The Logic of Ceasefires in Civil War

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Ceasefires play a role in almost all civil war peace processes. Yet existing studies undertheorize the ways in which different logics drive the design of ceasefire agreements, and the effect this has on violence suspension. Building on bargaining theory and existing ceasefire literature, we identify different bargaining problems conflict parties face over the course of a conflict, and three classes of ceasefire design they use to address these problems. We argue that the effect of ceasefires is driven both by these underlying logics and by the provisions they contain. Building on the PA-X data to capture the provisions included within all written civil war ceasefires between 1990 and 2019, and using Uppsala Conflict Data Program georeferenced event data, we estimate models of ceasefire survival, with conflict deaths as the main measure of whether a ceasefire remains in place. We find that definitive ceasefires (i.e., agreements with demobilization and incompatibility provisions), followed by preliminary ceasefires (i.e., agreements with compliance mechanisms), are associated with longer periods of violence suspension than cessation of hostilities agreements that lack such provisions. We discuss the implications of our results for conflict parties and third parties seeking to facilitate the transition from war to peace.

Los ceses al fuego desempeñan un papel en casi todos los procesos de paz de las guerras civiles. Sin embargo, los estudios no teorizan lo necesario acerca de las formas en que las diferentes lógicas impulsan el diseño de los acuerdos de cese al fuego, y el efecto que esto tiene en la suspensión de la violencia. Basándonos en la teoría de la negociación y en la bibliografía existente sobre los ceses al fuego, identificamos los diferentes problemas de negociación a los que se enfrentan las partes en conflicto en el transcurso del tal conflicto, y tres clases de diseño de cese al fuego que se utilizan para abordar estos problemas. Sostenemos que el efecto de los ceses al fuego están impulsados tanto por estas lógicas subyacentes como por las disposiciones que contienen. Con base en los datos de PA-X para capturar las disposiciones incluidas dentro de todos los ceses al fuego escritos entre 1990 y 2019, y utilizando los datos de eventos georreferenciados del Programa de datos sobre conflictos de Uppsala (Uppsala Conflict Data Program), estimamos modelos de supervivencia de los ceses al fuego, con las muertes en el conflicto como principal medida para saber si un cese al fuego sigue vigente. Encontramos que los ceses al fuego definitivos (es decir, los acuerdos con disposiciones de desmovilización e incompatibilidad), seguidos de los ceses al fuego preliminares (es decir, los acuerdos con mecanismos de cumplimiento), se asocian con períodos más largos de suspensión de la violencia en relación con los acuerdos de cese de las hostilidades que carecen de tales disposiciones. Debatimos las implicaciones de nuestros resultados para las partes del conflicto y los terceros que buscan facilitar la transición de la guerra a la paz.

Les cessez-le-feu jouent un rôle dans pratiquement tous les processus de paix intervenant dans les guerres civiles. Pourtant, les études existantes sous-théorisent les manières dont différentes logiques orientent la conception des accords de cessez-le-feu et l'effet que cela a sur la suspension de la violence. Nous nous sommes appuyés sur la théorie de la négociation et sur la littérature existante sur les cessez-le-feu, et nous avons identifié différents problèmes de négociation auxquels les parties en conflit étaient confrontées au cours d'un conflit, ainsi que trois catégories de conception de cessez-le-feu auxquelles ces parties ont recours pour gérer ces problèmes. Nous soutenons que l'effet des cessez-le-feu est à la fois déterminé par ces logiques sous-jacentes et par les dispositions qu'ils contiennent. Nous avons exploité la base de données PA-X (base de données sur les accords de paix) pour capturer les dispositions incluses dans l'ensemble des cessez-le-feu de guerre civile rédigés entre 1990 et 2019, et en utilisant des données d'événements géoréférencées de l'UCDP (Upsala Conflict Data Program), nous sommes parvenus à estimer des modèles de survie de cessez-le-feu, les décès liés au conflit étant la principale mesure du maintien en place du cessez-le-feu. Nous avons constaté que les cessez-le-feu définitifs (c-à-d, les accords comprenant des dispositions de démobilisation et d'incompatibilité), suivis des cessez-le-feu préliminaires (c-à-d, les accords comprenant des mécanismes de conformité), étaient associés à de plus longues périodes de suspension de la violence que les accords de cessation des hostilités qui manquent de telles dispositions. Nous abordons les implications de nos résultats pour les parties en conflit et les tierces parties cherchant à faciliter la transition de la guerre à la paix.

In September 2002, peace talks between the Government of Sudan and the Sudan People's Liberation Movement/Army almost came to a halt when Khartoum withdrew in the wake of an attack on the Southern town of Torit. Political negotiations only resumed after parties signed a Memorandum of Understanding (MoU) that put a ceasefire in place (Simmons and Dixon 2006, 24). Yet despite an extension of the ceasefire, a renewed outbreak of fighting threatened to derail the talks in early 2003. The talks came "back from the brink" (ICG 2003, 1) after the parties signed an addendum to the Memorandum, adding measures such as a verification and monitoring team to the previously ineffective ceasefire. The strengthened ceasefire was extended repeatedly and remained in place until the parties reached a comprehensive peace agreement in 2005.

The case of the Sudan North–South peace process illustrates the vital role ceasefires can play in peace talks. It also points to the importance of ceasefire design: a ceasefire with a verification and monitoring mechanism appears to have been more effective than a less comprehensive ceasefire in containing deadly violence.

This article shows that not all ceasefires are the same, and that more attention should be paid to the design of ceasefires and the strategic situation in which they are reached, as these factors together shape the expected outcome of ceasefires and their impact on the trajectory of conflict. Prior work on ceasefire design focusing on inter-state conflict (e.g., Fortna 2003, 2004; Werner and Yuen 2005), or on a comparison of ceasefires in an internal conflict (e.g., Karakus and Svensson 2017; Lundgren, Karakus, and Svensson 2019) tend to highlight either the effects of provisions, or the strategic situations in which they arise, but undertheorize the link between the two. They also tend not to conceptually distinguish between ceasefires that occur independently from, or as part of, a peace agreement (e.g., Fortna 2003, 2004; Werner and Yuen 2005; Lo, Hashimoto, and Reiter 2008). While the differences between these agreements tend to be less significant during interstate conflict, with regard to civil conflict, they are clearly driven by different logics, and are likely to have quite different implications on the bargaining situation.

Practical guidance tailored specifically for the policy community (e.g., Chounet-Cambas 2011; Brickhill 2018; Clayton et al. 2019) and the emerging body of literature focusing on ceasefires in intrastate peace processes (e.g., Mahieu 2007; Höglund 2011; Akebo 2013, 2016) provide important insights into why conflict parties engage in a ceasefire and the effects of these arrangements, but tend to undertheorize the process that leads to the adoption of different *provisions* within a ceasefire, or focus on aspects not directly linked to strategic decision-making processes.

This article attempts to address these inadequacies by offering a new conceptual and theoretical framework and by leveraging new data to assess the influence of different classes of ceasefire design during civil conflict. Building on existing ceasefire research and bargaining theory, we develop a three-part argument.

First, we show how the salience of different bargaining problems creates quite different logics for entering into a ceasefire. In information poor environments, conflict parties may use the announcement of a ceasefire to communicate their peaceful intentions or test the intentions of an opponent. This includes honest attempts to move toward a peaceful solution and dishonest efforts whereby parties use ceasefires in an attempt to gain some military advantage. When credible commitment supersedes imperfect information as the salient bargaining problem, parties may use ceasefires to build trust and create a more conducive environment for negotiations. Finally, once conflict parties have reached a peace agreement, and the commitment problem shifts to the process of implementation, a ceasefire sets out the terms under which the parties dismantle the status of war and demobilize or reconfigure the conflict parties.

Second, we argue that the different ceasefire logics shape ceasefire design, as conflict parties need to weigh the benefits of additional provisions (e.g., stronger, more resilient agreements) with the costs associated with those provisions (e.g., resources, time consuming, reputation, impact on bargaining environment). Conflict parties that use ceasefires for devious objectives or are uncertain about the intent of an opponent will likely favor a cessation of hostilities arrangement, i.e., an arrangement without costly compliance mechanisms. Parties that seek to create a conducive environment for peace negotiations are more likely to accept or demand a preliminary ceasefire, i.e., a ceasefire with costly compliance mechanisms, and those that agree on a peace agreement will put in place a definitive ceasefire that demobilizes or reconfigures one of the conflict parties.

