy—are earlier initiatives and the third is the current Peace Process initiated in 2012. Our analysis suggests that the first two failed because they were unable to dissociate words (i.e., political strategies) and facts (i.e., military strategies). This failure meant that the Demilitarized Zone plan simply moved the conflict from one stalemate region to another while the Democratic Security policy maintained it within the same breakdown region. By contrast, we conclude that the current Peace Process succeeded in reaching a preliminary agreement in Havana in August 2016 because of the parties’ willingness to combine an open dialogue using moderate rhetoric with an active military strategy.

The remainder of this article is organized as follows. Section 2 briefly summarizes the Colombian armed conflict; Section 3 proposes a model of bargaining under polarization; Section 4 analyzes the main properties of the model’s equilibrium; Section 5 discusses the implications of the model for conflicts in general while Section 6 does the same specifically for the conflict in Colombia; Section 7 reviews previous studies and compares the present work to (i) the literature on the relationship between polarization and political conflicts in general, and (ii) the game-theoretic literature applied to the specific case of the Colombian conflict; Section 8 presents our main conclusions; and lastly, formal proofs of the principal results and the figures accompanying the text are set out in the Appendix.
2 The Colombian armed conflict

Evidence of leftist guerrilla movements in Colombia dates back to the mid-1960’s. FARC started out as a peasant-based communist organization while the Castroist National Liberation Army (ELN) originally had an urban base mainly among unionized workers. The two guerrilla forces emerged as a protest against the prevailing institutional order, with FARC focusing on inequality in the distribution of land and the ELN on inequality in the distribution of income. Not until the 1980’s when the scale of the conflict grew, mainly due to FARC’s operations in rural areas, were their activities seen as significantly disruptive of the social order. Since 1982, successive Colombian governments have attempted to portray themselves as open to dialogue, but in most cases they set conditions that rejected certain key demands in the two group’s respective political agendas and thus were never accepted by either of them.

The administrations of presidents Virgilio Barco (1986-1990) and César Gaviria (1990-1994) engaged in negotiation processes that made little headway with FARC or the ELN but successfully exploited the military weakness of some smaller groups to persuade them to demobilize in return for an amnesty, their participation in the constitutional reform of 1990 and, in the case of the M-19, the creation of a leftwing political party (Nasi, 2008, [20]). Paradoxically, however, these negotiations gave rise to a number of factors that increased the overall polarization of the conflict. First, in many remote areas the active presence of drug traffickers combined with a weak

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2These smaller groups included the April 19th Movement (M-19), the Popular Liberation Army (EPL), the Revolutionary Workers Party (PRT), the Quintin Lame Armed Movement (MAQL) and the Socialist Renewal Current, a breakaway from the ELN.
government presence resulted in the rise of paramilitary groups or private militias supported by Colombia’s armed forces and the local rural elites (Bejarano, 2003, [2]). Second, FARC set up its own political party known as the Patriotic Union (UP), which participated in the established political process during the presidential elections of 1986. The party came under attack in a dirty war led by the paramilitary groups, who assassinated more than 2,000 of its members during the period 1986 to 1995 (Chernick, [?], p. 177).

This led to a radicalization of FARC and a polarization of the armed conflict. Third, and due to the foregoing, FARC viewed the demobilization of one of the small guerrilla groups (the EPL) in the wake of the negotiations as a betrayal of “guerrillero” ideals. This led to a bloody confrontation between FARC and the EPL that almost destroyed the latter organization. Finally, the negotiations themselves were subjected to sabotage attempts from various quarters (spoilers) and indiscriminate assassinations of negotiators, which further contributed to an increase in conflict polarization (Nasi, 2008, [20]).

Beginning in the 1990’s, FARC was able to strengthen its financial and military positions by resorting to various illegal economic activities (drug trafficking, illegal mining, extortion and kidnapping) as well as terrorism and displacement of civilians. While the paramilitary groups initially formed in response to the growth of guerrilla activity, they, too, exploited the lack of government presence to engage in similar profitable activities, as did various criminal gangs that also began to appear. All of these phenomena worsened the global level of conflict polarization. The situation continued to deteriorate under the Gaviria and Samper (1994-1998) administrations to the point where it became a high-intensity internal war.

Confronted with this escalation of the conflict, the administration of An-
drés Pastrana (1998-2002) launched a new round of peace talks with FARC in 1998. As a prerequisite to sitting down at the negotiating table, the guerrilla group demanded that the five municipalities where the talks were to be held would be demilitarized without agreeing a cease-fire. The government agreed to the condition, clearing the municipalities of any military presence to create a demilitarized zone covering about 42,000 km². This measure impacted both the military intensity and the polarization of the conflict. As regards the military aspect, armed hostilities on both sides decreased, which for FARC brought a series of military, economic and political benefits. Still, the process initially generated considerable optimism among Colombians that a peaceful solution was possible. The result was a decline in polarization on the side of the civil population, as may be deduced from the fact that had this not been the case, the government would not have put its political capital on the line by accepting the strong demilitarization condition insisted on by the guerrillas.

Hopes for the negotiations were dashed shortly thereafter, however, mainly due to the attitude of FARC, which unilaterally suspended the talks on three occasions, causing major delays in the whole process. In mid-1999, the two sides agreed to a complicated agenda containing 47 points, none of which were ever discussed. Later, in the year 2000, FARC and the government agreed to hold a series of so-called public hearings, an instance which suspended indefinitely any direct negotiations between them on the substantive agenda items while members of the public put forward their own peace proposals. Although the two sides attempted to focus the negotiations on achieving a cease-fire and a prisoner exchange, only on the latter was a narrow and partial agreement arrived at. No accord was reached on the former point due to FARC’s insistence that a cease-fire was only possible
once a peace agreement had been hammered out and the government had implemented 80% of the commitments undertaken. In the end, the process collapsed in 2002 due to the lack of progress in the negotiations and the growing tensions caused by increasing levels of violence including the hijacking by FARC of a commercial airliner.

With the failure of the Demilitarized Zone peace process initiated by Pastrana, Colombians took the view that FARC had simply taken advantage of the process to strengthen itself both militarily and economically. There was widespread feeling that the guerrilla group had agreed to the negotiations not with a genuine desire to reach a peaceful settlement but merely as a tactical move within a longer-term strategy of not renouncing the use of arms to achieve its political objectives. This perception together with the upsurge in acts of violence by FARC brought the conflict back to a level of polarization at least as high as it had been before the process began.

Proof of this setback was the decisive victory in the 2002 election scored by Alvaro Uribe, the presidential candidate put up by a right-wing coalition who promised to defeat the FARC militarily. With financial and military support provided by the United States under Plan Colombia, already articulated by the previous government, the Uribe administration designed and implemented during its 8-year rule (2002-2010) the Democratic Security policy (DS), a strategy aimed at putting an end to the conflict by military means. The original DS policy included measures such as a security tax, the recruitment of “peasant soldiers”, the creation of informer networks to feed the intelligence services, rewards for information, promoting desertions of illegal combatants and the setting up of rehabilitation zones in areas under FARC influence. Later, the government tried to bolster these initiatives with an Anti-Terrorism Bill that granted police powers to the military and
provided for police raids, telephone tapping and detention without a warrant.\(^3\)

The DS policy was applied as part of Plan Patriota to combat drug trafficking, a veritable war effort complementing Plan Colombia even though the official line still insisted it was not a true armed conflict. The military actions under Plan Patriota focussed mainly on the southern regions of the country, FARC’s strategic stronghold. The initiative was successful in weakening FARC and reducing its offensive capabilities, its main leaders ending up either captured or dead. Even so, the Plan did not break the group’s will, nor did its members abandon other important fronts such as communication corridors extending through other regions and sources of financing linked to drug and arms trafficking. Thus, beginning early 2005, FARC managed to reorganize and counterattack militarily, causing the death of dozens of soldiers in various ambushes directed at the armed forces.

Yet although the military success of the DS policy was relatively limited and the armed conflict actually intensified, the general public’s perception was that the level of security in the cities had improved. Opinion polls corroborated this feeling, which was ratified in some sense by the re-election of Uribe for a second presidential mandate. This electoral victory suggested that Colombians supported the military bias in the policy, thereby maintaining the high degree of polarization between the society and the guerrillas. This highly polarized climate was also fed by the Colombian government’s rhetoric, which favoured a military approach to the solution of the conflict.

\(^3\)The Uribe administration also passed the Justice and Peace Law (2005). Some paramilitary group members and a small number of guerrilla fighters turned themselves in under this law in return for a promise of lighter sentences, judicial pardons and financial rewards.
and refused to consider any further negotiations unless the guerrillas first laid down their arms. In a similar vein, the government undertook a diplomatic offensive to secure the condemnation of FARC by the international community. Directed especially at the OAS, the Rio Group and the Secretary General of the UN, this campaign eventually resulted in both the United States and the European Union declaring that the FARC was a terrorist organization.

