To Concede or To Resist? The Restraining Effect of Military Alliances

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Abstract

In this paper we examine the effects of an outside alliance to a target state on crisis bargaining between a challenger and target. Through a game-theoretic model, we demonstrate that alliances have effects on the incentives of both the challenger and the target. While the effect on the challenger generally aims toward peace (through reducing the demand a challenger is willing to make), the effect on the target’s behavior varies depending on the values the target and her ally place on the issue at stake, their expected costs of war, and the costs they would experience from damage to the alliance. When a target values an alliance highly, an ally’s recommendation for settlement can restrain targets, encouraging them to concede disputes without further escalation. Statistical analysis reveals evidence in support of this hypothesis. This study thus sheds light on how military alliances may encourage peaceful behavior not only from adversaries, but from member states as well.

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How do alliance commitments to a target state influence crisis bargaining between a challenger and target? While the effect on the challenger is generally straightforward—the expectation that a target may receive assistance in war reduces the demands the challenger is willing to make—the effect on the target’s behavior is not obvious. Some suggest that alliances may embolden targets and lead them to escalate disputes because the probability of winning a conflict with allied support is higher than without (e.g. Smith 1995). This suggests that if an alliance does not deter a challenger from making a demand, then militarized conflict may be particularly likely. However, such an argument ignores the possibility that allies may have incentives to restrain their partners and encourage them to concede demands in order to avoid conflict.

Many alliance agreements require allies to consult one another in the event of a crisis that has the potential to erupt into military conflict, and even when consultation is not formally required, it often occurs. During these consultations, allies have an opportunity to influence one another’s response to the crisis. The future credibility of the alliance may be damaged if the member states openly disagree about the response to potential challengers, and thus to the extent that they value the continuation of the alliance, allies have an incentive to coordinate their behavior. Sometimes, however, targets and their allies may prefer different responses; for example, a target may want to resist a demand while the ally would prefer the target concede rather than fight. Under what conditions do targets heed their allies’ wishes?

In this paper we explore this question by developing a three-actor crisis bargaining model. When the challenger makes a demand to the target, an ally of the target has an opportunity to recommend a response to the target. The target can oblige or defy the ally’s recommendation; however, if it defies, there will be some cost to the alliance relationship. Moreover, if the ally recommends that the target accept a demand by the challenger but the target rejects it, then the target will be fighting alone if the crisis is escalated to a military confrontation. Using this model we demonstrate that under some conditions allies are able to restrain targets and encourage them to concede without further escalation. Which scenario will emerge in equilibrium depends on the ally’s and the target’s values for the issue at stake, their respective values for the alliance, and their respective costs of war. For example, if the ally
cares little about the disputed issue, then it will be more likely to recommend a settlement in order to avoid war; if the target values the alliance, it will follow the ally's recommendation and settle with the challenger. This result suggests that alliances can have peaceful effects on both challengers and targets involved in crisis bargaining under certain conditions.

One of the interesting hypotheses to emerge from our model is that as the target's value for an alliance increases, disputes are more likely to be settled peacefully. We test this hypothesis by evaluating the probability that a target responds to a challenge with militarized action in a sample of all disputes in which the target of the dispute had an ally committed to defend her from 1816 through 2000. We find strong support for our hypothesis. When alliances provide a large capability enhancement for target states, target states are less likely to resist demands with military action.

We proceed as follows. First, we briefly summarize the literature on the effect of alliances on crisis bargaining. Second, we present a model of crisis bargaining that allows the target's ally to make a recommendation for settlement and derive hypotheses regarding the conditions under which targets are more and less likely to concede demands or escalate disputes. Next, we present our research design and our empirical results. The final section features concluding remarks.

**Alliances and Crisis Bargaining**

When a leader considers making a demand of another state, he takes into account many factors, but chief among them is the probability that his state will win a war that results from resistance to the demand. One of the most important factors affecting the probability of prevailing in war is whether a third-party would assist the target state. Leaders will be less likely to make demands when they expect their targets to receive assistance in war. Alliance commitments are one source of information potential challengers have about which states are likely to receive assistance in war. Defense pacts, in particular, are agreements among states to assist one another militarily in the event of threats to their sovereignty and/or territorial integrity (Leeds et al., 2002). Both theory and empirical evidence suggest that states with
allies committed to assist them are more likely to receive assistance in war.\textsuperscript{1} Thus, alliance commitments to target states reduce conflict by deterring potential challengers from making demands. This is a common feature of extended deterrence models (Morrow, 1994; Smith, 1995, 1998) and is supported empirically (Leeds, 2003; Johnson and Leeds, 2011).

Yet, all challengers are not deterred by alliances. In some cases challengers are still better off making a demand of a target with allies committed to defend her despite the target’s increased probability of success in war. How will the alliance commitment influence the target’s behavior? The conventional wisdom is that a target with allies will be emboldened and more likely to escalate disputes (Snyder, 1984; Smith, 1995). Since this set of targets has a higher probability of winning wars, fighting may be a better option than conceding. This potential effect of alliance commitments suggests that when alliances fail to deter demands, disputes involving targets with allies may be associated with higher risks of militarized conflict.

Yuen (2009) points out, however, that promised assistance may not always lead targets to resist demands. She argues that the promised assistance may actually reduce the challenger’s demand enough that conceding is a better option than war for the target. Challengers who make demands of targets with allies will only ask for concessions that they believe will make targets indifferent between conceding and fighting, even with an ally’s help. Thus, alliances may not be associated with greater risks of dispute escalation.

These existing models, however, do not explicitly consider interactions between the target and her ally. A target’s ally may not have the same salience for a particular issue or value a particular good as much as the target does, and thus might prefer to see a target make some concessions rather than escalate a dispute to war. If the disputed issue is not as important to the ally as it is to the target, the ally might prefer to preserve resources for other potential conflicts. Werner (2000) begins to consider this possibility by showing that challengers may choose demands that potential interveners will be willing to accept and thus remain out of the conflict. However, Werner does not consider the strategic interaction between the

\textsuperscript{1}For a review of this literature, see Morrow (2000)
ally and the target or the costs to an alliance when the alliance members disagree on their response to an external threat.

In most cases, allies will have an opportunity to consult with targets regarding their response to a demand. In fact, many alliance treaties require this. While sometimes the ally may recommend that the target resist the demand and reassure the target of allied support, in other cases the ally may recommend that the target concede the demand. A recommendation to concede is not cheap talk if the ally can credibly threaten not to come to the target’s aid if the target disregards the ally’s recommendation and ends up in a war. Indeed, several scholars have argued that allies are able to restrain their partners because they have a credible threat of not coming to their aid and weakening (or terminating) the alliance (Snyder, 1984, 1997; Gelpi, 1999; Pressman, 2008). The target then must determine whether the alliance is valuable enough to warrant conceding the challenger’s demand in order to preserve positive relations with the ally.

In fact, some scholars view the potential opportunity to restrain (or manage, in their parlance) a partner as one of the main attractions of alliances. This is one of Schroeder’s (1976) most important contributions to the alliance literature, and Snyder (1997) echoes this position, placing ‘increased control or influence over the allied state’ on his list of ‘the most important security benefits of alliances’ (p. 43-44). More recently, Weitsman (2004: 22) suggests that states involved in ‘tethering’ alliances, that is, those that are designed to manage and reduce militarized conflict, may mediate disputes involving their allies with the goal of avoiding war. Pressman (2008) examines six cases of alliance formation and determines that the desire to restrain an ally was an important motivation for alliance formation in several of these. Yet, thus far, the possibility of alliance restraint has not been included in the most well known formal theoretic models of crisis bargaining involving alliances.

Below we describe a crisis bargaining model featuring three actors—a potential chal-

\footnote{In the Alliance Treaty Obligations and Provisions (ATOP) Dataset (Leeds et al., 2002), more than half of the agreements in which states promise to defend one another militarily also include explicit commitments to consult and coordinate behavior in the event of military crisis.}
lenger, a potential target, and the target’s ally. If the challenger makes a demand, the ally recommends whether the target should concede or resist before the target responds to the challenger. In the model, whether the ally recommends concession depends on the ally’s value for the issue at stake, the ally’s expected costs of war, and the ally’s value for alliance with the target, and whether the target obliges an ally’s recommendation to concede depends on the target’s value for the issue at stake, the target’s expected costs of war and the target’s value for the alliance. These are exactly the factors that Snyder (1997: 179) expected would influence an alliance’s stance toward an adversary. Our formalization, however, allows us to be more precise in explaining the conditions under which targets with allies are likely to concede demands, and the conditions under which targets resist demands, allowing disputes to escalate. Our model also allows us to derive hypotheses suitable for evaluation in a large $N$ setting.