Finally, we show how the underlying logic motivating a ceasefire and the design of the ceasefire agreement collectively shape the outcomes associated with the ceasefire. Based on our reasoning, we expect that definitive ceasefires, followed by preliminary ceasefires, are associated with a longer period of violence suspension than cessations of hostility agreements.

To test our claims, we draw on the new PA-X Peace Agreement Database (Bell and Badanjak 2019), that includes 231 ceasefire agreements between 1990 and 2019. We classify all ceasefires as cessation of hostilities, preliminary or definitive ceasefires. Using survival models, we assess ceasefire survival, with conflict deaths as the main measure of whether a ceasefire remains in place, using the georeferenced event data (GED) from the Uppsala conflict data program (UCDP) (Sundberg and Melander 2013). The results provide strong support for our claims and are robust across a variety of model specifications. In sum, the findings highlight the importance of distinguishing between different classes of ceasefire design driven by different logics and the quite varied outcomes associated with these ceasefire classes. Together with our conceptual and theoretical framework, they highlight the importance of context appropriate ceasefire design, pointing to a limited agency of third-party actors in optimizing ceasefires through the inclusion of specific provisions. Our findings here are not only policy relevant, but also speak to academic debates discussing the process of attribution, as well as the capacity of institutions to shape actors behavior.

We start by setting out the current state of ceasefire literature and clarifying the range of arrangements that fall under our ceasefire definition. Based on previous ceasefire research, we discuss how specific ceasefire provisions make it more likely that a ceasefire holds. We then discuss the various bargaining problems a conflict party may face over the course of a conflict, and how they shape the underlying logic driving the design of a ceasefire, i.e., which provisions parties will likely include. We then lay out the methodological approach and research design, and discuss our results. Finally, we discuss the implications of our conceptual and empirical contribution for ceasefire research and practice.

Ceasefire Design in the Literature

A number of studies now discuss the motivations that might lead conflict parties to enter into a ceasefire during

civil conflict. Common conclusions are that ceasefires are initiated to facilitate humanitarian assistance (Aary 1995), support a peace process (Smith 1995, 155–62; Mahieu 2007, 209; Chounet-Cambas 2011, 8), increase legitimacy (Chounet-Cambas 2011, 8; Höglund 2011), signal good faith (Akebo 2013, 201–3), or demonstrate internal cohesion (Höglund 2011). At the same time, research also points to the "devious intentions" that might motivate a ceasefire, such as a desire to buy time to regroup and rearm (Smith 1995; Gartner and Melin 2009; Toft 2010), stall a process (Chounet-Cambas 2011, 15; Milton-Edwards 2017), score political points (Kriesberg 2005, 72), or facilitate illicit activity (c.f. Kolas 2011). Ceasefires have also been shown to be used for state-building processes (Sosnowski 2020).

This work, which relies mainly on in-depth case analysis, provides a useful indication of some of the primary motivations that might lead to the adoption of a ceasefire agreement. Yet collectively, the work provides few details on how ceasefires are designed in relation to the different purposes or how the design of a ceasefire helps or hinders the achievement of different goals.

More instructive here are studies of *interstate* conflict that consider ceasefires from a bargaining perspective. Informational asymmetries and commitment problems have long been argued to be critical for understanding the onset (Fearon 1995), dynamics (Wagner 2000), and resolution of conflict (Clayton 2013, 2016). Building on this understanding, Fortna (2003, 2004) identified a number of ways in which ceasefire design can be adapted to accentuate or alleviate bargaining problems. In particular, she showed that the inclusion of certain provisions can reduce uncertainty and raise the costs of attack. Focusing on peace duration, she prominently demonstrated that "stronger" ceasefire designs, i.e., agreements with more provisions, are associated with longer periods of peace (Fortna 2003, 354–56). The most effective provisions in this regard were demilitarized zones, third-party guarantees, peacekeeping, joint commissions for dispute resolution, and making the agreement as specific as possible (Fortna 2003, 356–63).

Fortna currently offers the most useful account of the functions associated with different ceasefire designs. While we expect that much of her basic logic applies beyond interstate wars, we argue that the argument needs to be adapted to reflect the specific challenges associated with civil conflict. In particular, her conceptual framework conflates ceasefires that are meant to suspend the hostilities (while conflict continues or while parties search for a political solution), with those meant to terminate hostilities (once the underlying conflict issues have been addressed). In other words, although accounting for political provisions, the study does not conceptually differentiate between violence suspending and conflict terminating agreements. This may not be particularly problematic in the context of interstate wars with which Fortna was concerned, as conflict parties can keep their own armed forces and a suspension of violence may be sufficient to return to a state of normalization. However, in civil conflicts, parties are required to agree on a common governance structure, requiring at least one party to disarm and demobilize (Walter 1997, 2009). This results in a fundamentally different bargaining situation, where parties have to overcome the more significant credible commitment problem before returning to a state of normality.

Another relevant distinction is that in civil conflicts, there is often no clear geographical separation of conflict parties, as the state claims the monopoly of force in the entire territory of the country. Accordingly, conflict parties have limited opportunities to raise the costs of attack through physical barriers, such as troop withdrawal or demilitarized zones.

Due to these fundamental differences in the nature of inter- and intra-state war, we set out to develop a new conceptual and theoretical framework to explain the logics that drive the design of ceasefire during civil conflict and show how this shapes subsequent civil violence.

Conceptualizing Ceasefires

We define ceasefires as arrangements that include a statement by at least one conflict party to stop violence temporarily or permanently from a specific point in time (see Clayton et al. 2021). In this sense, the defining characteristic of a ceasefire is that it contains a clear commitment by a conflict party that their armed forces will temporarily or permanently stop the use of violence. We include the stipulation that a ceasefire be linked to a specific point in time to distinguish them from more general statements and documents in which parties signal a loose commitment to ending violence in the future. In principle, ceasefires can be written or verbal, uni-, bi-, or multi-lateral.[1]

Our broad conception of ceasefires captures a wide range of arrangements. We adopt this expansive definition as we are concerned with considering how different ceasefire designs emerge from different underlying logics and how both the underlying logic and ceasefire design shape subsequent conflict dynamics. Thus, rather than limit which agreements are classified as ceasefires a priori, we adopt a broad definition to capture a full range of agreements and then below derive different classes of ceasefire design in relation to the logic that motivates their adoption.

Civil Conflict Ceasefire Design

Ceasefire design refers to the specific configuration of provisions that are included within an agreement. In many cases a ceasefire can be designed as a simple arrangement, including only a commitment to stop fighting. In other cases, agreements include more comprehensive designs that include a range of other provisions aimed at regulating the conflict behavior or the conflict itself. This can include, for example, methods of verification, lists of prohibited actions and timetables for negotiations. Of particular note are provisions relating to monitoring, demobilization, and the substantive incompatibility (see Fortna 2003, 2004; Haysom and Hottinger 2004; Chounet-Cambas 2011; PILPG 2013; Brickhill 2018).

Monitoring is one of the most significant ceasefire provisions, the inclusion or exclusion of which has a notable impact on the design of a ceasefire agreement. Monitoring refers to a group tasked with going out to actually observe and report back on the extent to which the parties are observing the terms of an agreement (Haysom and Hottinger 2004, 6–7; Pinaud 2020, 3–4; Buchanan, Clayton and Ramsbotham 2021). Studies of interstate conflict point to the benefits of ceasefire designs that include monitoring provisions (Fortna 2003, 2004). First, monitoring increases the costs related to ceasefire violations. Conflict parties tend to blame the opponent for any form of violence emerging during a ceasefire, to avoid third party audience costs. By observing what is happening in the battlefield, and providing information in this regard, ceasefire monitors offer a way to better attribute ceasefire violations to the aggressor, thus increasing the audience costs related to such

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[1]As we discuss below, for practical reasons we limit our empirical analysis to written, bi-lateral ceasefires.

violations (Fortna 2003, 343–44; Potter 2004, 3). This is particularly the case if external third parties are involved in monitoring efforts, as information provided by third parties will more likely be perceived as unbiased (Fortna 2003, 343–44; Haysom and Hottinger 2004, 6). Second, monitors help distinguish between accidents and genuine incidents, helping avoid that the former escalate unintentionally (Fortna 2003, 344; Chounet-Cambas 2011). Third, monitoring serves as an early warning mechanism. Presence on the ground allows monitors to gather information that extends beyond the absence of violence, thus making it harder for conflict parties to cheat and use the ceasefire to gain a military advantage.