Uribe’s successor Juan Manuel Santos (2010-2018), though he partially maintained his predecessor’s DS military policy, also initiated a Peace Process (PP) with FARC in Havana (2012-2016). FARC agreed to take part in this process but without surrendering its arms until all of the points to be negotiated had been complied with. This duality of approach on the part of the two sides meant in practice the coexistence of two apparently contradictory strategies: (i) an attempt to reach an agreement for a peaceful solution of the conflict, and (ii) a military strategy that would either condition the PP dynamic if it was successful, or alternatively, would allow the two parties to maximize the benefits or minimize the losses of an insoluble armed conflict.

For much of the conversations, the PP enjoyed the support of the Colombian people. This may be interpreted in our model as a reduction in the degree of polarization due to the initiative of the government side. This positive atmosphere for the peace process drew strength from the re-election of Santos to another term (2014-2018) and the outcome of the 2015 regional elections. Given this favorable context, both sides finally arrived at the August 2016 Havana agreement, which resulted in a definitive bilateral ceasefire at the end of that month. The accord is a preliminary one, however, and must be ratified by both sides in a nationwide referendum and a conference
Bargaining under Polarization

of FARC delegates.

But despite these so far encouraging results, there are still two factors that threaten to undermine the definitive success of the PP by increasing the degree of polarization: (i) the public perception that the PP is granting too many concessions to FARC, and (ii) FARC’s intransigence.

As regards concessions, the five major items on the peace process agenda all potentially allow FARC to obtain significant benefits in terms of its ideological program and its political, social and economic interests. Under the first item, titled *Agricultural Development*, the benefits would include the application of existing land reform provisions, the legalization of land occupations, the creation of a land distribution fund and rural development programs, and the setting up of peasant reserve zones within FARC’s area of influence where non-market economic systems could be developed. Under the second item, *Political Participation*, FARC would be allowed to have representatives for its areas of influence (to be known as Special Peace Districts) at various levels of government without having to submit to elections. Third, in relation to the *Solution of the Drug Problem*, the government would develop policies to combat drug trafficking and asset laundering and initiate coca crop substitution and drug rehabilitation programs, while FARC, for its part, would renounce drug trafficking. No action would be taken against the group regarding its past profits in this or any other criminal activities. Fourth, under *Justice, Truth and Reparations*, a transitional amnesty law would provide for the treatment of illegal acts committed by FARC including kidnapping as political rather than ordinary criminal offences. In addition, restrictions on the FARC leaders’ freedom would exclude prison terms and would not limit their right of political participation during the period the restrictions were in force. Fifth, and finally, under *End of the*
Conflict, FARC would not be required to lay down its arms until all of the agreements including a cease-fire were signed. An international mission would be set up to verify that both parties were honouring the cease-fire and make recommendations to them on preventing or correcting any cease-fire violations.

It is highly probable that these benefits for FARC will be interpreted by Colombians as excessive concessions that cross certain “red lines”. This risks increasing the polarization of society and therefore of the conflict itself, which could result in the agreement being delayed, blocked in the Colombian Congress, defeated in the ratification referendum or otherwise rendered impossible to implement even if it is ratified.

As for the degree of polarization of FARC, the group has maintained an intransient stance throughout the peace process, demanding exceptions on each point agreed to (such as the economic model) and insisting that “nothing is agreed until everything is right”. Furthermore, during much of the process FARC rejected the idea of a referendum to institutionalize an eventual accord, demanding instead that it be ratified by a constituent assembly. This maximalist position jeopardizes the ratification of the preliminary agreement at the conference of FARC delegates to be held in September 2016. And even if the conference does ratify the accord, there is still the possibility that the more radical factions of the guerrilla group, however much they might be in the minority, will sabotage its implementation.
3 A model of negotiation under polarization

In this section we propose a static distributive bargaining game between two delegated negotiators, each one representing one of the two parties to a conflict. Each party subjects her own negotiator to negative pressure proportional to the gain obtained by the other party’s negotiator. This pressure takes the form of a penalty imposed for ceding any part of the good in dispute. From these penalties we derive a measure of the level of conflict polarization, which we then use to characterize two classes of outcomes for the game: agreement and negotiation breakdown.

3.1 The bargaining game

The proposed game is based on the classic Nash demand game (Nash, 1953, [19]). Negotiators $A$ and $B$ —on behalf of two parties— try to resolve an ongoing conflict by means of a bargaining process modelled as the distribution between them of a pie of size $\pi$. The pie can be thought of as a set of economic and political claims in dispute expressed in a common unit. Each negotiator simultaneously demands a piece of the pie expressed by a number $x_i \in [0, \pi]$ for $i = A, B$. If $x_A + x_B \leq \pi$, an agreement is reached and each player gets the amount he chose. This outcome can be interpreted as a dialogued solution such as a peace treaty or a disarmament agreement.

If, on the other hand, $x_A + x_B > \pi$, there is a disagreement (or negotiation breakdown), which can be interpreted to mean the conflict continues. In this scenario each negotiator gets a conflict payoff (i.e., his outside option), which will be described in more detail later.

Polarization in the context of a delegated negotiation is modelled through externalities and penalties as follows. We assume that each of the two parties
represented by the negotiators experiences a negative externality—a kind of ‘envy’— as she is made not only better off by the surplus she obtains but also worse off by the share of the pie captured by her counterpart.\footnote{This notion of envy is used by Varian (1974, [27]) in the context of social choice to define an equitable distribution as one in which envy is absent. A similar concept in a negotiation context is employed by Kirchsteiger (1994, [15]) in an ultimatum game model.} This externality can be understood as a decrease in utility suffered by the parties due to polarized positions arising from ideological, religious, historical or ethnic issues. We also assume that each party transfers (completely or partially) the externality she experiences to her negotiator. This transfer takes the form of a penalty proportional to the concessions made by each negotiator to his counterpart, which are interpreted by the parties as a betrayal of their fundamental principles.

In the case of an agreement, these assumptions are captured by the payoff function for negotiator $i$ given by\footnote{These concepts of externalities, delegated negotiation and penalties are formalized in Appendix A.}

$$U_i(x_i, x_j) = x_i - \lambda_i x_j,$$

(1)

where $\lambda_i \geq 0$ is the marginal penalty imposed on negotiator $i$ for the share he concedes to negotiator $j$, for all $i, j = A, B; i \neq j$.

In the case of a disagreement, the net conflict payoff $\bar{U}_i$ to negotiator $i$ is given by

$$\bar{U}_i = V_i - \lambda_i V_j,$$

(2)

where $V_i, V_j \in \mathbb{R}$ represent the gross conflict payoffs to the negotiators, that is, the payoffs in the absence of externalities and penalties.\footnote{This assumption differs conceptually from the one made by Esteban and Ray (2008,}
gross conflict payoffs can be negative, which would make sense, for example, in the context of a war.

In order to obtain feasible solutions, we adopt the following assumption on the conflict payoffs:\footnote{This condition ensures that equilibrium partitions are non-negative and smaller than the pie up for division (see proof of Proposition 3.3).}

$$U_i \geq -\lambda_i \pi$$

for all $i$.

To express our main results more concisely we adopt the two definitions given below. In subsequent sections they will also prove useful for deriving a framework that allows us to perform both normative and descriptive analyses of a polarized conflict.

The first definition, based upon our notions of externalities and penalties, proposes a measure of polarization in the context of a negotiation.\footnote{As will be discussed in Section 7, there is a series of papers using a notion of polarization built around concepts of alienation and inter-group antagonism that resemble the concept of envy our measure of conflict polarization is built around. Among these papers are Esteban and Ray (1994, [7]; 1999, [8]; 2008, [9]; 2011, [10]), and Esteban and Schneider (2008, [11]).}

**Definition 3.1.** $\Lambda$, the level of conflict polarization, is defined as

$$\Lambda \equiv \lambda_A \lambda_B.$$
The second definition states the relationship between the total gross conflict payoff and the total surplus up for division.

**Definition 3.2.** \( \Upsilon \), the total gross conflict payoff relative to the total pie under negotiation, is defined as

\[
\Upsilon \equiv \frac{V_A + V_B}{\pi}.
\]

### 3.2 The equilibrium

Let \( X^* \) be the Nash equilibrium set of the bargaining game just described. We then say that the strategy pair \((x_A^*, x_B^*)\) belongs to this set if \( x_i \) solves the following program for negotiator \( i \):

\[
\begin{align*}
\max_{x_i} & \quad U_i(x_i, x_j) \\
\text{subject to} & \\
& x_i \geq 0 \\
& x_i \leq \pi \\
& U_i(x_i, x_j) \geq U_i \\
& x_i + x_j \leq \pi
\end{align*}
\]

where \( i, j = A, B \) with \( i \neq j \). Inequalities (5) and (6) are the program’s feasibility constraints, ensuring that each negotiator’s demand is non-negative but smaller than the total pie at stake. Condition (7) is the individual rationality constraint, according to which player \( i \) is willing to participate in the bargaining process only if he obtains a utility equal to or greater than the net payoff he got in the conflict scenario. Lastly, condition (8) is the agreement constraint imposed by the rules of the game.
If there exists a strategy profile \((x_A^*, x_B^*)\) that solves the foregoing program, we say that there is an agreement; if not, we say that there is a disagreement or negotiation breakdown. In this sense, the existence of at least one Nash equilibrium profile is equivalent to the existence of at least one agreement whereas the emptiness of the Nash equilibrium set is equivalent to a negotiation breakdown.

