Scraps of Paper? Agreements and the Durability of Peace

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Why does peace sometimes last and sometimes fall apart? What, if anything, can be done to enhance the durability of peace in the aftermath of war? Some cease-fires fall apart within days or months, others hold for years, while others last indefinitely. Why, for example, did a cease-fire in the Arab-Israeli war in 1948 fail within three months, while the next one lasted for years? Why has peace so often faltered between India and Pakistan but held, despite ongoing tensions, between North and South Korea? Surprisingly little theoretical or empirical work has explored this important question.

States have devised a number of mechanisms to try to make it easier to maintain peace. These mechanisms are often implemented as part of a cease-fire agreement. States set up demilitarized zones, accept international peacekeeping missions, establish dispute resolution procedures, sign formal agreements, and undertake other steps to try to enhance the prospects for peace. Do these measures work? If so, why? This article begins to answer this question by analyzing the duration of peace after international wars ending between 1946 and 1997. It draws on and develops theories of international cooperation to argue that measures such as these help enemies overcome the cooperation problem inherent in the aftermath of war. Students of international relations have long drawn on contracting theory and the new economics of organization literature to examine how actors can achieve cooperation even as anarchy makes it impossible to write enforceable contracts.[1] Scholar-

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1. See Coase 1988; Martin 1993; Moe 1984; Oye 1986; and Williamson 1985.

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ship in this vein points to a number of ways in which cease-fire agreements might influence the chances of maintaining peace. I argue that mechanisms within agreements can make durable peace more likely by changing the incentives to break a cease-fire, by reducing uncertainty about actions and intentions, and by preventing accidental violations from triggering another round of fighting. If this argument is correct, the content of cease-fire agreements should affect whether peace lasts. Individually and collectively, these measures should be associated with more durable peace, all else being equal.

Scholars of international relations in the realist tradition likely would argue that cease-fire agreements and the measures within them are at best epiphenomenal. In these scholars' view, agreements may reflect other factors that affect durability, but arguments that they themselves shape the chances for lasting peace are idealistic. In this view, agreements are merely "scraps of paper." They are not binding in an anarchical system and should have no independent effect on international behavior, least of all on decisions about war and peace.[2] To test the effects of agreements on the durability of peace, one therefore needs to control for other factors that affect the baseline prospects for peace. If, once these variables are included, agreement mechanisms have no effect, then one can conclude that agreements are only scraps of paper. If, however, agreements matter even when the baseline prospects are accounted for, this would support the argument that even deadly enemies can overcome the obstacles to cooperation.

A small but growing literature has begun to examine what makes peace easier or harder to maintain. For example, a number of scholars, including Zeev Maoz and Paul Hensel, have found that decisive victories tend to be more stable than stalemates.[3] Hensel also found that conflicts over territory were more likely to reemerge. In what is probably the most comprehensive examination of this issue to date, Werner finds that changes in relative capabilities over time provide the best explanation for the breakdown of peace.[4] She argues that the durability of peace is best examined as a decision to restart the war as part of an ongoing bargaining process, so that changes taking place after the fighting stops are most likely to affect whether it starts again.

The growing literature on "enduring rivalries" is closely related to the study of the resumption of war.[5] By selecting only cases of repeated conflict, much of this literature cannot address the question of why some rivalries endure while others do not. However, Stinnett and Diehl tackle this issue in their study of the paths to rivalry. They find, for example, that conflicts between contiguous states, between major powers, or between recently independent states are more likely to be

2. This is akin to the argument that international institutions are epiphenomenal. Mearsheimer 1994. See also Mearsheimer 2001. If agreements have no effect, however, it is not clear why states bother to write them. Leeds, Long, and Mitchell 2000.

3. See Maoz 1984; and Hensel 1994. Licklider 1995 found the same for civil wars.

4. See Werner 1997 and 1999. Her findings are discussed in greater detail below.

5. See, for example, Goertz and Diehl 1992; and Goertz and Diehl 1993.

repeated; that joint democracy reduces the likelihood of more conflict; and that territorial disputes and those ending in stalemates are more likely to endure.[6] At the other end of the rivalry life span, Bennett finds that domestic political factors such as regime type and issue salience affect the termination of rivalries.[7]

While scholars are beginning to learn why peace is harder to maintain in some cases than in others, there is not yet a good understanding of what can be done to make peace more likely to last. Existing works have only tangentially addressed whether deliberate mechanisms to try to maintain peace have been effective.[8] No systematic studies have explored whether and how the content of cease-fire agreements matters in the construction of lasting peace.[9] Are cease-fire agreements merely scraps of paper that have no effect on stability? Or is it the case that agreements can improve the prospect of a lasting peace?

The first section of this article develops cooperation theory to explain how specific mechanisms within cease-fire agreements might affect the durability of peace. This argument suggests that measures such as the withdrawal of forces, creation of demilitarized zones, formal cease-fire agreements, peacekeeping, third-party guarantees, and dispute resolution procedures should help foster peace that lasts. The more of these measures implemented, the longer peace should last, all else being equal. This section also lays out the counterargument and explores other variables that might be expected to affect the baseline prospects for peace. It is important to include these variables to guard against the possibility of finding spurious effects if these factors influence both the content of agreements and the duration of peace; in other words, to show that agreements are not epiphenomenal. The second section describes the econometric model and the data set of cease-fires in international wars used to test these hypotheses. The findings, presented in the third section, show that agreements are not merely scraps of paper; rather, the implementation of specific mechanisms within cease-fire agreements can help make peace last. Strong agreements lead to more durable peace.

In this study I define peace merely as the absence of war. I do not distinguish between relations that become very friendly and those that remain acrimonious despite the absence of violence. Under my definition, North and South Korea have been at "peace" for half a century. Clearly, not all varieties of peace are equally desirable, nor does stability necessarily coincide with social justice. Nevertheless, most wars cause poverty, disease, and dislocation, and all entail the large-scale loss of human life. Repeated conflict only exacerbates these tragedies. This study not only indicates that states can overcome obstacles to maintaining peace in war-torn areas, but also identifies the most effective ways of doing so.

6. Stinnett and Diehl 2001.

7. Bennett 1998. See also Goertz and Diehl 1995.

8. There has been more work done on this question for civil wars, including Walter 2001; Hampson 1996; and Hartzell, Hoddie, and Rothchild 2001.

9. Werner and others have examined the effects of negotiated settlements or of peace treaties (as opposed to armistices), but not of the content of the arrangements implemented.

Cooperation Theory and Agreements

Maintaining peace in the aftermath of war requires cooperation. Because war is costly, there is shared interest in avoiding renewed hostilities. This shared interest, however, does not automatically lead to peace. Recent belligerents have deeply conflicting interests and strong incentives to take advantage of each other.[10] They also have good reason to fear each other's intentions. Cooperation is therefore difficult to achieve. I argue that cease-fire agreements can foster cooperation in several ways, by changing incentives, by reducing uncertainty about actions and intentions, and by controlling accidental violations of the cease-fire.

This argument rests on three assumptions: (1) that states are rationally led; (2) that war is costly, and not desired for its own sake; and (3) that each ex-belligerent has incentives to take advantage of its opponent, or good reason to fear its opponent's intentions. I do not assume that both belligerents reach a cease-fire on equal footing.[11] There are usually winners and losers in war, and at least one side's acceptance of a cease-fire may have been "coerced." However, unless one side is completely eliminated in war, both sides can impose costs on each other, and the problem of cooperation maintains.[12]

First, by "rationally led" I mean that leaders make decisions purposefully and that they consider the expected costs and benefits of their actions. Leaders are not omniscient; they can make mistakes. But I assume that leaders do not act randomly, nor will they act in ways that they expect will be contrary to their interests. I do not assume that states are unitary actors, however. Leaders are subject to domestic political pressures, and may not exercise full control over all of those in whose name they lead.

Second, to say that actors prefer peace to war is not to say, naively, that they prefer peace to the possibility of winning a war and dictating terms, but to say that they would prefer to reach the outcome of war without the cost of fighting it. War is costly in terms of lives and money, and it is risky—there is always the chance of losing rather than winning. As Fearon has explained, war is "*ex post* inefficient."[13] Unless fighting is preferred for its own sake, even enemies would prefer to settle their disputes without resorting to war.

The inefficiency of war does not necessarily result in peace, however. This study concerns states who were recently at war, and who are, by definition, deadly en-

10. A shared interest in peace combined with conflicting individual interests constitutes the problem of cooperation. On the distinctions between harmony, cooperation, and deadlock, see Keohane 1984. See also Oye 1986.

11. For the sake of simplicity, I discuss the problem of cooperation as involving only two states. A number of wars in this study have multiple belligerents. These are split into separate dyadic observations in the quantitative research discussed below.

12. Kecskemeti 1964. The only case examined here in which one side was eliminated by the other is South Vietnam's fall to the North in 1975.

13. Fearon 1995.

emies.[14] I assume, third, that relations between adversaries are marked by seriously conflicting interests and deep mistrust. It is unlikely that the war settled the conflict to both parties' satisfaction. Indeed the war may have caused new issues of conflict. Both sides face incentives to take advantage of each other. They are bargaining over some disputed issue. If either side thought it could march in and take what it wanted without meeting much resistance, it would probably choose to do so. States prefer peace to war, but not to settling the dispute on their own terms. Conflicting interests give belligerents an incentive to break the cease-fire in a bid to make unilateral gains on the battlefield. This is the familiar game of prisoner's dilemma.

There may also be cases where neither side would prefer to attack, even unopposed. However, there is no easy way for actors to know this. In an atmosphere of deep mistrust in the aftermath of war, each side has good reason to fear attack from its opponent. Uncertainty and fear about the other's intentions can undermine cooperation even where perfect information would automatically yield a cooperative outcome. Security dilemma dynamics and their spirals of fear and hostility are especially likely among states who have recently engaged in mortal combat.[15] With communication channels severed during the war, and enemies likely to assume the worst about each other, incidents along the cease-fire line, even if accidental or the result of rogue forces, can reignite war. Peace is precarious.