**Model**

Suppose that there is a dispute over a unit of good between a challenger state, $C$, and a target state $T$. The target has an ally, $A$, with whom the target has a formal military alliance. The status quo is that the target owns the disputed good. The three players have a different valuation of the good, denoted by $v_c$, $v_t$, and $v_a$, where the subscripts represents the challenger, the target, and the ally. The challenger demands a division of the good, $x \in [0, 1]$, where $x$ is the challenger’s share, and $1 - x$ is the target’s share. If there is a war between the challenger and the target without the ally’s assistance, the target wins with probability $p \in (0, 1)$ and gets the whole unit of the good, but pays the cost of war; if the ally intervenes, then the alliance wins with probability $q \in (0, 1)$, where $q > p$, and the target gets to keep the good. The cost of war for each player is $k_c$, $k_t$, and $k_a$, respectively. Additionally, the ally and the target may incur additional costs from damaging the alliance relationship if they disagree on the appropriate response by the target. In particular, if the ally recommends that the target accept the challenger’s demand, but the target refuses, the target pays $c_t$ and the ally pays $c_a$. Although less likely, the alliance members also pay the costs if the ally recommends that the target reject the demand, but the target accepts. See
Table 1 for descriptions of the parameters.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
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<tbody>
<tr>
<td>$x, 1-x$</td>
<td>Challenger’s (target’s) payoff from a settlement</td>
</tr>
<tr>
<td>$v_i$</td>
<td>Actor $i$’s valuation of the disputed good</td>
</tr>
<tr>
<td>$p$</td>
<td>Target’s probability of winning a bilateral war</td>
</tr>
<tr>
<td>$q$</td>
<td>Alliance’s probability of winning a war</td>
</tr>
<tr>
<td>$k_i$</td>
<td>Actor $i$’s cost of war</td>
</tr>
<tr>
<td>$c_t, c_a$</td>
<td>Target’s (ally’s) cost of damaging the alliance</td>
</tr>
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</table>

The players’ strategies and the sequence of the game are as follows (see Figure 1). The challenger proposes a division $x$ to the target. The ally advises the target to accept or reject the demand. The target then decides to accept or reject the demand. If the target accepts the demand, then the status quo is changed to reflect the challenger’s demand; if the target rejects the demand, then the challenger has a choice of escalating or backing down from the demand. If the challenger escalates, then war occurs. If a war occurs as a result of both the ally and the challenger rejecting the challenger’s demand, then the ally will join the target to fight against the challenger. On the other hand, if the ally advised acceptance of the challenger’s demand but the target rejected, then the target will fight the challenger alone. The actors that participate in a war will pay the costs of war; in addition, if the allies disagree on their response to the challenger’s demand, each of them pays a cost for damaging the alliance relationship.

We first analyze a version of the game where the players have complete information about all aspects of the game—in particular, the players have no uncertainty about the others’ payoffs. Analyzing the complete information game will allow us to see more clearly what variables are driving the outcome that we are interested in, namely, the outcome that the ally is able to restrain the target (that is, encourage the target to concede the challenger’s demand). We then relax the assumption to allow the possibility that the challenger has incomplete information about the target’s cost of war, which leads to other possible outcomes that we may observe in the real world.

For the complete information game, we use backward induction to solve for Subgame
Perfect Equilibrium (SPE).

We first consider the challenger’s decision whether to escalate a crisis at the end of the game after the target rejects its demand. Suppose \((1 - q) v_c - k_c \leq 0\), i.e., the challenger is not willing to fight against the alliance when its offer is rejected by both \(A\) and \(T\). Then, there is a unique equilibrium to the game in which \(C\) makes no demand \((x = 0)\) and the status quo is preserved. Consider what the equilibrium means substantively. The condition, \((1 - q) v_c - k_c \leq 0\), can be transformed equivalently to \(1 - q \leq k_c/v_c\). The condition says that the relative cost of fighting—the ratio between the cost of war and the value of the good—for the challenger, \(k_c/v_c\), is at least as great as the expected benefit of war, \(1 - q\), if the challenger is fighting against the alliance. The challenger will not be willing to engage in such a war.
and will at most be willing to fight the target when the target is alone. Understanding this incentive, the ally will always make a credible commitment to the target about coming to the target’s aid in war, and consequently, the challenger will be deterred from making a demand at all, i.e., \( x = 0 \).

Below we consider the more interesting case where \( (1 - q)v_c - k_c > 0 \), i.e., the challenger is willing to fight against the alliance when its demand is rejected by both the ally and the target. If the challenger is willing to fight both, then it follows immediately that the challenger will be willing to fight the target in a bilateral war, \( (1 - p)v_c - k_c > 0 \), because the probability of winning against the target alone is greater than against the alliance. This means that in equilibrium the challenger fights whenever the target rejects its demand.

Next, we analyze the target’s response in an equilibrium. Consider the history of the game where the ally advised the target to accept a demand by the challenger. If the target accepts the demand, \( x \), then the target receives \( (1 - x)v_t \); if it rejects \( x \), then the target will be fighting a war against the challenger by itself and receive a payoff of \( pv_t - k_t - c_t \). That is, in the case of war, the target will not only fight the challenger alone and pay the cost of war, but also pay the cost of not listening to the ally’s advice. So the target will be better off accepting the demand if \( (1 - x)v_t \geq pv_t - k_t - c_t \), or

\[
x \leq (1 - p) + \frac{k_t + c_t}{v_t}
\]

Let \( x^{(1)} = (1 - p) + \frac{k_t + c_t}{v_t} \). Now consider the history of the game where the ally advised the target to reject a demand by the challenger. If the target accepts the demand, then it gets \( (1 - x)v_t - c_t \); if the target rejects the demand, then it gets \( qv_t - k_t \) because the allies will fight the challenger together and the alliance relationship is not damaged. So the target will accept the demand if \( (1 - x)v_t - c_t \geq qv_t - k_t \), or

\[
x \leq (1 - q) + \frac{k_t - c_t}{v_t}.
\]

Let \( x^{(2)} = (1 - q) + \frac{k_t - c_t}{v_t} \). Intuitively, \( x^{(2)} < x^{(1)} \); that is, when the target has the support of the ally in a war against the challenger, the threshold level for the target to accept a demand by the challenger is smaller. In other words, the target will be emboldened by the ally’s support and reject a wider range of demands by the challenger.
Given the above analysis, we now know that the target will respond to the challenger’s demand in three different ways depending on the size of the demand, $x$. If $x \leq x^{(2)}$, then the demand is sufficiently small that the target will always accept regardless of what the ally suggests. On the other hand, if $x > x^{(1)}$, then the demand is so big that the target will reject regardless of what the ally suggests. In these two cases, the ally’s position on the demand does not matter to the target. The most interesting case is when the demand falls in the middle range, i.e., $x^{(2)} < x \leq x^{(1)}$, such that the target’s behavior will be contingent on the ally’s reaction. More specifically, the target will accept the demand if the ally recommends acceptance and reject the demand if the ally recommends rejection. We define an equilibrium in which the target follows the ally’s advice as a coordination equilibrium. In this equilibrium, if the ally advises the target to accept a demand and preserve the peace, then the ally has a restraining effect on the target; on the other hand, if the ally gives the target a green light for defying the challenger’s demand, then the ally has an emboldening effect on the target.

Having analyzed the target’s equilibrium behavior in a coordination equilibrium, we now turn to the ally’s strategy in such an equilibrium. Specifically, when will the ally advise the target to accept a demand and when will it advise otherwise? If the ally recommends acceptance, then the ally’s payoff is $(1-x)v_a$ from a peaceful resolution of the conflict; if the ally recommends rejection, then it means that the ally will join the target to fight against the challenger in war and receive a payoff of $qv_a - k_a$. So the ally will recommend acceptance if $(1-x)v_a \geq qv_a - k_a$, or

$$x \leq (1-q) + \frac{k_a}{v_a} \quad (3)$$

Let $x^{(3)} = (1-q) + \frac{k_a}{v_a}$.

Finally, for the coordination equilibrium to emerge, it has to be the case that it is in the challenger’s best interest to make a demand that falls in the range $(x^{(2)}, x^{(1)})$. In other words, in the equilibrium the payoff for the challenger from making a demand $x$ such that $x^{(2)} < x < x^{(1)}$ has to be at least as good as $x \leq x^{(2)}$, or $x \geq x^{(1)}$. Combining all the equilibrium analysis thus far, we have the following proposition that characterizes the unique coordination equilibrium.
Proposition 1 (Coordination Equilibrium). If \( x^{(2)} \leq x^{(3)} \) (i.e., \( \frac{k_a}{v_a} \geq \frac{k_t - c_t}{v_t} \)), then there is a unique equilibrium in which the target follows the ally’s recommendation. Moreover, there are two types of coordination equilibrium depending on a further condition: (1) if \( x^{(3)} < x^{(1)} \) (i.e., \( q - p \geq \frac{k_a}{v_a} - \frac{k_t + c_t}{v_t} \)), then the challenger makes a demand such that \( x = x^{(3)} = (1 - q) + \frac{k_a}{v_a} \), and the demand will be accepted by both the ally and the target; (2) if \( x^{(1)} \leq x^{(3)} \) (i.e., \( q - p < \frac{k_a}{v_a} - \frac{k_t + c_t}{v_t} \)), then the challenger makes a demand such that \( x = x^{(1)} = (1 - p) + \frac{k_t + c_t}{v_t} \), and the demand will be accepted by both the target and the ally.

Because of the assumption of complete information, the equilibrium outcome is that the challenger makes a precise demand such that both the ally and the target accept and the conflict is resolved in peace. This equilibrium outcome is also characterized by the restraining effect of the alliance: the target accepts the offer conditional on the ally advising her to accept. Of course, in the real world, there can be uncertainty on several aspects of the model and the equilibrium outcome can be war. Nevertheless, with the complete information setting we can learn a great deal about how a restraining effect may come about and how an emboldening effect may come about. The latter effect only takes place off the equilibrium path in the complete information game, however, it is still part of the equilibrium strategies of the ally and the target in the coordination equilibrium.