The next proposition characterizes the set of Nash equilibria \(X^*\) computed on the basis of the above program.

**Proposition 3.3.** Consider the following condition:

\[
(1 - \Lambda)(1 - \Upsilon) \geq 0. \tag{9}
\]

If this condition holds then the Nash equilibrium set is not empty and is characterized by

\[
X^* = \{ (x_A^*, x_B^*) : x_A^* \in [x_A, \bar{x}_A], \ x_B^* \in [x_B, \bar{x}_B], \text{ and } x_A^* + x_B^* = \pi \}
\]

where

\[
\begin{align*}
x_i & = \frac{\lambda_i \pi + U_i}{1 + \lambda_i}, \tag{10} \\
\bar{x}_i & = \frac{\pi - U_j}{1 + \lambda_j}, \tag{11}
\end{align*}
\]

and \(i, j = A, B; i \neq j\).

**Proof:** See Appendix B.

The next result follows directly from Proposition 3.3.

**Corollary 3.4.** If \((1 - \Lambda)(1 - \Upsilon) = 0\), the Nash equilibrium set is a singleton given by

\[
X^* = \{ (x_A^*, x_B^*) : x_A^* = \bar{x}_A = \bar{x}_A \text{ and } x_B^* = \bar{x}_B = \bar{x}_B \}.
\]
Proof: See Appendix B.

Note that the existence of a Nash equilibrium in this bargaining game is not guaranteed. This is stated in the following proposition.

**Proposition 3.5.** If \((1 - \Lambda)(1 - \Upsilon) < 0\), there exists no strategy pair satisfying the Nash equilibrium conditions and thus \(X^*\) is empty.

Proof: See Appendix B.

## 4 Properties of the equilibrium

In this section we analyze the characteristics of the bargaining outcomes of the equilibrium established above, and also discuss the role played by penalties and conflict payoffs. More specifically, we examine (i) the conditions for an agreement or disagreement, and (ii) the conditions and characteristics of a unique agreement.

To facilitate the interpretation of our results we adopt two useful definitions. The first one defines a measure of the total welfare involved in a possible agreement:

**Definition 4.1.** \(U^*\), the total agreement payoff, is defined as

\[
U^* \equiv U_A(x_A^*, x_B^*) + U_B(x_A^*, x_B^*).
\]

The second definition is the measure of the total welfare involved in a disagreement:

**Definition 4.2.** \(U\), the total net conflict payoff, is defined as

\[
U \equiv U_A + U_B.
\]
Based on these two definitions we establish the following equivalence between two conditions for an agreement/disagreement:

**Corollary 4.3.** The condition $U^* \geq \underline{U}$ is equivalent to the condition $(1 - \Lambda)(1 - \Upsilon) \geq 0$.

**Proof:** See Appendix B.

Given this equivalence, we can then restate the results of propositions 3.3 and 3.5 as follows. Although the presence of externalities and penalties modifies the original Nash demand game, the condition for an agreement/disagreement in a negotiation conducted in a polarized environment can be written in terms of the classic condition comparing the total agreement payoff $U^*$ with the total net conflict payoff $\underline{U}$.

### 4.1 Agreement and breakdown outcomes

From propositions 3.3 and 3.5, it can be established that depending on the values taken by parameters $\Lambda$ and $\Upsilon$, the equilibrium of our distributive game under polarization generates four possible outcome regions, grouped into two classes: agreement and negotiation breakdown (see Figure 1).

#### 4.1.1 Agreement

The agreement outcomes are the unshaded regions in Figure 1, where $(1 - \Lambda)(1 - \Upsilon) \geq 0$ and therefore a deal can be reached. This is so because a compatible bargaining power relationship exists, which in the context of our model can occur in the two following cases:

**Region I.** The level of polarization is sufficiently high ($\Lambda \geq 1$) and the total gross conflict payoff $V_A + V_B$ is higher than the surplus up for division $\pi$
(\(\Upsilon \geq 1\)).

**Region III.** The level of polarization is moderate (\(\Lambda \leq 1\)) and the surplus up for division exceeds the total gross conflict payoff (\(\Upsilon \leq 1\)).

That region III scenarios are agreements is intuitive because in such scenarios, when the conflict payoffs are low enough a concession-making process can be successful as long as both negotiators incur sufficiently low penalties. By contrast, it is much less intuitive that region I scenarios are agreements because in this case, when polarization is sufficiently high a deal can be reached even if the total gross conflict payoff is greater than the pie to be distributed. Despite this apparent contradiction, both types of agreement share the same underlying economic rationale when we consider the agreement and conflict payoffs modified by polarization. In fact, according to Corollary 4.3, the condition \(U^* \geq U\) holds in both of these regions, which means that the total payoff of an agreement exceeds the net payoff of the conflict.

### 4.1.2 Negotiation breakdown

The negotiation breakdown outcomes are the shaded regions in Figure 1, where \((1 - \Lambda)(1 - \Upsilon) < 0\) and so negotiation is impossible. The interpretation of this result is that a breakdown will emerge in either of the two cases where bargaining powers become incompatible.

**Region II.** The level of polarization is sufficiently high (\(\Lambda > 1\)) and the surplus under negotiation exceeds the total gross payoffs of the conflict scenario (\(\Upsilon < 1\)).

**Region IV.** The level of polarization is moderate (\(\Lambda < 1\)) and the total gross conflict payoff is larger than the surplus under division (\(\Upsilon > 1\)).
The economic rationale behind the disagreement in cases in these two regions is found in Corollary 4.3. The condition that $U^* < \bar{U}$ clearly holds in both of them, implying that the total net payoff from an ongoing conflict exceeds the payoff from an agreement.

The case of region IV has already been studied in the literature, albeit without penalties.\(^9\) We therefore focus on the case described by region II, which is particularly interesting because it arises despite the fact that $\bar{\gamma} < 1$. In such a scenario, the level of polarization is too high because the political penalties the delegated negotiators incur when they make concessions to their counterpart are also too high. No compromise can then be reached and as a result, the negotiating process fails and a conflict scenario arises.

An alternative explanation for the negotiation breakdown can be derived from equation (10). It is easily shown that if $(1 - \Lambda)(1 - \bar{\gamma}) < 0$, then $x^*_A + x^*_B > \pi$. Thus, if either the level of conflict polarization is very high or the total gross conflict payoff exceeds the surplus under negotiation (but not both), the positions taken by the negotiators become so extreme that even the sum of their minimal positions is higher than the surplus at stake. As a result, an agreement is impossible to reach.

### 4.2 Numerical examples

Below we present some numerical examples that provide further insight into the specific characteristics of the outcomes generated by a negotiation under polarization. For this purpose we explore the players’ best-response functions. In our model these functions are readily obtained from the proof of

\(^9\) For instance, adapting Myerson (1991, [17])’s terminology, the region IV case might be called a non-essential bargaining problem.
Proposition 3.3. Negotiator $i$’s best response is given by

$$R_i(x_j) = \begin{cases} 
\pi - x_j & \text{if } x_j \leq x_j^- \\
\emptyset & \text{otherwise}
\end{cases}$$

for all $i \neq j$. Then all strategy pairs $(x_A^*, x_B^*)$ such that $x_A^* = R_A(x_B^*)$ and $x_B^* = R_B(x_A^*)$ belong to the set of Nash equilibria, and therefore represent all the possible agreements.

To illustrate this property, consider the following numerical example of an agreement belonging to region III in which we assume that (i) $\lambda_A = 4$ and $\lambda_B = \frac{1}{10}$, and thus, $\Lambda < 1$; and (ii) $V_A = V_B = 0$, hence, $\Upsilon < 1$. As shown in Figure 2, all the agreement solutions in this case lie on the segment along which the best-response functions of the two players coincide. More specifically, all of them are represented by the set $X^*$ containing all the strategy pairs $(x_A^*, x_B^*)$ such that $\frac{4}{5}\pi \leq x_A^* \leq \frac{10}{11}\pi$, $\frac{1}{11}\pi \leq x_B^* \leq \frac{4}{5}\pi$, and $x_A^* + x_B^* = \pi$. This is consistent with the results set out in Proposition 3.3.

