

Public Commitment in Crisis Bargaining

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The “audience cost” literature argues that highly-resolved leaders can use *public* threats to credibly signal their resolve in incomplete-information crisis bargaining, thereby overcoming informational asymmetries that lead to war. If democracies are better able to generate audience costs, then audience costs help explain the democratic peace. We use a game-theoretic model to show how public commitments can be used coercively as a source of bargaining leverage, even in a complete-information setting in which they have no signaling role. When *both* sides use public commitments for bargaining leverage, war becomes an equilibrium outcome. The results provide a rationale for secret negotiations as well as hypotheses about when leaders will claim that the disputed good is indivisible, recognized as a rationalist explanation for war. Claims of indivisibility may just be bargaining tactics to get the other side to make big concessions, and compromise is still possible in equilibrium.

Shortly after U.S. intelligence detected that the Soviet Union was shipping nuclear missiles to Cuba in October 1962, U.S. President Kennedy gave a televised speech in which he stated that the only outcome acceptable to the U.S. was a total withdrawal (or destruction) of the missiles from Cuba. In a less prominent crisis following the Iranian nationalization of the Anglo-Iranian Oil Company in 1951, British Prime Minister Clement Attlee also made public pronouncements. However, he only stated very limited goals, declaring in the House of Commons that it was not Britain’s intent to abandon the refinery entirely.

What explains why leaders sometimes make very strong public threats or commitments in international crises, and at other times make much more limited ones (or none at all)? The current theory about the purpose of making public commitments stipulates that they allow for highly-resolved leaders to *credibly* signal their resolve in incomplete-information crisis bargaining (Fearon 1994, 1997; Schultz 1999; Smith 1998). In international crises, leaders have an incentive to

Authors’ note: The name ordering is reverse alphabetical, and does not denote unequal contributions. We thank the anonymous reviewers for their valuable comments. We gratefully acknowledge the support of the National Science Foundation (SES-0518945 and SES-0518185). Because of space constraints, the proofs to all of the propositions in this article are provided in a technical supplement, which is available at the authors’ Web sites at <http://www-polisci.tamu.edu/faculty/tarar> and www.duke.edu/~bl38, as well the *ISQ* repositories at www.isanet.org/data_archive/, and the Dataverse Network: <http://dvn.iq.harvard.edu/dvn/>.

bluff about their resolve in order to get a better deal (Fearon 1995), and public threats are a mechanism by which information can be *credibly* conveyed. Thus, when we see a leader making a strong public threat, this is an indication that the leader is probably highly-resolved to carry it out. A less-resolved leader, on the other hand, is less eager to make a public threat, because of the audience cost she will have to pay if her bluff is called.¹

Thus, it has been argued that audience costs allow for credible information transmission in incomplete-information crisis bargaining. On the other hand, it has also been intuitively understood that public threats can also be a source of bargaining leverage, forcing the other side to yield (Fearon 1997; Schelling 1960; Schultz 2001). However, this raises a puzzle: when we observe leaders making strong public threats, are they sincerely signaling resolve and warning the other side to back down or else face war, or are they manipulatively trying to coerce the other side into making larger concessions? We stipulate that existing analyses of audience costs cannot distinguish between these two effects in a satisfactory way, because (1) they only look at incomplete information, in which the signaling role (as opposed to the bargaining leverage role) becomes paramount; and (2) they do not allow the disputed good to be divided, and hence can only get at the bargaining leverage role of public commitments in a very crude way (i.e., no concession at all, or concede the *entire* good).

To get a better understanding of the bargaining leverage role of public commitments, we analyze a game-theoretic model of crisis bargaining with audience costs in which, in contrast to previous formal models of audience costs, (1) there is complete information; (2) the disputed good is completely divisible and the two sides can make offers and counteroffers, and hence genuine bargaining is allowed; and (3) the leader endogenously chooses how much, if any, of the disputed good to publicly commit to obtaining (i.e., the leader endogenously chooses how severe a public “threat” to make, if any), and hence the size of the audience cost is endogenous rather than exogenously fixed.

We show that in this setting, public commitments can be used coercively as a source of *bargaining leverage*. In particular, by creating costs for accepting a small share of the disputed good, public commitments can be used to increase the minimal share of the good that one needs to avoid war (i.e., increase one’s “reservation value”), thus shrinking the preferred-to-war bargaining range in one’s favor and forcing the other side to make more concessions than it otherwise would. We characterize the equilibrium level of commitments that leaders make, and also identify various principal-agent problems that arise between the leader and her citizens, whereby the leader chooses to make smaller commitments than the citizens would like. Interestingly, this principal-agent problem whereby the leader chooses to make a *limited* public commitment, is the only reason why the other side has a strict incentive to enter into negotiations rather than going straight to war.

We find that when only one side can generate audience costs, that side obtains bargaining leverage, but a negotiated settlement is still reached. We find that when *both* sides can generate costly public commitments, there are only two equilibrium outcomes that satisfy a certain refinement: in one of them, a negotiated settlement is reached, and in the other one, war occurs. Both leaders are better off if no commitments are allowed than they are in either of these two

¹ Explanations for why a leader would pay an audience cost for backing down from a public threat focus on (1) violating the national honor (Fearon 1994), (2) signaling incompetence to voters (Fearon 1994; Smith 1998), (3) losing international credibility (Guisinger and Smith 2002; Sartori 2002), and (4) voters using the punishment mechanism to allow their leader to generate international bargaining leverage (Leventoglu and Tarar 2005). For further discussions about the microfoundations of audience costs, see Gowa (1999), Schultz (1999), and Slantchev (2006). For experimental/survey evidence that audience costs exist, see Tomz (2007). For indirect empirical evidence that audience costs exist, see Eyerman and Hart (1996), Gelpi and Griesdorf (2001), Partell and Palmer (1999), and Prins (2003).

equilibrium outcomes, and hence the leaders have an incentive to conduct the negotiations secretly in the two-sided case. However, one side's citizens prefer the negotiated settlement equilibrium to the no-commitment case, and hence one leader might face pressure from her citizens to negotiate publicly even though the leader's own preference is to negotiate secretly.

We find that when both sides can generate costly public commitments, war becomes an equilibrium outcome, even though this is a setting in which (1) there is complete information, (2) the disputed good is completely divisible (no issue indivisibilities), (3) there is no change in the distribution of power, and hence no commitment problems (Fearon 1995; Powell 2006), and (4) war is costly, so that there exists a range of negotiated settlements that both sides strictly prefer to war (Fearon 1995). That is, the mutual use of public commitments for bargaining leverage allows war to become an equilibrium outcome in a situation where otherwise it is not (and where, in fact, the deck is stacked strongly in favor of peace; none of Fearon's (1995) three rationalist explanations for war are present), and hence can be thought of as a new rationalist explanation for war whose origin lies in domestic politics.²

These results raise important questions about whether audience costs provide an explanation for the democratic peace. Previous works on audience costs have argued that if democratic leaders are better able to generate audience costs than are autocratic leaders, then democratic leaders are institutionally advantaged in their ability to credibly signal their private information, which should allow for negotiated settlements to be reached in jointly-democratic dyads (Fearon 1994; Guisinger and Smith 2002; Lipson 2003).³ That is, audience costs provide a signaling/informational explanation for the democratic peace. However, our analysis, which ignores the signaling role but captures the bargaining leverage role of audience costs, shows that in the two-sided audience cost case (as in a democracy-democracy dyad), and *only* in the two-sided case, war becomes an equilibrium outcome. Moreover, even if the leaders can coordinate on the negotiated settlement equilibrium rather than the war equilibrium, they still have an incentive to negotiate secretly instead—but in secret negotiations, audience costs obviously cannot be used to signal resolve and overcome informational problems.⁴ Our analysis raises serious questions about whether audience costs provide an explanation for the democratic peace. This will need to be resolved in future work that considers a setting in which the disputed good is divisible, so that the bargaining leverage role of public commitments can fully emerge, and there is incomplete information, so that their signaling role can appear. This will allow us to assess whether public commitments have a net stabilizing or destabilizing effect on crisis bargaining.⁵

² As noted above, there is also a negotiated settlement equilibrium that both leaders prefer to the war equilibrium, and hence the explanation would also have to account for why they fail to coordinate on the negotiated settlement equilibrium.

³ Fearon (1994) hypothesized that because it is easier to punish leaders in democracies than in autocracies, democratic leaders should on average face greater audience costs than autocratic leaders, other things equal. Eyerma and Hart (1996), Gelpi and Griesdorf (2001), Partell and Palmer (1999), and Prins (2003) present empirical evidence in support of this hypothesis. Weeks (2008) disaggregates different types of autocracies and presents statistical evidence that certain types of autocratic regimes face the same level of audience costs as democratic leaders, as well as a theory about why this is the case. For example, in autocracies in which opposition groups have overcome their coordination problem of challenging the government (e.g., Weingast 1997), leaders should face significant audience costs. We do not discuss at length the issue of whether democratic or autocratic leaders face greater audience costs, but merely note that this is an ongoing debate that has yet to be fully resolved. See Weeks (2008) for an extensive discussion.

⁴ Kurizaki (2007) and Sartori (2002) show that private diplomatic messages can credibly convey information in some circumstances.

⁵ Schultz (2001) shows that the presence of an office-seeking domestic opposition group offers an alternative explanation for why democracies are better able to credibly signal private information.