Yet despite these advantages, the literature also points to the costs associated with monitoring. It is costly and time consuming, both to deploy and maintain, and may not then be practicable when resources are scarce, international commitment is low, or a quick response is required (Potter 2004; Puttick 2017; Verjee 2019). This is particularly the case if there is high degree of uncertainty about whether the parties will stick to an agreement. On occasions, some (or all) conflict parties may also resist attempts to include monitoring in order to reduce the costs associated with reneging.

Demobilization provisions set out the terms under which the non-state actor will demobilize. They include disarmament of the rebels and demobilization of the organization, and usually the reintegration of the former rebels into civilian life. In some cases, demobilization provisions instead relate to how former rebels will be integrated into the state army or set out the structure of a new common military force (Glassmyer and Sambanis 2008; Chounet-Cambas 2011).

By dismantling the non-state organization, and disarming its members, demobilization mechanisms make a return to violent conflict much costlier, as conflict reoccurrence requires the organization to re-arm and re-mobilize (Walter 1997, 2009). Demobilization provisions thus fundamentally alter the bargaining situation. For as long as conflict parties keep their fighting capabilities intact, they may return back to armed conflict at any time should the other side fail to uphold a commitment or fail to make progress in the negotiation of a political settlement (Sticher and Vuković forthcoming). A non-state actor will therefore only agree to its demobilization if it feels that the main incompatibilities underlying the conflict have been addressed, and that the opponent will honor the agreement (Walter 1997, 2009). This means that demobilization mechanisms tend to occur most often alongside *substantive incompatibility provisions*, those elements of an agreement that address the main issues underlying the conflict which would often form part of a peace agreement.

To summarize, existing literature offers some useful hints as to how the design of a ceasefire, in particular the inclusion of monitoring and/or demobilization provisions, may have an independent effect on violence suspension. At the same time, it is logical to assume that conflict parties design a ceasefire with a specific purpose in mind, but the relationship between the broader purpose and ceasefire design has until now been largely overlooked. To identify the primary logics driving the adoption of different ceasefire designs and theorize how the logics and ceasefire design might together shape civil violence, we develop an argument building on the bargaining theory of war.

The Logics of Ceasefire Design

The term bargaining is used broadly to include different means through which conflict parties seek to increase their outcome in a process, through negotiation and violence. Bargaining theory is a mainstay of conflict research. The central tenant of this collection of work is that as war is always costly, conflicting parties should always prefer to conclude an *ex ante* agreement to avoid *ex post* inefficiency of war. Yet wars frequently occur and defy resolution (Walter 2001; Mattes and Savun 2009). The key explanation for why this is the case relates to problems of imperfect information and credible commitment.

In short, problems of asymmetric information occur as during conflict, when conflict parties seek to increase their bargaining power, they have an incentive to misrepresent their capabilities and resolve. By extension, even if they want to communicate their real strength, the opponent may not trust this information. This potentially leads to a situation where parties fail to find a mutually acceptable agreement, even if both would profit from one (Lax and Sebenius 1986; Fearon 1995).

The problem of commitment occurs when belligerent's incentives to abide by the terms of an agreement are expected to shift over time or when the items in dispute are expected to reshape future bargaining power (Powell 2006). It is challenging for an actor to convincingly convey their commitment to a peace process, when it is expected that they will later have an incentive to renege on the agreement. In this way, future incentives for exploitation can prevent the conclusion of an agreement (Beardsley et al. 2006). The problem of credible commitment is particularly acute in civil conflicts, as the non-state actor will likely have to disarm and demobilize as part of any final settlement, leaving it vulnerable to post-demobilization defection by the state (Walter 1997, 2009).

Throughout a process, bargaining problems manifest in different ways, to different degrees, under different guises, focusing on different objects of uncertainty. Peace processes are rarely linear, and thus fits and starts and multiple regressions are more likely to be seen than any neat sequence. In what follows, we set out how the logic driving the initiation of a ceasefire shifts according to salience of different manifestations of the core bargaining challenges. We focus on three key manifestations of the bargaining challenges that create three different logics for a ceasefire, which translate into three quite different classes of ceasefire design.[2]

Logic 1: Signaling with "Cessation of Hostilities" Agreements

In the "earlier" phases of a negotiation process, information asymmetries present the most salient challenge.[3] Operating in an information poor environment, it is difficult for a conflict party to credibly communicate their intention to an opponent, and equally trust any information that their opponent communicates about their own intentions. In this context, ceasefires can perform a valuable function signaling intent. For those conflict parties that favor a political settlement over continued fighting, a ceasefire can provide an effective signal of their intention to move toward an agreement, while also providing an opportunity

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[2] Conflict parties may also use other ways of overcoming these challenges. In our framework, we focus on the use of ceasefires, as the aim is to identify different logics driving ceasefire designs and the effect this has on violence suspension. There are also likely more than three different manifestations of the bargaining problems.

[3] "Earlier" phases of the negotiation process here suggest before the parties have firmly recognized the utility of a negotiated solution, or before they trust that the opponent firmly recognizes the utility of a negotiated solution. It should not be interpreted as implying any temporal ordering, as peace processes are rarely linear and the bargaining challenges that we discuss may occur on multiple occasions with different sequences.

to assess the intentions of an opponent. By sticking to an agreement, and foregoing opportunities to take advantage of the opponent during a ceasefire, conflict parties can send a strong signal that they are serious about exploring negotiations.

On the other hand, if a conflict party believes that its goals are best served through continued fighting, announcing a ceasefire to feign peaceful intent but later reneging on it may offer an opportunity to gain a military advantage (Richmond 1998). For example, a conflict party may intend to use such a ceasefire to re-organize, re-arm, or attack the opponent when it is most vulnerable (Crocker, Hampson, and Aall 2004, 158; Gartner and Melin 2009, 566; Toft 2010, 15; Chounet-Cambas 2011, 7–8, 20).

We expect that in both cases—i.e., whether parties use a ceasefire to signal peaceful intent for honest or devious intentions—they will prefer a simple ceasefire design without costly compliance mechanisms. The logic here is that parties seeking to gain a military advantage will want to keep the costs of defection low, making it easy to escalate back to violence and potentially avert blame for the collapse of an agreement. Conversely, the logic for those who see the benefits of a political settlement, and seek to communicate their intentions to an opponent, is to ensure that they do not impose a significant price in the event that the gesture is not reciprocated and equally do not provide too strong a signal as to risk calling into question their violent resolve. They are thus likely not to want to risk the time, resources, and political capital associated with developing a more robust ceasefire design.

We use the label *cessation of hostilities* arrangements for simple ceasefire designs that include only a narrow suspension of conflict violence. Alternative labels used to describe this type of arrangement include a "truce," "window of silence" or a "pause in fighting." Cessation of hostilities can be called quickly, without negotiating the precise conditions under which they take place, and they do not require time-intensive or costly accompanying measures such as putting into place a monitoring force. They may also be quickly called off, should the other side fail to replicate, show signs of misusing the ceasefire to make military gains, or simply renege on an agreement as planned. However, if a cessation of hostilities holds, it sends a powerful signal of goodwill, helping parties reduce uncertainties about intentions and may lead to the onset or development of political negotiations. This is equally the case for temporarily limited ceasefires that expire, as they have been intended to only hold for a limited time. And even if cessations of hostilities arrangements fail, this does not necessarily imply devious objectives, as this class of ceasefire design lacks the mechanisms to effectively deal with incidents or attribute responsibility in case of violations.

An example of a cessation of hostilities arrangement that served a short-term signaling function is the 2017 *Quito Agreement on a Temporary and Bilateral Cease-Fire* between the Government of Colombia and the National Liberation Army (ELN). The agreement was signed in September 2017, about half a year into negotiations between the two parties, and remained in place for the designated period between October 2017 and January 2018 (Ryland et al. 2018). Its official purpose was to "improve the humanitarian situation of the population," but the agreement was clearly linked to belligerent signaling during the ongoing peace talks. When the ELN refused to extend the ceasefire and resumed attacks hours after it expired, the government recalled its chief negotiator and temporarily suspended the talks.