Consider now a numerical example of a breakdown negotiation in region II. For this case, we assume that (i) $\lambda_A = 2$, $\lambda_B = 1$, and thus, $\Lambda > 1$; and (ii) $V_A = V_B = V > 0$ such that $2V < \pi$, hence $\Upsilon < 1$. As can be observed in Figure 3, since the best-response functions of both players have no coincident points, the Nash equilibrium set $X^*$ (and thus the set of all agreements) described in Proposition 3.3 is empty. Alternatively, it can also be seen in the figure that the sum of the two parties’ minimal positions exceeds the surplus at stake, i.e., $x_A + x_B = \frac{2\pi - V}{3} + \frac{1}{2}\pi > \pi$, which of course makes any agreement solution impossible.
4.3 Unique agreement and the role of penalties

We now examine further the agreement cases, that is, regions I and III. Note that from Corollary 3.4, an agreement will be unique as long as 

\[(1 - \Lambda)(1 - \Upsilon) = 0\]

(i.e., on the dotted cross in Figure 1). The agreement set \(X^*\) then collapses to a unique sharing rule given by

\[x_i^* = \frac{\lambda_i \pi + U_i}{1 + \lambda_i} = \frac{\pi - U_i}{1 + \lambda_j}\]

for all \(i, j = A, B, i \neq j\). This being so, in order to explore and isolate the role played by penalties, suppose in addition that \(\Lambda = 1\) (i.e. the horizontal dotted line in Figure 1) and that \(V_A = V_B = 0\).\(^{10}\) In this case, the unique agreement solution becomes

\[x_A^* = \frac{\lambda_A \pi}{1 + \lambda_A} = \frac{1}{1 + \lambda_B} \pi, \quad (12)\]

\[x_B^* = \frac{\lambda_B \pi}{1 + \lambda_B} = \frac{1}{1 + \lambda_A} \pi. \quad (13)\]

Notice that this equilibrium is inequitable when there is an asymmetric structure of penalties, i.e., \(\lambda_A \neq \lambda_B\). In this environment, the negotiator who obtains the largest fraction of the pie at stake is the one who suffers the largest penalty, that is, the one with the largest value of \(\lambda\).\(^{11}\) For example, if \(\lambda_A = 4\) and \(\lambda_B = \frac{1}{4}\), then by (12) and (13), the equilibrium shares are \((\frac{4}{5} \pi, \frac{1}{5} \pi)\). Thus, although a high \(\lambda\) would appear at first glance to put negotiator \(i\) in a weak bargaining position, our results demonstrate that in a polarized bargaining situation, such a weakness can in fact become a source of strength. The intuition behind this result is that a high \(\lambda\) has to be interpreted ‘as if’ negotiator \(i\)’s hands are tied relatively more tightly behind

\(^{10}\)The other case that could be explored is when \(\Upsilon = 1\), which is represented by the vertical dotted line in Figure 1.

\(^{11}\)This property holds because \(x_i^*\) is increasing (decreasing) in \(\lambda_i (\lambda_j)\).
his back. Thus, if a settlement is reached it will be his counterpart \((j)\) who will make the larger concessions.

The unique agreement can also be fully \textit{egalitarian} if we assume a specific \textit{symmetric} structure of penalties in which \(\lambda_A = \lambda_B = 1\). In this case, both negotiators have the same bargaining power and a fifty-fifty solution will thus be achieved, as can be confirmed from equations (12) and (13).

Finally, to illustrate in another way some of the properties discussed in this section, Figure 4 summarizes all the negotiation outcomes that can be derived from our model. In particular, it shows the role played by penalties in the compatibility of bargaining powers and therefore in the occurrence of different scenarios such as a negotiation breakdown, multiple agreements, a unique but asymmetric agreement, and a perfectly equitable agreement. Since only the role of penalties is emphasized, all the bargaining outcomes are illustrated assuming that \(V_A = V_B = 0\).

5 Implications for a general conflict solution

The formal results of the previous section using the four negotiation outcome regions are now applied to the general problem of conflict solution. Our approach is a normative analysis that prescribes which class of policies and strategies followed by the parties or recommended by a mediator could be successful in attaining an agreement solution.

The analysis considers both of the disagreement regions (II or IV) as the two possible starting points of a negotiation process that has yet to arrive at an agreement. In either case, the agreement region (either I or III) it is desired to have the conflict converge towards must first be chosen. The necessary changes in the \(\Lambda\) and \(\Upsilon\) parameters to achieve a successful strategy...
are then analyzed.

**Disagreement in region II.** If the starting point is a stalemate in this region, the conflict can converge to either of the two agreement region targets but the combination of policies to be applied will be different for each one.  

*Policy A: convergence from region II to region III.* To improve the chances of moving the conflict to agreement region III, the policy adopted should combine two elements: (i) military strategies that maintain a high-intensity war (to keep $\gamma$ below 1), and (ii) political strategies that reduce polarization (to reduce $\Lambda$ below 1). This policy is represented by a green downward-pointing arrow in Figure 5.

*Policy B: convergence from region II to region I.* To improve the chances of moving the conflict to agreement region I, the policy adopted should be a mix of: (i) military strategies that mitigate the destructive effects of the conflict, reducing it to a low-intensity war (to raise $\gamma$ above 1), and (ii) political strategies that maintain a high global polarization level (to keep $\Lambda$ above 1). This policy is represented in Figure 5 by a blue arrow from region II to region I.

**Disagreement in region IV.** If the starting point is a stalemate in this region, the conflict can again converge to either of the two agreement region targets, and here, too, the combination of policies to be applied will be different for each one.

*Policy C: convergence from region IV to region III.* To improve the chances of moving the conflict to agreement region III, the policy adopted should combine two elements: (i) military strategies that increase the intensity of the conflict so that it becomes a very destructive war (to lower $\gamma$ below 1), and (ii) political strategies that preserve a moderate level of polarization (to
keep Λ below 1). This policy is represented in Figure 5 by a green arrow pointing leftward from region IV to region III.

**Policy D: convergence from region IV to region I.** To improve the chances of moving the conflict to region I, the policy adopted should be a mix of:

(i) military strategies that maintain the conflict at a low intensity (to keep Υ above 1), and (ii) political strategies that strongly polarize the conflict (to raise Λ above 1). This policy is represented by an upward-pointing blue arrow in Figure 5.

The foregoing suggests that a successful policy must always combine military and political strategies in a *dissociated* manner such that ‘words’ and ‘facts’ are in some sense contradictory. Otherwise, with rhetoric and military actions working in the same direction, the conflict may simply evolve from one type of disagreement to another type. In colloquial terms, and making an analogy between a polarized conflict and a dogfight, we can group and describe the four policies discussed above as follows:

**Policies A and C:** Move the conflict towards a *fight in which the dogs bite more than they bark.*

**Policies B and D:** Move the conflict towards a *fight in which the dogs bark more than they bite.*

Note that from an ethical viewpoint, policies B and D may be superior as under this class of policies the costs of the conflict in terms of human casualties could turn out to be lower than those incurred under policies A and C. In general, this should be true since the latter two policies involve maintaining a high-intensity war whereas the former two entail more passive military strategies that lead the disagreement scenario to a relatively low-intensity armed conflict.
On the other hand, if policies B and D were, in fact, adopted by the negotiators, they might be difficult to sustain as they would likely strike the parties they represent as contradictory and hardly credible. For instance, policy B would imply maintaining a highly belligerent rhetoric in order to sustain a high level of polarization. It seems reasonable to suspect that menacing words by the negotiators in this type of communication strategy would quickly become empty threats if a dialogued peace process were simultaneously being conducted. Perhaps the only real chance of success for this policy would therefore be to publicly break off the peace process while in reality continuing it in the form of private discussions.

6 Implications for a solution to the Colombian conflict

The results of Section 4 and the four-region framework are now applied to the particular problem of solving the Colombian conflict. We thus perform a descriptive analysis that examines why different plans and strategies adopted in the past have failed in practice to reach an agreement solution and why the current peace process has so far been successful.

Unlike the previous section, we are now studying a real conflict and thus we must first determine, for each negotiation attempt to be analyzed, the actual starting region. We then identify which changes in the $\Lambda$ and $\Upsilon$ parameters have finally made the conflict to converge towards a given agreement/disagreement region.
6.1 The past negotiation initiatives

Our framework is applied to two of the Colombian government’s past policies discussed here earlier for resolving the conflict: (i) Demilitarized Zone, and (ii) Democratic Security. In each case, we examine the reasons behind its failure.