A final contribution of our analysis is that, by allowing the leaders to endogenously choose how much (if any) of the disputed good to publicly commit to obtaining, we provide hypotheses about when leaders will publicly commit to obtaining the *entire* disputed good, which resembles claiming that the good is indivisible, which Fearon (1995) and others identify as a rationalist explanation for war.⁶ Although issue indivisibility has been recognized as a rationalist explanation for war, there has been relatively little theorizing about *when* claims of issue indivisibility will be made (important exceptions include Goddard 2006; Hassner 2003; Toft 2003; Walter 1997). Our results predict that a leader will only commit to the *entire* good if she believes that the other side has *no* resolve for war, and this prediction is broadly consistent with a number of historical cases that we discuss (including the two cases with which we began this article)—when the other side has positive resolve for war, a leader only commits to a limited amount of the good in equilibrium. Interestingly, we find that when a leader *is* committing to the entire good, she is still willing to compromise in equilibrium and accept less than all of the good. This suggests that when we observe a leader claiming issue indivisibility, this might just be a bargaining tactic to get the other side to make big concessions, and that she is still willing to compromise in equilibrium. A policy implication is that when leaders are observed making claims of issue indivisibility, third-party mediators should not give up and assume that compromise is impossible, and war is inevitable. For example, despite the fact that the 1993 Oslo Accords between the Israelis and Palestinians explicitly left the final status of Jerusalem to be decided in future negotiations, almost immediately afterwards, Israeli leaders continued to publicly state that Jerusalem is the “undivided, eternal capital of Israel” (Makovsky 2001; Perlmutter 1995). Nevertheless, Israeli Prime Minister Ehud Barak was willing to make some compromises on Jerusalem at the 2000 Camp David talks, despite having committed to all of it.

In related work, Leventoğlu and Tarar (2005), building on earlier work by Muthoo (1999), examine how endogenous public commitments can affect *non-crisis* bargaining over a divisible good, i.e., bargaining in which there is no outside option of war.⁷ This captures bargaining over treaties, economic agreements, or other peacetime international agreements. We find that in a crisis bargaining setting, many of the results that they find for non-crisis bargaining carry over, such as that public commitments can be used to generate bargaining leverage, that various principal-agent problems arise between the leader and her citizens, and that two-sided commitments can lead to bargaining inefficiencies that give the leaders an incentive to conduct the negotiations secretly. Leventoğlu and Tarar (2005) speculate that in crisis bargaining, two-sided public commitments might lead to inefficient war being an equilibrium outcome, and we show here that that conjecture is indeed correct. In their non-crisis setting, Leventoğlu and Tarar (2005) show that the incentive for both leaders to negotiate secretly in the two-sided case only arises when they face roughly the same level of audience costs (if one leader faces much higher audience costs, she prefers to negotiate publicly to obtain bargaining leverage), whereas we find that in a crisis setting, the incentive to negotiate secretly *always* arises in the two-sided case, regardless of the relative magnitudes of the audience costs (as long as both are

⁶ Powell (2006) shows that the core cause of war when the good is indivisible is a commitment problem, and not the issue indivisibility itself. However, this commitment problem would not be a problem if the good was divisible, and hence issue indivisibility can be thought of as a “second-layer” rationalist explanation for war which, when present, leads to war through a commitment problem.

⁷ Another important difference is that in Leventoğlu and Tarar (2005), the status quo payoffs are zero, and hence there are mutual gains to be had in dividing the pie, whereas in the current article, the pie is already fully divided in some ratio, and hence there are no mutual gains to be had: in any agreement reached, one side has to compromise from the status quo.

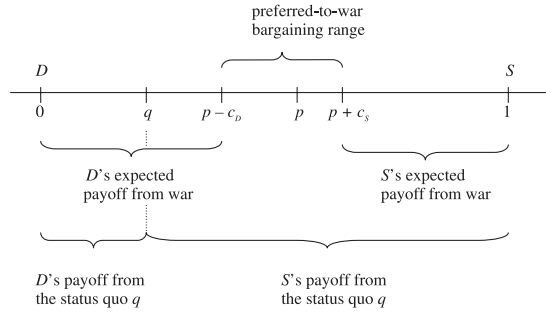


FIG. 1. The Bargaining Approach to War

positive). This suggests that the incentive to negotiate secretly is more prevalent in a crisis setting than in a non-crisis setting. Moreover, because we examine the role of public commitments in *crisis* bargaining, our results speak to the issue of whether endogenous audience costs provide an explanation for the democratic peace. Finally, our analysis is novel in that it provides hypotheses about when leaders will commit to the *entire* disputed good, and hence speaks to the question of issue indivisibility as a rationalist explanation for war.⁸

The rest of the article is organized as follows. In the next section, we describe the baseline crisis bargaining model that we use, and then supplement the model by allowing the leaders to make public commitments before the crisis bargaining begins. We then present the equilibrium results, first in the situation where only one side can make a costly public commitment, and then when both sides can make public commitments. We then offer some concluding remarks.

The Model

The Baseline Crisis Bargaining Model

To model how public commitments can be used to influence crisis bargaining over a divisible good, we use the bargaining approach to war used by many formal models of crisis bargaining. Figure 1, drawn from Fearon (1995) and Powell (1996a,b, 1999), graphically illustrates the bargaining approach to war. Two countries (labeled *D*, henceforth a “he,” and *S*, henceforth a “she”) are involved in a dispute over a divisible good (e.g., territory) whose value to both sides is normalized to 1. The two sides can either peacefully reach an agreement on a division of the good, or they can go to war, in which case the side that wins obtains the entire good and the side that loses receives none of it. Moreover, war is costly, with *D* and *S*’s cost of war being c_D , $c_S > 0$, respectively. Assume that if war occurs, side *D* wins with probability $1 > p > 0$ and side *S* wins with probability $1 - p$ (thus, p measures the extent to which the military balance favors *D*). Then, country *D*’s expected utility from war is $EU_D(\text{war}) = (p)(1) + (1 - p)(0) - c_D = p - c_D$, and country *S*’s expected utility from war is $EU_S(\text{war}) = (p)(0) + (1 - p)(1) - c_S = 1 - (p + c_S)$. Thus, as seen in Figure 1, the costliness of war opens up a bargaining range of agreements $[p - c_D, p + c_S]$ such that for all agreements in this range, both sides prefer the agreement to war.

There is some status quo division of the disputed good $(q, 1 - q)$, where $1 \geq q \geq 0$ is *D*’s share and $1 - q$ is *S*’s share. Powell (1996a,b, 1999) defines a state to be “satisfied” if the status quo division of the good provides it with at least as

⁸ From a more technical perspective, our analysis is also novel in that in the two-sided commitment case, Leventoglu and Tarar (2005) only examine simultaneous commitments, whereas we examine simultaneous as well as sequential commitments.

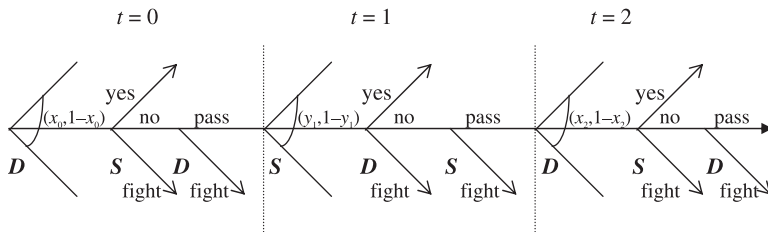


FIG. 2. The Baseline Crisis Bargaining Model

much utility as going to war. In contrast, a state is “dissatisfied” if it strictly prefers to go to war rather than live with the status quo. Thus, D is satisfied if $q \geq p - c_D$, and dissatisfied if $q < p - c_D$ (this is the case shown in Figure 1). S is satisfied if $1 - q \geq 1 - p - c_S$, or $q \leq p + c_S$. S is dissatisfied if $q > p + c_S$. Both sides are satisfied if $p + c_S \geq q \geq p - c_D$ (i.e., if the status quo lies within the preferred-to-war bargaining range). Only D is dissatisfied if $q < p - c_D$, and only S is dissatisfied if $q > p + c_S$. If the two sides agree on the probability that each prevails in war, then at most, one state can be dissatisfied.

To determine the agreement that will be reached within the preferred-to-war bargaining range, we use the bargaining model of Leventoğlu and Tarar (2008), which is shown in Figure 2 (the figure shows only three periods of the model, but this is actually an infinite-horizon model).⁹ The two sides take turns making offers and counteroffers (the figure shows D making the first offer, but this is not necessary) until an agreement is reached or one side opts for war. In general, if an agreement is reached on some division of the pie ($z, 1-z$) in period t ($t = 0, 1, 2, \dots$), where z is D 's share and $1-z$ is S 's share, then D 's payoff is $\sum_{i=0}^{t-1} \delta^i q + \sum_{i=t}^{\infty} \delta^i z$ and S 's payoff is $\sum_{i=0}^{t-1} \delta^i (1 - q) + \sum_{i=t}^{\infty} \delta^i (1 - z)$. Recall that $(q, 1-q)$ is the status quo division of the good, from which the players get utility until an agreement is reached or war occurs, where $0 < \delta < 1$ is the common discount factor. If they go to war in some period t ($t = 0, 1, 2, \dots$), then D 's payoff is $\sum_{i=0}^{t-1} \delta^i q + \sum_{i=t}^{\infty} \delta^i (p - c_D)$ and S 's payoff is $\sum_{i=0}^{t-1} \delta^i (1 - q) + \sum_{i=t}^{\infty} \delta^i (1 - p - c_S)$.