From Proposition 1 we know that for the coordination equilibrium to emerge, it must be the case that \( \frac{k_a}{v_a} \geq \frac{k_t - c_t}{v_t} \). First, from this inequality we can see that all else equal, the higher the cost of war for the ally \((k_a)\), the more likely it is that the ally will restrain the target for a peaceful resolution of a conflict. Symmetrically, the lower the value of the contested good for the ally \((v_a)\), the more likely it is that a restraining effect will take place in equilibrium. Second, for the restraining effect to exist, it must be the case that the target will condition its behavior on the ally’s recommendation, which means that the target’s cost of fighting cannot be so high that it will not fight even without the ally restraining her. So the inequality also suggests that the cost of war for the target \((k_t)\) cannot be too high, or symmetrically, the target’s value for the contested good \((v_t)\) cannot be too low. On the other hand, if the target attaches a high value to the alliance relationship \((c_t)\), then the restraining effect is more likely to exist.
Moreover, the second condition in Proposition 1 suggests that the challenger’s demand varies with the ally’s contribution to the probability of the ally and target prevailing in war, and with the costs of war and value for the issue of both the ally and target. The challenger makes the demand that will make either the target or the ally prefer to concede rather than fight. If the ally would contribute a lot to the war effort and/or if the ally values the issue a lot and/or if the ally expects low costs from war, i.e., \( q - p \geq \frac{k_a}{v_a} - \frac{k_t + c_t}{v_t} \), then the challenger has to make a smaller demand in order to keep the ally from recommending that the target reject the demand; if, on the other hand, \( q - p < \frac{k_a}{v_a} - \frac{k_t + c_t}{v_t} \), i.e., the ally’s contribution in war is not too big and/or the ally has a low value for the issue and/or high costs of war, then the challenger can demand a larger share from the target and still have the demand accepted by both the target and the ally. To provide a complete characterization of all possible equilibria, the next proposition characterizes the other possible unique equilibrium for the parameter range that complements those for Proposition 1.

**Proposition 2 (Unconditional Appeasement Equilibrium).** If \( x^{(3)} < x^{(2)} \) (i.e., \( \frac{k_a}{v_a} < \frac{k_t - c_t}{v_t} \)), then there is a unique equilibrium in which the challenger makes a small demand, \( x = x^{(2)} = 1 - q + \frac{k_t - c_t}{v_t} \), such that the target will accept it no matter what the ally advises. Because the ally does not want to damage the alliance relationship, it advises acceptance in the equilibrium.

What our complete information game does not capture is the possibility that the challenger miscalculates a demand such that it is rejected by the target and/or the ally. Therefore, we do not observe war that results from interesting dynamics between the target and the ally. So now we turn to an incomplete information scenario in which the challenger does not know the value of the target’s cost of war, \( k_t \), with certainty. Specifically, suppose that it is common knowledge that the challenger knows that \( k_t \) is uniformly distributed on \((K, \bar{K})\), while the ally knows \( k_t \). In addition, we assume that the challenger does not observe whether the ally advises the target to accept the offer or not. We maintain the earlier assumption, \((1 - q)v_c - k_c > 0\), so that the challenger will always fight once it makes an offer and the target rejects. Given that the challenger’s strategy is the same as before when the target rejects an offer, the target’s best response is the same as before, thus \( x^{(1)} \) and \( x^{(2)} \) are still
the two cutpoints that condition the target’s behavior. That is, if $x \leq x^{(2)}$ then the target will always accept; if $x > x^{(1)}$ then the target will always reject; if $x^{(2)} < x < x^{(1)}$, then the target’s behavior will be contingent on the ally’s reaction. Furthermore, the ally’s best response is the same as before given that the target and challenger’s subsequent optimal actions are the same as those in the complete information game. What is different is the challenger’s optimal offer at the beginning of the game given that the challenger does not know the target’s cost of war.

We present two main results from the incomplete information game that describe the relationship between the ally’s valuation of the alliance, $c_a$, and the kinds of equilibrium outcomes that we will observe. Recall that under the complete information game we cannot observe emboldenment—the target resists a demand because of the ally’s recommendation, entrapment—the ally is dragged into war by the target, or abandonment—the ally leaves the target to fight the challenger alone, all of which have been discussed in historical accounts of wars. In the incomplete information game, it is much more difficult for the challenger to make a demand that will ensure acceptance by both the ally and the target; consequently, many kinds of war outcomes can occur.

**Proposition 3 (Restraint or Entrapment).** *If the ally values the alliance relationship highly, then a restraining effect will contribute to a peaceful outcome, and war will result from an entrapment effect.*

There can be both peace and war when the ally values the alliance relationship highly. The peace may come under two scenarios. The first is that the challenger makes a very small demand, $x < x^{(2)}$, so that the target accepts no matter what the ally says; the second is that the challenger makes a moderately large demand, $x^{(2)} < x < x^{(1)}$, and the target accepts only if the ally advises restraint and the ally does in equilibrium. The ally is more likely to advise restraint when the ally expects high costs from war and/or places low value on the issue at stake. Under these conditions, the restraining effect contributes to a peaceful outcome. In the same equilibrium, war only occurs if the challenger makes a high demand, $x > x^{(1)}$. In this case the target will reject the demand no matter what the ally says, and
the ally gives in to the target’s desire. As a result, war occurs between the challenger and the alliance rather than between the challenger and the target. This is a case where the ally joins the war because it knows that the target will fight the challenger with or without its assistance, and the ally wants to avoid damage to the alliance relationship. This dynamic is consistent with the entrapment effect that appears in historical accounts. In this equilibrium the alliance does not increase the probability of war, although it does expand the war. The target would have been willing to fight the challenger alone, and the ally joins in order to maintain the alliance.

**Proposition 4 (Restraint or Abandonment).** *If the ally does not value the alliance relationship highly, a restraining effect will contribute to a peaceful outcome, and war will result from the target’s willingness to fight the challenger alone.*

Again, there can be both peace and war when the ally does not value the alliance relationship too highly. The peace may come about in similar circumstances as those for Proposition 3, i.e., because of a very small demand, \( x < x^{(2)} \) by the challenger or a restraining effect from the alliance partner even when the demand is moderately large, \( x^{(2)} < x < x^{(1)} \). On the other hand, war breaks out due to different alliance dynamics from those for Proposition 3; only bilateral wars are possible. If the challenger makes a high demand, \( x > x^{(1)} \), then the target will reject no matter what the ally says, but contrary to the previous case where the ally values the alliance relationship highly, in this case the ally will not come to the target’s aid when the target fights the challenger. In other words, the ally abandons the target in war.

Notably, emboldenment—the case in which a target resists a challenger’s demand only because the ally encourages her to do so—does not occur in our model in equilibrium. Because the challenger knows the ally’s payoffs, the challenger never makes a demand that the ally will resist regardless of the target’s preferences. It is possible that emboldenment would occur in equilibrium in a model in which the challenger had incomplete information about both the payoffs of the ally and the payoffs of the target, but such a model would be much less tractable, and we suspect that the primary relationships we test here would not change
in such an exercise.

So what can we say about the relationships between observable factors and the probability that a target escalates a dispute rather than conceding a demand? Some of the factors that appear to be important in this regard are familiar to crisis bargaining models— for example, the actors’ costs of war, the values the actors place on the disputed goods, and the probability that the challenger can defeat the target (or the target plus the ally) in war. The unique predictions of our model, however, have to do with the effect of the value the target and ally place on the alliance. The most straightforward result is that the ally’s ability to restrain the target increases as the target values the alliance relationship more; consequently, the probability of war decreases.

**Proposition 5 (The Probability of War).** Under the incomplete information where the challenger is uncertain about the target’s cost of war, the probability of war decreases as the target’s valuation of the alliance relationship ($c_t$) increases.

This proposition, like the others, is proven in the appendix and leads quite directly to our comparative statics hypothesis: Targets with allies are less likely to respond to challengers with militarized actions when the alliance is valuable to them.

**Research Design**

One of the unique implications of our model is that targets of disputes will be less likely to resist demands as the cost of damaging their alliance relationship increases. To test this hypothesis we are interested in a sample of observations where a challenger initiated a dispute against a target that had at least one ally committed to defend her in a conflict with this challenger. In order to generate such a sample we combine data from the Correlates of War (COW) project and the Alliance Treaty Obligations and Provisions (ATOP) project.

First, we identify a set of observations where a challenger initiated a dispute against a target in a given year. To do this we use the COW Militarized Interstate Dispute (MID) dataset and, specifically, Maoz’s dyadic version of the dataset (Ghosn, Palmer, and Bremer
In this sample, one state, the challenger, threatened, displayed, or used force against another state, the target. These data include 2,354 directed dyad-years from 1816 to 2000 in which a challenger initiated a dispute against a target.\(^3\)

Second, we identify the subset of disputing directed dyad-years where the target of the dispute had allies committed to defend her against the challenger of the dispute. Simply because the target is an alliance member does not mean her allies agreed to defend her against the challenger. Many alliances do not require defensive military support and the ones that do are often invoked only under specific conditions. Therefore, to determine whether the target in the observation had an alliance applicable to a dispute with the challenger we utilize the coding of Johnson and Leeds (2011). Their coding is based on information from the ATOP project which has detailed information about states’ promised alliance obligations in alliance treaties (Leeds et al. 2002). These data indicate that in 1,085 of the 2,354 disputing directed dyad-years the target had at least one alliance applicable to the dispute.