A hypothetical case helps illustrate the obstacles to peace. Imagine two states that have just fought a war over a piece of territory (Israel and Syria in 1973, perhaps, or El Salvador and Honduras after the 1969 Football War). The war was costly and the two states would prefer not to fight again, but they would each like more of the disputed land, preferably all of it. Both believe it to be rightfully theirs, and domestically, occupation of any part of it by the enemy is seen as a travesty. The side that lost territory in the war has an incentive to try to win it back, and the side that gained may hope it can now claim more. Both sides therefore have incentives to try to encroach upon the other, or even to make a dramatic advance, to push the cease-fire line farther toward the other side.

Moreover, both states have good reason to fear encroachment or attack by the other. These fears have likely been exacerbated by leaders' inflammatory remarks for domestic consumption. Both sides will be particularly wary of military maneuvers, resupply efforts, or anything that might be a precursor to a new attack. When the fighting stopped, soldiers were likely left in close proximity to their enemies, facing each other "eyeball-to-eyeball" across the cease-fire line. The chance of troops firing across the line or of skirmishes as each side tries to improve its position is quite high. If irregular troops were involved in the fighting, or if com-

14. Peace is more or less automatic among friendly states, or among states who are far away from, and have little to do with, each other; between Belize and Mozambique, say. For a related discussion of "politically relevant" dyads, see Maoz and Russett 1993.

15. Jervis 1978. In assurance games such as stag Hunt, it is the grave payoff of being attacked and the difficulty of assessing intentions that makes cooperation risky.

mand and control are somewhat loose, there may be incidents of unauthorized attacks or advances. In such a tense atmosphere of mistrust, with normal diplomatic channels cut, such small clashes can easily escalate. Whether through deliberate action, spirals of fear and preemption, or accident and involuntary defection, the probability of war erupting anew is high.[16]

Although both sides are better off with peace, they cannot simply declare peace and leave it at that. Their commitments to maintain peace are not credible.[17] An actor with hostile intentions has an incentive to say it will abide by the cease-fire so that its partner will cooperate and be "suckered" into letting down its guard and perhaps leaving itself vulnerable to attack. In international relations, of course, there is no external enforcement power to prevent actors from such cheating. This is the central problem of cooperation under anarchy in international relations.

So how do deadly enemies ever achieve peace? Cease-fire arrangements rely on reciprocity and mutual deterrence. Each side stops fighting in exchange for the other side doing the same. If either breaks the cease-fire, the other will respond in kind. It is the prospect of return fire that deters attack. This is so central to the notion of a cease-fire that it may seem quite obvious. However, for reciprocity and deterrence to work, several things must be true: the cost of reinitiating conflict must outweigh the incentives to attack; it must be easy to distinguish compliance from noncompliance; both sides must be reassured about each other's intentions, especially if a there is a military advantage to striking first; and accidents must be prevented from triggering another war. These requisites suggest both the obstacles to peace and strategies for overcoming them.

Cease-fire agreements can employ three types of strategies to ensure that peace lasts: changing incentives by making it more costly to attack; reducing uncertainty about actions and intentions; and preventing or controlling accidental violations. These strategies suggest specific observable mechanisms, the effects of which are tested below.

Altering Incentives

War will resume if the incentives to attack exceed the cost of breaking the cease-fire. But there are steps belligerents and the international community can take to increase the costs of an attack. These steps widen the bargaining space between belligerents and make another bout of war less likely. Adversaries can tie their

16. Reiter 1995 found preemption to be rare as the sole cause of war. But conflicts that start or escalate to war through preemption are most likely among deadly enemies, such as Israel and its Arab neighbors in 1967. Similarly, wars rarely start purely by accident, but escalating clashes, often at least partially the result of accidents or unauthorized action, can contribute to the spiral toward war. Such was the case between India and Pakistan in 1965, and arguably again in 1999. Escalating clashes led to the second war between China and Vietnam, and to serious fighting short of full-scale war between Honduras and El Salvador in 1976.

17. For analyses of the problem of credible commitments as an obstacle to peace see Fearon 1995; and Walter 2001.

own hands by physically constraining their ability to attack. Withdrawal of troops from the front line, creation of a demilitarized buffer zone, and arms control make remobilizing for war more difficult. These actions also make a successful surprise attack much less likely.

Belligerents may also be able to alter incentives by declaring their cease-fire formally. By signing a formal agreement, states invoke international law. Of course, with no higher authority to enforce it, international law is not binding in the way that domestic law is. International agreements can be broken, but breaking them risks losing international aid and military support, and legitimizes retaliation by the other side. Formal and public declaration of a cease-fire thus invokes international audience costs.[18]

Actors may also turn to outsiders to help them enforce a cease-fire. Commitment by a third party to guarantee the peace serves as a deterrent, again by raising the cost of noncompliance. An external guarantor takes on some of the responsibility for retaliation in the event of defection. The presence of peacekeeping troops interposed between forces may also serve as a physical and reputational buffer to ensure the cease-fire.

Reducing Uncertainty About Actions and Intentions

Agreements can reduce uncertainty by specifying the terms of a cease-fire. Marking the exact location of the cease-fire line provides a focal point that can help prevent "salami tactic" attempts to push the line to either side's advantage. Spelling out the rules of the cease-fire explicitly helps to define compliance and noncompliance, which serves to prevent misunderstandings and avoid unnecessary tension. The more specific the agreement, the less uncertainty there will be about what constitutes compliance.

Verification mechanisms can alleviate concerns about detecting aggressive moves by the opponent in time to respond. Monitoring may be less important in cease-fire agreements than other sorts of agreements, because states are likely to rely on national intelligence for warning of an attack, and it is difficult to hide aggression once it starts.[19] However, neutral referees can play an important role in fostering stable peace. Because it is costly to be seen as the aggressor, states will try to blame the other side for any fighting that starts. Without neutral observers, claims of being the victim of aggression are not credible and there are bound to be disputes over "who started it." Monitors to investigate incidents and provide

18. Agreeing to peace and signing a formal document in the first place may involve substantial domestic audience costs if peace is unpopular with some groups. Both Anwar Sadat and Yitzhak Rabin paid, tragically, with their lives. In cases such as these, audience costs serve a very different role: willingness to make peace despite significant domestic opposition serves as a credible signal of commitment. Martin 1993.

19. On verification in the context of arms control, see Schelling and Halperin 1961, chap. 9; and Gallagher 1999.

unbiased information on compliance are therefore important for distinguishing unprovoked aggression from legitimate retaliation. The international audience costs of breaking a cease-fire, therefore, often depend on impartial monitoring.

Physical constraints, audience costs, and third-party guarantees or peacekeeping efforts change belligerents' incentives, but also serve as important signaling devices that can reduce uncertainty about intentions. Willingness to accept measures that make war more costly is a credible signal of benign intent. States contemplating an attack will be less willing than those with nobler intentions to sign on to measures that increase the physical or political cost of fighting. Critics might argue that this concedes the point that agreements are epiphenomenal; only those who intend to abide by the cease-fire will agree to strong mechanisms, but it is the intentions, not the mechanisms, doing the causal work. This argument is unfalsifiable, as is there is no way to measure intentions a priori (if there were, international relations would be very different and war might not exist at all). But it also misses the point. Of course intentions matter. One of the ways in which agreements affect the durability of peace is by providing credible ways of signaling these intentions and overcoming the security dilemma.

In the abstract, there are two distinct causal pathways possible: one in which agreement mechanisms influence peace directly by constraining states or providing information, and another in which mechanisms simply signal intentions. However, the two pathways are not so easily distinguished in reality. As the literature on signaling and "cheap talk" suggests, if there are incentives to misrepresent, as there surely are among deadly enemies, signals are only credible if they are costly. For a state to limit its ability to wage war, or to open itself up to verification is costly, and therefore credible. That is, the indirect signaling function depends in large part on the more direct effects of agreement mechanisms.[20]

Controlling Accidents

Reciprocal strategies can be very vulnerable to accidents and misunderstandings. If troops stray over the cease-fire line, or fire accidentally, and the other side retaliates, the situation can quickly spiral back into full-blown war. If leaders do not exercise full control over their troops (or in some cases over civilians), rogue groups opposed to peace can easily upset it by violating the cease-fire and provoking retaliation.

Ongoing negotiations and dispute resolution procedures can alleviate this danger by preventing misunderstandings and providing a forum for resolving differences before a spiral of retaliation is triggered. However, because both sides have

20. Some of the mechanisms examined here signal by "tying hands," creating costs only if a state reneges on its commitment. This is true of the reputational costs invoked by a formal agreement, for example. Others "sink costs" by requiring payment *ex ante*, for example withdrawing from territory. Others, such as verification measures, may do both. On this distinction, see Fearon 1997.

an incentive to blame violations on accidents or rogue factions, communication by itself may not always be credible.

Withdrawal of forces, buffer zones, and arms control can help prevent accidents and misunderstandings from occurring in the first place.[21] "Confidence-building measures" to regulate and make transparent behavior (such as military exercises) that is likely to cause tension can also prevent misunderstandings and alleviate suspicions. Cease-fire agreements often hold each state responsible for violations coming from its own territory, to prevent these violations from being used as an excuse for intentional defection. Agreements may also include concrete measures for internal control to deal with this problem of "involuntary defection."[22] In addition to acting as referees, international monitors investigate and mediate small clashes and disputes to keep them from escalating.