If both sides are satisfied, i.e., $p + c_S \geq q \geq p - c_D$, then the status quo is not revised in equilibrium, because neither side can credibly threaten to use force to try to change the status quo. If one side, say D , is dissatisfied (i.e., $q < p - c_D$; this is without loss of generality, since at most one side can be dissatisfied), then it can credibly threaten to use force to try to change the status quo, and hence the status quo needs to be revised in its favor for war to be avoided. Figure 3 shows the stationary equilibrium proposals (which are accepted, hence war is avoided) that D and S make for D , x^* and y^* , respectively, as a function of the discount factor δ , when D is dissatisfied. When the discount factor is low, then each side just offers the other its utility from war. That is, whoever gets to make the first proposal gets all of the gains from avoiding war (i.e., its most preferred outcome in the preferred-to-war bargaining range). When the discount factor gets in the medium range, then S has to start compromising when making a proposal, and hence her proposal y^* for D starts increasing. When the discount factor becomes high, then both sides' proposals for D start decreasing.¹⁰

⁹ This model modifies the one in Powell (1996a,b, 1999) by allowing states to go to war in any period rather than just in periods in which the other side makes an offer.

¹⁰ Leventoğlu and Tarar (2008) provide a detailed analysis of this model under complete and incomplete information, as well as the intuition behind the trend just described. As is shown there, when δ is in the high range, there is a broad range of agreements that can be supported in non-stationary subgame-perfect equilibria (SPE), and Figure 3 just shows the stationary SPE proposals.

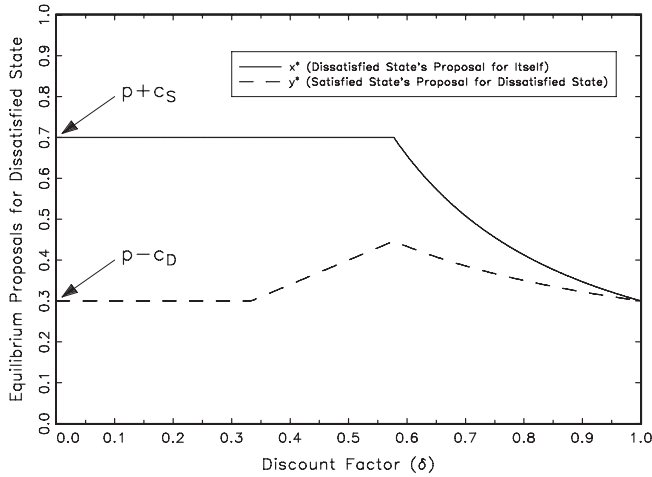


FIG. 3. Stationary Equilibrium Proposals in the Baseline Crisis Bargaining Model

Allowing for Public Commitments

In this article, we want to investigate the impact that public commitments can have on crisis bargaining over a divisible good, when the leader can endogenously choose how much (if any) of the disputed good to publicly commit to obtaining. Therefore, we suppose that before the baseline crisis bargaining game (described above) begins, one or both sides can publicly commit to obtaining a certain amount of the disputed good. For example, the dissatisfied leader D publicly commits to some $\tau_D \in [0, 1]$ before the bargaining game begins, where τ_D is endogenously chosen. In any period in which D 's share of the pie (say, z) for that period is at least τ_D , then leader D 's personal payoff for that period is simply z . However, in any period in which D 's share of the pie for that period is strictly less than τ_D (i.e., $z < \tau_D$), then leader D 's personal payoff for that period is $z - a_D(\tau_D - z)$ rather than z , where $a_D \geq 0$ is D 's "audience cost coefficient," which measures the extent to which violating a public commitment by a given amount is costly.¹¹ The bigger the deficit between D 's public commitment and what he actually obtains (i.e., the bigger the difference $\tau_D - z$ is), the bigger the audience cost that he pays (e.g., maybe he is less likely to be re-elected). Moreover, the bigger the audience cost coefficient a_D , the more costly it is to violate a public commitment by a given amount. Under Fearon's (1994) hypothesis that democratic leaders usually pay greater audience costs than autocratic leaders, we would expect democratic leaders to have higher values of a_D than autocratic leaders, on average. Note that in this model, and in contrast to previous formal models of audience costs, the magnitude of the audience cost is determined endogenously, by the amount that the leader publicly commits to as well as the amount that he ends up accepting in the bargaining subgame (both of which are endogenous). The only part of the audience cost that is exogenous is a_D .

We assume that the audience cost applies to the status quo payoff and any agreement reached, but not to the war payoff. That is, if a leader publicly commits to more than his war payoff but war occurs, the leader does not pay an audience cost in that case, since he is not backing down from a public commitment by accepting an agreement that gives him less than what he committed to.

¹¹ This is the same cost structure used by Leventoğlu and Tarar (2005) and Muthoo (1999) to investigate how public commitments can affect *non-crisis* bargaining over a divisible good, i.e., bargaining where there is no outside option of war.

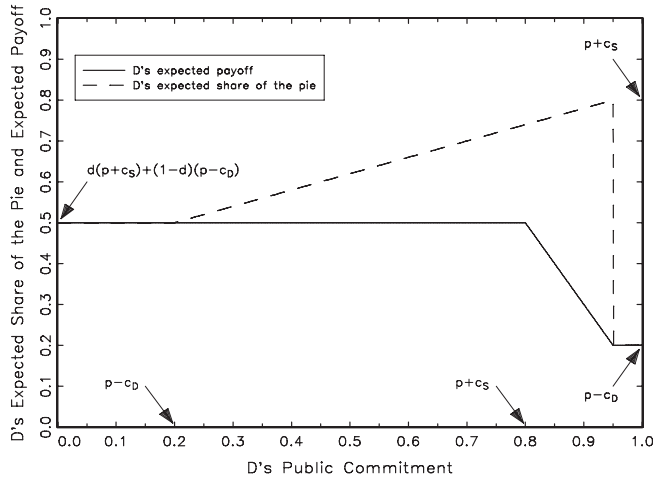


FIG. 4. *D's* Expected Share of the Pie and Expected Personal Payoff

Everything is analogous for *S* — she can publicly commit to some amount $\tau_S \in [0, 1]$ (which is endogenously chosen), and her audience cost coefficient is $a_S \geq 0$.

We now present the results for the case where the discount factor δ is relatively low. Recall from Figure 3 that in the baseline crisis bargaining model, when δ is low, each side just offers the other its utility from war when making an offer. It is particularly interesting to investigate, in this scenario, whether a leader can use a public commitment to get the other side to compromise in its proposal.¹²

The Results

Only *D* Can Make a Public Commitment

In the baseline crisis bargaining model, when δ is low, then whoever gets to make the first proposal gets all of the gains from avoiding war, i.e., *D* proposes $x^* = p + c_S$ for himself, and *S* proposes $y^* = p - c_D$ for *D*. Thus, if $0 < d < 1$ is the probability that *D* gets to make the first proposal, then *D's* ex ante expected share of the pie in the baseline crisis bargaining game is $d(p + c_S) + (1 - d)(p - c_D)$.

Now suppose *D* can make a public commitment $\tau_D \in [0, 1]$ before the crisis bargaining game begins. Figure 4 shows the “partial equilibrium” results, i.e., it shows leader *D's* expected share of the pie (dashed line) and expected personal payoff (share of the pie minus any audience cost paid; solid line) in the SPE of the bargaining *subgame*, as a function of *D's* public commitment $\tau_D \in [0, 1]$ (which is taken as *given* in the partial equilibrium analysis; later, we will determine equilibrium commitment levels of the entire game). When *D* commits to no more than his utility from war ($\tau_D \leq p - c_D$), the commitment has no effect on the bargaining subgame, because the normal proposals made, $x^* = p + c_S$ and $y^* = p - c_D$, satisfy *D's* (low) public commitment, and hence it is as if no commitment at all was made. Therefore, leader *D's* expected share of the pie and his expected personal payoff remain at $d(p + c_S) + (1 - d)(p - c_D)$.

When *D* starts committing to more than his utility from war, $\tau_D > p - c_D$, then *D* starts paying an audience cost in *S's* usual proposal $y^* = p - c_D$, and hence leader *D's* personal payoff for accepting this proposal is less than his utility from war. Therefore, *S* has to start compromising when making a proposal if she wants

¹² The overall results are similar when the discount factor is medium or high.

to avoid war (which she does, until D 's commitment becomes too high), i.e., y^* starts increasing. Thus, D 's expected share of the pie starts increasing in τ_D — the more he commits to, the more S has to compromise when making a proposal, in order to avoid war. (D is still proposing $x^* = p + c_S$ for himself, because this is all he needs to offer S .)

An interesting thing to note in this range is that, although D 's expected share of the pie is increasing, leader D 's expected personal payoff is not. The reason is that S compromises in just such a minimal way so as to leave leader D indifferent between accepting that agreement (with audience costs) and going to war. That is, suppose D commits to some τ_D a little larger than $p - c_D$. If S actually proposes $y = \tau_D$, i.e., the amount that D actually committed to, then D 's personal payoff for accepting this agreement is τ_D , which is greater than his war payoff ($p - c_D$) by a discrete amount. However, all S needs to offer D in order to avoid war is an agreement that, with audience costs, gives leader D a utility of just $p - c_D$ (his utility from war). Thus, instead of proposing $y = \tau_D$, S proposes some y^* which satisfies $\tau_D > y^* > p - c_D$ and is such that leader D 's personal utility for accepting this agreement (with audience costs) is just $p - c_D$.¹³ That is, S compromises, but in just a minimal way that leaves leader D with no gain in personal utility. Thus, although his expected share of the pie is increasing, his personal payoff is not.