After identifying the sample we code the dependent variable. The hypothesis we are evaluating suggests that targets that have high costs of damaging their alliance relationship will be less likely to resist the demands of their challengers militarily. Therefore, to code our dependent variable we use information from the COW MID data regarding how the target responded to the challenger. If the target responds with any form of militarized action (that is, responds with a threat, display, or use of force) we code the target as resisting the demands of the challenger. The target resists in 493 of the 1,085 directed dyad-years (44\%).\(^4\)

The key independent variable in the empirical analysis is our measure of the target’s cost of damaging its alliance relationship. To operationalize this concept we measure how important the alliance relationship is to the target’s security. Some states rely a lot on a particular alliance relationship for security while others do not. The more important the alliance relationship is to the target’s security, the more costly it will be for the target to damage the relationship. To capture how important an alliance is to a target’s security we

\(^3\)In years in which a challenger initiated more than one dispute against the same target, we include the dispute with the highest hostility level reached by the target.

\(^4\)We also analyzed the same model with war as the dependent variable (that is, whether the dispute reached a hostility level of 5) and we draw the same conclusions regarding our primary independent variable.
use the following expression:

\[ \frac{\text{cap}_A}{\text{cap}_A + \text{cap}_T} \]

which is the ratio of the alliance’s military capabilities to the sum of the alliance’s and target’s military capabilities. This variable is always between 0 and 1 where values closer to 1 indicate that the alliance is more important to the target’s security and that damaging the relationship would be costly. Therefore, as this variable increases the target should be less likely to resist the challenger and the coefficient associated with this variable should be negative.

To generate this variable we need to measure the military capabilities of each target and its allies. We use the composite index of national capabilities (CINC) scores from the COW project to measure the actors’ military capabilities (Singer et al. 1972). To identify a target’s allies we refer to the alliances that the Johnson and Leeds (2011) coding indicate are applicable to the dispute. We then use the alliance member level data from the ATOP project to determine which states were members of these alliances during the dispute and had defensive obligations to the target. After identifying the allies we sum up all of their CINC scores to generate \( \text{cap}_A \). If a target had only one bilateral alliance then \( \text{cap}_A \) is a function of one state’s military capabilities, but if the target had a multilateral alliance or multiple alliances then \( \text{cap}_A \) is a function of multiple states’ military capabilities.\(^5\)

To estimate the effect of our key independent variable we include several other variables that may also influence the target’s decision to resist the challenger militarily. We include two dichotomous variables that code whether the challenger had any offense or neutrality pacts that were applicable to the dispute. These alliances would make the target less likely to resist the challenger because they provide information that other states will aid the challenger or that other states will not aid the target. The coding for these variables come from Johnson

\(^5\)In 264 observations the target was allied to only one other state through one bilateral alliance. In the other observations the target either was a member of a multilateral alliance or had multiple relevant alliances in effect at the same time. In the analysis reported in the text we aggregate the capabilities of all unique allies, but we have done two robustness checks: we conducted the analysis using only the strongest single alliance, and we conducted the analysis excluding cases in which a state had more than one alliance. In both instances, the results were similar to those reported here. Given that conflict with any member of an alliance could lead to damage to the alliance as a whole, we believe it is appropriate to consider the costs a state would experience from damaging a full alliance rather than simply relations with one member.
and Leeds (2011). We also include a variable that captures the challenger’s probability of defeating the target in war. As this probability increases, we would expect the target to be less likely to resist the challenger. We measure this variable using the ratio of the challenger’s military capabilities to the sum of the challenger’s and target’s military capabilities. As before, the actors’ CINC scores are used to measure their military capabilities (Singer et al. 1972).

We also take into account factors that may influence selection into the sample. States do not become involved in disputes randomly, and if this process is not modeled then our estimates can be biased. To account for the selection process we estimate our results using a censored probit model in which the dependent variable for the selection stage is a dichotomous variable that codes whether the potential challenger initiates a dispute against the potential target in the directed dyad-year. The selection equation is estimated using the sample of 585,467 directed-dyad years from 1816 to 2000 in which the target had at least one alliance that is applicable to a potential dispute with the challenger.

We include a number of variables in the selection equation to model dispute initiation. First, we include the three control variables that are in the outcome equation: whether the potential challenger has a relevant offensive ally, whether the potential challenger is a member of a relevant neutrality pact, and the potential challengers probability of winning. Challengers that have relevant offensive or neutrality pacts should be more likely to initiate disputes. This is because these challengers expect to receive assistance in war or that the target will not receive assistance in war and thus expect to be more likely to succeed in accomplishing their goals through the threat or use of force. Additionally, when a challenger has a high probability of defeating the target in war it should be more likely to initiate a dispute. We use the same operationalizations of these variables as mentioned above.

We also include several variables in the selection equation that do not appear in the

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6 As a robustness check, we estimated our results using a measure in which we added all the target’s defensive allies’ capabilities to its capabilities and all the challenger’s offensive allies’ capabilities to its capabilities and our results did not change.

7 In addition to estimating the censored probit model, we also estimated a probit model where we included the selection variables directly into the outcome equation and our conclusions do not change.
outcome equation. We contend that these variables influence the challenger’s decision to initiate a dispute but not the target’s decision to resist. These variables are used to identify the censored probit model.\(^8\) The first variable is the natural log of the capital-to-capital distance between the challenger and target. As the distance between the challenger and target increases, the challenger should be less likely to initiate a dispute because conflict with more distant states is more costly, and states further apart have fewer issues to dispute. The data on distance are obtained from the EUGene data generation program (Bennett and Stam 2000). Second, we control for whether the challenger and target are jointly democratic. A large body of research suggests that pairs of democratic states are less likely to enter into disputes (e.g. Russett and Oneal 2001). We consider the challenger and target to be democratic if they have scores of 6 or higher on the Polity2 variable from the PolityIV data set (Marshall and Jaggers 2002). Third, we include the challenger and target’s S-score, which is used to capture the similarity of the two states’ interests (Signorino and Ritter 1999). As this variable increases, the two states’ interests are considered to be more similar, and thus they should be less likely to have disagreements that could prompt militarized disputes. Lastly, we take into account any temporal dependence in the data using the strategy suggested by Carter and Signorino (2010). That is, we include a variable that codes the number of years since the last conflict in the dyad as well as the square and the cube of that variable.

Results

Table 2 reports the results of our analysis. Given that we estimate our results using a censored probit model, we have two sets of coefficients. The top panel reports the coefficients that are associated with the variables in the target resistance equation, and the bottom panel reports the coefficients that are associated with the variables in the dispute initiation equation. The key variable in our analysis is the first variable in the table. It is our measure of the target’s cost of damaging its alliance relationship. Our theoretical model expects that as this variable increases, targets should be less likely to resist their challengers. This is because as

\(^8\)As a robustness check, we have estimated the censored probit model while including each of our identifying variables in the outcome equation, and our conclusions do not change.
this variable increases, targets’ allies will be able to restrain them if they choose and convince them to concede demands and avoid war. We make no assumption that allies always prefer to restrain their allies; whether they do depends on their values for the issues at stake and their costs of war. What our model does suggest, though, is that when allies do wish to restrain their partners, they will be more successful at doing so as the costs of damaging the alliance increases for the target. The coefficient associated with this variable reported in Table 2 supports this implication from our model. As targets’ costs of damaging their alliances increase, they are less likely to resist demands of challengers.

This can be seen clearly in Figure 2, which graphs the predicted probability of target resistance given dispute initiation with 95% confidence intervals across different costs for the target damaging its alliance relationship. To generate this graph we apply the approach suggested by King, Tomz, and Wittenberg (2000) to the censored probit model. The graph shows that when it is not very costly for the target to damage its alliance relationship, the target is more likely to resist a challenger’s demand than when it is costly for the target to damage its alliance relationship. The predicted probability of target resistance given dispute initiation for low costs is approximately .45 but as the costs of damaging and alliance increase, the predicted probability decreases to approximately .28.

In addition to our key independent variable having the expected effect, many of the other variables in our censored probit model are consistent with our expectations and past research. First, when the challenger has a relevant offense or neutrality pact it is more likely to initiate a dispute and the target is less likely to resist. Additionally, challengers are less likely to initiate disputes against targets that are further away and targets that have similar interests. Finally, the negative and significant correlation parameter, rho, suggests that there are important unmeasured factors that make dispute initiation more likely and target resistance less likely. This also suggests that the censored probit model is appropriate

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More specifically, we simulate the parameters of the model by randomly drawing 1,000 values from a multivariate Normal distribution characterized by our estimates of the parameters and the estimated variance-covariance matrix. We then set the other covariates at values for an average directed dyad-year and generate 1,000 predictions for different values of our key independent variable. The 50th percentile of the 1,000 predictions is the point prediction while the 2.5 percentile is the lower confidence bound and the 97.5 percentile is the upper confidence bound.
for these data.