Logic 2: Supporting Negotiations with "Preliminary Ceasefire" Agreements

As parties convey and reveal more information through fighting (Wagner 2000), negotiation (Filson and Werner 2002; Powell 2004), or ceasefires (Sticher and Vuković forthcoming), their expectations about the relative strength converge and a bargaining range emerges. While at this point the problem of imperfect information is not yet solved (see Werner and Yuen 2005, 267), it is no longer the most salient bargaining problem. Conflict parties now see the potential benefit of a conflict settlement over fighting and have an incentive to settle. Yet the continuation of violence on the battlefield can be a serious impediment to negotiations (Touval 1995, 335; Mahieu 2007, 3; Sticher 2021). In addition, conflict parties face the problem of credible commitment, with conflict parties doubting the willingness and ability of the opponent to deliver on a peace deal post agreement (Walter 1997, 2009; Reiter 2009). Continuing violence in particular might lead parties to doubt their opponent's ability to deliver on a peace deal, as they cannot be sure if violence is instigated by, or in opposition to, the parties taking part in negotiations (Stedman 1997). This is particularly the case when there are questions surrounding the unity and control over one side's forces.

We argue that in this bargaining context a second logic for ceasefires arises—creating an environment more conducive to negotiations. A ceasefire can help to achieve this function in three key ways. First, by suspending violence on the battlefield, it disrupts the cycle of hatred and anger, removing a key impediment to working toward a joint solution (Touval 1995; Mahieu 2007, 210; Sticher 2021). Second, by successfully delivering on a ceasefire promise, a conflict party leadership can demonstrate commitment and the ability to deliver within a process, mitigating the credible commitment problem. Third, by collaborating in the context of a ceasefire, conflict parties can continue to build up confidence in each other (see Höglund 2011, 222–23, 238; Akebo 2013, 201–3) and in the peace process.

If the logic for a ceasefire is to create an environment conducive for negotiation, parties have greater incentives to adopt stronger, more comprehensive ceasefire designs. For including provisions for monitoring and other related compliance mechanisms creates stronger ceasefire institutions to build trust and cooperation between the parties, supporting the negotiations and reducing the risk of an unintentional ceasefire failure due to skirmishes and non-strategic violations. Parties may thus accept or demand monitoring and related provisions, even if they are costly and time-consuming to arrange. They may also agree to other measures that make it more costly to attack, such as withdrawal of forces from specified areas (see Fortna 2003, 342–43).

At the same time, conflict parties will still likely resist any ceasefire design that includes provisions that threaten to undermine their military capacity, in particular demobilization provisions, as conflict parties have yet to agree on how to address the underlying incompatibilities. In other words, before a peace agreement is reached, conflict parties will want to have a strong and resilient ceasefire in place, yet keep their fighting capabilities to uphold the pressure to negotiate and return to violent conflict should negotiations fail. Practitioners tend to label this class of ceasefire design (i.e., agreements that include provisions for compliance but not demobilization)—*preliminary ceasefires.* For the logic, as we argue above, is to suspend the violence temporarily to enable a more permanent political solution. In most cases, preliminary ceasefires involve the introduction of a monitoring

force, which is deployed to monitor the parties' compliance. Depending on the conflict context, additional compliance mechanisms may be necessary or useful, such as verification or complaint mechanisms.[4]

To be clear, we do not suggest that conflict parties that engage in a preliminary ceasefire never pursue a military victory. Rather, we suggest that conflict parties that see the benefits of conflict settlement and seek to create a conducive environment for peace negotiations are more likely to engage in a preliminary ceasefire than parties that seek to gain a military advantage or are uncertain about the intent of the opponent.

A preliminary ceasefire may evolve from a cessation hostilities agreement, particularly if the conflict parties feel that the latter was not sufficient in suspending the conflict violence (e.g., Sudan North–South process, mentioned in the introduction. See ICG 2003, 1). However, preliminary ceasefires may also be negotiated in the absence of any existing ceasefire agreement, at the start or during the course of peace negotiations. An example of the latter is the *25-Point Ceasefire Code of Conduct Agreed between the Government of Nepal and CPN (Maoist)*. The conflict parties signed this agreement in May 2006 in order to facilitate peace talks. It remained in place until the two parties reached a comprehensive peace agreement in November 2016.

Logic 3: Dismantling the Status of War with "Definitive" Ceasefires

Once conflict parties reach a peace agreement, they enter a new phase of the bargaining process. The main challenge associated to this phase is no longer the negotiations over how to address the underlying conflict incompatibilities, but how to ensure that the settlement is implemented properly, a notoriously challenging task (Walter 2001; Beardsley 2008). In particular, conflict parties need to agree on the sequence and conditions for implementing the incompatibility provisions, while setting in motion the process to dismantle the status of war.

In this context, a ceasefire is no longer one of several possible bargaining instruments, but instead an integral and indeed necessary part of conflict settlement. In comparison to the previously discussed bargaining situations, where a ceasefire required only a temporarily suspension of violence, in this case the underlying ceasefire logic is focused squarely on the ultimate termination of the armed conflict. The termination of intrastate conflict requires that the monopoly of force return to the state. The key ceasefire logic in this context is therefore to set out the terms under which the non-state actor demobilizes. However, a non-state actor will only agree to such demobilization when it feels that the incompatibility issues are sufficiently addressed, i.e., if it recognizes the benefits of negotiated settlement over continued fighting (Wood 2010; Chounet-Cambas 2011; Thomas 2014). Ceasefires driven by this logic must therefore include a design that includes demobilization provisions *and* contain or accompany a political agreement addressing the contested conflict issues. The state actor may also agree to some demilitarization measures, but these will always remain more limited, as the monopoly of force in peace times remains with the state actor.

Practitioners tend to label this class of ceasefire design as—*definitive ceasefires*. In contrast to the other classes of ceasefire design discussed above, definitive ceasefires form part of the *outcome* of negotiations, rather than part of the

negotiation process itself. They therefore most often occur as the security clauses or appendix to a comprehensive peace agreement. Alternatively, they may constitute a separate agreement that enters into force with the signature of a peace deal. Because of their association with peace agreements, an alternative name for them is "peace agreement ceasefires." Definitive ceasefires also always include a commitment to cease hostilities from a specific point in time and may also contain compliance monitoring mechanisms, though, in some instances, compliance-related activities may form part of the mandate of a commission tasked with the oversight of the overall peace agreement implementation.

Commonly, a preliminary ceasefire is in place as conflict parties negotiate the details of a definitive ceasefire as part of a political settlement (e.g., Philippines Bangsamoro process). However, there are also definitive ceasefires that are negotiated in the absence of a preliminary ceasefire, for example, the 2016 *Agreement on the Bilateral and Final Ceasefire, End of Hostilities, and Surrender of Weapons* between the Government of Colombia and the Revolutionary Armed Forces of Colombia (FARC). At the time of the agreement, the FARC was implementing a unilateral cessation of hostilities and the government partly replicated by ceasing its aerial bombings. The conflict parties signed a definitive ceasefire in June 2016, with the explicit understanding that it would only enter into force with the signing of a final peace deal.

Table 1 provides an overview of our argument. As we set out above, the logic underlying the adoption of a ceasefire shifts with the salience of different bargaining challenges. Different ceasefire logics also demand different classes of ceasefire design (i.e., agreements that include different provisions).

Of course, some ceasefire may not fit neatly our classes of ceasefire design and actors may choose to resolve bargaining challenges using different tools. For example, in contexts such as Sudan or Colombia, parties demonstrated intent and commitment within the process using various confidence-building measures, instead of, or alongside, ceasefires. Yet we maintain that the classes of ceasefire design that we identify are a common means of addressing the bargaining challenges that we raise, and thus expect that, all else being equal, these ceasefire classes will be associated with quite different outcomes.

The Combined Effects of Ceasefire Logic and Design on Civil Violence

The preceding discussion sets out how the logic underlying the adoption of a ceasefire shifts with the salience of different bargaining challenges and how different ceasefires logics are likely to lead to different ceasefire designs. Yet beyond explaining ceasefire design, we are also concerned with identifying how different classes of ceasefire design influence civil violence. We therefore derive expectations with regard to how long the different ceasefire designs are likely to stop civil violence, based on both the specific design of the ceasefire and the logic that produces it.

When conflict parties announce a ceasefire to signal a peaceful intent (either honestly or as a means of gaining a military advantage) they are unlikely to desire that the ceasefire last indefinitely. Signaling intent, as we argue above, is likely to lead conflict parties to adopt a cessation of hostilities arrangement, rather than a more comprehensive ceasefire design. This class of ceasefire design lacks the provisions that make a ceasefire costly to break and resilient to skirmishes and is therefore vulnerable to a relatively quick

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[4] In specific case contexts, verification, complaints, or other mechanisms may even substitute the function of a monitoring mission.