Note that the effect of the public commitment (in this range) is essentially to reduce the size of the preferred-to-war bargaining range in D 's favor from $[p - c_D, p + c_S]$ to $[y^*, p + c_S]$. That is, the public commitment increases the minimal amount that D needs to avoid war (thus increasing his “reservation value”), and in a sense thus increases his resolve for war (but without actually increasing his payoff from war).

When D starts committing to more than $p + c_S$, then leader D 's personal utility starts decreasing. The reason is that D is now committing to so much that he is paying an audience cost even in his own proposal, $x^* = p + c_S$ (and D cannot push S beyond this agreement, as S would rather let war occur). S is still compromising more and more (i.e., y^* is still increasing), and hence D 's expected share of the pie is still increasing in τ_D (D 's proposal for himself remains at $x^* = p + c_S$). However, as before, S compromises in just such a minimal way so as to leave leader D 's personal utility to be just $p - c_D$ when S makes a proposal, and when D makes a proposal he proposes $x^* = p + c_S$, in which he now pays an audience cost (which is increasing in τ_D), and so his personal payoff is strictly decreasing in this range.

Finally, when D 's commitment exceeds a threshold that we denote by τ_{DWAR} (and which is about 0.95 in Figure 4), then D is committing to so much that S would rather allow war to occur than satisfy D 's minimal demand. That is, when D commits to τ_{DWAR} , the preferred-to-war bargaining range has shrunk to the point $p + c_S$, and if he commits to any more, the range disappears entirely, and hence war occurs in the bargaining subgame.

This completes the description of the “partial equilibrium” results. We are now in a position to determine what comprises SPE of the *entire* game, i.e., including the commitment stage. As seen from Figure 4, any commitment level from 0 to $p + c_S$ is a SPE commitment level. Each of these commitment levels gives leader D the same (maximal) personal utility, and hence these are all SPE commitment levels. However, any $\tau_D > p + c_S$ gives leader D a strictly lower personal utility, and hence these are *not* equilibrium commitment levels.

What can we learn from this analysis? First, even under complete information, public commitments can be useful. In crisis bargaining over a *divisible* good, public commitments can be used to generate bargaining leverage and cause the

¹³ As is shown in the appendix, $y^* = \frac{p - c_D + a_D \tau_D}{1 + a_D}$.

other side to make more concessions than it otherwise would, even in a complete information setting in which audience costs have no signaling role. The results predict that the leader himself will not be better off, because under complete information the other side compromises in just such a minimal way so as to not give the leader himself any net gains. However, the country's expected share of the pie is strictly greater than without the public commitment tactic, and hence the citizens (who do not pay audience costs, only the leader does) strictly benefit from the commitment tactic. And the other side is strictly worse off, because it gets a smaller expected share of the pie than it would without the commitment tactic.

Notice from Figure 4 that there is a principal-agent situation, because the citizens (who do not pay audience costs) want the leader to publicly commit to τ_{DWAR} (the amount that maximizes the expected share of the pie, but does not yet cause war), but the leader never commits to more than $p + c_S$ (i.e., all of the gains from avoiding war) in equilibrium.¹⁴ This gets to an interesting issue. Namely, it is the credibility that the leader really will be punished for violating a public commitment that allows the leader to use the commitment tactic to force the other side to make concessions, concessions which benefit the citizens—however, it is this same credibility (which ensures that the tactic works) that ensures that the leader will not use the commitment tactic to the citizens' *maximum* advantage. The citizens' strategy of imposing costs on their leader for backing down from a public commitment is to their benefit (which provides a microfoundation for audience costs); however, it also ensures that the benefit will not be all that it can be. This also gets to an issue that Fearon (1997) discusses at length, namely whether a leader can generate arbitrarily large audience costs. Our results suggest that even if he can, he will choose not to do so in equilibrium (i.e., he makes a *limited* commitment in equilibrium).

Also note that this principal-agent situation is what gives S a strictly positive incentive to enter into negotiations. If D were to commit to τ_{DWAR} , then leader S is indifferent between entering into negotiations and going to war, as her expected payoff either way is $1 - p - c_S$. However, when D commits to less than τ_{DWAR} , then S 's expected payoff for entering into negotiations is strictly greater than $1 - p - c_S$ (her war payoff).

Finally, note that these results get to the theory of "issue indivisibility" as a cause of war. Fearon (1995) briefly mentions that issue indivisibility may be a third rationalist explanation for war (the other two being private information and commitment problems), but did not find the issue indivisibility argument very compelling. However, a number of students of international and civil conflict have found the idea intriguing, and it has become quite prominent (e.g., Goddard 2006; Hassner 2003; Toft 2003; Walter 1997). The idea is that, even if war is costly and a preferred-to-war bargaining range thus exists, if the disputed issue is considered to be not continuously divisible (for example, Jerusalem and Kashmir are disputed issues that have at times been portrayed as being indivisible), no feasible division may lie within the preferred-to-war bargaining range, and hence costly war can occur even under complete information. Under this framework, when we observe leaders stating that the good is indivisible and they must hence have it all, these are sincere statements that explain why war occurs and a negotiated settlement was not reached.

However, our results suggest that leaders can use public statements about how much of the disputed good they expect to get as a source of *bargaining leverage*. A natural question that arises is, under what conditions will the leader publicly

¹⁴ It is easy to show that $\tau_{DWAR} > p + c_S$ for all parameter values.

commit to obtaining the *entire* good? This is very similar (although not necessarily identical) to the leader publicly stating that the good is indivisible.¹⁵

In equilibrium, the leader commits to at most $p + c_S$. Thus, the only time the leader can be publicly committing to obtaining the entire disputed good in equilibrium is when $p + c_S \geq 1$. In substantive terms, this condition means that S 's utility from war ($1 - p - c_S$) is 0 (or negative), i.e., that S 's resolve for war is so low (either because of a low probability of winning, or a high cost of war, or both) that she would rather turn over the *entire* disputed good than go to war. As long as S 's utility from war is strictly positive (i.e., S would be willing to go to war to keep at least some of the disputed good), D never publicly commits to obtaining the entire disputed good in equilibrium. (More generally, a comparative static of the model is that the maximum commitment that D is willing to make in equilibrium, $p + c_S$, is decreasing in S 's utility from war—the greater S 's utility from war, the less the maximum that D commits to in equilibrium.)

Also note that, because the citizens' desired commitment level τ_{DWAR} is strictly greater than $p + c_S$, the citizens want the leader to publicly commit to the entire good under more circumstances than the leader. When $p + c_S \geq 1$, so that the leader can be publicly committing to the entire good in equilibrium, $\tau_{DWAR} > 1$, so that the citizens also want this. However, even when $p + c_S < 1$, then as long as $a_D \leq \frac{c_S + a_D}{1 - (p + c_S)}$ (i.e., the audience cost coefficient is not too high), it is the case that $\tau_{DWAR} \geq 1$, so that the citizens want the leader to be committing to the entire good, but the leader chooses not to.¹⁶ This is another principal-agent situation created by the ability to generate costly public commitments.

Another important result is that, when D is publicly committing to the entire good in equilibrium (a necessary condition for which is that $p + c_S \geq 1$), war does not occur (under complete information); instead, a negotiated settlement is reached. And, when S is chosen to make the first offer, D accepts less than all of the disputed good, despite having committed to obtaining all of it (recall that in equilibrium, S 's offer y^* to D is strictly less than D 's commitment τ_D). This has potentially important policy implications, because it suggests that even when a leader is publicly committing to the entire disputed good, this may just be a tactic to force the other side to make large concessions, and the leader is still willing to compromise in equilibrium and a negotiated settlement can still be reached. A statement to the effect that the good is indivisible should not necessarily convince outside observers (or even the other side) that war is inevitable and that there is no point in further negotiations.¹⁷

¹⁵ Intuitively, it seems that when the leader explicitly says that the good is indivisible, he is creating even more costs for backing down than by just saying that he expects to obtain the entire good in negotiations—however, empirically it would be hard to distinguish between these two types of statements. For example, the 1993 Oslo Accords between the Israelis and Palestinians explicitly left the final status of Jerusalem to be decided in future negotiations. However, almost immediately afterwards, Israeli leaders continued to publicly state that Jerusalem is the “undivided, eternal capital of Israel” (Makovsky 2001; Perlmutter 1995). Was this a statement that Jerusalem is indivisible (it obviously is not), or just that the Israelis expect to get all of Jerusalem in the final negotiations? It is hard to say. We discuss this case in more detail later on.

¹⁶ That is, it can be shown that τ_{DWAR} is decreasing in a_D . When $a_D > \frac{c_S + a_D}{1 - (p + c_S)}$, then $\tau_{DWAR} < 1$. Why is τ_{DWAR} decreasing in a_D ? Recall that τ_{DWAR} is the commitment threshold beyond which D needs more than $p + c_S$ to avoid war (and hence war occurs). When a_D is high, then audience costs build up very rapidly (and also the corresponding amount that D needs to avoid war), and hence the threshold is quite low.

¹⁷ Goddard (2006) also points out the bargaining leverage role of claiming issue indivisibility. She writes: “Finally, legitimization strategies can serve as a rhetorical commitment device. By denouncing the legitimacy of an opponent’s claim, actors try to appear irrevocably committed to a position, forcing their opponent to compromise” (Goddard 2006, 43). For the most part, however, her analysis focuses on how “legitimation strategies” *inadvertently* create *real* issue indivisibilities from which no compromise is possible, whereas our analysis (which focuses on complete information) suggests that, even when the entire disputed good is being publicly committed to, compromise is still possible in equilibrium. An incomplete-information version of our model would allow us to examine whether the use of public commitments for bargaining leverage can *inadvertently* lead to negotiation failure, and this is a promising area for future research.