Two variables that are not consistent with our expectations are our measures of joint democracy and the challenger’s probability of winning. First, joint democracy is in the expected direction but does not reach conventional levels of statistical significance. Given that this variable is significant in other studies that use all dyad-years, our finding suggests that there may be a relationship between joint democracy and the presence of outside alliances, which is a condition we used to constrain our sample. However, even in our sample, if we employ a lower threshold for joint democracy (5 or higher on the polity2 variable), joint democracy is statistically significant and negatively related to dispute initiation as expected. Second, our measure of the challenger’s probability of winning is insignificant and in the opposite direction. This result is most likely due to the difficulty in measuring the challenger’s probability of winning in our sample. Our sample consists of directed dyad-years where the target had outside alliances. Given that we are unable to measure the level of capabilities the challenger thinks the allies are going to contribute to a war, we are unable to fully capture the challenger’s probability of winning. In neither case does the fact that these common variables from dispute initiation models behave slightly differently in our sample of directed dyad years involving targets with allies make us question the relationships we have observed about our primary variable of interest.

We already know that states with allies committed to defend them are less likely to be targeted in militarized disputes (Leeds 2003; Leeds and Johnson 2011). Past research has also demonstrated that targets with allies are less likely to resist disputes than targets without allies (Leeds and Johnson 2011). Here, we also find that in the small sample of cases in which challengers initiate disputes against targets with allies, targets that seem to depend most on their allies for their security (that is, targets with allies who enhance their military power significantly) are less likely to escalate disputes than those whose alliances may be less valuable to them. Taken together, these findings suggest that enhancing the security of states through powerful and valuable alliances can be a force for peace.

10 As mentioned before, we estimated our results using a measure where we added all the target’s defensive allies’ capabilities to its capabilities and all the challenger’s offensive allies’ capabilities to its capabilities and our results did not change.
Conclusion

Whether military alliances have pacific or inflammatory influences on interstate disputes is a question of great interest to scholars and policymakers. Unfortunately, a simple answer has been hard to obtain because different kinds of alliances can have different effects under different conditions. In this paper, we advance research in this area by examining the conditions under which allies influence a target’s response to a challenger’s demand.

The conventional wisdom is that alliance commitments embolden targets and lead them to escalate disputes. Because targets with allied support expect to achieve a better outcome through war than targets without allied support, they are more likely to resist demands. Therefore, disputes involving targets with allies are more likely to produce costly multilateral wars.

However, this line of reasoning ignores the possibility that allies may have incentives to restrain their partners. That is, under certain conditions allies may prefer that their partners concede to demands in order to avoid conflict, and allies may have sufficient influence over targets to change their behavior. Under some circumstances, allies may actually prevent disputes from ending up in war.

To explore this possibility we develop a three-actor crisis bargaining model in which an ally recommends a response to the target following a challenger’s demand. If the target does not follow the ally’s recommendation, the target and ally suffer damage to their alliance relationship, which is costly to both of them. We find that there is a range of parameter values in which a coordination equilibrium emerges; the target conditions her behavior on the ally’s recommendation. Whether a coordination equilibrium emerges depends on the values the target and ally attach to the issue at stake, the target’s and ally’s costs of war, and the costs the target and ally expect from damage to their alliance.

One of the new predictions that results from adding allied consultation to a typical crisis bargaining model is that when a target expects high costs from damaging an alliance relationship, war becomes less likely. Targets are more likely to concede demands when
they will risk damaging an alliance by escalating a dispute. Importantly, we do not assume that allies always wish to restrain targets. What our model suggests, however, is that when allies do wish to restrain targets, their ability to do so depends on the target’s value for the alliance. As long as some allies prefer to restrain their partners, we should observe a lower probability of resistance by targets who depend more on their alliances. We evaluate this proposition by analyzing whether target states whose allies provide strong security benefits are less likely to respond to challengers with military action. In a sample of militarized interstate disputes spanning the 1816-2000 time period, we find support for this hypothesis. This increases our confidence in the utility of our approach.

Our research suggests that military alliances not only deter challengers from initiating conflicts, but may also help to settle some portion of the conflicts that are initiated before they escalate to high levels of military force. Alliances give outside states both an interest in peace and a credible punishment to impose upon an ally who chooses war. As such, they are important institutions for conflict management as well as war fighting. Moreover, our study makes clear that understanding crisis bargaining may sometimes require not only understanding interactions among adversaries, but among allies as well.
Table 2: Censored Probit Analysis of Dispute Initiation and Target Resistance, 1816-2000

<table>
<thead>
<tr>
<th>Target Resistance</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target’s Cost of Damaging its Alliance</td>
<td>$-0.40^{**}$</td>
<td>$(0.13)$</td>
</tr>
<tr>
<td>Challenger has a Relevant Offensive Alliance</td>
<td>$-0.27^{*}$</td>
<td>$(0.13)$</td>
</tr>
<tr>
<td>Challenger has a Relevant Neutrality Pact</td>
<td>$-0.43^{**}$</td>
<td>$(0.13)$</td>
</tr>
<tr>
<td>Challenger’s Probability of Winning in War</td>
<td>$0.21$</td>
<td>$(0.12)$</td>
</tr>
<tr>
<td>Constant</td>
<td>$1.63^{**}$</td>
<td>$(0.20)$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dispute Initiation</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenger has a Relevant Offensive Alliance</td>
<td>$0.28^{**}$</td>
<td>$(0.04)$</td>
</tr>
<tr>
<td>Challenger has a Relevant Neutrality Pact</td>
<td>$0.41^{**}$</td>
<td>$(0.04)$</td>
</tr>
<tr>
<td>Challenger’s Probability of Winning in War</td>
<td>$-0.06$</td>
<td>$(0.03)$</td>
</tr>
<tr>
<td>Challenger-Target Capital-to-Capital Distance</td>
<td>$-0.40^{**}$</td>
<td>$(0.01)$</td>
</tr>
<tr>
<td>Joint Democracy</td>
<td>$-0.06$</td>
<td>$(0.04)$</td>
</tr>
<tr>
<td>Challenger-Target Similarity of Interests</td>
<td>$-0.51^{**}$</td>
<td>$(0.05)$</td>
</tr>
<tr>
<td>Constant</td>
<td>$1.03^{**}$</td>
<td>$(0.10)$</td>
</tr>
<tr>
<td>Rho</td>
<td>$-0.58^{**}$</td>
<td>$(0.08)$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Observations</th>
<th>Uncensored Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>585,467</td>
<td>1,085</td>
</tr>
</tbody>
</table>

Standard errors in parentheses
Two-tailed tests: ** p<0.01, * p<0.05

peaceyears, (peaceyears)^2, (peaceyears)^3 included in dispute initiation estimation stage
Figure 2: The Effect of the Target’s Costs of Damaging its Alliance on Resistance

This figure graphs the predicted probability of target resistance given dispute initiation with 95% confidence intervals across different costs for the target damaging its alliance relationship. The x-axis identifies different values of the target’s cost of damaging its alliance and the y-axis identifies the probability of the target resisting the challenger militarily. The black line represents our predictions for different values of the target’s cost of damaging its alliance. The gray shade around the black line provides the 95% confidence interval for each prediction. These predictions are based on 1,000 simulated parameters from the censored probit model reported in Table 2 while the other variables are set at values for an average directed dyad-year.
Appendix

Proposition 1 (Coordination Equilibrium). If $x^{(2)} \leq x^{(3)}$ (i.e., $\frac{k_a}{v_a} \geq \frac{k_t-c_t}{v_t}$), then there is a unique equilibrium in which the target follows the ally’s recommendation. Moreover, there are two types of coordination equilibrium depending on a further condition: (1) if $x^{(3)} < x^{(1)}$ (i.e., $q-p \geq \frac{k_a}{v_a} - \frac{k_t+c_t}{v_t}$), then the challenger makes a demand such that $x = x^{(3)} = (1-q) + \frac{k_a}{v_a}$, and the demand will be accepted by both the ally and the target; (2) if $x^{(1)} \leq x^{(3)}$ (i.e., $q-p < \frac{k_a}{v_a} - \frac{k_t+c_t}{v_t}$), then the challenger makes a demand such that $x = x^{(1)} = (1-p) + \frac{k_t+c_t}{v_t}$, and the demand will be accepted by both the target and the ally.

Proof. Below we solve for the coordination equilibrium where the target follows the ally’s recommendation. That is, if $A$ accepts an offer by $C$, then $T$ also accepts; if $A$ rejects an offer, then $T$ also rejects. We solve the game by backward induction.

Suppose $(1-q)v_c - k_c \leq 0$, i.e., $C$ is not willing to fight against the alliance when its offer is rejected by both $A$ and $T$. Then $C$’s best response at the end of the game following rejections by both $A$ and $T$ is back down. Then $T$’s best response is reject, and $A$’s best response is reject as well. This is true for all $x > 0$. Consequently, there is a unique equilibrium to the game in this case where $C$ makes no demand ($x = 0$) and the status quo is preserved.

Below we consider the more interesting case where $(1-q)v_c - k_c > 0$, i.e., $C$ is willing to fight against the alliance when its offer is rejected by both $A$ and $T$. It is then also true that $(1-p)v_c - k_c > 0$, i.e., $C$ is willing to fight $T$ alone, because the probability of winning against $T$ is greater than against the alliance. This means $C$’s equilibrium strategy is fight whenever $T$ rejects.