The theory put forth here is an institutionalist argument about mechanisms to overcome the obstacles to cooperation. I hypothesize that agreements can enhance the durability of peace by raising the cost of breaking a cease-fire, reducing uncertainty, and preventing and controlling accidents. While these three strategies for maintaining peace are presented separately, their functions are intimately connected, and specific mechanisms often serve several purposes. For example, monitoring by peacekeepers reduces uncertainty by ensuring that defectors will be caught. This also raises the cost of reinitiating war. In practice, much of peacekeepers' day-to-day work entails mediation and the prevention of small clashes from spiraling out of control. Physical constraints that alter the incentives for war also necessarily reduce fears of impending attack and reduce the likelihood of accidents. Belligerents' willingness to implement measures to tie their own hands and raise the cost of attack serves as a credible signal of commitment and thereby reduces uncertainty and makes accidents easier to control.

While analytically distinct, the strategies of raising costs, reducing uncertainty, and controlling accidents therefore overlap in practice. The strategies themselves cannot be observed directly. But the specific mechanisms discussed above can be observed and their effects tested empirically. I focus on the following measures: withdrawal of forces, establishment of demilitarized zones, arms control, measures to control potential rogue groups, third-party involvement, peacekeeping, confidence-building measures, dispute resolution procedures, the specificity of agreements, and whether agreements are formal or tacit.

I use the term "strength of agreement" to refer to the number and extent of the measures implemented as part of a cease-fire. Agreement strength varies from none, if a cease-fire takes place with no agreement or without implementing any of the measures listed above (as when the second war between China and Vietnam sim-

21. On the role of arms control in providing stability, see Jervis 1993.

22. For example, irregular forces were disarmed after the Football War between El Salvador and Honduras. The United Nations Emergency Force was given responsibility for pursuing *fedayeen* (guerrillas) in the Sinai after 1956.

ply fizzled out with no real cease-fire agreement), to very strong if the agreement implements significant buffer zones, peacekeepers, confidence-building measures, is formal and very specific, and so on. (The agreements reached between Israel and Egypt after the Yom Kippur war, as well as the Korean Armistice, are examples.) If the cooperation theory spelled out here is correct, peace should last longer, ceteris paribus, the stronger the agreement implemented. Furthermore, each of the individual measures should be associated with more durable peace. Both together and separately, these mechanisms are hypothesized to increase the stability of peace.

Political Settlement

Altering incentives, reducing uncertainty, and controlling accidents are all rather apolitical strategies for avoiding war. But the political content of an agreement should also be important. Resolving the underlying issues of conflict, if it is possible, is a way of removing the reason to fight. Whether an agreement purports to settle the political issues over which the war was fought, rather than simply to stop hostilities, should affect stability. I focus on the more mechanical tools for maintaining peace, because settlement of the basic political issues, whether by agreement or by force, is quite rare in the post–World War II era. Most wars end with the fundamental issues still in dispute, even if one side clearly won the war (Israel's decisive victory in 1967 did not settle the Arab-Israeli issue, for example). Nevertheless, when a settlement of substantive political issues is reached, whether imposed or agreed to, one should expect it to be associated with stable peace.

The Counterargument: Agreements Are Epiphenomenal, Merely "Scraps of Paper"

All else being equal, stronger agreements should lead to more durable peace. All else is not equal, however. The agreement aside, peace will be easier to maintain in some cases than in others. The counterargument to the hypothesis that agreements can foster peace is that when cooperation is relatively easy, parties will be able to draft strong agreements. These are the very cases in which peace will last in any case. Conversely, when cooperation is difficult and the chances of peace falling apart are high for other reasons, belligerents will be unable to conclude agreements that do anything more than paper over differences. Any apparent relationship between the strength of agreements and the duration of peace is therefore spurious. According to this argument, agreements are merely epiphenomenal; they reflect other factors that determine the duration of peace but have no independent effect of their own.

In related research I have tested this counterargument directly, examining whether stronger agreements are implemented when these situational variables make peace easier or harder to maintain. I have found little evidence that states only implement strong agreements in the easy cases. If anything, just the opposite is true,

with strong agreements more likely when they are most needed; that is, when these control factors make peace most precarious.[23] Nonetheless, it is crucial to control for other variables that might affect the baseline prospects for peace (the "degree of difficulty," as it were) to test accurately the effects of cease-fire agreements.[24] In the empirical tests below, I control for a series of factors that make peace more or less difficult to maintain. Following other studies of the resumption of war, one should expect peace to last longer after decisive military victories than after stalemates.[25] Because the cost of war is the main reason to cooperate in the first place, one might also expect peace to be more stable the more costly the war just fought. Belligerents with a history of conflict before the war are likely to have a harder time maintaining peace, either because repeated conflict is a good indicator of the intractability of the dispute or because conflict breeds future conflict. One might expect cooperation to be most difficult when war threatens states' very existence or when the fight is over territory.[26] Because contiguous states are more likely to fight in the first place, one might expect them to be more likely to fight again than states separated by more than a border.[27] Changes in relative military capabilities should also affect the durability of peace. Research on democracy and war suggests that dyads that become jointly democratic should be able to maintain peace.[28] Bueno de Mesquita and Lalman's measure of states' "expected utility for war" might help one predict when a war will resume.[29] Whether the war was bilateral or included more than two states might also affect stability.

If the counterargument that cease-fire agreements are epiphenomenal is correct, the strength of agreements should have no bearing once these other factors are taken into account.

Method: Model and Data

The Econometric Model

This article examines the duration of peace; why some cease-fires fall apart quickly while others last longer. Early studies of durability judged the success or failure of peace dichotomously by whether the conflict resumed within some time period

23. Fortna forthcoming, chap. 4.
24. Downs, Rocke, and Barsoom 1996.
25. Wars that end with a victor-imposed regime change are particularly stable. Werner 1999. There are only a few such cases in the data examined here, however. Controlling for this variable by dropping these cases makes no change to the results presented.
26. See Powell 1991; Fearon 1998; and Smith and Stam 2001. See Hensel 2000 for a review of studies of territorial conflict.
27. See Bremer 1992; and Hensel 2000.
28. See Russett 1993; and Brown, Lynn-Jones, and Miller 1997. Leadership changes do not have a significant effect on the resumption of war. Werner 1999.
29. Bueno de Mesquita and Lalman 1992. See also Bennett and Stam 2000b.

(five years, say). The use of an arbitrary time period is problematic, however. What one chooses as the time limit by which to judge success can significantly affect results. One could instead use the criterion of whether war has ever resumed to distinguish permanent peace from any cease-fire that fails. This would at least be an analytic, rather than arbitrary, distinction between the two categories. However, this method runs into another problem—the issue of "censored data." Peace that has lasted to date may not continue to hold. Even if peace has lasted quite a long time, one cannot know how long it will continue to last. Israel and Syria have not fought a full-fledged war in almost twenty years, but they might yet.[30] Those cases in which peace has lasted to date are considered "censored."

Fortunately, a class of econometric models exists that avoids all of these problems. Duration models (also known as hazard rate or survival time models) estimate the effects of independent variables on the length of time something lasts, and the models can incorporate our uncertainty about how long the phenomenon (in this case, peace) will continue into the future. Of the several duration models to choose from, I use a Weibull model. Unlike some models, it does not require an assumption that the hazard rate (the instantaneous rate of failure given survival to a given point) is constant over time. The Weibull, therefore, allows us to test competing hypotheses about whether peace becomes easier or harder to maintain over time. The Weibull does, however, assume that the shape of the hazard rate is monotonic. To see whether this is a reasonable assumption, I have also run a Cox proportional hazard model that makes no assumption about the shape of the hazard. The findings are not significantly different, suggesting that the Weibull model is appropriate. The Weibull gives more precise estimates in a small data set like the one used here.[31]

The Cease-Fires Data Set

To test the hypotheses laid out above, I constructed a data set that includes information on cease-fires and how long they lasted; on the situation between the belligerents at the time of cease-fire (their history of conflict, the decisiveness of military victory, etc.) as well as changes over time (in relative capabilities, regime type, etc.); and detailed information on the nature and content of any agreement and peace mechanisms that accompanied or followed the cease-fire.

The data set covers cease-fires in international wars ending between 1946 and 1997. Each case is a cease-fire between a pair of principal belligerents in the

30. India and Pakistan fought a war in the Kargil region in 1999 after the data used here were censored, underlining the importance of treating with care our uncertainty about peace that has lasted to a certain point.

31. Box-Steffensmeier and Jones 1997, 1435. For a technical explanation of duration models, see Greene 1993.

Correlates of War Version 3 (COW) data set's list of interstate wars.[32] I split multilateral wars from the COW data set into separate dyads and eliminated minor participants.[33] A cease-fire is defined as an end to or break in the fighting, whether or not it represents the end of the war. It need not be accomplished through an explicit agreement. COW wars in which fighting stopped and started again are divided into separate cases, one for each cease-fire. During the first Arab-Israeli war in Palestine, for example, there was a break in the fighting in 1948 in accordance with a United Nations (UN) Security Council resolution ordering a cease-fire. Three months later, the cease-fire failed when Israel launched an offensive to seize the Negev. Another cease-fire ended the war in 1949. I treat these as distinct cases. History tends to forget the failed cease-fires, focusing only on the ones that succeeded in ending the war. Breaking these into separate cases is therefore crucial to avoid selecting on the dependent variable.[34] Cease-fires range in length from two weeks (the first Turco-Cypriot cease-fire) to fifty years and counting (Korea).

Because wars that start and stop again are treated as separate observations, and because multilateral wars are split into dyads, not all of the cases in the data set are independent of one another. I correct for the statistical problem of autocorrelation by calculating robust standard errors,[35] but a substantive caveat should also be noted. Because the Arab-Israeli conflict has been both multilateral and oft-repeated, much of the data set thus consists of Middle East cases. Domination of the data set by one conflict raises issues of generalizability. However, in neither the quantitative work, nor related case-study research have I found significant differences between the Middle East cases and others that would skew results.[36]

There are forty-eight cease-fire cases in the data set. They are listed in Appendix 1. Each of these cease-fires is a subject for which there are multiple observations over time, each of a year or less, for a total of 876 observations. This allows me to record changes in military capabilities over time, the arrival or departure of peacekeepers, or the fact that a new agreement has been reached implementing new measures. These are known as "time-varying covariates" in the duration analysis lingo. For each subject, the time spans run continuously to the start of a new war or the end of the data at the beginning of 1998. The duration model treats

32. One interstate war from the COW list is dropped because it never reached an interstate cease-fire. The war between Vietnam and Cambodia "ended" with the installation of a pro-Vietnam government, but the fighting between this new government and the Khmer Rouge continued as a civil war.