These equilibrium results are broadly consistent with a number of historical cases. For example, in the 1962 Cuban Missile Crisis, U.S. President Kennedy essentially publicly committed to the entire disputed good by publicly stating that the only acceptable outcome is a total Soviet withdrawal of all nuclear missiles from Cuba.¹⁸ Consistent with our results, he did compromise (but only in secret), by agreeing to withdraw nuclear missiles from Turkey.¹⁹ Our results predict that Kennedy would have committed to the entire disputed good only if he believed that Soviet leader Khrushchev's resolve for going to war on this issue was very low, which he did indeed believe (1999, 11, 13, 49, 80, 96–7).

Similarly, following Iraq's invasion of Kuwait on August 1, 1990, U.S. President George Bush essentially committed to the entire disputed good by publicly stating that the only acceptable outcome is a total Iraqi withdrawal from Kuwait and the restoration of the Kuwaiti government.²⁰ In line with our prediction, important administration officials believed that Iraq did not have significant resolve for war against the United States. For example, in their joint memoir of the major foreign policy events during Bush's presidency, George Bush and Brent Scowcroft write (1998, 328) that during an August 4 National Security Council meeting:

[Chairman of the Joint Chiefs of Staff Colin] Powell said he did not think Saddam wanted to mess with us. He believed we had to get Americans into Saudi Arabia, to show the flag. The President thought Powell was on the right track. "I'm inclined to feel that a small U.S. military presence and an air option will do it," he said. "Iraq did badly versus Iran."

Bush also writes that:

I thought the Defense Department overestimated Iraq's strength and resolve. Despite the size of their army, I just didn't see the Iraqis as being so tough. They had been unable to defeat Iran; they had never fought over long supply lines, or at any time when they did not control the air. Besides, some of our Arab coalition friends were telling me that Iraq's military was overrated (Bush and Scowcroft 1998, 353–4).

On the other hand, the results predict that a leader commits to only a *limited* amount of the disputed good if it believes that the other side has significant resolve for war. This is consistent with the 1951 Abadan Crisis that emerged between Iran and Great Britain when the former decided to nationalize the Anglo-Iranian Oil Company, whose main refinery (the world's largest) and associated British personnel lay on the island of Abadan. In the House of Commons, British Prime Minister Clement Attlee made only limited public commitments, declaring that "there may have to be a withdrawal from the oil wells [on mainland Iran] and there may have to be a withdrawal from some part of Abadan, but our intention is not to evacuate entirely" (Cable 1991, 87). Importantly, British officials believed that Iran was quite willing to go to war if Britain launched a

¹⁸ In his broadcast to the American public on October 22, 1962, Kennedy stated that the placement of Soviet nuclear missiles in Cuba "is a deliberately provocative and unjustified change in the status quo which cannot be accepted by this country if our courage and our commitments are ever to be trusted again by either friend or foe...Our unswerving objective, therefore, must be to prevent the use of these missiles against this or any other country and to secure their withdrawal or elimination from the Western Hemisphere" (Kennedy 1999, 152).

¹⁹ Gaddis (1997, 271–2) argues that Kennedy probably would have compromised in public, if that was needed to resolve the crisis peacefully.

²⁰ In a televised address on August 8, Bush declared that, "...we seek the immediate, unconditional, and complete withdrawal of all Iraqi forces from Kuwait...Kuwait's legitimate government must be restored to replace the puppet regime" (Bush and Scowcroft 1998, 341). This followed Bush's earlier statements on August 5 that, "...I view very seriously our determination to reverse this awful aggression...This will not stand, this aggression against Kuwait" (Bush and Scowcroft 1998, 332–3).

military operation to gain control over the island; i.e., that Iran had significant resolve for war on this issue (e.g., Cable 1991, 43, 70, 92).

The model has multiple SPE, in which leader D commits to anything from 0 to all of the gains from avoiding war (i.e., $p + c_S$). This is because, as seen in Figure 4, the leader's personal payoff is the same for all of these commitment levels. However, as can also be seen in the figure, the country's share of the pie, which can be thought of as the payoff of the citizens, is *not* the same for all of these commitment levels: it is maximized (among all SPE commitment levels) at $\tau_D = p + c_S$. This suggests a natural equilibrium selection criterion. If the leader is indifferent (in expected personal utility terms) among a variety of commitment levels, a reasonable argument can be made that he will choose the one that makes his citizens the happiest. To capture this idea, we introduce a refinement that we call a "pie-maximizing" SPE, which is defined as a SPE in which, given the other side's strategy, among all of his best responses (i.e., those that maximize his personal payoff), the leader chooses the one that maximizes his country's share of the pie. Although the model has a continuum of SPE, it has a *unique* pie-maximizing SPE, in which leader D commits to all of the gains from avoiding war, i.e., $\tau_D = p + c_S$. Any SPE that is not pie-maximizing (i.e., any $\tau_D < p + c_S$) is unstable in the sense that the leader can increase his country's share of the pie without decreasing his personal payoff by choosing a higher commitment level, and hence the leader has at least a weak incentive to adopt such a deviation.

Only S Can Make a Public Commitment

Now suppose only the satisfied leader can make a public commitment. The results are very similar. Namely, if S commits to less than her utility from war ($\tau_S \leq 1 - [p + c_S]$), then the commitment has no effect. Once she commits to more than this, then the usual proposal that D makes, $x^* = p + c_S$, makes leader S worse off (with audience costs) than war, and hence D starts compromising when he makes a proposal. However, as above, D compromises in just such a minimal way so that leader S 's personal utility does not increase. When S commits to more than all of the gains from avoiding war ($\tau_S > 1 - [p - c_D]$), then she pays an audience cost even in her own proposal, $y^* = p - c_D$, and hence her personal payoff starts decreasing. If she commits to more than a certain level, which we call $\tau_{S,WAR}$, then she is committing to so much that D would rather go to war than satisfy her minimal demand (in particular, S needs an amount that leaves D with less than $p - c_D$), and hence war occurs in the bargaining subgame.

Thus, there is a continuum of SPE, in which she commits to anything from 0 to all of the gains from avoiding war ($1 - [p - c_D]$). There is a *unique* pie-maximizing SPE, in which she commits to all of the gains from avoiding war ($\tau_S = 1 - [p - c_D]$).

The only significant way that the results differ from the case where only D can make a public commitment is that, in the case where only S can make a public commitment, she never commits to the entire good in equilibrium. Recall that in the case where only D can make a public commitment, he only commits to the entire good in equilibrium when $p + c_S \geq 1$, i.e., when S is so unresolved that she would rather turn over the entire disputed good than go to war. In the case where only S can make a public commitment, she only commits to the entire disputed good in equilibrium when $1 - [p - c_D] \geq 1$, or $p - c_D \leq 0$. In substantive terms, this means that D 's utility from war is 0 (or negative), i.e., D is so unresolved that he would rather turn over the entire disputed good than go to war. However, this contradicts the idea that D is dissatisfied, i.e., that $0 \leq q < p - c_D$. (The intuition is that the fact that D is dissatisfied means that he has at least some positive resolve for war.) The model predicts that when only the satisfied

leader can make a costly public commitment, she never publicly commits to the entire disputed good.²¹

Both Sides Can Make Public Commitments

Now suppose that both sides have positive audience cost coefficients a_D and a_S , and they simultaneously announce their public commitments τ_D and τ_S . It turns out that there are four classes of SPE (these are described in more detail in the appendix; the first three classes always exist, and the fourth class exists when the audience cost coefficients a_D and a_S are sufficiently high). The first is where neither side makes a significant commitment, i.e., neither side commits to more than its utility from war, and hence neither has to compromise in its proposal. The second class is where only one side commits to more than its utility from war (but no more than all of the gains from avoiding war), and (only) the other side has to compromise in its proposal. These two classes of SPE are not pie-maximizing in that, given the other side's strategy, at least one leader can increase its share of the pie without decreasing its personal payoff by choosing a higher commitment level.

The third class of SPE involves each side committing to more than its utility from war, but strictly less than all of the gains from avoiding war. Within this class of SPE, there is only one that is pie-maximizing, in which D commits to an amount that we denote by $\tau_{D_{\text{CRIT}}}$ and S commits to an amount denoted by $\tau_{S_{\text{CRIT}}}$. Each of these amounts is less than all of the gains from avoiding war,²² and hence each side moderates its commitment relative to the unique pie-maximizing SPE when only it can make a costly public commitment. These public commitments are also mutually incompatible, in the sense that they cannot both be simultaneously satisfied, and hence at least one side must pay an audience cost in any negotiated settlement reached.²³ Each side proposes for itself the amount of its public commitment, and these proposals are accepted (and hence a negotiated settlement is reached in the first period). Each side pays an audience cost in the other side's proposal, but not in its own.

In this pie-maximizing SPE, each leader's expected personal payoff is lower than if no commitments were made (which is one of the SPE in the first class). Why? In the no-commitment case, when a leader makes a proposal, it gets all of the gains from avoiding war. In the pie-maximizing SPE described above, a leader has to compromise when making a proposal, and hence gets strictly less when it makes a proposal (although it does not pay an audience cost in its own proposal). When the *other* side makes a proposal, it offers *more* than in the no-commitment case, but (as before) just compromises in such a minimal way that the leader's personal payoff (with audience costs) is still just its utility from war (as in the no-commitment case). Thus, in expected utility terms, both leaders strictly prefer the no-commitment SPE to the pie-maximizing SPE.