Next, we solve for $T$’s best response in the equilibrium. Consider the history where $A$ accepted an offer $x$. If $T$ also accepts $x$, then it receives $(1-x)v_t$; if it rejects $x$, then it receives $pv_t - k_t - c_t$. So $T$ accepts if $(1-x)v_t \geq pv_t - k_t - c_t$, or

$$x \leq (1-p) + \frac{k_t+c_t}{v_t} \quad (4)$$

Let $x^{(1)} = (1-p) + \frac{k_t+c_t}{v_t}$. Now consider the history where $A$ rejected an offer $x$. If $T$ accepts $x$, then it gets $(1-x)v_t - c_t$; if $T$ rejects $x$, then it gets $qv_t - k_t$. So $T$ accepts if $(1-x)v_t - c_t \geq qv_t - k_t$, or

$$x \leq (1-q) + \frac{k_t-c_t}{v_t}. \quad (5)$$

Let $x^{(2)} = (1-q) + \frac{k_t-c_t}{v_t}$. Note that $x^{(2)} < x^{(1)}$.

Now we turn to $A$ and $C$’s best responses.

---

11We assume that when $C$ is indifferent between fighting and backing down, it backs down.
Case 1: If \( x \leq x^{(2)} \), then \( T \) accepts \( x \) no matter what \( A \) does. So \( A \) compares \((1-x)v_a\) with \((1-x)v_a - c_a\), and its best response is accept. Moreover, given that \( A \) and \( T \) both accept any \( x \leq x^{(2)} \), \( C \)'s optimal offer is \( x^{(2)} \), receiving a payoff of \( v_c(1 - q + \frac{k_a - c_a}{v_t}) \).

Case 2: If \( x^{(2)} < x \leq x^{(1)} \), then \( T \) accepts if \( A \) accepts, and rejects if \( A \) rejects. Given \( T \)'s best response, \( A \) compares \((1-x)v_a\) with \( qv_a - k_a\), and will accept if \((1-x)v_a \geq qv_a - k_a\). That is, \( A \) accepts \( x \) if
\[
x \leq (1 - q) + \frac{k_a}{v_a}
\]  
(6)

Let \( x^{(3)} = (1 - q) + \frac{k_a}{v_a} \).

(1) Suppose \( x^{(3)} < x^{(2)} \), i.e., \( \frac{k_a}{v_a} < \frac{k_t - c_t}{v_t} \). Then \( x^{(3)} < x \), and it will be rejected by \( A \) as well as by \( T \). In this case, \( C \) gets \((1 - q)v_c - k_c\).

(2) Suppose \( x^{(2)} \leq x^{(3)} < x^{(1)} \), i.e., \( \frac{k_a}{v_a} \geq \frac{k_t - c_t}{v_t} \) and \( q - p \geq \frac{k_a}{v_a} - \frac{k_t + c_t}{v_t} \). If \( x \leq x^{(3)} \), then it will be accepted by \( A \) and \( T \), and the best offer by \( C \) is \( x^{(3)} \), which gives it a payoff of \( v_c(1 - q + \frac{k_a}{v_a}) \); if \( x > x^{(3)} \), then it will be rejected by \( A \) and \( T \), and the payoff for \( C \) is \( v_c(1 - q) - k_c \). Clearly, \( C \)'s best response in this case is offering \( x^{(3)} \), receiving \( v_c(1 - q + \frac{k_a}{v_a}) \).

(3) Suppose \( x^{(2)} < x^{(1)} \leq x^{(3)} \), i.e., \( q - p < \frac{k_a}{v_a} - \frac{k_t + c_t}{v_t} \) (which implies \( \frac{k_a}{v_a} \geq \frac{k_t - c_t}{v_t} \)). Then \( x < x^{(3)} \), and it will be accepted by \( A \) and \( T \). In this case, the best offer \( C \) can make is \( x^{(1)} = (1 - p) + \frac{k_t + c_t}{v_t} \), and its payoff is \( v_c(1 - p + \frac{k_t + c_t}{v_t}) \).

Case 3: If \( x > x^{(1)} \), then \( T \) rejects no matter what \( A \) does. So \( A \) compares \( pv_a - c_a \) with \( qv_a - k_a \), and accepts \( x \) if \( pv_a - c_a \geq qv_a - k_a \). That is, \( A \) accepts \( x \) if
\[
q - p \leq \frac{k_a - c_a}{v_a}
\]  
(7)

Moreover, given \( A \) and \( T \)'s strategies, by making an offer \( x > x^{(1)} \), \( C \) gets \((1 - p)v_c - k_c\) if \( q - p \leq \frac{k_a - c_a}{v_a} \), or \((1 - q)v_c - k_c\) otherwise.

So far, we have found \( A \)'s best response given any \( x \), and we also know \( C \)'s optimal offer for different regions of \( x \). Next we find \( C \)'s overall optimal offer, so that we can characterize the equilibrium for the entire game. Moreover, we are interested in a coordination equilibrium. In cases 1 and 3, the target does not condition its equilibrium strategy on what \( A \) does; therefore, there is no coordination equilibrium if \( C \)'s equilibrium offer is either \( x^* \leq x^{(2)} \), or \( x^* > x^{(1)} \). A coordination equilibrium can only exist if \( x^{(2)} < x^* \leq x^{(1)} \) (case 2 scenario). So below we analyze \( C \)'s best response and find out the conditions under which \( C \)'s optimal offer is some \( x^* \) such that \( x^{(2)} < x^* \leq x^{(1)} \). Because \( C \)'s payoff depends on the location of \( x^{(3)} \) for case 2, again we analyze three cases to find \( C \)'s optimal offer.

(1) If \( x^{(3)} < x^{(2)} \), i.e., \( \frac{k_a}{v_a} < \frac{k_t - c_t}{v_t} \), then \( C \)'s payoff from offering \( x \in (x^{(2)}, x^{(1)}) \) is \((1 - q)v_c - k_c\) because it will be rejected by both \( A \) and \( T \). The strategy is weakly dominated by offering \( x > x^{(1)} \), so it is not an equilibrium strategy.
(2) If \( x^{(2)} \leq x^{(3)} < x^{(1)} \), i.e., \( \frac{k_a}{v_a} \geq \frac{k_t-c_t}{v_t} \) and \( q-p \geq \frac{k_a}{v_a} - \frac{k_t+c_t}{v_t} \), then \( C \)'s optimal offer for \( x \in (x^{(2)}, x^{(1)}) \) is \( x^{(3)} = 1-q + \frac{k_a}{v_a} \), which brings a payoff of \( v_c x^{(3)} = v_c (1-q + \frac{k_a}{v_a}) \). It is easy to see that this payoff is higher than that from offering \( x \leq x^{(2)} \) (case 1). If \( v_c x^{(3)} \) is also higher than the payoff from \( x > x^{(1)} \) (case 3), then we will have found a coordination equilibrium. If \( q-p > \frac{k_a-c_a}{v_a} \), then the payoff from \( x > x^{(1)} \) is \((1-p) v_c - k_c \), which is smaller than \( v_c (1-q + \frac{k_a}{v_a}) \), so the coordination equilibrium exists. On the other hand, if \( q-p \leq \frac{k_a-c_a}{v_a} \), then the payoff from \( x > x^{(1)} \) is \((1-p) v_c - k_c \). To have \( v_c (1-q + \frac{k_a}{v_a}) \geq (1-p) v_c - k_c \), it must be that \( q-p \leq \frac{k_a}{v_a} + \frac{k_c}{v_c} \), which is satisfied given that \( q-p \leq \frac{k_a-c_a}{v_a} \). Therefore, there is indeed a unique coordination equilibrium when \( x^{(2)} \leq x^{(3)} < x^{(1)} \). The equilibrium outcome is that \( C \) offers \( x^{(3)} = 1-q + \frac{k_a}{v_a} \) and it will be accepted by both \( A \) and \( T \). The conditions for the equilibrium are: \( \frac{k_a}{v_a} \geq \frac{k_t-c_t}{v_t} \) and \( q-p \geq \frac{k_a}{v_a} - \frac{k_t+c_t}{v_t} \).

(3) If \( x^{(2)} < x^{(1)} \leq x^{(3)} \), i.e., \( q-p < \frac{k_a}{v_a} - \frac{k_t+c_t}{v_t} \) (which implies \( \frac{k_a}{v_a} \geq \frac{k_t-c_t}{v_t} \)), then \( C \)'s optimal offer for \( x \in (x^{(2)}, x^{(1)}) \) is \( x^{(1)} = (1-p) + \frac{k_t+c_t}{v_t} \), which brings a payoff of \( v_c x^{(1)} \). It strictly dominates offering either \( x \leq x^{(2)} \) and \( x > x^{(1)} \), thus there is again a unique coordination equilibrium when \( x^{(1)} \leq x^{(3)} \). The equilibrium outcome is that \( C \) offers \( x^{(1)} = 1-p + \frac{k_t+c_t}{v_t} \) and it will be accepted by both \( A \) and \( T \).