33. Defined as those contributing less than one-tenth the number of troops committed by the largest provider of troops.

34. I used COW data on when states "left" and "reentered" the war, supplemented by my research, to determine these breaks in the fighting. It is possible that I have missed some very short-lived cease-fires. This selection bias should work against my own argument, however, as brief cease-fires are much more likely to be reported if accompanied by strong agreements than by weak ones.

35. These are calculated using Huber's method, with cases clustered by conflict. All of the Arab-Israeli cases are one cluster, all of the India-Pakistan cases another, and so on. Cases are assumed to be independent between clusters but not necessarily within clusters.

36. Where controlling for Arab-Israeli cases made a significant difference in the results, it is discussed below.

each subject as a history, focusing on whether peace survived each time period in the history. Peace is considered to fail at the start of another COW war between the same two belligerents. The data set is censored at the end of 1997.[37] War resumes eventually in twenty-one cases, and is censored in the other twenty-seven.

Data on the various aspects of agreements come from my research on each case.[38] I investigated and coded the following aspects of agreements: the extent of withdrawal of forces, demilitarized zones, arms control measures, peacekeeping (whether a monitoring mission or a peacekeeping force, and whether the mission was new or was left over from a previous mission before the war broke out), third-party involvement in peacemaking or guarantees of the peace, the specificity of any agreement, whether it was formal or tacit, dispute resolution procedures, confidence-building measures, measures to control possible rogue action, and whether the political issues over which the war was fought were settled.[39] See Appendix 2.

Not all of the cease-fires are accompanied by agreements, of course. The data set includes a number of cases in which fighting stopped with a unilateral withdrawal, in which war simply fizzled to an end with no explicit cease-fire, or in which fighting ended with the installation by one side of a "friendly" government for the other (as in Hungary in 1956). In such cases, the mechanisms under discussion here are coded as zero unless measures were implemented in the absence of an agreement.

Agreement strength is measured in two ways. One is simply an index of the mechanisms implemented, with a point for a demilitarized zone, another for arms control measures, half for a monitoring mission or one for an armed peacekeeping force, and so on. This measure is crude but has the benefit of being objective and replicable by others. It ranges from 0 to 10. The other is a more subjective coding of the extent of the measures implemented. This measure is a five-point scale ranging from none for cease-fires with no mechanisms (Russo-Hungary or Uganda-Tanzania, for example) to very strong for formal, detailed agreements with peacekeeping contingents, demilitarized zones, dispute resolution procedures, and so on (the Korean Armistice and the Egyptian-Israeli agreements after 1973 fall into this category). It is derived from a qualitative comparison of all of the cases in the data set.[40] The objective and subjective measures are highly correlated (.88).

37. The North Vietnam–South Vietnam case is censored immediately because South Vietnam ceased to exist.

38. Sources included references surveying international conflict in the postwar era (including Bercovitch and Jackson 1997; Brogan 1992; Butterworth 1976; Goldstein 1992; Miall 1992; and Tillema 1991), secondary sources on each conflict, and primary documents, including cease-fire agreement texts.

39. To prevent my own knowledge of outcomes from biasing my coding, I coded the cases "blind," that is, hiding proper names or other information that would allow me to identify the case. While it was not feasible to have someone duplicate the entire data set to check inter-coder reliability, a research assistant "spot checked" randomly selected cases.

40. Note that neither measure includes whether the agreement settled the political issues over which the war was fought, which I consider separately.

Using both helps ensure that the subjective coding is not biased and that the objective coding is fairly accurate.

Data on situational or control variables come from existing data sets. A dummy variable marks whether the war ended in a tie or in a military victory for one side. The COST OF WAR measure is based on battle deaths. HISTORY OF CONFLICT measures the extent to which the belligerents' shared past is marked by serious disputes. I include measures noting whether one side's very existence was threatened by the war, whether the fight was over territory, whether belligerents are contiguous, and whether the war involved more than two states. Following Werner, I use the COW material capabilities data to measure changes in relative capabilities.[41] Measures of expected utility were generated in EUGene.[42] Appendix 2 provides more specific details of coding and data sources.[43]

Findings

Baseline Prospects for Peace

With a relatively small data set, it is not possible to test all of the hypotheses outlined above simultaneously. I begin with an assessment of the baseline prospects for peace, leaving the agreement aside for the time being. Table 1 shows the statistical results. Coefficients indicate the effect of variables on the hazard of war resuming. Positive coefficients indicate variables associated with peace that falls apart more quickly (a higher hazard of failing), and negative coefficients mark variables associated with more durable peace (a lower risk of another war). To give a sense of the relative size of effects, the right-hand column presents estimated hazard ratios for variables found to have a significant effect. Hazard ratios are interpreted relative to a baseline of one: a ratio of 0.50 indicates that the hazard is cut in half, while a ratio of 2.0 indicates a doubling of the risk of another war.

Wars that end in a tie are much (twenty-seven times) more likely to be repeated than those that end with a decisive victory for one side. More costly wars are followed by substantially more durable peace, all else being equal. Peace is significantly more fragile between belligerents with more acrimonious shared histories, and is almost six times more precarious when one side's existence is threatened

41. Because democratic dyads never fight, there are no cease-fires between democratic states, but some dyads become jointly democratic after a cease-fire is in place (for example, Britain and Argentina after 1983). Joint democracy may make peace more durable, but the finding depends largely on how one codes Cyprus during the extremely short-lived cease-fire in 1974. It is also called into question by the 1999 Kargil War between India and Pakistan (which occurs after the data used here are censored). For further discussion of these cases and the relationship between democracy and the durability of peace, see Fortna forthcoming, chap. 3. Here, I control for the possible effects of the democratic peace by dropping those few observations in which both states are democracies (based on Polity data) in some tests.

42. Bennett and Stam 2000a.

43. Complete data is available online at ⟨http://www.columbia.edu/~vpf4/scraps.htm⟩.

TABLE 1. *The baseline prospects for peace (Weibull estimates)*

	1 Baseline prospects	*2 Territory*	*3 Lagged shift in capabilities*	*4 Expected utility measures*	
Variables	*Coefficient (RSE)*	*Coefficient (RSE)*	*Coefficient (RSE)*	*Coefficient (RSE)*	*Hazard ratio*
TIE	3.50*** (0.26)	2.61*** (0.43)	1.21 (1.49)	3.44*** (0.16)	27.35
COST OF WAR	−0.70*** (0.19)	−0.59*** (0.17)	−0.26 (0.27)	−0.73*** (0.20)	0.51
HISTORY OF CONFLICT	1.13*** (0.22)	1.24*** (0.24)	1.42*** (0.45)	1.04*** (0.20)	2.90
EXISTENCE AT STAKE	1.87*** (0.26)		0.29 (0.24)	1.61*** (0.27)	5.70
TERRITORIAL CONFLICT		0.88 (1.07)			
CONTIGUOUS	0.73** (0.29)	0.21 (0.55)	0.65 (0.55)	0.88** (0.43)	2.08
MULTILATERAL WAR	−0.08 (0.35)				
CHANGE IN RELATIVE CAPABILITIES	0.90*** (0.19)	0.73*** (0.19)		3.20*** (0.35)	2.42
LAGGED CHANGE IN CAPABILITIES			−3.71*** (0.76)		
EU: DEMAND PREDICTED				−1.12** (0.53)	
EU: WAR PREDICTED				−0.95 (0.60)	
Constant	−6.34*** (1.92)	−4.76*** (1.62)	−14.55*** (1.72)	−4.68*** (1.82)	
Shape parameter *p*	0.81* (0.09)	0.64*** (0.11)	1.49*** (0.14)	0.77* (0.11)	
N	727	770	748	556	
Subjects	47	48	40	41	
Log likelihood	−42.08	−51.43	−25.45	−36.52	

Note: Cases of joint democracy are dropped in Model 1. Model 3 is affected by missing data bias. Negative coefficients and hazard ratios <1 indicate decrease in risk of another war (increase in duration of peace). Positive coefficients and hazard ratios >1 indicate increase in risk of another war (decrease in duration of peace). RSE = robust standard errors. ***$p \leq .01$. **$p \leq .05$. *$p \leq .10$. Two-tailed tests used.

by the conflict.[44] Contrary to many other studies of the importance of territorial conflict, Model 2 shows that wars over real estate are not significantly more likely to resume than wars over other issues. Territorial disputes may be more salient than other issues over which states rattle their swords, but not more important than other issues over which states have already deemed it worth fighting a war. Neighboring states are estimated to be twice as likely to fight again, but this finding is not always statistically significant.[45]

As Werner's argument would predict, changes in relative capabilities over time do seem to be associated with the resumption of war. But it is not entirely clear from this finding which way the arrows run. Do changes in relative capabilities lead to war, or does war lead to changes in relative capability? For example, was the India-Pakistan war over Bangladesh caused by Pakistan's falling capabilities, or did the war, which severed Pakistan in two, cause our measures of capability to drop? Because many of the factors that go into the measure of a state's capability (population, energy consumption, and iron and steel production, among other things) are not likely to have an immediate effect on war-fighting capability, I lagged the measure of the change in relative capabilities by one year (see Model 3). The positive effect on the risk of war drops away completely. In fact, the lagged variable shows that power shifts are associated with much more durable peace. This is probably the result of a missing data bias,[46] as it is unlikely that shifts in power are actually stabilizing. These results, however, cast significant doubt on the finding that changes in relative capabilities cause peace to break down.[47]

The results for predictions of conflict in Buena de Mesquita and Lalman's expected-utility international interaction game are inconsistent over various specifications of the model; in many (such as Model 4), they are associated with more durable peace, exactly the opposite of what their predictions would expect.[48] Controlling for the democratic peace by dropping cases in which both sides have become democratic does not significantly change other results.[49]

44. The latter finding is driven largely, but not entirely, by the Arab-Israeli cases.

45. While neighbors are more likely to fight in the first place, all of the states in these data have proven themselves to have both reason to fight and the ability to reach each other militarily. It is thus not surprising that the effects of contiguity are weaker for the resumption of war than for propensity to fight in the first place.