Thus, there is an incentive on the part of the leaders to mutually refrain from making public commitments in the two-sided case. However, the no-commitment SPE is not pie-maximizing, in that each leader can increase its country's share of the pie without decreasing its personal payoff by making a higher commitment level, given the other side's strategy. In this sense, the no-commitment SPE is not stable and would be hard to maintain.

²¹ It is certainly possible for her citizens to want her to publicly commit to the entire good. When $a_S \leq \frac{s+a_D}{p-a_D}$, then $\tau_{\text{SWAR}} \geq 1$ (τ_{SWAR} is the commitment level that maximizes the share of the pie but does not yet lead to war, and hence the commitment level that the citizens want). The intuition is exactly the same as in footnote 16.

²² In particular, it is the case that $\tau_{D_{\text{CRIT}}} = \frac{a_S(p-a_D)+(p+s)(1+a_D)}{1+a_D+a_S}$ and $\tau_{S_{\text{CRIT}}} = \frac{(1+a_S)[1-(p-a_D)]+a_D[1-(p+s)]}{1+a_D+a_S}$. Also note that $p-a_D < \tau_{D_{\text{CRIT}}} < p+s$ and $1-(p+s) < \tau_{S_{\text{CRIT}}} < 1-(p-a_D)$.

²³ That is, $\tau_{D_{\text{CRIT}}} + \tau_{S_{\text{CRIT}}} > 1$ — the sum of their commitments exceeds the amount of pie available to be divided.

Moreover, except for a knife-edge value of d , the probability that side D makes the first proposal, it is the case that one country's expected share of the pie is strictly greater in the pie-maximizing SPE than in the no-commitment SPE (and the other side's share is strictly lower), and hence this side's citizens will want their leader to make a significant public commitment even in the two-sided case.²⁴

Because of these two reasons, there is an incentive on the part of the leaders to keep the negotiations secret in the two-sided case, so that they find it easier to maintain the no-commitment SPE. With secret negotiations, it is easier for the leaders to resist pressure from their domestic constituents as well as their own temptation to make public commitments. Moreover, this points to an important role for third-party mediators in international negotiations, namely they can help the leaders by providing a forum for secret negotiations. And in some cases mediators can reduce the disputants' audience costs by making it seem as though the final agreement was "handed down" or imposed by third parties.²⁵

For example, during the Camp David negotiations between Egypt and Israel in September 1978, U.S. President Carter insisted that no reporters and television cameras be allowed during the course of the negotiations, in part to isolate each side from domestic pressures and perhaps to make it easier for each side to restrain itself from making public commitments. Previous negotiations between the two sides had taken place in the public eye with both sides making large demands that the other rejected as unacceptable. It was only in the relative secrecy of Camp David that the two sides were able to reach an agreement (Telhami 1990).

Similarly, the negotiations that led to the 1993 Oslo Accords between the Israelis and Palestinians were conducted secretly and only made public once an agreement had been reached. Public talks sponsored by the U.S. were occurring at the same time in Washington with a different Palestinian negotiating team. The Washington talks were publicly known and the Palestinian team there was making large demands regarding settlements and Jerusalem that the Israeli team found unacceptable (Perlmutter 1995). An agreement was only able to be reached in the secret negotiations being held in Oslo, and sponsored by Norway.

Finally, when the audience cost coefficients a_D and a_S are sufficiently high, then there exists a fourth class of SPE in which both sides commit to greater than their war thresholds, and war occurs. That is, D commits to greater than τ_{DWAR} and S commits to greater than τ_{SWAR} , where these values are the same as in the one-sided commitment cases. Recall that in the one-sided "partial equilibrium" results, if D commits to more than τ_{DWAR} , then D needs more than $p + c_S$ to avoid war, but S is not willing to compromise this much, and hence war occurs in the bargaining subgame. The same is true if only S can make a costly public

²⁴ It can be shown that country D 's expected share of the pie is strictly greater in the pie-maximizing SPE than in the no-commitment SPE when d is below a certain threshold, and S 's share of the pie is strictly greater when d is above this threshold. That is, a side's expected share of the pie is strictly greater than in the no-commitment case precisely when the *other* side is significantly likely to make the first proposal. What is the intuition behind this somewhat counter-intuitive result? Recall that when your side makes the first proposal, you have to compromise (in the pie-maximizing SPE), and when the other side makes the first proposal, it has to compromise. Hence, when both sides can make costly public commitments, the commitment tactic is beneficial in bringing in a greater share of the pie precisely when the *other* side is sufficiently likely to make the first proposal. This suggests an interesting idea. Within the preferred-to-war bargaining range, we normally think that the more powerful or diplomatically influential negotiator can get most of the gains, which in the formal model would be captured by supposing that it is more likely to make the first proposal (i.e., in a more general setting, d should be thought of simply as a parameter that measures D 's bargaining capabilities relative to S). The results suggest that the commitment tactic is primarily a useful tool for the side that is otherwise disadvantaged in the bargaining process, i.e., it is a "tool of the weak." Indeed, when $d = 1$, then side D cannot benefit at all from the commitment tactic, as it is already certain to get all of the gains from avoiding war (but side S can benefit by using the tactic to force D to compromise).

²⁵ We thank an anonymous reviewer for pointing this out.

commitment and commits to more than τ_{SWAR} . In the one-sided cases, the side that can make a costly public commitment never commits to so much in equilibrium. In the two-sided case, as long as the audience cost coefficients a_D and a_S are high enough that the war thresholds are less than 1 (so that each side can actually be committing to an amount that exceeds its war threshold), then there exist SPE in which each side commits to greater than its war threshold, and war occurs.²⁶

Why is this an equilibrium? If D is committing to more than his war threshold, war occurs regardless of S 's commitment level (because D needs more than $p + c_S$ to avoid war, and S is not willing to compromise this much), and so S is indifferent among all of her commitment levels, and hence can rationally choose to commit to more than her war threshold as well. And, given that S is committing to more than her war threshold, war occurs regardless of D 's commitment level (because S needs an amount that leaves D with less than $p - c_D$), and so D can rationally choose to commit to more than his war threshold as well. When both sides are choosing more than their war thresholds, each is choosing a best response to what the other is doing, and hence these are SPE.²⁷ Also note that these SPE are pie-maximizing (but only in a trivial sense—if the other side is committing to more than its war threshold, war is the outcome regardless of your commitment level, and so *any* commitment level is pie-maximizing, because no pie is divided). Finally, note that these war SPE further reinforce the incentive on the part of the leaders to negotiate secretly in the two-sided case.

When the two sides *sequentially* (rather than simultaneously) make their commitments, then the war SPE are no longer SPE. In the sequential commitment model, the side committing second can only rationally make an extreme commitment level (i.e., one that exceeds its war threshold) if the first side has done so as well. The first side can anticipate this, and hence never makes an extreme commitment level in a SPE. In the sequential commitment model, there is a *unique* pie-maximizing SPE, which is the same as the pie-maximizing SPE described above (in the third class of SPE) in which a negotiated settlement is reached, but both leaders have lower expected personal payoffs than if no commitments were allowed. Somewhat surprisingly, this is true regardless of which side gets to make the first commitment; hence, there is no advantage (or disadvantage) to making the first commitment.²⁸

However, the logic behind the war SPE does seem to capture the public statements made by Israeli and Palestinian leaders since the 1993 Oslo Accords. Ever since the Oslo Accords, which explicitly left the final status of Jerusalem to be decided in future negotiations, Israeli prime ministers have continued to publicly declare that Jerusalem is the “undivided, eternal capital of Israel,” whereas the late Palestinian leader Yasser Arafat repeatedly made public statements promising that East Jerusalem would become the capital of a Palestinian state (Perlmutter 1995).

Arafat also made numerous statements promising to secure a right of return for Palestinian refugees to their former homes in Israel, whereas all Israeli prime

²⁶ In particular, it is required that $a_D > \frac{c_S + c_D}{1 - (p + c_S)}$ and $a_S > \frac{c_S + c_D}{p - c_D}$, so that $\tau_{D\text{WAR}} < 1$ and $\tau_{S\text{WAR}} < 1$, and hence D and S can actually be committing to an amount that exceeds their war thresholds. See footnotes 16 and 21.

²⁷ Note that there is a continuum of such SPE, because there is a continuum of extreme commitment levels; any $\tau_D > \tau_{D\text{WAR}}$, and any $\tau_S > \tau_{S\text{WAR}}$.

²⁸ Moreover, a less demanding equilibrium refinement also uniquely selects this SPE: it is the only SPE that satisfies the assumption that the side committing second's strategy is to choose its pie-maximizing best response to whatever commitment level the first side chooses. Under this assumption about side 2's strategy, the side committing first has a unique best response (not just a unique *pie-maximizing* best response, a unique best response *period*), namely to commit to its critical commitment level, $\tau_{D\text{CRIT}}$ for D and $\tau_{S\text{CRIT}}$ for S , and the unique pie-maximizing best response of the other side is to commit to its critical commitment level.

ministers have publicly declared that that is not an option. Makovsky (2001) writes:

The process also allowed each side to make contrary claims at home...Israeli leaders were able to continually promise their constituents what they wanted—including a united Jerusalem under Israeli sovereignty—while Arafat could promise his people what they wanted—including the right of return for all Palestinians to long-abandoned homes inside Israel.