Table 1. Overview of the salient bargaining challenges and the related ceasefire logics and ceasefire design classes

Salient bargaining challenge	Ceasefire logic	Provisions to address bargaining challenge				Ceasefire design class
		Stop fighting	Compliance monitoring	Demobilization	Incompatibility	
Asymmetric information	Signal intent	X				Cessation of hostilities
Commitment problem, ongoing violence	Supporting negotiations	X	X			Preliminary ceasefire
Implementation	Dismantling status of war	X	(X)	X	X	Definitive ceasefire

collapse. Any reduction of violence resulting from the ceasefire is therefore likely, either intentionally or unintentionally, to be short lived.

As a process progresses and the conflict parties see the benefits of a negotiated agreement, i.e., imperfect information is no longer the most salient bargaining problem, the logic of a ceasefire shifts to creating an environment conducive to peace negotiations. In these cases, a ceasefire is meant to last for the duration of the peace negotiations, which in many cases extend over a long period. At the same time, conflict parties may still want to resort back to violence if they are unhappy with the way in which negotiations proceed and so would not be willing to consent to any significant permanent restraints of their military capacity. In this situation, conflict parties will likely use a preliminary ceasefire, i.e., a ceasefire that is costlier to break and more resilient to skirmishes and non-strategic violations. They may put it in place for a limited time period with the option of extending it or declare an indefinite ceasefire that they suspend if negotiations fail to progress. Logically, we thus expect that preliminary ceasefires are likely to be followed by a longer period of reduced violence than cessation of hostilities, both because of the logic that drives them and the related provisions they entail. This leads to the first hypothesis:

Hypothesis 1: *Preliminary ceasefires are more likely to be followed by longer periods of violence suspension than cessations of hostilities.*

Once conflict parties have reached a peace agreement, they will want to ensure that the conflict violence is terminated, rather than only temporarily suspended. To do so, they put in place a definitive ceasefire that includes demobilization provisions and is part of, or directly linked to, a peace agreement. Such agreements fundamentally alter the bargaining situation. We expect them to be associated with longer periods of violence suspension than any other class of ceasefires, both because of the direct and inseparable link between demobilization and incompatibility provisions, and because practically it becomes much harder for the non-state actor to return to violent conflict as its members disarm and the organization demobilizes. This leads to the second hypothesis:

Hypothesis 2: *Definitive ceasefires are more likely to be followed by longer periods of violence suspension than preliminary ceasefires and cessations of hostilities.*

To be clear, our arguments regarding the likely effect of ceasefires on civil violence focus on both (1) the independent effect of the specific class of ceasefire design and (2) the underlying logic that motivated the adoption of an agreement. To recap, we have argued that throughout a process bargaining problems manifest in different ways
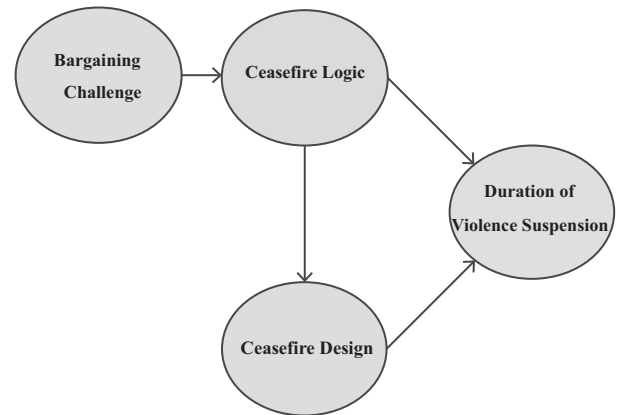
Figure 1. Relationship between the components of our framework.

that bring to the fore specific challenges. Ceasefires are one instrument of addressing these bargaining challenges. Depending on which bargaining problem is most salient, a different logic for a ceasefire emerges. The underlying ceasefire logic shapes the class of ceasefire design, but is also likely to have a direct bearing on how long we expect a ceasefire to hold. Figure 1 visualizes our argument.

Research Design

Independent Variables

To test our hypotheses, we require data on all civil war ceasefire agreements. For this purpose, we draw on the new PA-X Peace Agreement Database (Bell and Badanjak 2019). The PA-X database provides "an archive and comprehensive census of peace agreements using a broad definition to capture agreements at all phases of the peace process, in both intrastate and interstate conflict" (Bell and Badanjak 2019, 1). This is the most complete collection of peace-related agreements currently available. We use v.3 of the PA-X data that covers all written agreements from 1990 to 2019. From this data, we extract all agreements that (1) take place during intra-state conflict and (2) meet our definition of ceasefire (i.e., include an explicitly declared intention, by at least one belligerent, to suspend hostilities from a specific point in time). Using our broad definition of a ceasefire captures the full range of arrangements through which conflict parties might agree to temporarily suspend and/or terminate hostilities. This includes documents with labels such as truces, cessation of hostilities, armistices, preliminary and definitive ceasefire agreements. We exclude unilateral agreements and those limited to a specific geographic space (i.e., local

ceasefires) based on the assumption that different logics determine the adoption and observance of these agreements. In total, we identify 231 agreements that match our selection criteria.[5]

Having identified the population of ceasefire agreements, we next systematically code each of the different classes of ceasefire agreements according to the typology we discuss above.[6]

We code as cessation of hostilities arrangement any ceasefire that does not include any provision to account for the monitoring of the agreement or attempts to dismantle or demobilize the insurgent force. In total, we classify 103 of the 231 agreements as cessation of hostilities.

We code as preliminary ceasefire any agreement that includes a monitoring provision that provides for, promises, or highlights the existence of a group tasked with monitoring a ceasefire, but does not attempt to dismantle or demobilize the insurgent force. Monitors can be people, groups, conflict parties, internationals, IOs or any other actor tasked with going out to actually observe the ceasefire. They might be called monitors, observers, or something similar. In total, we classify 91 of the 231 agreements as preliminary ceasefires. In robustness checks, we also assess the impact of other compliance provisions.

Finally, we code as definitive ceasefire any agreement that includes both demobilization and substantive incompatibility provisions. Demobilization mechanisms are those provisions within an agreement that set out terms under which the non-state actor will demobilize. This includes the creation of a new common army, integrating the rebels in the state army, disarming, demobilizing and reintegrating the rebels into society, or a combination of the above. We also require that definitive ceasefires include a substantive incompatibility provision, i.e., provisions that attempt to resolve in whole or in part the primary incompatibility, or are linked to an agreement that performs this function.[7] In total, we classify thirty-seven ceasefires as definitive. While not a defining feature, definitive agreements can also include compliance-orientated provisions, indeed around 73 percent of definitive agreements also include a provision for monitoring.

Dependent Variable

Our outcome of interest is whether and how long ceasefires hold. We are thus not directly interested in the "overall success" of a ceasefire, which varies according to the underlying purpose driving a ceasefire and could include aspects such as enabling progress in peace negotiations (Clayton, Nathan, and Wiehler 2021). Rather, we use a narrow definition of whether and how long ceasefires hold, measuring

it in terms of violence suspension, which is an immediate and necessary objective for all ceasefires. To operationalize this, we look at the period of time (in days) from when a ceasefire comes into effect, until it crosses a certain violence fatalities threshold within the specific UCDP dyad to which the ceasefire relates, or is superseded by a subsequent agreement.[8] For our initial analysis, we use a battlefield fatalities threshold of 25, i.e., examine the length of time from when a ceasefire comes into effect, until there are twenty-five fatalities in the conflict, as this is the most commonly used threshold for capturing the onset (or re-initiation) of civil conflict (Gleditsch et al. 2002). In robustness checks, we use other fatality thresholds.

We measure fatalities using the UCDP GED (Sundberg and Melander 2013) v.20.1, the most disaggregated dataset covering individual events of organized violence (i.e., phenomena of lethal violence occurring at a given time and place). These events are sufficiently fine-grained to assess the influence of ceasefires, with temporal durations disaggregated to single, individual days. For our primary analysis, we take all observations for which we have precise information on at least the week in which the event took place (216,872 of 225,385 [96 percent] of events), but in robustness checks also include events with a higher and lower degree of temporal accuracy.

Data Structure and Modeling Approach

This paper examines different logics that drive the use of ceasefires, exploring why ceasefire outcomes vary widely. Given that the PA-X data cover all agreements reached between 1990 and 2019, we limit our analysis to this period. To assess potential effects that different forms of ceasefires have on the duration of violence suspension that follows, we use a series of Cox proportional hazard models to estimate how different classes of ceasefire shape the hazard rate of conflict violence re-emerging.[9] We also conduct robustness checks using a Weibull model.