6.1.1 Demilitarized Zone

As we saw in Section 2, the Demilitarized Zone plan (DZ) was an offer made by the Pastrana administration to FARC in the late 1990’s. At that point the conflict had already become a high-intensity war with both sides displaying great destructive power. It had also reached a very high level of polarization, mainly because (i) FARC had intensified the use of very unpopular practices such as kidnappings, extortion and drug trafficking, and (ii) the paramilitary groups had entered the conflict and were employing similar tactics.

We thus conjecture that before implementation of DZ, the conflict was in region II, which is therefore our starting point. Our analysis is that the policy failed because it was unable to dissociate rhetoric from facts. Regarding the latter, the strategy implied a lowering of the intensity of the conflict, allowing both parties to increase their gross conflict payoffs. In terms of our model this would mean an increase in the value of parameter $\Upsilon$ above 1. As for words, DZ was accompanied by a softer rhetoric, first by the government and then by FARC. This may have moved the conflict from a high level of polarization to a more moderate level. In our model this would be a decrease in parameter $\Lambda$ to a value below 1.

The joint increase of $\Upsilon$ and decrease of $\Lambda$ may have moved the dispute from region II to region IV, thus merely swapping one type of disagreement.
for another. In terms of our dogfight analogy, the failure of DZ can be interpreted as a policy that moved the conflict from a fight in which the dogs bark and bite (region II) to a fight in which the dogs neither bark nor bite (region IV). This situation is represented in Figure 6 by a downward-pointing red arrow.

6.1.2 Democratic Security

The Colombian government adopted the Democratic Security policy (DS) under President Uribe early in the present century. We begin our analysis of this military strategy with a discussion of what we believe was its starting point.

As we explained in Section 2, in the late 1990’s the DZ plan allowed FARC to increase its military capacity, which it used to inflict severe infrastructure damage and heavy loss of civilian life. Thus, by the early 2000’s the conflict was again at a high intensity level. The plan’s failure also returned the conflict to a high level of polarization, especially since the civilian population felt that the guerrillas had betrayed the good faith underlying the DZ peace process by using it to bolster their military capabilities. Indeed, FARC not only intensified the violence of its actions but also extended them to drug trafficking and other practices. We can thus plausibly claim that this higher degree of violence provoked a significant increase in the level of negative externality experienced by the civil population due to the increase in political, economic and territorial benefits obtained by the guerrilla group. It is also likely that the population used the 2002 election to penalize the government then in power (its delegated negotiator) for the failure of DZ by transferring to the government this higher externality, reflected in terms of
our model by an increase in its $\lambda$ parameter. In that election, the centrist coalition that had initiated DZ did not even run and a new right-wing coalition proposing a military strategy to defeat the guerrillas was voted in with a strong majority.

This political shift is an additional element that may have affected the global polarization level of the conflict. It probably exacerbated the ideological differences between the two sides, confronting the ultra-left guerrilla group with a more conservative administration. The change can be expressed in our model as an increase in FARC’s $\lambda$ parameter, which is consistent with the group being subjected to a higher negative externality for each unit of the surplus at stake that ends up in the hands of the government. Such a situation is plausible because FARC’s members may believe it is less likely a right-wing government will redistribute the surplus—as land or other resources—among the rural poor but rather will divert it towards the wealthier sectors of the population. We therefore conjecture that the failure of the DZ plan brought the conflict back from region IV to region II, making the latter the starting point for the DS policy.

As for DS itself, we would argue that it failed because it was not able to properly dissociate rhetoric from facts. As regards the latter, it was shown in Section 2 that in the first stage of the government’s strategy, much damage was done to FARC’s military capacity, resulting in serious losses for the group both economically and politically. But in the second stage, the guerrillas were able to reorganize militarily and inflict heavy losses both in infrastructure and human life. On balance, we conclude that DS further increased the conflict’s military intensity, meaning that both parties either held down or lowered their respective gross conflict payoffs. In the context of our model, this implies that the $\Lambda$ parameter was kept below 1 or even...
reduced.

Regarding the rhetoric, DS was accompanied by a more aggressive discourse, especially that of the Uribe government, which insisted that the conflict would only end when the guerrillas were defeated militarily. We may reasonably suppose that this confrontational rhetoric exacerbated the ideological gap between the two parties, which as argued above had already widened due to the election of a right-wing coalition. In terms of our model, all of this implies that DS increased even further the degree of polarization of the conflict, thus keeping it at a level where parameter $\Lambda$ was greater than 1.

The joint decrease in $\Upsilon$ and increase in $\Lambda$ may mean that the conflict remained in region II, receding even further from a possible solution. In terms of our dogfight analogy, the failure of DS can be described as a policy that strengthened the conflict as a fight in which the dogs bark and bite. This situation is represented in Figure 6 by an upward-pointing red arrow in region II.

Finally, we note that this failure of the DS policy to successfully articulate a strong military strategy with a peace process was highlighted at the time by other analysts, who criticized the policy’s “military bias and narrow political content” (Leal, 2006, [16]).

6.2 The current peace process

We now turn to a descriptive analysis of the current Colombia peace process (PP). Our goal is to identify the conditions that have led to some real achievements of the PP policy, most notably the 2016 Havana Agreement.

We conjecture that the starting point of the conflict was in breakdown
region II and that the process moved the conflict to agreement region III. Our overall assessment is that the preliminary success of PP is explained mainly by the right combination of this policy with an active military strategy by both parties. This claim relies on the fact that such a mixed approach satisfies the necessary condition identified by our model for the definitive solution of a polarized conflict: the dissociation of rhetoric from facts.

Regarding the facts, the military strategy implied sustaining the high intensity level of the conflict and thus maintaining a low total gross conflict payoff. In our model, this means keeping parameter $\Upsilon$ low enough (less than 1). As for the rhetoric, the intrinsically conciliatory nature of a peace process forced the negotiators on both sides (the government and FARC) to adopt a softer tone, as more belligerent language would have damaged their credibility in the eyes of their respective constituents. This reduced the conflict polarization to a relatively moderate level, which in terms of our model implies a decrease in the $\Lambda$ parameter to a value below 1.

The right mix of words and facts, represented by the joint efforts to keep $\Upsilon$ low and reduce $\Lambda$, could therefore shift the conflict from the disagreement region II to the agreement region III. Once again in terms of our two-dogs analogy, the success of the current peace process together with military actions may be seen as a policy of moving the conflict from a fight in which the dogs bark and bite (region II) to a fight in which the dogs bite more than they bark (region III). This situation is represented in Figure 6 by a downward-pointing green arrow.

The above analysis may justify the apparently contradictory nature of the dual approach the Colombian government and FARC have pursued during the last few years of the conflict. As described in Section 2, the two parties have combined (i) an attempt to reach a negotiated solution to the
conflict (the PP) with (ii) a military strategy aimed either at conditioning the outcome of the peace process or maximizing their payoffs from an armed conflict.

6.2.1 Modifying the surplus to be distributed $\pi$

So far, we have analyzed changes in the $T$ ratio that are due only to changes in the gross conflict payoffs $V_i$ (i.e., the numerator) without considering changes in the size of the surplus to be distributed. We now consider modifications of the surplus $\pi$ in the Colombian conflict and its consequences for the chances of reaching a negotiated settlement.

In the context of the current PP, an increase in $\pi$ can be associated with the parties’ decision to broaden the array of elements put on the negotiation table. As we explained in Section 2, the Havana talks agenda embraced a diverse range of issues grouped into five major items: (i) agricultural development, (ii) political participation, (iii) solution of the drug problem, (iv) justice, truth and reparations, and (v) the end of the conflict. It is thus evident that the PP has incorporated additional dimensions into the bundle of rights to be considered in a potential agreement, all of which are highly valued by the two parties in dispute.

Our assessment is that this increase in $\pi$ — and thus a decrease in $T$ — was a factor that in general made the reaching of a peace agreement at Havana more difficult. This conclusion is based on the fact that, under the assumption the conflict began in disagreement region II, the widening of the spectrum of claims under negotiation was of no use in achieving a solution to the conflict unless the negotiators implemented a softer rhetoric, thus decreasing $\Lambda$. That this is so is apparent in Figure 5, where only a type-A
policy is consistent with both increasing $\pi$ and the reaching of an agreement.

Reducing $\Lambda$ was a difficult task, however, since regardless of the efforts of both negotiators, it was likely the level of polarization would rise. As Section 2 pointed out, this was the case in the Colombian conflict because all five major PP agenda items involved points that the civil population might interpret as excessive concessions by the government to FARC. Principal among these concessions were a sort of (partial) amnesty for the guerrilla leaders, their right to participate in politics and implicit sentence reductions for criminal acts such as kidnapping and drug trafficking.\(^{12}\)

The possibility of a definitive peace treaty that grants additional benefits to FARC could therefore increase the political costs for the government among sectors contrary to any dialogued solution and especially to any kind of implicit, partial or selective amnesty. In this environment, the ratification of the preliminary agreement in a referendum would be even less likely since a simultaneous increase in $\Lambda$ and decrease in $\Upsilon$ might only worsen the negotiation breakdown. This situation is represented in Figure 6 by the upward-sloping red arrow beginning in region II, and would thus have the same effects as the DS policy.