The manner in which the leaders seemed to talk past each other and made extreme (and very incompatible) public commitments resembles the logic behind the war SPE (and indeed conflict has more or less been the outcome since the 2000 Camp David talks and then the 2001 Taba talks failed to result in an agreement), whereby each side finds it rational to unilaterally eliminate the bargaining range because the other side is doing so as well. In describing the difficulties of reaching a peace settlement, Diehl (2007, A27) writes of the “incurable proclivity of both Israelis and Palestinians to burden negotiations with maximalist demands and negotiating tricks intended to elide what both sides know to be the available settlement terms.”

Conclusion

In this article, we use a divisible-good model of crisis bargaining to examine how public commitments can be used to generate bargaining leverage under complete information. Previous models of audience costs examine a setting in which the disputed good is indivisible and there is private information, and show that audience costs can act as a credible signaling device (Fearon 1994, 1997; Schultz 1999; Smith 1998). Under the hypothesis that democracies are usually better able to generate audience costs than are autocracies, it has also been theorized that the greater signaling abilities of democracies (via audience costs) provide an informational explanation for the democratic peace (Fearon 1994; Guisinger and Smith 2002; Lipson 2003).

The implications of our analysis have been discussed at length earlier in the article, and we merely note here that the bargaining leverage role of public commitments somewhat mitigates *against* the democratic peace, as opposed to their signaling role (which has been the focus of previous work). In the crisis bargaining model that we use, if neither side can generate audience costs (e.g., an autocracy-autocracy dyad, under Fearon’s 1994 hypothesis that democratic leaders tend to face greater audience costs than autocratic leaders on average), a negotiated settlement is reached and war is avoided. If only one side can generate audience costs (e.g., a democracy-autocracy dyad), that side obtains bargaining leverage, but a negotiated settlement is still reached and war is avoided. It is only when *both* sides can generate *sufficiently large* audience costs (as in a democracy-democracy dyad) that war becomes a SPE outcome.²⁹

However, even if one does not find the war SPE compelling, consider that the “audience costs as an explanation of the democratic peace” argument is that two highly-resolved democratic leaders *will* use audience costs to credibly signal their resolve and hence have a chance of reaching a preferred-to-war negotiated settlement. However, in a bargaining setting, we have identified an incentive on the part of leaders to *not* use public commitments in the two-sided case, because (in the only pie-maximizing SPE) they either lead to war or an inefficient (for the leaders) negotiated settlement. Indeed, our analysis provides a rationale for why the leaders would have an incentive to keep the negotiations secret (in the

²⁹ This refers to the fact that the war SPE only exists when $a_D > \frac{\alpha_S + \alpha_D}{1 - (\beta + \alpha_S)}$ and $a_S > \frac{\alpha_S + \alpha_D}{\beta - \alpha_D}$.

two-sided case)—but in secret negotiations, audience costs obviously cannot be used to overcome war-causing informational asymmetries. This all suggests that whether audience costs provide a sound explanation for the democratic peace is an open question, and a natural step for future research will be to examine a model in which the disputed good is divisible, so that the bargaining leverage role of public commitments can fully emerge, and there is incomplete information, so that their signaling role can appear. This will allow us to assess whether public commitments have a net stabilizing or destabilizing effect on crisis bargaining.

Appendix

Because of space constraints, the proofs to all of the propositions in this article are provided in a technical supplement, which is available at the authors' Web sites at <http://www-polisci.tamu.edu/faculty/tarar> and <http://www.duke.edu/~bl38>, as well the *ISQ* repositories at http://www.isanet.org/data_archive/, and the Dataverse Network: <http://dvn.iq.harvard.edu/dvn/>.

No Public Commitment Allowed (The Baseline Crisis Bargaining Model)

The baseline crisis bargaining model is analyzed in detail in Leventoğlu and Tarar (2008). However, for the sake of completeness, we begin here by presenting the result when D is dissatisfied (i.e., $q < p - c_D$) and D 's discount factor δ_D is relatively low (Proposition 1 of Leventoğlu and Tarar 2008), and then build on this result to see what happens when public commitments are allowed.

Proposition 1 : *If $\delta_D \leq \frac{(p-c_D)-q}{(p+c_S)-q}$, then the following are SPE in the baseline crisis bargaining model:*

(a) D always proposes $(x^*, 1 - x^*)$, where $x^* = p + c_S$. He always accepts any offer $(y, 1-y)$ such that $y \geq p - c_D$. In any period in which he gets a lower offer than this, he fights (does not say no). In any period in which S rejects his offer, he fights rather than passes.

(b) S always proposes $(y^*, 1 - y^*)$, where $y^* = p - c_D$. She always accepts any offer $(x, 1-x)$ such that $x \leq p + c_S$. In any period in which she gets a worse offer, she is indifferent between fighting and saying no (since in the latter case D fights anyway), and hence can be choosing either (or mixing). In any period in which D rejects her offer, she passes rather than fights.

Only D Can Make a Public Commitment

We now present the “partial equilibrium” results, i.e., we present the SPE of the bargaining subgame when D makes a low, moderate, medium, large, or extreme public commitment. These results are plotted in Figure 4, which allows us to determine the SPE of the entire game (i.e., including the commitment stage).

Low Public Commitment, $\tau_D \leq q (< p - c_D)$

The above result still holds, and the exact same proof carries through, as no audience cost is paid in the status quo or in the agreements $y^* = p - c_D$ and $x^* = p + c_S$.

Moderate Public Commitment, $q < \tau_D \leq p - c_D$

Now D 's status quo payoff becomes $q - a_D(\tau_D - q)$ rather than q , but no audience cost is paid in the agreement $y^* = p - c_D$ (or $x^* = p + c_S$), and so the above result still holds, but now the upper bound on δ_D is $\delta_D \leq \frac{a_D(\tau_D - q) + [(p - c_D) - q]}{a_D(\tau_D - q) + [(p + c_S) - q]}$ (note

that this is a less restrictive upper bound on δ_D than is the usual (i.e., when public commitments are not allowed) condition that $\delta_D \leq \frac{(p-c_D)-q}{(p+c_S)-q}$.

Medium/Large Public Commitment, $p - c_D < \tau_D \leq \frac{(p+c_S)(1+a_D)-p+c_D}{a_D}$ ($> p + c_S$)

Now suppose that τ_D is large enough that D starts paying an audience cost in S 's usual proposal $y^* = p - c_D$, so that D now prefers war over this agreement, and hence S has to start compromising in y^* in order to avoid war, but τ_D is not too large. (In particular, D 's public commitment is small enough that S still prefers to compromise and appease D rather than let war break out. In the next section, we will show that when $\tau_D > \frac{(p+c_S)(1+a_D)-p+c_D}{a_D}$, war occurs. Hence, let us call this right-hand-side $\tau_{DWAR} = \frac{(p+c_S)(1+a_D)-p+c_D}{a_D}$.)

It turns out that in this range for τ_D of $p - c_D < \tau_D \leq \tau_{DWAR}$ there are actually two subranges to consider, when $p - c_D < \tau_D \leq p + c_S$ (so that no audience cost is paid in D 's usual proposal $x^* = p + c_S$; we will call this a medium public commitment), and when $p + c_S < \tau_D \leq \tau_{DWAR}$ (we will call this a large public commitment; D pays an audience cost in his usual proposal $x^* = p + c_S$).

Proposition 2: *If $\delta_D \leq \frac{a_D(\tau_D-q)+[(p-c_D)-q]}{a_D(\tau_D-q)+[(p+c_S)-q]}$ when $p - c_D < \tau_D \leq p + c_S$ or $\delta_D \leq \frac{a_D(\tau_D-q)+[(p-c_D)-q]}{a_D[(p+c_S)-q]+[(p+c_S)-q]}$ when $\tau_{DWAR} \geq \tau_D > p + c_S$, then the following are SPE.³⁰*

(a) D always proposes $(x^*, 1 - x^*)$, where $x^* = p + c_S$. He always accepts any offer $(y, 1-y)$ such that $y \geq \frac{p-c_D+a_D\tau_D}{1+a_D}$ (this is the audience-cost equivalent of demanding at least his payoff from war; this amount is bigger than $p - c_D$, but with audience costs makes his personal utility just $p - c_D$). In any period in which he gets a lower offer than this, he fights (does not say no). In any period in which S rejects his offer, he fights rather than passes.

(b) S always proposes $(y^*, 1 - y^*)$, where $y^* = \frac{p-c_D+a_D\tau_D}{1+a_D}$. She always accepts any offer $(x, 1-x)$ such that $x \leq p + c_S$. In any period in which she gets a worse offer, she is indifferent between fighting and saying no (since in the latter case D fights anyway), and hence can be choosing either (or mixing). In any period in which D rejects her offer, she passes rather than fights.

Extreme Public Commitment, $\tau_D > \frac{(p+c_S)(1+a_D)-p+c_D}{a_D}$ ($> p + c_S$)

Proposition 3: *When D makes such a high public commitment, then the following are SPE (regardless of the value of δ_D) in which each side makes unacceptable offers and war occurs in the first period regardless of who makes the first offer:*

(a) Whenever D makes a proposal, he proposes some $(x, 1-x)$, where $x > p + c_S$. He always accepts any offer $(y, 1-y)$ such that $y \geq \frac{p-c_D+a_D\tau_D}{1+a_D}$ (this is the audience-cost equivalent of demanding at least his payoff from war; this amount is bigger than $p - c_D$, but with audience costs makes his personal utility just $p - c_D$). In any period in which he gets a lower offer than this, he fights (does not say no). In any period in which S rejects his offer, he fights rather than passes.