46. Data for this lagged variable are missing for the first year of each cease-fire. Inclusion of this variable thus excludes the most short-lived cease-fires, those that fail within one year.

47. This hypothesis deserves further testing with finer grain measures of military capabilities. Some components of the COW capability index (military manpower and expenditures, for example) are likely to affect war-fighting ability more quickly than others (those tapping industrial power). War also is likely to affect some components more quickly than others. To further complicate the picture, it may be that states ramp up their military capabilities in anticipation of impending war, so that changing capabilities may be an indicator, rather than a cause, of war.

48. The results are no stronger if I generate predictions using S, as suggested by Signorino and Ritter 1999, rather than Tau-B to measure policy similarity.

49. Democracy in one but not both states is associated with very unstable peace, but this finding is driven entirely by the cases involving Israel and India and is not robust to alternative model specifications. While states in transition to democracy might be especially war-prone, democratization has no significant effect on the durability of peace. See Mansfield and Snyder 1995.

These findings suggest that it will be much harder to maintain peace in a case like the 1948 cease-fire in the Arab-Israeli War—which took place without a clear victor, between states whose entire history was marked by violence, and with the very existence of one side at stake—than in a case such as the Falklands War, fought by states a long distance from each other with little previous history of militarized conflict, ending in a very lopsided victory for Britain, with a relatively low death toll.

In sum, then, to control for the baseline prospects for peace, one needs to control for the decisiveness of victory, the cost of war, the belligerents' previous history of conflict, and whether the war threatened one side's existence. To be safe, one might also want to control for contiguity, joint democracy, and for changes in relative capability, though the latter might be spurious.

Agreement Strength

Table 2 shows the effects of the strength of cease-fire agreements (measured in two different ways) on the durability of peace. Estimates of both coefficients and hazard ratios are given. The subjective coding of agreement strength is a categorical variable (none, very weak, weak, moderate, strong). Model 1 shows the comparison to the omitted middle category (weak). As expected, the strongest agreements yield the most durable peace, and moderately strong agreements perform better than weak ones. Compared to the median agreement (weak), moderate agreements reduce the risk of another war by an estimated 57 percent (as indicated by the hazard ratio of 0.43), and strong agreements reduce the hazard of failure by more than 80 percent. Very weak agreements are associated with the least durable peace, faring perhaps even worse than no agreement at all. But compared to the middle category, peace falls apart more quickly with both very weak and no agreements. These effects are jointly significant.[50]

The findings are even clearer if one uses the objective index of agreement strength (Model 2). The negative and statistically significant coefficient indicates that the stronger the agreement, the longer peace lasts, all else being equal. A unit increase in agreement strength is associated with about a 20 percent reduction in the risk of another war. Overall, I find fairly strong support for the hypothesis that the content of agreements matter. Even when one takes the baseline prospect for peace into account, stronger agreements lead to more durable peace.

As this finding contrasts with Werner's finding that the existence of a peace treaty has no significant effect on the durability of peace, it is worth exploring the discrepancy further.[51] Werner's peace treaty variable codes whether the war ended

50. Joint significance is determined with F-tests using STATA's "test" command.

51. Werner 1999. Neither the difference in time period examined, nor whether all belligerents or only principal participants are included accounts for the discrepancy in our findings. Neither restricting her model to post-1945 cases only, nor dropping minor participants from it makes a significant difference to her results. Adding minor participants to my data would only strengthen the finding that strong agreements last (most of these cases involve the Korean Armistice, a very strong agreement that has lasted a very long time).

TABLE 2. *Agreement strength (Weibull estimates)*

	1 Agreement strength (subjective measure)		*2 Index of strength (objective measure)*	
Variables	*Coefficient (RSE)*	*Hazard ratio*	*Coefficient (RSE)*	*Hazard ratio*
AGREEMENT STRENGTH				
None	0.32 js (0.52)	1.38		
Very weak	0.40 js (0.38)	1.50		
Weak	(omitted category)			
Moderate	−0.83*** js (0.21)	0.43		
Strong	−1.70 js (1.50)	0.18		
INDEX OF AGREEMENT STRENGTH			−0.25*** (0.06)	0.78
TIE	3.53*** (0.61)	34.28	3.63*** (0.33)	37.58
COST OF WAR	−0.55*** (0.21)	0.58	−0.68*** (0.18)	0.50
HISTORY OF CONFLICT	0.90*** (0.31)	2.46	0.95*** (0.26)	2.59
EXISTENCE AT STAKE	2.10*** (0.31)	8.13	2.31*** (0.31)	10.10
CONTIGUOUS	1.38*** (0.44)	3.99	1.20*** (0.24)	3.31
CHANGE IN RELATIVE CAPABILITIES	0.82*** (0.20)	2.28	0.85*** (0.19)	2.33
Constant	−8.37*** (2.44)		−6.60*** (1.72)	
Shape parameter *p*	0.90 (0.08)		0.91 (0.06)	
N	727		727	
Subjects	47		47	
Log likelihood	−39.78		−40.62	

Note: Cases of joint democracy are dropped. Negative coefficients and hazard ratios <1 indicate decrease in risk of another war (increase in duration of peace). Positive coefficients and hazard ratios >1 indicate increase in risk of another war (decrease in duration of peace). RSE = robust standard errors. js = jointly significant. ***$p \leq .01$. **$p \leq .05$. *$p \leq .10$. Two-tailed tests used.

with a peace treaty as opposed to a cease-fire or armistice, or no agreement at all. I draw a distinction between the political content of the agreement—that is, whether the political issues were settled (discussed below)—and the more mechanical tools that make peace more durable even in the absence of a political settlement. The Korean Armistice is a good example: it is a very strong (in my terms) agreement that did not settle the underlying issue of the war.[52] Plugging my variables of agreement strength into Werner's model suggests tentatively that stronger agreements yield more durable peace. The coefficient for the index of strength becomes negative, unlike the coefficient for Werner's treaty variable, indicating a reduction in the hazard rate.[53] The coefficient is not statistically significant, but with so few cases (and particularly so few peace failures) left in the data set, neither are the variables that Werner concludes are important. This brings us to the second issue.

In Werner's data, only twelve of sixty-three post–World War II cases experience another round of fighting. Werner does not include cease-fires that fell apart so quickly that the new fighting was considered part of the same war. As explained above, this results in selection bias. By ignoring the resumption of fighting after a two-week cease-fire during the Turco-Cypriot War, for example, or the breakdown of the first attempt at peace during the 1948–49 Arab-Israeli War, Werner's data truncates the dependent variable. Because these short-lived cease-fires tend not to be accompanied by strong peace agreements, omitting them biases findings away from the conclusion that such agreements affect the durability of peace. By coding not just the existence of an agreement but its content, and by including cease-fires that failed very quickly, I show that agreements matter.

Assessing Individual Peace Mechanisms

Although mechanisms to alter incentives, reduce uncertainty, and control accidents are effective in the aggregate, examining the effects of each peace mechanism individually is important to know how best to maintain peace. Tables 3 to 5 show the results of each mechanism in turn, controlling for the baseline prospects for peace. Unfortunately, the small data set and problems of multicolinearity mean it is not possible to test all of these measures simultaneously. Because many aspects of agreements are correlated, it is difficult to reach strong conclusions about which measures are most effective relative to each other. For each mechanism, I checked the results controlling for the other aspects of agreements that were highly

52. In the data set used here, the variable political settlement (discussed further below) comes closest to Werner's variable. But note that the variables differ in some cases. We agree that Israel and Egypt eventually signed a peace treaty after the Yom Kippur War, for example, but while she treats the second Kashmir War as ending with a peace treaty, I code the Tashkent Agreement as a cease-fire, as it did not settle the issue of Kashmir.

53. Results of tests using Werner's data are available online at ⟨http://www.columbia.edu/~vpf4/scraps.htm⟩. The results are similar for the categorical coding of agreement strength.

correlated with the measure under consideration.[54] Including correlated aspects of agreements solves the omitted variable bias but introduces multicolinearity, which reduces the efficiency of the estimates. Note that while the trade-off between multicolinearity and omitted variable bias makes it difficult to assess precisely the relative merits of each aspect of agreements, it does not call into doubt the general finding that agreements matter in the construction of durable peace. The bias arises because the omitted agreement mechanisms also affect the durability of peace, contradicting the null hypothesis that agreements do not matter.

As Table 3 indicates, withdrawing forces from the cease-fire line may reduce the risk of another war, but not significantly so. Troops withdraw to the status quo ante in about one-third of the cases examined here, suggesting that the norm against taking (and keeping) territory by force is fairly strong. Failure to withdraw from land captured during war has often laid the seeds for another round of fighting (the continuing strife over territories occupied by Israel in 1967 being the best example). But returning to the prewar lines does not ensure peace. Israel and Egypt fought again after Israel withdrew from the Sinai in 1956, for example.