For this analysis, our dependent variable is ceasefire termination, which can occur in two ways: (1) the agreement crosses a fatality threshold (as we discuss above), which we imply as a return to violence, or (2) a new ceasefire enters into effect that supersedes the prior agreement. This second criterion is necessary to ensure that the effects of a subsequent agreement are not attributed to the earlier agreement. One criticism that could be levied at our approach is that it conflates ceasefire failure and ceasefire success, as a new ceasefire agreement could indicate that a previous agreement was successful and should be maintained. However, we only code an agreement as being superseded by another agreement if the subsequent agreement includes a new effect date (i.e., the parties commit to stop fighting on a new date). From studying the agreements, parties tend to use a new effect date when an existing agreement is perceived to have failed,[10] is seen as insufficient to uphold the violence suspension, or represents a new underlying logic

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[5] In total v.3 of the PA-X data includes 844 ceasefire-related agreements. Our primary analysis focuses on the 231 of these agreements that meet our definition of ceasefire. Of the other agreements, 385 agreements broadly discuss a ceasefire but do not include a declared intention to cease hostilities. We aggregate agreements that took place on the same day, which results in a drop of twelve additional agreements. Fifty-eight ceasefires do not relate to a UCDP conflict dyad and so cannot be used in our analysis. Finally, we exclude 158 local or unilateral ceasefires. We use the broader body of ceasefire-related agreements and local and unilateral ceasefires in our robustness checks.

[6] In addition, we code a number of additional provisions that we introduce and discuss as robustness checks.

[7] This broadly corresponds with what the PA-X data code as "Framework-substantive, partial/comprehensive." A possible problem with our approach is that a definitive agreement might not refer to a related agreement that deals with the substantive issues, leading us to miss a definitive agreement. This is unlikely, as peace agreements almost always refer in the main text or appendix to the definitive ceasefire. We also checked all agreements that came into effect on the same day and, where appropriate, considered multiple documents as one agreement.

[8] See comment in next section.

[9] Lacking a strong theory pointing to a specific form of hazard function, we follow Box-Steffensmeier and Jones's (2004, 47–68) advice in selecting the Cox proportional hazards model. We leave the particular distributional form of the duration unspecified and make the assumption that the explanatory variables shift the hazard rate proportionately. We test for this proportionality assumption in robustness checks and find that we cannot reject the hypothesis of proportionality in our analysis.

[10] Ceasefire violations (e.g., movement of troops if prohibited under an agreement) may lead to the perception of ceasefire failure without being directly linked to battle-related deaths. Conflict parties tend to respond to such perceptions in one of three ways: announce the end of the ceasefire, let the situation spirals out

(for example, if the parties reach a peace agreement and are now facing a new bargaining situation, which they address through a definitive ceasefire that supersedes a preliminary ceasefire). In all these cases, we want to attribute the effect that follows to the new class of ceasefire design and view the prior ceasefire as terminated. In robustness checks, we also undertake an analysis that treats only the violence measure as ceasefire termination, and right-censors ceasefires when they are superseded by a new agreement.

We measure the start date of an agreement as the date at which an agreement comes into effect, which we code from the written agreements. Most agreements come into effect within a few days of being signed, though this process can extend weeks and, on a few occasions, more than a month. The duration of a ceasefire is therefore measured as the number of days from the date on which an agreement enters into effect, until the violence threshold is crossed or the agreement is superseded by a subsequent ceasefire with a new effect date. This data consist of 393,353 days of violence suspension, relating to eighty-two conflict dyads. The advantage of using survival models is that it allows us to account from the problem of "censored" data or the fact ceasefires that held beyond the end of 2019 might not hold in the future.

Controls

To account for omitted variable bias, we include a number of control variables that might relate to the duration in which a ceasefire holds. In particular, we account for regime type using the electoral democracy index from the V-Dem project (Coppedge et al. 2018) as we expect that ceasefires within democratic states might be more durable. We also control for GDP per capita (The World Bank 2019) and population (The World Bank 2019), to account for instability, general state weakness, and an increased likelihood of civil conflict in some states, which we assert might also lead to less durable ceasefire.

We also account for key conflict characteristics. First, we include controls that indicate the presence of other conflict dyads or armed conflicts within the state (Gleditsch et al. 2002). We expect that contexts in which there are multiple rebel groups operating are more vulnerable to ceasefire failure. We also control for whether the conflict is over territory or governmental control. As territorial conflicts have often proven to be more challenging to resolve, we assert that this might also make ceasefire less durable (Gleditsch et al. 2002). We include a lagged violence variable indicating the number of fatalities in the previous month to account for temporal dependency. In robustness checks, we also include other specifications to account for temporal dependence. Finally, as Fortna (2008) previously argued, ceasefires might be more likely to hold in the presence of a peacekeeping force. We therefore control for the presence of a peacekeeping force in each conflict month. For robustness checks, we also add a series of additional controls (see below).

Analysis

Recall that Hypothesis 1 sets out our claim that preliminary ceasefires are more likely to be followed by a longer sus-

pension of violence than cessations of hostility agreements, while Hypothesis 2 asserted that definitive ceasefire agreements suspend violence for longer than all other ceasefire agreements. We assess these claims by estimating a number of Cox proportional hazard models. We cluster the standard errors by country to address possible dependency in countries. For ease of interpretation, we report coefficient estimates rather than the hazard ratios. Negative coefficients indicate a lower likelihood of agreement termination, and thus longer expected violence suspension, while positive signs indicate a higher probability of termination and thus shorter post-agreement periods without violence. In the initial analysis, we include our indicator for preliminary ceasefire agreements and definitive ceasefire agreements, and use cessation of hostilities agreements as the reference category. In model 1, we include our indicator for preliminary ceasefires and definitive ceasefires with only a lagged violence measure to account for temporal dependence (not reported). In model 2, we add additional controls to account for state characteristics, including a measure of political regime, population (logged), and GDP per capita. In model 3, we add conflict controls, capturing the type of incompatibility, counts of other conflicts, and conflict dyads within the state, as well as the presence of a peacekeeping force.

As expected, in all models the preliminary ceasefire variable shows a negative coefficient that is statistically significant. Indeed, in comparison to cessation of hostilities agreements, preliminary ceasefires are shown to suspend violence for a longer period. We therefore find support for Hypothesis 1. Further in line with our expectations, definitive ceasefires have the expected negative effect on agreement termination. In all models, definitive agreements are more likely than cessation of hostilities agreements to produce a sustained suspension of violence, an effect that is statistically significant in all analyses.

To further assess the difference between preliminary and definitive ceasefires, we drop cessation of hostilities agreements and re-estimate the analysis, this time using preliminary ceasefires as the reference category (model 4). As expected, the difference between preliminary and definitive agreements shows a negative sign and is statistically significant. This provides support for Hypothesis 2.

One critique that could be levied at our analysis is the specific violence threshold we set for ceasefires to hold, as we count a ceasefire as terminated when they cross the twenty-five battle-related deaths within the dyad. It could be argued that ceasefires seek to stop all violence and so judging agreements against such a high threshold risks classifying agreements as success when they suffer notable violence. Equally, it could be suggested that a threshold of twenty-five battle-related deaths is too low and risks classifying ceasefires as terminated when they suffer only a minor violation or belligerent skirmish. As a result, we re-estimate our fully specified model instead using a threshold of one battle-related deaths (models 5 and 6), and hundred battle-related deaths (model 7 and 8).

We present the results in Table 2. Once again, our findings show that both preliminary and definitive agreements are more likely to suspend violence for longer periods than cessation of hostilities agreements, whether we account for a total suspension of violence (i.e., no subsequent fatalities) or how they prevent the return of considerable violence (i.e., more than hundred deaths).

To demonstrate the substantive difference between the different forms of agreement, we generate survival

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of control and the arrangement unravel, or renegotiate the agreement. The first two options are likely followed by an uptake in conflict violence (and thus captured through our first criterion), while the second option is captured through our second criterion.