Finally, a note on how our model can help explain the perception that under the current PP, FARC seems to be achieving significant benefits at the expense of the civil population. As we showed in Subsection 4.3, the model predicts that the penalty $\lambda$’s are a source of bargaining power, so in the case of an agreement, the negotiator who gets a higher share of the surplus to be distributed should be the one who is more severely penalized.

\(^{12}\)This despite the fact that during the process the government insisted there were red lines it would not cross, including the defence of the army, private property and a market economy (The Economist, 2014, [25]).
This implies that FARC’s relatively higher degree of intransigence, radicalism and polarization during the current peace process (see Section 2) may be an important source of the political, economic and criminal sentencing concessions made by the government to the guerrilla group.

7 Comparison with related literature

In this section we develop two comparative analyses of our model. The first one compares the model to the literature linking polarization and political conflicts while the second one contrasts it with the game theory-based literature devoted specifically to the Colombian case.

7.1 Extant literature on polarization and conflicts

The present article is intended as a contribution to the political economy literature on the theoretical characterization of the relationship between polarization and conflict intensity.\(^{13}\) The model that most closely resembles ours is Esteban and Ray (1999, [8]), who propose a behavioral formulation that relates the level and pattern of social conflict to the social distribution of individual characteristics (wealth, ethnicity, religion, political ideology). They apply their model to groups that differ in these characteristics and behave as rent-seekers in a contest to achieve their preferred social outcomes. These differences are modelled in terms of individual preferences, which depend on the outcomes for members of other groups and thus reflect

\(^{13}\)This literature is increasingly extensive. Here, we confine ourselves to a comparative analysis of works closely related to ours. Other contributions include the proposal of an alternative index of polarization (Reynal-Querol, 2002, [22]) and the study of evidence on the relationship between polarization and the incidence of civil wars (Montalvo and Reynal-Querol, 2005, [18]).
a concept of *alienation* or inter-group distance of preferences with respect to a given social outcome. This concept explains the formation of various interest groups within which preferences are similar but between which they differ, and also predicts the size of each group. The interplay between this inter-group heterogeneity (alienation) and intra-group homogeneity (identity) determines the degree of polarization of the social distribution of characteristics as the *sum of inter-personal antagonisms*. The authors show that this polarization metric affects the intensity of the conflict (measured as the total amount of resources dissipated in the contest), although in general the relationship between conflict and distribution is non-linear and complex. They also show that bimodality in the social distribution of characteristics generates the highest level of conflict intensity, which is closely related to the concept of polarization they proposed in an earlier work (Esteban and Ray, 1994, [7]) and thereby also to our results on the level of polarization and the occurrence of a negotiation breakdown.

Another obvious connection between Esteban and Ray (1999, [8]) and the present paper is their concept of *antagonism* between players, which resembles our notion of *envy* and the role played by these preference-based concepts in explaining conflict intensity or conflict occurrence. Despite these similarities, they differ in two crucial aspects, namely, which scenario is modelled strategically and what mechanism is used to model it. Whereas we model the *peace* scenario as a distributive bargaining problem, Esteban and Ray model the *conflict* scenario as a rent-seeking contest. As a consequence, Esteban and Ray’s setting only has the concept of conflict intensity; the notion of negotiation breakdown is absent.

However, the differences between their rent-seeking model and our framework are significantly narrowed in a later work by the same authors (Esteban
Bargaining under Polarization

and Ray, 2008, [9]). This new formulation distinguishes between the occurrence of a conflict and its intensity. Although still quite different from our model, its results are surprisingly similar, in particular as regards the incidence of a conflict. The 2008 version has an alternative peaceful scenario that represents the status quo, and the political system allocates social outcomes over different interest groups. In this context, conflict is conceptualized as a costly challenge to that status quo that takes the form of a rent-seeking contest, as in their 1999 paper. Assuming a fixed-share political system, the comparison between conflict and peace payoffs leads to a conclusion resembling our four-region characterization of agreement and negotiation breakdown outcomes in that the likelihood of a conflict depends not only on the degree of society’s polarization but also on how costly the conflict is. This would explain the non-monotonic relationships observed in practice between polarization and conflict incidence and therefore also elucidate the cases where conflict incidence decreases (increases) even though polarization increases (decreases). Nevertheless, since the 2008 model assumes a specific value (equal to 1) for all individuals’ level of alienation to simplify the computations, their results do not depend on the level of antagonism but do on the size of each interest group. In contrast, our framework is equivalent to a situation in which both interest groups in the dispute have the same size and level of identity, but the degree of antagonism between them (in our case, the level of penalties) is crucial in characterizing the relationship between polarization and conflict incidence.

Our analysis is also related to Yared (2010, [28]), who applies the theory of repeated games with coarse information and develops a dynamic theory of war and peace. In his model, two countries (or two groups within a country), one aggressive and the other non-aggressive, each have a limited commit-
ment, in the former case to peace in the future and in the latter case to wealth concessions. Also, the non-aggressive country has an informational advantage regarding its capacity to implement concessions. Both of these frictions make reaching a peaceful agreement more difficult and increase the likelihood of a war. This framework delivers results that explain phenomena such as conflict escalation, temporary wars, and total war (i.e., permanent war with no negotiation whatsoever). Despite evident methodological differences, two characteristics of Yared’s framework closely resemble assumptions in our model. First, both approaches suppose that concession-making can be costly for negotiators and that this cost can be derived from domestic opposition to the country’s respective governments. Second, in both of them a central element is that the parties to the dispute weigh up the payoffs of a pacific (or negotiated) solution versus those of going to war. Thus, in our paper as well as in Yared’s, at the end of the day the occurrence of one or other scenario depends crucially not only on the cost of war but also on the cost of making concessions.

7.2 Previous game theory literature on the Colombian conflict

The game-theoretic literature on the Colombian conflict has focused on the economic incentives of the parties to the dispute. This contrasts with the political science literature on the subject, which has emphasized the need to differentiate the conflict’s particular characteristics (Ortiz, 2002, [21]). In examining the conditions under which the conflict payoffs are higher or lower than the benefits of an agreement, game theorists have considered the political and ideological elements to be exogenous. This economics-
oriented approach does not, however, account for the effects of polarization on the possibility of a truce or permanent peace accord versus a negotiation breakdown.

Salazar and Castillo (2001, [23]) describe the conflict as a territorial struggle between the Colombian government, FARC and the paramilitary groups. Modelling it as a dynamic game with imperfect information, they attempt to determine what conditions can maintain a low-intensity conflict in which high-income agents agree to pay both the illegal taxes imposed by the guerrillas and those imposed by the government. They also look at what factors condition a high-intensity conflict where the same agents prefer to finance a private investment (a paramilitary one) instead of continuing to pay the guerrilla tax. Among these conditions, certain ideological or political characteristics are mentioned but not formally incorporated into their model. The latter is also true of Gorbaneff and Jacome (2000, [13]), who develop a multistage game to analyze the bargaining strategies of the government and FARC and the costs of a peace agreement, but assume that the conflict is simply a “kleptocratic rivalry” between the government and the guerrillas in which insurgency is an illegal but rational economic activity.

Zuleta et al. (2013, [29]) apply the notion of pre-donations suggested by Sertel (1992, [24]) to the Colombian conflict, establishing conditions under which a transfer from the government to the guerrilla group can be a successful mechanism to avoid the war. The authors find that when the conflict costs to the government and the guerrillas are sufficiently high, there may exist a pre-donation scheme acceptable to both parties that allows them to obtain a cease-fire. In a sense, this result is similar to the classic condition that a disagreement is less likely when outside options (conflict payoffs) are smaller than the benefits of an agreement, and thus suggests that escala-
tion of the war could be an optimal strategy for increasing the chances of a pre-donation scheme being acceptable to both parties. Finally, the article mentions non-economic demands such as political power and judicial benefits the guerrillas may attempt to obtain through pre-donations. Although in the context of our model these demands may affect the polarization of the conflict and its resolution, in Zuleta et al. they are not formally incorporated.

Castillo and Salazar (2009, [4]) employ a social network approach to characterize the conditions under which an illegal organization can be weakened and eventually disbanded through desertions motivated by economic incentives. Their analysis concludes that when the organization’s members have finite minimum desertion values, the success of such an economic policy depends on the network structure. However, the existence of a hard core of members with infinite minimum desertion values is a barrier to this process, and thus guarantees the survival of these organizations in the face of aggressive economic incentives and constant military pressure. This last result is particularly relevant to the present study as the hard core includes the members with the highest level of cohesion—in our terminology, the most polarized members—who are less responsive to economic motivations and are less willing to negotiate.