Demilitarized zones (DMZs) to separate troops help foster durable peace. Even partial or very limited zones can help reduce the danger of accidents and skirmishes (for example, the number of incidents between India and Pakistan dropped markedly when narrow DMZs were established after the first and second Kashmir wars), but this effect is only marginally significant. However, full DMZs (defined as those 2 km wide or more, running the full length of the cease-fire line) have a clear stabilizing effect, reducing the hazard of another war by about 90 percent. DMZs have contributed to peace between El Salvador and Honduras after the Football War, in Korea, and between Israel and Syria in the Golan Heights. Arms control measures have not reduced the likelihood of recurrent war.[55]

Nor have measures to establish internal control over potential rogue groups made peace more stable. A number of cease-fire agreements specify that each side is responsible for any hostile action coming from its territory. Such statements are not effective at making states rein in irregular forces; in fact these statements are more likely an indicator of a serious problem with rogue groups. In some cases (such as the Football War), there is evidence that concrete measures to disarm irregular forces can help cement peace. But in many cases, the problem has not been one of "involuntary defection" by rogue groups, but of the voluntary use of irregular forces to carry out covert aggression. This problem, especially prominent in India and Pakistan and in the Middle East, has not been effectively dealt with.

54. These checks produce far more output than can be printed here (complete data is available online at ⟨http://www.columbia.edu/~vpf4/scraps.htm⟩. Where findings are not robust to these changes in model specification, I note this in the discussion below.

55. The sign of the coefficient for arms control flip-flops depending on model specification.

TABLE 3. *Individual peace mechanisms (Weibull estimates)*

Variables	*Coefficient (RSE)*	*Hazard ratio*	*Coefficient (RSE)*	*Hazard ratio*
WITHDRAWAL	−0.33 (0.75)	0.72		
DEMILITARIZED ZONES				
Partial	−0.83* (0.47)	0.43		
Full	−2.38** (1.03)	0.09		
ARMS CONTROL	0.45 (0.48)	1.57		
INTERNAL CONTROL				
Responsible			0.70 (0.78)	2.01
Concrete			0.28 (1.21)	1.32
THIRD-PARTY				
Mediation			1.33 (1.02)	3.79
Guarantee			−15.54*** (0.97)	0.000
TIE	3.47*** (0.32)	32.10	3.26*** (0.36)	26.04
COST OF WAR	−0.45** (0.19)	0.64	−0.85*** (0.21)	0.43
HISTORY OF CONFLICT	1.16*** (0.16)	3.20	0.56* (0.31)	1.75
EXISTENCE AT STAKE	1.85*** (0.65)	6.35	2.22*** (0.84)	9.16
CONTIGUOUS	0.76 (0.48)	2.13	1.68*** (0.45)	5.35
CHANGE IN RELATIVE CAPABILITIES	1.13*** (0.22)	3.09	0.66*** (0.18)	1.93
Constant	−7.49*** (2.64)		−6.07*** (2.32)	
Shape parameter *p*	0.76** (0.10)		0.83 (0.11)	
N	770		770	
Subjects	48		48	
Log likelihood	−46.07		−44.33	

Note: Negative coefficients and hazard ratios <1 indicate decrease in risk of another war (increase in duration of peace). Positive coefficients and hazard ratios >1 indicate increase in risk of another war (decrease in duration of peace). RSE = robust standard errors. ***$p \leq .01$. **$p \leq .05$. *$p \leq .10$. Two-tailed tests used.

The effect of third parties on peace depends on their level of involvement. Outsiders often help mediate a cease-fire, as the United States did for Israel and Egypt in 1970 to end the War of Attrition, or as Iran did in Armenia and Azerbaijan in 1992. Third parties may also pressure client states to stop fighting, as in the Sinai War and the Iran-Iraq War. This level of involvement may help warring states reach a cease-fire to begin with, but it does not help them keep it. If anything, cease-fires reached with outside mediation appear to be more likely to break down quickly (the coefficient is positive but not significant). Explicit guarantees, though not terribly frequent, are much more successful. There are no cases of peace failing when an outside state has explicitly underwritten the cease-fire. Unlike in civil wars, such guarantees are not necessary[56] (there are many cases of durable peace without them), but they clearly help reduce the risk of another war.

Table 4 shows the effect of peacekeeping. The international community has sent monitors or armed peacekeepers to about two-thirds of the interstate cease-fires in the post–World War II era. These efforts have helped keep the peace, but the effectiveness of peacekeeping can be easily undermined. The presence of monitors appears to lengthen the duration of peace.[57] However, the presence of armed peacekeepers does not have a statistically significant effect. A look at peacekeeping's record suggests an important difference between missions deployed at the time of the cease-fire, and those already in place before the war broke out. More than half of peacekeeping's failures (that is, cases where peacekeepers were present and war resumed) were those of missions deployed long before the cease-fire. In many cases these missions were largely inactive and had been discredited by their earlier failures. The UN Force in Cyprus (UNFICYP), had been deployed in 1964 to help keep peace between Turkish and Greek Cypriots in an internal conflict. It could do nothing to prevent military action by Turkey in 1974, nor was its presence effective in maintaining a cease-fire in the midst of the Turco-Cypriot War. Both the UN Truce Supervision Organization (UNTSO) in the Middle East and the UN Military Observer Group (UNMOGIP) in Kashmir were effective in the early years of their deployments, but after more bouts of fighting—in 1956 and especially 1967 in the Middle East, and in 1965 in Kashmir—these missions were rendered useless. Both missions remain in place today, but are inactive.

If one drops cases in which peacekeeping contingents were already deployed before the war (for example, keeping the first Arab-Israeli cease-fire when UNTSO was first established but dropping subsequent cases in which UNTSO is the only peacekeeping mission), one can see that new peacekeeping missions have been quite effective.[58] Of course, new peacekeeping missions are not foolproof, or there would

56. Walter 2001.

57. This finding is not as strong when the Arab-Israeli conflict is controlled for. Deploying a larger number of peacekeepers seems to reduce the risk of another war, but this effect is not statistically significant (results not shown).

58. Note that because almost all of the omitted cases are wars that ended with a decisive victory but were repeated, the hazard ratio for the variable tie is highly exaggerated.

TABLE 4. *Individual peace mechanisms (Weibull estimates)*

	All peacekeeping		*New peacekeeping only*	
Variables	*Coefficient (RSE)*	*Hazard ratio*	*Coefficient (RSE)*	*Hazard ratio*
PEACEKEEPING				
Monitors	−1.10* (0.59)	0.33	−6.87*** (2.62)	0.001
Armed forces	−0.21 (0.80)	0.81	−7.29* (4.05)	0.001
TIE	3.79*** (0.47)	44.24	11.17** (4.50)	70898.3
COST OF WAR	−0.70*** (0.18)	0.50	−1.84* (1.10)	0.16
HISTORY OF CONFLICT	1.27*** (0.29)	3.56	7.38** (3.77)	1605.81
EXISTENCE AT STAKE	2.35*** (0.23)	10.50	7.66* (4.27)	2124.89
CONTIGUOUS	0.97** (0.40)	2.63	1.43** (0.69)	4.17
CHANGE IN RELATIVE CAPABILITIES	0.80*** (0.23)	2.23	−0.16 (0.37)	0.85
Constant	−5.78*** (1.88)		−15.18** (7.34)	
Shape parameter *p*	0.76* (0.11)		1.82 (1.18)	
N	770		593	
Subjects	48		37	
Log likelihood	−46.78		−16.67	

Note: Negative coefficients and hazard ratios <1 indicate decrease in risk of another war (increase in duration of peace). Positive coefficients and hazard ratios >1 indicate increase in risk of another war (decrease in duration of peace). RSE = robust standard errors. ***$p \leq .01$. **$p \leq .05$. *$p \leq .10$. Two-tailed tests used.

never be old missions discredited by their failure to keep peace. But there is a large and statistically significant difference between cease-fires overseen by a fresh set of international peacekeepers and those without the benefit of peacekeeping.[59]

59. This finding contradicts the conclusions of Diehl, Reifschneider, and Hensel 1996; however the results they report in Table 4 suggest that both active and operational involvement by the UN reduce the risk of another dispute.

TABLE 5. *Individual peace mechanisms (Weibull estimates)*

Variables	*Coefficient (RSE)*	*Hazard ratio*	*Coefficient (RSE)*	*Hazard ratio*
CONFIDENCE-BUILDING MEASURES	−0.18 (2.11)	0.83		
SPECIFICITY	−0.04*** (0.01)	0.96		
DISPUTE RESOLUTION				
Ongoing mediation			1.84*** (0.49)	6.27
Joint commission			−16.69*** (0.81)	0.000
FORMAL AGREEMENT			−0.69 (0.57)	0.50
TIE	3.57*** (0.33)	35.36	2.24*** (0.28)	9.35
COST OF WAR	−0.25 (0.28)	0.78	−0.31* (0.16)	0.73
HISTORY OF CONFLICT	0.52*** (0.13)	1.69	0.68*** (0.18)	1.97
EXISTENCE AT STAKE	3.24*** (0.57)	25.49	1.98*** (0.47)	7.21
CONTIGUOUS	1.93*** (0.28)	6.89	1.16*** (0.27)	3.20
CHANGE IN RELATIVE CAPABILITIES	1.53*** (0.09)	4.63	1.08*** (0.18)	2.94
Constant	−12.18*** (2.73)		−10.49*** (2.95)	
Shape parameter *p*	1.08 (0.17)		1.07 (0.27)	
N	757		770	
Subjects	47		48	
Log likelihood	−37.64		−37.36	

Note: Negative coefficients and hazard ratios <1 indicate decrease in risk of another war (increase in duration of peace). Positive coefficients and hazard ratios >1 indicate increase in risk of another war (decrease in duration of peace). RSE = robust standard errors. ***$p \leq .01$. **$p \leq .05$. *$p \leq .10$. Two-tailed tests used.