Table 2. Cox proportional hazard models

	(1) Twenty-five fatality threshold	(2) Twenty-five fatality threshold	(3) Twenty-five fatality threshold	(4) Twenty-five fatality threshold	(5) One fatality threshold	(6) One fatality threshold	(7) Hundred fatality threshold	(8) Hundred fatality threshold	(9) Matched data	(10) Matched data
Preliminary ceasefire	-0.347+	-0.649**	-0.743**		-0.586**		-0.742**		-0.752**	-0.746**
	(0.09)	(0.01)	(0.00)		(0.00)		(0.00)		(0.00)	(0.00)
Definitive ceasefire	-1.084**	-1.490**	-1.224**	-0.887**	-1.019**	-0.667*	-1.337**	-0.978**	-1.308**	-1.024**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)
Democracy		-0.821	-0.191	-1.396	0.572	-0.758	-0.077	-1.927	-0.937	-1.024**
		(0.33)	(0.84)	(0.27)	(0.47)	(0.54)	(0.94)	(0.13)	(0.49)	(0.00)
Population (logged)		-0.207+	-0.305**	-0.043	-0.236*	-0.038	-0.333**	-0.071	-0.212	-0.275
		(0.06)	(0.00)	(0.77)	(0.01)	(0.75)	(0.00)	(0.68)	(0.22)	(0.83)
GDP per capita (logged)		0.190	0.110	-0.236	0.208	-0.053	0.089	-0.153	0.136	-0.197
		(0.25)	(0.51)	(0.13)	(0.12)	(0.73)	(0.61)	(0.41)	(0.45)	(0.21)
Government incompatibility			-0.395	-0.742+	-0.121	-0.567*	-0.439	-0.810+		-0.769*
			(0.12)	(0.06)	(0.60)	(0.04)	(0.15)	(0.07)		(0.02)
Number of conflicts in state			0.155+	0.078	0.110	-0.040	0.137	-0.021		0.003
			(0.08)	(0.70)	(0.20)	(0.78)	(0.17)	(0.91)		(0.98)
Count dyads in conflict			0.366**	0.205	0.304**	0.162	0.354**	0.220		0.376**
			(0.00)	(0.14)	(0.01)	(0.27)	(0.00)	(0.12)		(0.00)
Peacekeeping			0.039	-0.013	0.075	-0.077	0.081	0.000		-0.045
			(0.85)	(0.96)	(0.69)	(0.75)	(0.69)	(1.00)		(0.84)
Number of subjects	214	190	190	103	190	106	190	106	148	148
Number of observations	8,682	7,802	7,802	6,025	5,299	4,370	8,783	6,714	4,974	4,974
Number of terminations/failures	165	147	147	72	162	82	142	69	114	114
Time at risk	261,070	234,611	234,611	181,814	158,423	131,436	264,477	202,789	149,174	149,174
Log likelihood	-774.5	-662.6	-651.1	-285.8	-710.1	-320.1	-630.4	-273.5	-483.8	-473.9
Chi-squared	30.00	38.29	299.5	51.03	141.1	50.13	136.7	122.0	30.77	128.0

Notes: P values in parentheses $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$.
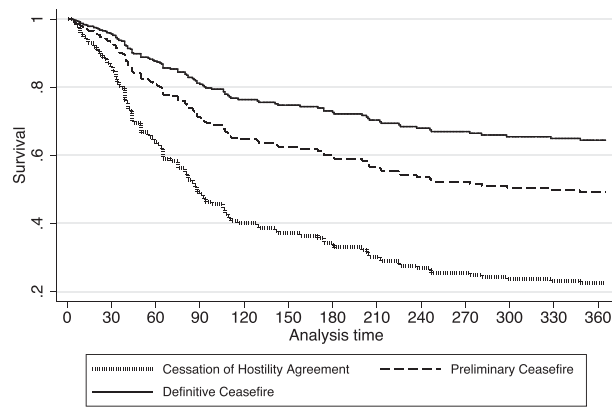
Figure 2. Cox proportional hazards regression survival curves, twenty-five fatality threshold.
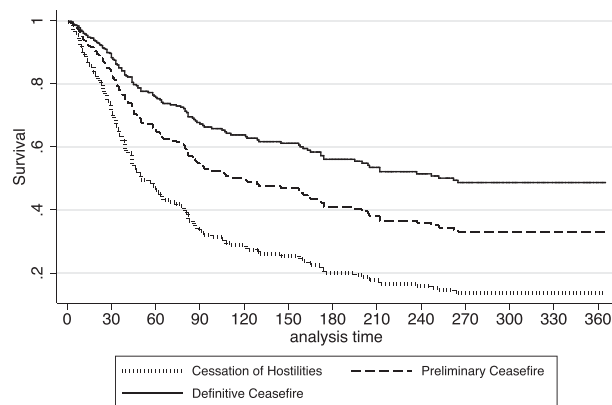

Figure 3. Cox proportional hazards regression survival curves, one fatality threshold.

plots.[11] Figures 2 and 3 present the survival rates for our three classes of ceasefire design—definitive ceasefire, preliminary ceasefire, and cessation of hostilities—for the 365 days following their effect date. Figure 2 represents the twenty-five battle-related fatality threshold, whereas the Figure 3 represents the one fatality threshold. The black unbroken line represents definitive ceasefires, dashed line preliminary ceasefires, and dotted line cessation of hostilities agreements. In line with our expectations, the greater durability of definitive agreements is clearly visible after only a few weeks. At the twenty-five fatality level, thirty days after a ceasefire coming into effect 96 percent of definitive agreements remain active, about 92 percent of preliminary agreements, and only 85 percent of Cessation of hostilities. Within three months, the gap has significantly widened, with our model predicting only 48 percent of Cessation of Hostilities remaining in effect, compared to 70 percent of preliminary and 80 percent of definitive agreements. By the end of the year, only 21 percent of all of the cessation of hostilities agreements held, around 49 percent of preliminary agreements remained in effect, while more than 65 percent of definitive agreements had prevented a return to violence. Unsurprisingly we see far greater failure rates at the one fatality threshold. After only three months, almost 70 percent of Cessation of hostility agreements, 50 percent of preliminary, and 30 percent of definitive agreements have terminated. This is an interesting indication of just how common violence is after most ceasefires. The dynamics for the hun-

dred fatality level are very similar to those for twenty-five, with longer survival times (see figure A1 in the online appendix). Taken together the results provide strong support for hypotheses 1 and 2.

Of course, what is not clear from the prior analysis is if the effect we observe for preliminary ceasefires is driven by (1) the monitoring mechanism associated with the agreement, or (2) the underlying logic of the ceasefire agreement, indicated by parties' acceptance of monitoring provisions (i.e., endogeneity). In our theoretical discussion, we are clear that we expect both dynamics to be at play. However, we also wish to assess as much as possible the independent impact of monitoring provisions. As we are unable to locate a suitable instrument, we attempt to account for this potential endogeneity by matching pair observations that featured monitoring with similar observations without this provision. This removes observations without monitoring that lack an analog among the ceasefire cases with monitoring (Ho et al. 2007). Pre-processing our data in this manner allows us to better assess the effect that monitoring produces independent of the conflict dynamics that might be more likely to lead the conflict parties to agree to monitoring in the first place. We identify pairs using the MatchIt package in R, adopting 1:1 nearest neighbor matching (Ho et al. 2007). This produces ninety-two pairs of control and treatment observations from the original sample (i.e., we drop fifty-six ceasefire that did not have monitoring and lack a suitable pair in those ceasefires that had monitoring). Having matched our data, we re-estimate models 2 and 3, presenting the results as models 9 and 10. The results remain negative and significant, and the marginal effects of preliminary agreements produce an equivalent effect. Balance tests reveal that the pairs are closely matched, meeting or exceeding the standard for variance. For example, all variables receive a value of ≤ 0.25 for standardized bias (e.g., the difference in the means of the treated and control groups, divided by the standard deviation of the treated group); this is considered a "good match" (Ho et al. 2007, 23 footnote 15). Nevertheless, matching is a relatively imperfect approach, as we are only able to match on the observable characteristics.[12] However, the analysis offers the best possible indication that the inclusion of a monitoring provision within an agreement does have an independent effect on increasing the duration of a ceasefire agreement.

To this point, our analysis considers as preliminary agreements only those ceasefires that included a monitoring provision. There are, however, other provisions that might be included within a ceasefire in an attempt to overcome uncertainties related to commitment and ability to deliver, as discussed above. Moreover, it might be that the inclusion of more compliance provisions has a cumulative effect, producing in effect what Fortna considers a "stronger" agreement. To assess the impact of other provisions, we code the inclusion within each of our ceasefires of provisions relating to verification (i.e., a group tasked with actively verifying the completion of predefined tasks such as the destruction of weapons), a complaint mechanism (i.e., some process for violation verification or violation investigation, which sets out a clearly defined process for the investigation of potential ceasefire violations), and the creation of a ceasefire commission (i.e., an institutional body—normally composed of the conflict parties themselves in collaboration

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[11] Using model 3 estimates.