(b) Whenever S makes a proposal, she proposes some $(y, 1-y)$, where $y < \frac{p-c_D+a_D\tau_D}{1+a_D}$. She always accepts any offer $(x, 1-x)$ such that $x \leq p + c_S$. In any period in which she gets a worse offer, she is indifferent between fighting and saying no (since in the latter case D fights anyway), and hence can be choosing either (or mixing). In any period in which D rejects her offer, she passes rather than fights.

³⁰ Note that these are less restrictive upper bounds on δ_D than is the usual (i.e., when public commitments are not allowed) condition that $\delta_D \leq \frac{(p-c_D)-q}{(p+c_S)-q}$.

Only S Can Make a Public Commitment

Low Public Commitment, $\tau_S \leq 1 - p - c_S$

In this case, S does not pay an audience cost in the agreement $x^* = p + c_S$ (or the agreement $y^* = p - c_D$, or the status quo), and so it is as if no commitment at all were made. That is, the same result holds as when D is dissatisfied and no public commitments are allowed, and the proof is exactly the same.

Medium Public Commitment, $1 - p - c_S < \tau_S \leq 1 - p + c_D$

Now S pays an audience cost in the agreement $x^* = p + c_S$, but not in the agreement $y^* = p - c_D$, or in the status quo.

Proposition 4: If $\delta_D \leq \frac{(1+a_S)[(p-c_D)-q]}{[(p+c_S)-q]+a_S(1-\tau_S-q)}$, then the following are SPE:³¹

(a) D always proposes $(x^*, 1 - x^*)$, where $x^* = \frac{(p+c_S)+a_S(1-\tau_S)}{1+a_S}$ (this is the agreement that, with audience costs, makes S just indifferent between accepting it and going to war; $x^* < p + c_S$, but by accepting this agreement, leader S's personal payoff is just $1 - p - c_S$). He always accepts any offer $(y, 1-y)$ such that $y \geq p - c_D$. In any period in which he gets a lower offer than this, he fights (does not say no). In any period in which S rejects his offer, he fights rather than passes.

(b) S always proposes $(y^*, 1 - y^*)$, where $y^* = p - c_D$. She always accepts any offer $(x, 1-x)$ such that $x \leq \frac{(p+c_S)+a_S(1-\tau_S)}{1+a_S}$. In any period in which she gets a worse offer, she is indifferent between fighting and saying no (since in the latter case D fights anyway), and hence can be choosing either (or mixing). In any period in which D rejects her offer, she passes rather than fights.

Large Public Commitment, $1 - p + c_D < \tau_S \leq \frac{c_S+c_D+a_S[1-(p-c_D)]}{a_S}$ ($> 1 - p + c_D$)

Now S pays an audience cost even in the agreement $y^* = p - c_D$, but τ_S is small enough that D still prefers to compromise rather than let war break out. The exact same result as before still holds.

Extreme Public Commitment, $\tau_S > \frac{c_S+c_D+a_S[1-(p-c_D)]}{a_S}$ ($> 1 - p + c_D$)

Proposition 5: When S makes such a high public commitment, then the following are SPE (regardless of the value of δ_D) in which each side makes unacceptable offers and war occurs in the first period regardless of who makes the first offer:

(a) Whenever D makes a proposal, he proposes some $(x, 1-x)$, where $x > \frac{(p+c_S)+a_S(1-\tau_S)}{1+a_S}$. He always accepts any offer $(y, 1-y)$ such that $y \geq p - c_D$. In any period in which he gets a lower offer than this, he fights (does not say no). In any period in which S rejects his offer, he fights rather than passes.

(b) Whenever S makes a proposal, she proposes some $(y, 1-y)$, where $y < p - c_D$. She always accepts any offer $(x, 1-x)$ such that $x \leq \frac{(p+c_S)+a_S(1-\tau_S)}{1+a_S}$ (this right-hand side is the agreement that, with audience costs, makes S just indifferent between accepting it and going to war). In any period in which she gets a worse offer, she is indifferent between fighting and saying no (since in the latter case D fights anyway), and hence can be choosing either (or mixing). In any period in which D rejects her offer, she passes rather than fights.

Both Sides Can Make Public Commitments

Using the one-sided results, it is straightforward to see that in the two-sided case, (i) when D commits to some $p - c_D \geq \tau_D \geq 0$, then S's set of best responses

³¹ Note that this is a less restrictive upper bound on δ_D than is the usual (i.e., when public commitments are not allowed) condition that $\delta_D \leq \frac{(p-c_D)-q}{(p+c_S)-q}$.

is $1 - p + c_D \geq \tau_S \geq 0$, (ii) when D commits to some $\tau_{DWAR} > \tau_D > p - c_D$, then S 's set of best responses is $1 - y^* \geq \tau_S \geq 0$, where $y^* = \frac{p - c_D + a_D \tau_D}{1 + a_D}$ ($\in (p - c_D, p + c_S)$) is the proposal that, with audience costs, makes D just indifferent between accepting it and going to war, and (iii) when $\tau_D \geq \tau_{DWAR}$, then any commitment by S is a best response, as war occurs regardless of her commitment level. Similarly, it is straightforward to see that (i) when S commits to some $1 - p - c_S \geq \tau_S \geq 0$, then D 's set of best responses is $p + c_S \geq \tau_D \geq 0$; (ii) when S commits to some $\tau_{SWAR} > \tau_S > 1 - p - c_S$, then D 's set of best responses is $x^* \geq \tau_D \geq 0$, where $x^* = \frac{(p + c_S) + a_S(1 - \tau_S)}{1 + a_S}$ ($\in (p - c_D, p + c_S)$) is the proposal that, with audience costs, makes S just indifferent between accepting it and going to war; and (iii) when $\tau_S \geq \tau_{SWAR}$, then any commitment by D is a best response, as war occurs regardless of his commitment level. Knowing the best-response functions, it is straightforward to determine that the following are the set of SPE:

(1) $0 \leq \tau_S \leq 1 - p - c_S$ and $0 \leq \tau_D \leq p - c_D$, i.e., neither commits to more than its utility from war (neither makes a significant commitment that causes the other side to compromise in its proposal). These SPE are not pie-maximizing for either side, as each pie-maximizes (given the other's strategy) by committing to all of the gains from avoiding war. Also note that each side's expected utility and share of the pie is the same as if no commitments at all were made (which is one element of this set of SPE).

(2a) $0 \leq \tau_S \leq 1 - p - c_S$ and $p - c_D < \tau_D \leq p + c_S$, i.e., only D commits to more than its utility from war (only D makes a significant commitment that causes the other side to compromise in its proposal), but does not commit to more than all of the gains from avoiding war. The only SPE in this class that are pie-maximizing from D 's perspective are the ones where $\tau_D = p + c_S$, and none are pie-maximizing from S 's perspective, as she pie-maximizes (given D 's commitment) by committing to $1 - y^*$, where $y^* = \frac{p - c_D + a_D \tau_D}{1 + a_D}$ ($\in (p - c_D, p + c_S)$) is the offer that makes D indifferent between accepting this offer (with audience costs) and going to war. Note that leader D 's expected personal utility is the same in these SPE as if no commitments at all were made, but his expected share of the pie is higher. Leader S 's expected share of the pie, as well as her personal payoff (the two are the same, as no audience costs are paid), are lower than if no commitments were allowed. So S is being hurt in this SPE. D pays an audience cost in S 's proposal, but not in his own.

(2b) $0 \leq \tau_D \leq p - c_D$ and $1 - p - c_S < \tau_S \leq 1 - p + c_D$, i.e., only S commits to more than its utility from war, but does not commit to more than all of the gains from avoiding war. This is completely analogous to the previous set of SPE, in which only D makes a significant public commitment.

(3) $p - c_D < \tau_D \leq x^*$ and $1 - p - c_S < \tau_S \leq 1 - y^*$, where $x^* = \frac{(p + c_S) + a_S(1 - \tau_S)}{1 + a_S}$ ($\in (p - c_D, p + c_S)$) is the proposal that (with audience costs) makes S just indifferent between accepting it and going to war, and $y^* = \frac{p - c_D + a_D \tau_D}{1 + a_D}$ ($\in (p - c_D, p + c_S)$) is the proposal that (with audience costs) makes D just indifferent between accepting it and going to war. In these SPE, each side commits to more than its payoff from war, but less than all of the gains from avoiding war. Because each side commits to more than its payoff from war, each side has to compromise when making a proposal. The only SPE in this class that are pie-maximizing for D are those in which $\tau_D = x^*$, and the only ones that are pie-maximizing for S are those in which $\tau_S = 1 - y^*$. A SPE in this class is pie-maximizing for both sides if and only if both of these conditions hold, which establishes the unique pie-maximizing SPE in which an agreement is reached (i.e., the solution to these two equations gives $\tau_D = \tau_{Dcrit}$ and $\tau_S = \tau_{Scrit}$, where these values are as given in the main body of the text). In all of these SPE, each leader's expected personal payoff is less than if no commitments were allowed, but (except for a knife-edge value of d , the probability that D makes the first proposal; see the

discussion in the main text) one side's share of the pie is strictly higher (and the other's is strictly lower). Each side pays an audience cost in the other side's proposal, but not in its own.

(4) If $a_D > \frac{c_S + c_D}{1 - (p + c_S)}$ so that $\tau_{D_{WAR}} < 1$, and $a_S > \frac{c_S + c_D}{p - c_D}$ so that $\tau_{S_{WAR}} < 1$, then there are SPE (which are pie-maximizing as well, but only in a trivial sense) in which $\tau_D > \tau_{D_{WAR}}$ and $\tau_S > \tau_{S_{WAR}}$, and war occurs. The logic for why these are SPE is given in the main body of the text.

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