Lastly, in an empirical work, Ugarriza and Craig (2012, [26]) explore the relevance of three indicators of ideology—discourse, attitudes, and emotional responses—based on interviews with jailed combatants in the Colombian conflict. This research finds that ideology continues to play a role in the internal dynamic and cohesion of different guerrillas and armed groups, acting as a motivation to fight in addition to the individual economic motives most previous literature on the Colombian conflict has focussed on.
The results of this study thus challenge the greed-grievance duality adopted after the cold war to explain armed conflicts, which has emphasized the tension between personal economic benefits (greed) and socioeconomic and political motivations (grievance). Ideological factors should therefore be taken into account when analyzing armed conflicts as they offer a third dimension, namely, greed. Interestingly, since the authors quantify ideology using indicators that in some sense capture the degree of antagonism among different groups towards particular ideas and beliefs, this approach can be related to our notions of polarization, radicalism and their associated belligerent rhetoric.

The various models just discussed above do not, however, account formally for the polarized environment of the Colombian conflict, nor do they consider the crucial role played by this polarization in the failure of past peace-making efforts. In the context of our model, this means that these analyses characterize the possibility of a resolution of the conflict under the implicit assumption that the level of conflict polarization is sufficiently low. They therefore focus solely on the conditions under which the global agreement payoff exceeds the conflict payoffs without considering policies that could modify the level of conflict polarization. Our model can then be seen as a generalization of these previous works in the sense that it incorporates an additional dimension into the analysis, one that in fact reverses the relevant comparison between agreement and conflict payoffs when the level of polarization is sufficiently high.
8 Concluding remarks

This article proposed a model of delegated distributive negotiation to resolve a conflict in a polarized environment. A polarization measure was constructed from the penalties imposed by the parties to the dispute on their respective delegated negotiators when either of the latter makes concessions to their counterpart. We showed that the incorporation of polarization adds an important dimension to the characterization of bargaining processes and their solution, resulting in a more complex analysis than one based solely on the conventional cost-benefit trade-off between maintaining or ending a conflict.

This richer analysis predicts that in a polarized dispute, four regions — two regions of agreement and two of disagreement (i.e., negotiation breakdown)— can emerge, depending non-monotonically on the level of polarization and the total gross conflict payoff relative to the surplus up for negotiation. The non-monotonicity property implies that a prerequisite for achieving a negotiated solution is the implementation, ideally by both parties, of negotiation policies mixing in contradictory fashion rhetoric-based strategies — oriented towards modifying polarization levels— and military strategies — oriented towards modifying payoffs from an ongoing conflict. Thus, in an analogy with a dogfight, an agreement may be reached if the parties adopt policies that turn the conflict into a struggle in which either (i) the dogs bite rather than bark, or (ii) the dogs bark rather than bite. Policies that do not so dissociate rhetoric with military strategy are doomed to fail and will keep the conflict going without a definitive peaceful resolution.

The four-region framework was applied to the case of the long-running internal conflict between the government of Colombia and the FARC guer-
rilla group. It was concluded that past attempts to find a solution to the conflict such as the Demilitarized Zone plan and the Democratic Security policy all failed because they were unable to separate rhetoric from military actions. By contrast, the same analysis suggests that the current peace process has so far been successful because the agreement reached in Havana was the result of conversations that were properly counterbalanced by active military strategies. It also indicates that the significant political, economic and criminal sentencing benefits FARC has so far seemed to achieve in the Havana talks are the result of a bargaining strength based on the group’s relatively higher level of polarization. It is likely that the more antagonistic stance of the FARC members, as opposed to the relatively moderate attitude of Colombian society, had exerting greater pressure on the guerrilla group’s leaders, pushing them to be particularly tough negotiators and so achieve significant concessions from the Colombian government.

The proposed model can serve as a baseline formulation to which the specific characteristics of other polarized conflicts can be added in order to gain a greater understanding of the bargaining processes involved. One such additional element might be a mediator incorporated into the process as an active player, whose objective function optimizes a trade-off between equity and efficiency or simply values the reaching of an agreement (see Camiña and Porteiro, 2009, [3]). The model could also be extended to obtain a dynamic version that characterizes more formally the different paths followed in practice by polarized conflicts in order to explain, for example, why some real-world disputes have converged to negotiated solutions while others continue unresolved. It would also be of interest to model conflict payoffs (i.e., outside options) as endogenous variables rather than exogenous ones as in the setting analyzed here. In the context of a polarized environment, this
extension could be constructed by assuming that these non-agreement payoffs depend on threats chosen strategically by the parties to the dispute in a previous stage. Since the results of the present study depend heavily on the total conflict payoffs, such a development would enable an explicit consideration of the role played by comparative military advantages of the parties in the success or failure of the negotiations to reach an agreement.

References


9 Appendix

9.1 Appendix A: Externalities and penalties

In what follows we give a formal treatment of the notions of externalities, delegated negotiation, and penalties introduced in the main text. We begin by assuming that there are two risk-neutral parties, 1 and 2, engaged in a polarized conflict who delegate the bargaining process to two risk-neutral negotiators, A and B, respectively. Each party pays her negotiator a fee consisting of a share of the surplus obtained by him if an agreement is struck. This share is represented by $\alpha$ and $\beta$ for negotiator A and B, respectively, with $\alpha, \beta \in (0, 1)$. We also assume that party $i$ suffers a negative externality if her counterpart gets a positive share of the surplus. The (marginal) externality is represented by parameter $\delta_i > 0$, with $i = 1, 2$. Thus, the two parties’ payoffs are described by the following functions:

$$v_1(x_A, x_B) = (1 - \alpha)x_A - \delta_1x_B$$
$$v_2(x_A, x_B) = (1 - \beta)x_B - \delta_2x_A.$$ 

A further assumption is that each party transfers—at least partially—her externality (or “envy”) to her respective negotiator through a penalty represented by the parameter $\gamma_j \geq 0$, with $j = A, B$. Thus, the negotiators’ payoffs are described by

$$u_A(x_A, x_B) = \alpha x_A - \gamma_A x_B$$
$$u_B(x_A, x_B) = \beta x_B - \gamma_B x_A.$$ 

After normalizing by $\alpha$ and $\beta$, these functions become

$$U_A(x_A, x_B) = x_A - \lambda_A x_B$$
$$U_B(x_A, x_B) = x_B - \lambda_B x_A,$$ 

where $\lambda_A = \alpha / (1 - \alpha)$ and $\lambda_B = \beta / (1 - \beta)$. 


where \( U_A = \frac{u_A}{\alpha} \), \( U_B = \frac{u_B}{\beta} \), \( \lambda_A = \frac{\gamma_A}{\alpha} \geq 0 \), \( \lambda_B = \frac{\gamma_B}{\beta} \geq 0 \), such that \( U_A \) and \( U_B \) are utility functions similar to those described by equation (1).

### 9.2 Appendix B: Proofs

**Proof of Proposition 3.3.** Before demonstrating the main result, we must derive two following auxiliary results. The first one is derived below.

**Lemma 9.1.** The following expressions are equivalent:

\[
(1 - \lambda)(1 - \gamma) \geq 0, \\
\frac{x_A}{\bar{x}_A}, \\
\frac{x_B}{\bar{x}_B}.
\]

**Proof.** Recalling the definitions of \( x_A \) and \( \bar{x}_A \) in (10) and (11), respectively, inequality (15) can be rewritten after some simple algebraic manipulations as

\[
(1 - \lambda_A \lambda_B)\pi \geq (1 + \lambda_B)\bar{U}_A + (1 + \lambda_A)\bar{U}_B.
\]

Substituting (2) into \( \bar{U}_A \) and \( \bar{U}_B \) and then proper factoring yields

\[
(1 - \lambda_A \lambda_B)\pi \geq (1 - \lambda_A \lambda_B)(V_A + V_B).
\]

Since it is possible that \( \lambda_A \lambda_B \) is equal to 1, we cannot eliminate it by dividing both sides by \( 1 - \lambda_A \lambda_B \). We therefore rewrite the above expression as

\[
(1 - \lambda_A \lambda_B)(\pi - (V_A + V_B)) \geq 0,
\]

which, after dividing by the strictly positive \( \pi \) and applying definitions 3.1 and 3.2, becomes

\[
(1 - \lambda)(1 - \gamma) \geq 0,
\]

thus completing the proof of the equivalence between (14) and (15).
The demonstration of the equivalence between (14) and (16) is similar and is therefore not shown here. Given these two equivalences, (15) and (16) must also be equivalent by transitivity.

We now derive the second auxiliary result.

**Lemma 9.2.** The following expressions are equivalent:

\[
\begin{align*}
U_i &\geq -\lambda_i \pi \\
x_i &\geq 0 \\
\overline{x}_j &\leq \pi.
\end{align*}
\]

for all \(i, j = A, B; i \neq j\).