[12] In the presented models, we match on polyarchy, population, GDP per capita, incompatibility, peacekeeping, and a count of other conflicts and dyads active in the state. We also tested a number of additional variables, but they did not notably improve the balance of the matched pairs.

The Logic of Ceasefires in Civil War

Table 3. Cox proportional hazard models

	(11) Twenty-five fatality threshold	(12) Twenty-five fatality threshold	(13) Twenty-five fatality threshold	(14) Twenty-five fatality threshold	(15) Twenty-five fatality threshold
Preliminary "strength"	−0.125+				
	(0.10)				
Preliminary—verification		−0.391+			
		(0.07)			
Preliminary—complaints			0.086		
			(0.63)		
Preliminary—commission				0.058	
				(0.76)	
Preliminary—any provision					−0.407+
					(0.08)
Definitive ceasefire	−0.768**	−0.826**	−0.878**	−0.881**	−0.771**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Democracy	−0.156	−0.241	−0.283	−0.263	−0.121
	(0.85)	(0.77)	(0.73)	(0.74)	(0.89)
Population (logged)	−0.197*	−0.178+	−0.170+	−0.172+	−0.226*
	(0.04)	(0.05)	(0.07)	(0.06)	(0.02)
GDP per capita (logged)	0.043	0.039	0.044	0.040	0.069
	(0.80)	(0.82)	(0.79)	(0.81)	(0.69)
Government incompatibility	−0.454+	−0.441+	−0.485+	−0.472+	−0.441+
	(0.07)	(0.09)	(0.07)	(0.06)	(0.09)
Number of conflicts in state	0.110	0.114	0.118	0.123	0.123
	(0.19)	(0.17)	(0.15)	(0.12)	(0.15)
Count dyads in conflict	0.366**	0.354**	0.318**	0.311**	0.317**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Peacekeeping	0.005	−0.017	−0.080	−0.090	−0.040
	(0.98)	(0.94)	(0.71)	(0.67)	(0.85)
Number of subjects	190	190	190	190	190
Number of observations	7,802	7,802	7,802	7,802	7,802
Number of terminations/failures	147	147	147	147	147
Time at risk	234,611	234,611	234,611	234,611	234,611
Log likelihood	−656.4	−656.4	−657.6	−657.7	−655.4
Chi-squared	241.6	204.2	219.8	231.7	219.6

Notes: Standard errors in parentheses $^+p < .10, ^*p < .05, ^{**}p < .01$

with international actors—that is tasked with overseeing the ceasefire more broadly).

In line with Fortna's earlier work, we first create a count variable capturing the sum of all possible provisions and include this in model 11 (table 3). We find a negative and statistically significant relationship, offering some preliminary evidence in line with Fortna's earlier argument relating to ceasefire agreement strength. However, in models 12–15, we disaggregate the provisions to assess their individual impact. As expected, the inclusion of each of these provisions appears to increase the duration of ceasefires agreements, but only verification has a significant effect ($p < .10$). It therefore appears that the inclusion of the monitoring provision is the dominant driver of agreement strength. Finally, we include a variable to capture the presence of any compliance provision within an agreement to assess if the provisions play substitutive role. The logic here is that depending on the context, different provisions may be adopted to perform similar purposes. The effect is in the expected direction, and the p value is below the least conservative measure of statistical significance ($p = .08$), but again the effect is driven by monitoring. It therefore appears that while other compliance mechanisms might have some marginal influence on the duration of ceasefires, preliminary agreements involving monitoring provisions are those most likely to endure.

Robustness Tests

To assess the robustness of our findings, we change a number of modeling specifications. We provide full detail of all the robustness checks in the online appendix, and here offer only a brief overview of the additional analysis. In all cases, our results are consistent with the primary analysis.

First, we reconsider the specification of our independent variables: (1) adding local and unilateral ceasefires (table A1 in the online appendix), (2) removing time-fixed ceasefires (table A2 in the online appendix), (3) removing observations beyond one year (table A2 in the online appendix), (4) using alternative measures for definitive ceasefire from the PA-X data (table A3 in the online appendix), (5) considering changes in ceasefire class that might result from subsequent "upgrade" agreements (table A4 in the online appendix), and (6) controlling for prior ceasefires (table A4 in the online appendix).

Second, we reconsider the specification of our dependent variable: (1) using an alternative calculation of conflict duration (table A5 in the online appendix), (2) strengthening and relaxing the temporal confidence level for the UCDP GED data (table A5 in the online appendix), (3) right-censoring those observations in which an agreement was replaced by another agreement (table A6 in the online appendix), and (4) including civilian fatalities (table A6 in the online appendix).

Third, we reconsider a number of our modeling assumptions: (1) clustering instead on UCDP conflict ID and Dyad ID (rather than country) (table A7 in the online appendix), (2) jackknife estimations to control for potential outliers (table A8 in the online appendix), (3) using a Weibull model (table A8 in the online appendix), (4) using different lagged violence variables (table A9 in the online appendix), (5) accounting for possible autocorrelation (table A10 in the online appendix), and (6) including a number of additional controls to account for possible omitted variable bias (table A11 in the online appendix).

Implications

Ceasefires play a vital role in civil conflict peace processes, but have until now been largely overlooked in the literature. To-date, it has been challenging for research to measure the effects associated with ceasefires in civil conflict, as studies tend to conflate a broad collection of agreements with different characteristics and often quite varied objectives. This practice conceals the differing logics that likely motivate the adoption of ceasefires (Akebo 2016). Our conceptual and theoretical framework aims to fill this gap. Building on bargaining theory, we argue that parties face different bargaining challenges over the course of a conflict, and that these challenges drive the underlying logic of ceasefire design. In particularly information poor environments, conflict parties are uncertain about the intent of the opponent and tend to adopt a lean agreement with a suspension of violence at its core, what we call a cessation of hostilities agreement. If parties see the benefits of a negotiated settlement, a ceasefire can help them create a conducive negotiation environment. In these cases, they tend to adopt ceasefires with compliance mechanisms, i.e., preliminary ceasefires that make defection more costly and the ceasefire more resilient to skirmishes and non-strategic violations. Finally, once conflict parties agree on how to address the underlying incompatibilities, a definitive ceasefire with demobilization provisions linked to the political settlement helps terminate the armed conflict and renders a return to full conflict violence more difficult and costly, particularly for the non-state actor.

Using new data on ceasefire agreements from 1990 to 2019, we find evidence that the class of ceasefire design strongly conditions their influence on civil conflict violence. Definitive ceasefires, followed by preliminary ceasefires, are associated with longer periods of violence suspension compared to cessations of hostilities. Our results highlight the importance of distinguishing ceasefire classes, for we may expect different trajectories when parties agree to a cessation of hostilities, a preliminary or a definitive ceasefire.

More generally, our analysis suggests that the design of ceasefires matters. We show that different outcomes are driven by the underlying ceasefire logic itself and by an independent effect of the provisions that are included in an agreement as a result of these varying logics. The difficulty lies in disentangling these effects (see, e.g., Fortna 2003, 344). In this article, we test for associations between ceasefire class and outcome. Future research could employ different research methods such as process tracing to further disentangle the effects, with cases such as the Sudan North–South process—discussed at the beginning of this article—offering interesting in-case variation.

In this article, we focus on the conflict party perspective, setting the role of third parties such as mediators aside. Yet our theoretical framework and our findings offer some insight into the important, if limited agency these actors may have in helping design ceasefires that hold. In particular,

our framework cautions against pressuring parties to adopt specific ceasefire provisions without an understanding of the case context. If conflict parties indeed use ceasefires and their provisions to address specific bargaining challenges, this limits the extent to which ceasefires can be optimized. Demobilization and incompatibility mechanisms combined are associated with the longest periods of violence suspension, but these provisions are the main outcome of political negotiations rather than technical add-ons. In many cases, it may make sense to implement a less comprehensive ceasefire, to silence the guns while the parties negotiate over these provisions. Similarly, in high-risk contexts, where parties do not have a history of cooperation, calling for compliance mechanisms may add an additional barrier to put an immediate halt to the violence. The risk that cessations of hostilities break down is higher, but they are put in place more easily and more quickly than preliminary ceasefires. And if they hold, they send a signal that parties are genuinely interested in exploring political negotiations. In short, our conceptual framework and our results suggest that conflict parties, and third parties offering technical support to them, should seek to devise agreements that are as comprehensive as possible, provided that the provisions are still aligned with the political context in which the ceasefire takes place.

Supplementary Information

Supplementary information is available at the *International Studies Quarterly* data archive.

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