To summarize the findings from (1)-(3), if \( x^{(3)} < x^{(2)} \), i.e., \( \frac{k_a}{v_a} < \frac{k_t-c_t}{v_t} \), then there is no coordination equilibrium; if \( x^{(2)} \leq x^{(3)} \), i.e., \( \frac{k_a}{v_a} \geq \frac{k_t-c_t}{v_t} \), then there is a unique coordination equilibrium, but the offer made by the challenger is different depending on a further condition: whether \( x^{(1)} \leq x^{(3)} \), i.e., \( q-p < \frac{k_a}{v_a} - \frac{k_t+c_t}{v_t} \).

**Proposition 2 (Unconditional Appeasement Equilibrium).** If \( x^{(3)} < x^{(2)} \) (i.e., \( \frac{k_a}{v_a} < \frac{k_t-c_t}{v_t} \)), then there is a unique equilibrium in which the challenger makes a small demand, \( x = x^{(2)} = 1-q + \frac{k_t-c_t}{v_t} \), such that the target will accept it no matter what the ally advises. Because the ally does not want to damage the alliance relationship, it advises acceptance in the equilibrium.

**Proof.** This is an equilibrium in which the target accepts \( x^{(2)} \) no matter what the ally says. From the proof for Proposition 1 case 1, we know that \( T \) always accepts \( x^{(2)} \). Given that \( T \) always accepts, \( A \) will accept because \( (1-x^{(2)}) v_a > (1-x^{(2)}) v_a - c_a \). What is left to check is whether \( C \) has an incentive to deviate. Because \( \frac{k_a}{v_a} < \frac{k_t-c_t}{v_t} \), we only need to check two cases.

1. If \( q-p \leq \frac{k_a-c_a}{v_a} \), then \( x^{(2)} \) is \( C \)'s best response if \( x^{(2)} v_c \geq (1-p) v_c - k_c \), which implies \( q-p \leq \frac{k_t-c_t}{v_t} + \frac{k_a}{v_a} \). This is always true given \( q-p \leq \frac{k_a-c_a}{v_a} \) and \( \frac{k_a}{v_a} < \frac{k_t-c_t}{v_t} \).
2. If \( q-p > \frac{k_a-c_a}{v_a} \), then \( x^{(2)} \) is \( C \)'s best response if \( x^{(2)} v_c \geq (1-q) v_c - k_c \), which implies \( \frac{k_t-c_t}{v_t} > \frac{k_a}{v_a} \). This is always true given \( \frac{k_a}{v_a} < \frac{k_t-c_t}{v_t} \).
Proposition 5 (Probability of War). Under the incomplete information where the challenger is uncertain about the target’s cost of war, the probability of war decreases as the target’s valuation of the alliance relationship \((c_t)\) increases.

Proof. Suppose \(C\) only knows that \(k_t \sim F(k_t)\), where \(F(k_t)\) is a uniform distribution on \((K, \bar{K})\). We assume that \(A\) knows \(k_t\). In addition, we assume that \(C\) does not observe whether \(A\) accepts the offer or not. We maintain the earlier assumption, \((1 - q)v_c - k_c > 0\), so that \(C\) will always fight if \(T\) rejects an offer. Given \(C\)’s strategy, \(T\)’s best response is the same as before, and consequently \(A\)’s best response is the same as those in the complete information game. What is different is \(C\)’s optimal offer at the beginning of the game.

To briefly recap, \(T\) always accepts if \(x \leq x^{(2)} = (1 - q) + \frac{k_a - c_a}{v_a}\), always rejects if \(x \geq x^{(1)} = (1 - p) + \frac{k_a}{v_a}\), and accepts if \(A\) accepts and rejects if \(A\) rejects if \(x^{(2)} < x < x^{(1)}\). For \(A\), we have the following: If \(x \leq x^{(2)}\), then \(A\) accepts; if \(x^{(2)} < x \leq x^{(1)}\), then \(A\) accepts if \(x \leq x^{(3)} = (1 - q) + \frac{k_a}{v_a}\); if \(x > x^{(1)}\), then \(A\) accepts if \(q - p \leq \frac{k_a - c_a}{v_a}\).

Because \(k_t\) affects both \(x^{(1)}\) and \(x^{(2)}\), \(C\) does not know their values with certainty, though it knows \(x^{(3)}\). Therefore, \(C\) maximizes its expected utility from offering \(x\). If \(x \leq x^{(2)}\), then \(C\) gets \(v_c x\); if \(x > x^{(1)}\), then \(C\) gets \((1 - p)v_c - k_c\); if \(q - p \leq \frac{k_a - c_a}{v_a}\), and \((1 - q)v_c - k_c\) otherwise. Finally, if \(x^{(2)} < x \leq x^{(1)}\), then \(C\)’s payoff also depends on where \(x^{(3)}\) locates in relation to \(x^{(2)}\) and \(x^{(1)}\). In particular, if \(x^{(2)} < x^{(3)} < x^{(1)}\), then both \(A\) and \(T\) will accept if \(x \leq x^{(3)}\), and both reject if \(x > x^{(3)}\).

Below we analyze separately the case where the ally rejects the offer when the challenger offers \(x \geq x^{(1)}\), which implies \(k_a - c_a < (q - p)v_a\), and the opposite case where the ally accepts \(x \geq x^{(1)}\), which implies \(k_a - c_a \geq (q - p)v_a\).

Case 1. The ally rejects \(x \geq x^{(1)}\), i.e., \(k_a - c_a < (q - p)v_a\)

1. Suppose the challenger offers \(x \leq x^{(3)}\). Then,
\[
Pr(x \leq x^{(2)})v_c x + Pr(x > x^{(1)})(1 - q)v_c - k_c) + Pr(x^{(2)} \leq x \leq x^{(1)})(1 - q)v_c - k_c)
\]
\[
= Pr(x \leq x^{(1)})v_c x + Pr(x > x^{(1)})(1 - q)v_c - k_c)
\]
\[
= Pr(k_t \geq (x + p - 1)v_t - c_t)v_c x + Pr(k_t \leq (x + p - 1)v_t - c_t)(1 - q)v_c - k_c)
\]
\[
= \frac{K - (x + p - 1)v_t - c_t}{\Delta} + (x + p - 1)v_t - c_t)((1 - q)v_c - k_c)
\]
\[
where \(\Delta = \bar{K} - K\). The first order conditions (FOC) is:
\[
\frac{K - (x + p - 1)v_t - c_t}{\Delta} + (1 - q)v_c - k_c = 0,
\]
which gives us the solution: \(x = \frac{\bar{K} - q}{2} + \frac{1}{2} + \frac{c_t}{2v_t} + \frac{1}{2v_c}((1 - q)v_c - k_c)\). From \(x^{(2)} \geq 0\) we have \(K = c_t - (1 - q)v_t\), and from \(x^{(1)} \leq 1\) we have \(K = pv_t - c_t\). Therefore \(x^* = \frac{1}{2} + \frac{1}{2v_c}((1 - q)v_c - k_c)\). If \(x^*\) is an interior point, it must satisfy \(x^* < x^{(3)}\), i.e., \(\frac{1}{2} + \frac{1}{2v_c}((1 - q)v_c - k_c) < (1 - q) + \frac{k_a}{v_a}\). Thus, the condition for \(x\) to be an optimal interior solution is \(\frac{k_a}{v_a} + \frac{k_c}{v_c} \geq \frac{q}{2}\).

2. Suppose the challenger offer \(x > x^{(3)}\). Then,
\[
Pr(x \leq x^{(2)})v_c x + Pr(x > x^{(1)})(1 - q)v_c - k_c) + Pr(x^{(2)} < x < x^{(1)})(1 - q)v_c - k_c)
\]
\[ P_r(\text{x} \leq 1 - q + \frac{k_a - c_a}{v_t}v_c) + P_r(\text{x} \geq 1 - q + \frac{k_a - c_a}{v_t}(1 - q)v_c - k_c) \]

\[ = P_r(k_t \geq (x + q - 1)v_t + c_t)v_c, x + Pr(k_t < (x + q - 1)v_t + c_t)(1 - q)v_c - k_c) \]

\[ = \frac{K - (x + q - 1)v_t - c_t}{\Delta}v_c, x + \frac{K - (x + q - 1)v_t + c_t - \Delta}{\Delta}(1 - q)v_c - k_c). \]

The FOC is \[ \frac{K - (x + q - 1)v_t - c_t}{\Delta}v_c, x + \frac{K - (x + q - 1)v_t + c_t - \Delta}{\Delta}(1 - q)v_c - k_c) = 0, \] therefore, \[ x = \frac{K - \frac{q}{2} + \frac{k_c}{2v_t}}{1} \leq \frac{c_t}{2v_t} + \frac{1}{2v_t}((1 - q)v_c - k_c), \] or \[ x^{**} = \frac{1}{2} + \frac{1}{2v_t}((1 - q)v_c - k_c) - \frac{c_t}{v_t} - \frac{q - p}{2} > (1 - q) + \frac{k_c}{v_t}. \] Thus, the condition for \[ x^{**} \] to be an optimal interior solution is \[ \frac{k_c}{v_a} + \frac{a}{v_t} + \frac{k_c}{2v_t} < \frac{p}{2}. \]

The conditions found in 1 and 2 cannot be satisfied simultaneously, therefore we can at most have one optimal point in one of the two ranges. We consider each case separately.