**Proof.** The above equivalences follow directly upon substituting the definitions of \(x_i\), \(\overline{x}_j\) and \(U_i\) and performing some simple algebraic manipulations.

We can now show the main result of this proposition. Notice first of all that in program (4)-(8), if constraints (5) and (8) are jointly satisfied, then so is constraint (6), meaning it is redundant and can be eliminated.

Therefore, if \((x_A, x_B)\) is a Nash equilibrium strategy profile, then \(x_A\) is an optimum of \(A\)’s optimization problem and must satisfy the KKT conditions. Moreover, since the problem is concave, \(x_A\) is a global optimum. Thus, if \(\mu_{1A}, \mu_{2A}, \mu_{3A} \in \mathbb{R}\) denote the Lagrange multipliers of the problem, the Lagrangian \(L(\cdot)\) is given by

\[
L(x_A, x_B, \mu_{1A}, \mu_{2A}, \mu_{3A}) = U_A(x_A, x_B) + \mu_{1A}x_A - \mu_{2A}(x_A + x_B - \pi) + \mu_{3A}(U_A(x_A, x_B) - \underline{U}_A),
\]
such that the following properties must be satisfied:

**P1** stationarity:

\[ \frac{d\mathcal{L}(\cdot)}{dx_A} = 1 + \mu_{1A} - \mu_{2A} + \mu_{3A} = 0; \]

**P2** primal feasibility:

**P2a** \( x_A \geq 0, \)

**P2b** \( x_A + x_B \leq \pi, \)

**P2c** \( U_A(x_A, x_B) \geq \underline{U}_A; \)

**P3** dual feasibility:

\[ \mu_{1A}, \mu_{2A}, \mu_{3A} \geq 0; \]

**P4** complementary slackness:

**P4a** \( \mu_{1A}x_A = 0, \)

**P4b** \( \mu_{2A}(x_A + x_B - \pi) = 0, \)

**P4c** \( \mu_{3A}(U_A(x_A, x_B) - \underline{U}_A) = 0. \)

Analogously, \( x_B \) is an optimum for \( B \)'s optimization problem and must also satisfy the KKT conditions. There then exist multipliers that satisfy the above properties P1-P4 in which the corresponding substitutions have previously been made (subscript \( B \) for \( A \), \( x_B \) for \( x_A \) and \( x_A \) for \( x_B \)).

We now compute the strategy pair \( (x_A, x_B) \) that satisfies the Nash equilibrium. First, assume for \( A \) that \( \mu_{2A} = 0 \). Then \( \mu_{1A} + \mu_{3A} = -1 \) by P1, which contradicts P3. Thus, \( \mu_{2A} \) must be positive, hence, \( x_A + x_B = \pi \) by P4b. Second, by using the last equation to substitute either \( x_A \) or \( x_B \) into property P2c and replacing \( U_A(x_A, x_B) \) according to (1), we prove both
\( x_A \geq \underline{x}_A \) and \( x_B \leq \overline{x}_B \). Likewise for \( B \), \( \mu_{2B} \) implies that \( x_A + x_B = \pi \), which together with condition P2c for negotiator \( B \), ensures that \( x_B \geq x_B \) and \( x_A \leq \overline{x}_A \). Thus, \( x_A \in [\underline{x}_A, \overline{x}_A] \) and \( x_B \in [\underline{x}_B, \overline{x}_B] \). Given these results, the Nash equilibrium set \( X^* \) is not empty if only if these two intervals are neither empty, i.e., as long as \( \underline{x}_A \leq \overline{x}_A \) and \( \underline{x}_B \leq \overline{x}_B \). Note that the last two conditions are verified by Lemma 9.1, since by assumption in the present proposition, condition (14) holds. Third, Lemma 9.2 guarantees that \( \underline{x}_A \) and \( \underline{x}_B \) are nonnegative given that condition (17) is an assumption of the model. Lastly, the same lemma ensures that \( \overline{x}_A \) and \( \overline{x}_B \) are equal to or less than \( \pi \).

**Proof of Corollary 3.4.** It follows immediately from Lemma 9.1 that the following expressions are equivalent:

\[
(1 - \Lambda)(1 - \Upsilon) = 0, \\
\underline{x}_A = \overline{x}_A, \\
\underline{x}_B = \overline{x}_B.
\]

Applying these equivalences to Proposition 3.3, it follows that the interval \([\underline{x}_i, \overline{x}_i]\) shrinks so that finally \( x_i^* = \underline{x}_i = \overline{x}_i \) for \( i = A, B \). □

**Proof of Proposition 3.5.** First, note that Lemma 9.1 establishes, among other things, the following statement:

\( \underline{x}_i \leq \overline{x}_i \Rightarrow (1 - \Lambda)(1 - \Upsilon) \geq 0, \)

for \( i = A, B \). By the rules of propositional logic, it is therefore also true that

\( (1 - \Lambda)(1 - \Upsilon) < 0 \Rightarrow \underline{x}_i > \overline{x}_i, \)

for \( i = A, B \). The second part of this last statement implies that the intervals characterizing Nash equilibrium strategies \( x_i^* \) in Proposition 3.3 are
empty, hence, the set \( X^* \) is also empty. \( \square \)

**Proof of Corollary 4.3.** Since \( x_B^* = \pi - x_A^* \), the function \( U^* \) becomes

\[
\pi(1 - \lambda_A) + (\lambda_A - \lambda_B)x_A^*.
\]

There are two possible cases: (i) \( \lambda_A \geq \lambda_B \), and (ii) \( \lambda_A \leq \lambda_B \).

If \( \lambda_A \geq \lambda_B \), then \( U^* \geq \bar{U} \) as long as

\[
\pi(1 - \lambda_A) + (\lambda_A - \lambda_B)x_A \geq \bar{U}.
\]

Upon substituting \( x_A \) and \( U \), and performing some algebraic manipulations, this inequality becomes

\[
\frac{\pi(1 - \lambda_A \lambda_B) + (\lambda_A - \lambda_B)(V_A - \lambda_A V_B)}{1 + \lambda_A} \geq V_A(1 - \lambda_B) + V_B(1 - \lambda_A).
\]

Adding \( \lambda_A \lambda_B(V_A + V_B) \) to both sides and rearranging, we have

\[
(1 - \lambda_A \lambda_B)(\pi - V_A - V_B) \geq 0.
\]

Finally, multiplying both sides by \( 1/\pi \) and applying the definitions of \( \Lambda \) and \( \Upsilon \), we obtain

\[
(1 - \Lambda)(1 - \Upsilon) \geq 0.
\]

If, on the other hand, \( \lambda_A \leq \lambda_B \), it is clear from (20) that condition \( U^* \geq \bar{U} \) will hold as long as

\[
\pi(1 - \lambda_A) + (\lambda_A - \lambda_B)x_A \geq \bar{U}.
\]

From this expression it can be shown that after substituting \( x_A \) and \( U \) and performing algebraic manipulations similar to those carried out in the previous case, we get the same equivalence. \( \square \)
Figure 1. Four-region framework. The two agreement regions are in white while the disagreement (negotiation breakdown) regions are shaded. The dotted lines represent unique agreement equilibria.
Figure 2. Compatible bargaining powers. An agreement is reached when $(1 - \Lambda)(1 - \Upsilon) \geq 0$. The best responses $R_i(x_j)$ for both players and the agreement set $X^*$ are shown for the case where $\lambda_A = 4, \lambda_B = \frac{1}{10},$ and $V_A = V_B = 0$. 
Figure 3. Incompatible bargaining powers. A negotiation breakdown occurs when 
\((1 - \Lambda)(1 - \Upsilon) < 0\). The best responses \(R_i(x_j)\) for both players are shown for the case
where \(\Lambda_A = 2\), \(\Lambda_B = 1\) and \(V_A = V_B = V' \in (0, \frac{3}{2})\).
Figure 4. Equilibrium and compatibility of bargaining powers based on penalties assuming that $V_A = V_B = 0$. The shaded region represents a compatible bargaining power relationship ($\Lambda \leq 1$). On the curve ($\Lambda = 1$), a unique agreement is attained. A particular perfectly equitable solution exists under symmetry ($\lambda_A = \lambda_B = 1$). A negotiation breakdown occurs if bargaining powers are incompatible due to the penalties imposed on the two negotiators ($\Lambda > 1$).
Figure 5. Successful policies to move the conflict from a stalemate to an agreement region. Green arrows represent policies mixing a moderate rhetoric with active military actions. Blue arrows represent policies combining a belligerent rhetoric with a permissive military strategy.
Figure 6. Past and current attempts to reach an agreement in the Colombian conflict. The red arrows represent two failed policies: Demilitarized Zone (downward-sloping arrow) and Democratic Security (upward-sloping arrow). The green arrow represents the current Peace Process with an active military strategy.