The jury is still out on the effectiveness of confidence-building measures, because they are relatively rare. The risk of another war appears to be lower in cases where measures such as notification of troop rotations or hotlines between military commanders have been implemented (see Table 5). But these measures have

been employed in only a few cases, making it is possible that this finding is merely an artifact of the data.

I examined two types of dispute resolution between belligerents: that provided by ongoing third-party mediation after a cease-fire has been reached;[60] and joint commissions made up of representatives from both states in the war. The former is not an effective dispute resolution tool; in fact it is associated with peace that is significantly more likely to break down quickly. But joint commissions such as those set up after the Korean War, between Ethiopia and Somalia in 1988, or between El Salvador and Honduras in 1980, have been much more successful. The history of the armistice commissions between Israel and its Arab neighbors suggests that willingness to work within such a forum can provide an important signal of intentions. These commissions worked well in their early years to settle disputes over land use and fishing and farming rights, as well as to handle small incidents between soldiers. Conversely the breakdown of these regimes both signaled and contributed to increasing hostility on both sides.[61]

All else being equal, the more specific the cease-fire agreement, the longer peace tends to last. More specific agreements also tend to implement other measures to keep peace, but the finding that specificity reduces the hazard of another war holds up even when these other measures are controlled for. The most detailed agreements, such as the Korean Armistice and the Israeli-Egyptian peace agreement, have been followed by lasting peace. Cases of medium detail (China-India, the Gulf War, and the two Kashmir Wars, for example) have had mixed success, and the much less detailed agreements (for example, the Six Day War and the first Turco-Cypriot cease-fire) have tended to fail quickly. Demarcating the exact location of the cease-fire line put a halt to efforts on both sides to push for slight advantages in the early days of each cease-fire between India and Pakistan.[62] Of course, deliberate attacks cannot be stopped by specifying the location of the cease-fire line, but defining compliance can clearly help prevent skirmishing as both sides try to improve their positions.

Peace tends to last longer after formal agreements than after tacit or unilaterally declared cease-fires, all else being equal, but the difference is not significant statistically, nor terribly robust to different model specifications. Concern about international audience costs often plays a role in states' decisions about whether, when, and how to fight each other. India and Pakistan, for example, have both tried hard not to appear as the aggressor in their repeated wars, using proxy forces rather than regular troops to initiate hostilities.[63] These two states have also fought

60. As opposed to mediation to reach a cease-fire, which was examined above.

61. For the history of these Military Armistice Commissions, see Azcárate 1966; Khouri 1963; and Kinsolving 1967.

62. See UN document S/6710 and addenda, various dates 1965–66.

63. Pakistan sent Azad Kashmir forces across the cease-fire line in 1965, successfully laying the blame for the war on India's retaliation. India learned the lesson and sponsored the Mukti Bahini insurgency in East Pakistan (Bangladesh) in 1971.

in places where their formal agreement left loopholes, as on the Siachen Glacier in the early 1980s.[64]

However, formalizing a cease-fire may not be crucial for invoking international audience costs. The general norm against aggression means that costs may be paid even for breaking an informal cease-fire. The international reaction has often been muted, either by great powers turning a blind eye for strategic reasons (especially during the Cold War), or by a UN reluctant to threaten its impartiality by naming an aggressor.[65] Formalism may, therefore, not be the best way to test for the role of international audience costs.

In sum, arms control, third-party mediation, and attempts to control irregular forces have not helped maintain peace, and may in fact be associated with especially fragile peace. Confidence-building measures, formalizing an agreement, and withdrawal of forces may help, but the evidence to support their role is unclear. The most effective tools for maintaining peace in the aftermath of war are demilitarized zones, explicit third-party guarantees, peacekeeping, joint commissions for dispute resolution, and making the cease-fire specific.

Political Settlement

Not surprisingly, political agreement on the issues over which the war was fought leads to very durable peace (see Table 6). In fact, there are no cases in the wars examined here in which both sides agreed explicitly to a political settlement and war later resumed. But, as mentioned earlier, such settlement is quite rare in the post–World War II period. Only three wars led to an explicit agreement on the basic dispute over which the war was fought: the Yom Kippur War between Israel and Egypt; the Iran-Iraq War, in which Iraq conceded the Shatt al'-Arab waterway to secure its flank with the outbreak of the Gulf War; and the Gulf War itself, in which Iraq formally renounced its claim to Kuwait when it surrendered.[66] Wars that end leaving the basic issues unsettled, as in the Korean Armistice, have been the norm rather than the exception. Even if one includes settlements imposed unilaterally by a decisive victor (but without official acceptance by the defeated side, as in the Falklands), settlement is rather rare.[67] This de facto category also ap-

64. Lamb 1991, 325–26. The cease-fire line is not marked on the glacier, both because the territory is so inhospitable, and because specifying a terminus would require agreement on the disputed border with China.

65. A blatant example of this was the UN's decision not to blame Pakistan for its role in starting the 1965 war with India. For Secretary General U Thant's rationale, see UN document S/6651 (3 September 1965), 7.

66. In a few other cases, belligerents eventually settled their political conflict many years after the war ended, as Israel and Jordan did in 1994.

67. The basic issue of the war has been settled unilaterally in eight wars (nine dyads) in these data: Russia-Hungary, China-India, Vietnam (North versus South), India and Pakistan in 1971, the second round of the Turco-Cypriot War, Uganda-Tanzania, the Falklands War, and the second part of the Azeri-Armenian War.

TABLE 6. *Political settlement (Weibull estimates)*

Variables	*Coefficient (RSE)*	*Hazard ratio*
POLITICAL SETTLEMENT		
Imposed	−15.34*** (1.02)	0.000
Agreed	−15.57*** (0.99)	0.000
TIE	2.94*** (0.47)	18.89
COST OF WAR	−0.66*** (0.18)	0.52
HISTORY OF CONFLICT	0.91*** (0.23)	2.49
EXISTENCE AT STAKE	1.55*** (0.45)	4.73
CONTIGUOUS	0.68* (0.36)	1.97
CHANGES IN RELATIVE CAPABILITIES	0.81*** (0.24)	2.25
Constant	−4.96** (2.50)	
Shape parameter *p*	0.72* (0.14)	
N	770	
Subjects	48	
Log likelihood	−46.39	

Note: Negative coefficients and hazard ratios <1 indicate decrease in risk of another war (increase in duration of peace). Positive coefficients and hazard ratios >1 indicate increase in risk of another war (decrease in duration of peace). RSE = robust standard errors. ***$p \leq .01$. **$p \leq .05$. *$p \leq .10$. Two-tailed tests used.

pears to be quite stable. None of these imposed settlements have failed.[68] Not surprisingly, settling the underlying political issues is the best way to ensure peace. But this advice is not particularly useful for most belligerents. When the under-

68. The imposed settlement between India and Pakistan in 1971 failed when they fought again in 1999 after our point of censoring. If a time-constant model is used with data on the resumption of war up to 2000 (results not shown), unilaterally settled wars are statistically indistinguishable from wars that end with no settlement—in fact the coefficient suggests they may be less stable. This supports the findings of Hensel 1994. However, the 1971 settlement concerned Bangladesh. India chose not to press the Kashmir issue, which continues to be actively contested.

lying issues remain disputed, it is the other mechanisms examined in this study that can be used to maintain peace.

Duration Dependence

Intuitively, one might expect peace to be most precarious immediately after a cease-fire and to stabilize over time. The antagonism generated by the fighting is most raw just after hostilities end, and once things settle down, states should have a somewhat easier time maintaining peace. This would suggest negative "duration dependence"; that is, a cease-fire's likelihood of failing (given that it has held thus far) goes down over time. But if Fearon and others are right that one of the reasons states fight costly wars is the inability to gauge each other's capabilities and resolve (the combination of private information and incentives to misrepresent), then one might expect peace to be easiest to maintain in the early stages.[69] The war just fought will have revealed information about military capabilities and political resolve. Over time, however, uncertainty will creep back in. This would lead one to expect positive duration dependence for the survival of peace; the risk of another war should increase with time.[70]

The shape parameter p, specifically whether it is greater than or less than one, gives an estimate of whether the risk of another war goes up or down, or stays the same over the course of a cease-fire. In most of the models presented here, the shape parameter p is less than one, indicating that the hazard rate is decreasing. The shape parameter p is only greater than one in models that are likely affected by missing data bias. This finding fits better with the intuitive notion that peace is most fragile early on and solidifies over time than with the hypothesis derived from the perspective that sees war as a problem of information. But one should note that the value of this parameter is not always statistically significant. The risk of war may simply be constant over time.[71]

Conclusion

Are some war-torn areas simply doomed to repeated conflict and warfare, or is there something that can be done to improve the chances for peace? The findings of this article warrant optimism. Peace is hard to maintain among deadly enemies, but mechanisms implemented in the context of cease-fire agreements can help reduce the risk of another war. Peace is precarious, but it is possible. Agreements are not merely scraps of paper, their content affects whether peace lasts or war resumes.

69. See Blainey 1973; and Fearon 1995.
70. On the importance of considering duration dependence, see Beck, Katz, and Tucker 1998.
71. Note that independent variables should "soak up" or explain some of the duration dependence, so it is not surprising that in more completely specified models, p is closer to one.

The job of building peace is harder in some cases than in others. It is more difficult when wars end in stalemates, when states' previous history is riddled with conflict, and when war can threaten the very existence of one side. It seems to be harder for neighbors, but it is easier when states have just fought a very deadly war, giving a greater incentive to avoid further bloodshed.

But given these givens, states can act to improve the chances for peace. I have focused on measures that: alter incentives by raising the cost of an attack either physically or politically; reduce uncertainty by specifying compliance, regulating activities that are likely to cause tension, providing credible signals of intention; or help prevent or manage accidents from spiraling back to war. Do these measures help encourage durable peace? I find that, in general, they do. All else being equal, peace lasts longer when stronger agreements, implementing more of these measures, are in place. A counterargument suggests that strong agreements are only associated with durable peace because they are implemented in the easy cases. But the effects of agreements do not wash out when the baseline prospects for peace are controlled for.

While some international relations scholars might be surprised to learn that states can institute measures to overcome the obstacles to peace, practitioners probably know this already. For them, the value of this research is in its lessons about which mechanisms work better than others. Because these measures are often implemented in conjunction with each other, one cannot reach conclusions about this that are as strong as one might like. But the history of cease-fires over the past half-century suggests that creating buffer zones between opposing armies is quite effective. Making the terms of the cease-fire, including the location of the cease-fire line, as specific as possible is also important, as is setting up joint commissions to discuss the inevitable conflicts and misunderstandings that arise in the aftermath of fighting. Confidence-building measures, formal agreements, and withdrawal of forces do not hurt, but the evidence that these measure help is less clear-cut.

For their part, outsiders interested in helping belligerents maintain peace can improve its chances by providing an explicitly stated guarantee of the cease-fire, and by deploying international monitors or troops as peacekeepers. But third parties should be aware that mediation to reach a cease-fire may be counterproductive in the long run. Peacekeeping can easily become discredited. Leaving a mission in place after it has failed does little to bolster the prospects for peace.

That states can implement measures to reduce the risk of another war raises the question of whether they can do more to prevent war breaking out in the first place. If demilitarized zones or peacekeeping can help maintain peace after war, can they do so beforehand? Obviously one cannot answer this question definitively without a wider study, but at least in theory, the measures discussed above should be effective preemptively. The challenge is likely to be in convincing states to implement them. It is normal, and therefore politically more acceptable, to take measures to ensure peace in the aftermath of war. Giving up territory to create a buffer zone or allowing international peacekeepers to infringe on their sovereignty before hostilities break out, of course, is more difficult.

Whether or not the measures examined here can help prevent war in the first place, I have shown that measures to reduce uncertainty, alter incentives, and manage accidents can help maintain peace in the hardest cases—among deadly enemies with strong incentives to take advantage of each other and in an atmosphere of deep mistrust. Maintaining peace is difficult, but even bitter foes can and do institute measures to avoid another war. Creating a durable peace requires work, but it is possible.

Appendix 1: Cease-Fires 1946–97

War	*Between*		*Cease-fire*	*War resumes*
Palestine 1	Israel	Iraq	18 July 1948	15 Oct. 1948
Palestine 1	Israel	Egypt	18 July 1948	15 Oct. 1948
Palestine 1	Israel	Syria	18 July 1948	15 Oct. 1948
Palestine 1	Israel	Lebanon	18 July 1948	15 Oct. 1948
Palestine 1	Israel	Jordan	18 July 1948	15 Oct. 1948
Palestine 2	Israel	Iraq	31 Oct. 1948	6 Oct. 1973
Palestine 2	Israel	Egypt	7 Jan. 1949	29 Oct. 1956
Palestine 2	Israel	Syria	31 Oct. 1948	5 June 1967
Palestine 2	Israel	Lebanon	31 Oct. 1948	11 April 1982
Palestine 2	Israel	Jordan	31 Oct. 1948	5 June 1967
First Kashmir	India	Pakistan	1 Jan. 1949	5 Aug. 1965
Korean	U.S.	China	27 July 1953	
Korean	U.S.	No. Korea	27 July 1953	
Korean	So. Korea	China	27 July 1953	
Korean	So. Korea	No. Korea	27 July 1953	
Russo–Hungarian	USSR	Hungary	14 Nov. 1956	
Sinai	UK	Egypt	6 Nov. 1956	
Sinai	France	Egypt	6 Nov. 1956	
Sinai	Israel	Egypt	6 Nov. 1956	5 Jun 1967
Sino–Indian	China	India	22 Nov. 1962	
Vietnamese	No. Vietnam	U.S.	27 Jan. 1973	
Vietnamese	No. Vietnam	So. Vietnam	30 April 1975 [censored immediately]	
Second Kashmir	Pakistan	India	23 Sept. 1965	3 Dec. 1971
Six Day	Israel	Egypt	10 June 1967	6 March 1969
Six Day	Israel	Syria	10 June 1967	6 Oct. 1973
Six Day	Israel	Jordan	10 June 1967	10 Oct. 1973
Israeli–Egyptian	Israel	Egypt	7 Aug. 1970	6 Oct. 1973
Football	El Salvador	Honduras	18 July 1969	[72]
Bangladesh	India	Pakistan	17 Dec. 1971	
Yom Kippur	Israel	Egypt	24 Oct. 1973	
Yom Kippur	Israel	Syria	24 Oct. 1973	5 June 1982
Yom Kippur	Israel	Jordan	24 Oct. 1973	
Turco–Cypriot 1	Turkey	Cyprus	29 July 1974	14 Aug. 1974
Turco–Cypriot 2	Turkey	Cyprus	16 Aug. 1974	
Ethiopian–Somalian	Cuba	Somalia	14 March 1978	

(*continued*)

72. War between India and Pakistan resumed on 26 May 1999, after these data are censored.

Appendix 1 (Continued)

War	*Between*		*Cease-fire*	*War resumes*
Ethiopian–Somalian	Ethiopia	Somalia	14 March 1978	
Ugandan–Tanzanian	Tanzania	Uganda	12 April 1979	
Ugandan–Tanzanian	Tanzania	Libya	12 April 1979	
Sino–Vietnamese	China	Vietnam	10 March 1979	5 Jan. 1987
Iran–Iraq	Iran	Iraq	20 Aug. 1988	
Falklands	UK	Argentina	20 June 1982	
Lebanon	Israel	Syria	5 Sept. 1982	
Sino–Vietnamese	China	Vietnam	6 Feb. 1987	
Gulf War	U.S.	Iraq	11 April 1991	
Gulf War	Saudi Arabia	Iraq	11 April 1991	
Gulf War	Kuwait	Iraq	11 April 1991	
Azeri–Armenian 1	Armenia	Azerbaijan	21 Mar 1992	11 April 1992
Azeri–Armenian 2	Armenia	Azerbaijan	12 May 1994	

Appendix 2: Cease-Fires Data Set

Variables	*Values*	*Source / Notes*
TIE	0 = military victory for side A 1 = military tie	Stam 1996; and COW Version 3, Small and Singer 1982
COST OF WAR	= natural log of both states' battle deaths	COW
HISTORY OF CONFLICT	= (prewar MID disputes / years both states part of the inter-state system). Coded 1 for wars at independence	Militarized Interstate Disputes 1996 (MID); Jones, Bremer, and Singer 1996
EXISTENCE AT STAKE	0 = existence not at stake 1 = existence at stake	Brecher and Wilkenfeld 1992 (ICB2) highest "gravity of value threatened" in dyad
TERRITORIAL CONFLICT	0 = not territorial 1 = territorial	MID "revision type"
CONTIGUOUS	0 = not contiguous 1 = contiguous by land, or <150 miles by sea	
MULTILATERAL WAR	0 = bilateral war 1 = multilateral war	
CHANGE IN RELATIVE CAPABILITIES	= abs(((cap_1-lagcap_1)/lagcap_1) − ((cap_2-lagcap_2)/lagcap_2))	Werner 1999, 923 fn.7. cap is COW capabilities index for current year, lagcap is previous year
LAGGED CHANGE	= change in capabilities from previous year	
EXPECTED UTILITY: DEMAND PREDICTED	0 = equilibrium outcome not demand 1 = equilibrium outcome demand	Bueno de Mesquita and Lalman 1992's "international interaction game" from EUGene Bennett and Stam 2000a
WAR PREDICTED	0 = equilibrium outcome not war 1 = equilibrium outcome war	

(*continued*)

Variables	*Values*	*Source / Notes*
JOINT DEMOCRACY	0 = one or both not a democracy 1 = both sides democracies	Polity III "dem" = 6 or higher Jaggers and Gurr 1996
AGREEMENT STRENGTH	0 = none 1 = very weak 2 = weak 3 = moderate 4 = strong	
INDEX OF STRENGTH	= formal_d + with_sqa + dmz_dum + ac_dum + (pk/2) + (ext_inv/2) + (detail/3) + (internal/2) + info_dum + (disp_res/2)	
WITHDRAWAL	0 = none 1 = partial, to status quo ante, or beyond	Includes unilateral withdrawals but not withdrawals from partial DMZs
DEMILITARIZED ZONES	0 = none 1 = partial (not along full cease-fire line, or < 2 km) 2 = demilitarized zone at least 2 km	
ARMS CONTROL	0 = none 1 = arms embargo, limits near cease-fire line, specific weapons prohibited	
INTERNAL CONTROL	0 = none 1 = stated responsibility for actions from own territory 2 = concrete measures to ensure control	
THIRD-PARTY INVOLVEMENT	0 = none 1 = mediate cease-fire, restraint, patron, etc. 2 = explicit or well-understood guarantee of peace	Does not include UN mediation
PEACEKEEPING	0 = none 1 = monitoring (unarmed military observers) 2 = peacekeeping forces (armed)	Includes UN, other regional organization, and ad hoc peacekeeping missions
PK_PRE	0 = new for this war 1 = present from earlier conflict	Cases with both new and old missions coded 0
CONFIDENCE-BUILDING MEASURES	0 = none 1 = military info exchanged, hot line, onsite or aerial verification	
DISPUTE RESOLUTION	0 = none 1 = ongoing third-party mediation 2 = joint commission of belligerents	Does not include peacekeepers providing dispute resolution
SPECIFICITY	= number of paragraphs in agreement text	
FORMAL AGREEMENT	0 = no declared cease-fire, or tacit or informal acceptance of cease-fire 1 = formal acceptance of cease-fire proposal or agreement	
POLITICAL SETTLEMENT	0 = no settlement 1 = settlement imposed by force or unilateral action (de facto) 2 = settlement by agreement (de jure)	

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