Suppose \[ \frac{k_a}{v_a} + \frac{\alpha}{v_t} + \frac{k_c}{2v_t} \geq \frac{q}{2}, \] then \[ x^* \] is an interior optimal solution while there is no interior solution for \[ x > x^{(3)}. \] Since \[ x > x^{(3)} \] is half open and half closed, and the boundary solution \[ x = 1 \] is never optimal, therefore, \[ x^* = \frac{1}{2} + \frac{1}{2v_t}((1 - q)v_c - k_c) \] is optimal for all \[ x \in [0, 1]. \]

Next, we calculate the probability of war:

\[ P_r(\text{war}) = P_r(x \geq x^{(1)}) = P_r(1 + \frac{l - q}{2} - \frac{k_c}{2v_t} \geq 1 - p + \frac{k_c}{v_t}) \]

\[ = P_r(-\frac{q}{2} - \frac{k_c}{2v_t} + p \geq \frac{k_a + c_a}{v_t}) = P_r(k_t \leq (p - \frac{q}{2} - \frac{k_c}{2v_t})v_t - c_t) \]

Let \[ H = (p - \frac{q}{2} - \frac{k_c}{2v_t})v_t - c_t, \] then higher \[ H \] implies a higher probability of war. We find \[ \frac{\partial H}{\partial c_t} = -1, \] the probability of war decreases as \[ c_t \] increases.

Suppose on the other hand \[ \frac{k_a}{v_a} + \frac{\alpha}{v_t} + \frac{k_c}{2v_t} < \frac{p}{2}, \] thus \[ x^{**} \] is optimal while no interior optimum exists for \[ x < x^{(3)}. \] We need to compare the boundary point \[ x^{(3)} \] with \[ x^{**}. \] Since \[ ((1 - q) + \frac{k_a}{v_a})v_c > (1 - q)v_c - k_c, \] \[ x^{(3)} \] weakly dominates \[ x^{**}. \] Hence, the probability of war is:

\[ P_r(\text{war}) = P_r(x^{(3)} > x^{(1)}) = P_r(1 - q + \frac{k_a}{v_a} > 1 - p + \frac{k_a + c_a}{v_t}) \]

\[ = P_r(k_t < (\frac{k_a}{v_a} - q + p)v_t - c_t) \]

Let \[ H = (\frac{k_a}{v_a} - q + p)v_t - c_t. \] Since \[ \frac{\partial H}{\partial c_t} = -1, \] the probability of war decreases in \[ c_t. \]

There is a gap between the conditions \[ \frac{k_a}{v_a} + \frac{k_c}{2v_t} \geq \frac{q}{2} \] and \[ \frac{k_a}{v_a} + \frac{\alpha}{v_t} + \frac{k_c}{2v_t} < \frac{p}{2}. \] If neither of the two conditions hold, there is no interior optimal solution for \[ x > x^{(3)} \] and \[ x \leq x^{(3)}. \] Thus the boundary solution \[ x^{(3)} \] is optimal and the analysis of the war is in the previous paragraph applies here. In sum, when \[ \frac{k_a}{v_a} + \frac{k_c}{2v_t} \geq \frac{q}{2}, \] the challenger’s optimal offer is \[ x = \frac{1}{2} + \frac{1}{2v_t}((1 - q)v_c - k_c); \] otherwise \[ x^{(3)} \] is optimal.

Case 2. The ally accepts \( x \geq x^{(1)}, \) i.e., \( k_a - c_a \geq (q - p)v_a; \)

1. Suppose \( x \leq x^{(3)} \) when \( x \) is the offer proposed by the challenger.

\[ P_r(x \leq x^{(2)})v_c > P_r(x \geq x^{(1)})(1 - p)v_c - k_c) + P_r(x^{(2)} < x < x^{(1)})v_c \]

\[ = P_r(x < 1 - p + \frac{k_a + c_a}{v_t})v_c + P_r(x > 1 - p + \frac{k_a + c_a}{v_t}(1 - p)v_c - k_c) \]

\[ = P_r((x + p - 1)v_t - c_t < k_t)v_c + P_r(k_t < (x + p - 1)v_t - c_t)((1 - p)v_c - k_c) = \frac{K - (x + p - 1)v_t + c_t}{\Delta}v_c, x + \frac{K - (x + p - 1)v_t - c_t - \Delta}{\Delta}(1 - p)v_c - k_c) \]
The FOC is \( \frac{K-(x+p-1)v_t+c_t}{\Delta} v_c - \frac{v_t v_c x + v_t x}{\Delta} ((1-p)v_c - k_c) = 0 \), therefore, \( x = \frac{K}{2v_t} - \frac{p}{2} + \frac{1}{2} + \frac{c_t}{2v_t} + \frac{1}{2v_c}((1-p)v_c - k_c) \), or \( x^* = \frac{1}{2} + \frac{1-p}{2} - \frac{k_c}{2v_c} \). If \( x \) is an interior solution, then \( x^* < x^{(3)} \), i.e., \( \frac{1}{2} + \frac{1-p}{2} - \frac{k_c}{2v_c} < (1-q) + \frac{k_c}{v_t} \). Hence, the condition for \( x \) to be an optimal solution is \( \frac{k_c}{v_t} + \frac{k_c}{2v_c} \geq q - \frac{p}{2} \).

2. Suppose \( x > x^{(3)} \) where \( x \) is the offer proposed by the challenger.

\[
Pr(x \leq x^{(2)})v_t x + Pr(x > x^{(1)})((1-p)v_c - k_c) + Pr(x^{(2)} < x < x^{(1)}((1-q)v_c - k_c)
= Pr(x \leq 1 - q + \frac{k_c - c_t}{v_t}) v_t x + Pr(x \geq 1 - p + \frac{k_c + c_t}{v_t}((1-p)v_c - k_c) + Pr(x^{(2)} < x < x^{(1)}((1-q)v_c - k_c)
= Pr(k_t \geq (x+q-1)v_t + c_t) v_c x + Pr(k_t \leq (x+p-1)v_t - c_t)((1-p)v_c - k_c) + Pr((x+p-1)v_t - c_t \leq x \leq (x+q-1)v_t + c_t)((1-q)v_c - k_c)
= \frac{K-(x+q-1)v_t-c_t}{\Delta} v_c x + \frac{K-(x+p-1)v_t-c_t}{\Delta}((1-p)v_c - k_c) + \frac{(q-p)v_t+2c_t}{\Delta}((1-q)v_c - k_c).
\]

The FOC is \( \frac{K-(x+q-1)v_t-c_t}{\Delta} v_c x + \frac{K-(x+p-1)v_t-c_t}{\Delta}((1-p)v_c - k_c) = 0 \), therefore, \( x = \frac{K}{2v_t} - \frac{q}{2} + \frac{1}{2} - \frac{c_t}{2v_t} + \frac{1}{2v_c}((1-p)v_c - k_c) \), or \( x^* > x^{(3)} \), i.e., \( 1 - q - \frac{k_c}{2v_c} - \frac{c_t}{v_t} > 1 - q + \frac{k_c}{v_t} \). Thus, the condition for \( x \) to be an optimal solution is \( \frac{k_c}{v_t} + \frac{k_c}{2v_c} + \frac{c_t}{v_t} \leq \frac{q}{2} \).

Note again the conditions from cases 1 and 2 cannot hold simultaneously. Therefore we consider each case separately.

Suppose \( \frac{k_c}{v_t} + \frac{k_c}{2v_c} \geq q - \frac{p}{2} \), then \( x \) in case 1 is optimal \( (x < x^{(3)}) \) while there is no optimal interior solution for \( x > x^{(3)} \). Since \( x > x^{(3)} \) is half open and half closed, and \( x = 1 \) is never optimal, \( x = \frac{1}{2} + \frac{1-p}{2} - \frac{k_c}{2v_c} \) is the optimum for all \( x \in [0, 1] \).

\[
Pr(war) = Pr(x \geq x^{(1)}) = Pr(1 - q + \frac{k_c}{2v_c} + \frac{1}{2} - \frac{c_t}{2v_c} + \frac{1}{2v_c}((1-p)v_c - k_c) > 1 - p + \frac{k_c + c_t}{v_t})
= Pr(k_t \leq (\frac{p}{2} - \frac{k_c}{2v_c})v_t - c_t).
\]

Let \( H = (\frac{p}{2} - \frac{k_c}{2v_c})v_t - c_t \), if \( H \) increases, then the possibility of war also increases. \( \frac{\partial H}{\partial v_t} = -1 \), so if \( c_t \) increases, then the probability of war decreases.

Suppose \( \frac{k_c}{v_t} + \frac{k_c}{2v_c} + \frac{c_t}{v_t} < \frac{q}{2} \), then \( x \) in case 2 is optimal and interior optimal solution exists for the interval \( x \leq x^{(3)} \). Compare the boundary solution \( x^{(3)} \) with \( x \), it be can be shown again that for the challenger offering \( x^{(3)} \) always dominates offering \( x \). When \( x^{(3)} \) is optimal, the probability of war is:

\[
Pr(war) = Pr(x^{(3)} > x^{(1)}) = Pr(1 - q + \frac{k_c}{2v_c} > 1 - p + \frac{k_c + c_t}{v_t})
= Pr(k_t < (\frac{p}{2} - \frac{k_c}{2v_c})v_t - c_t).
\]

Let \( H = (\frac{k_c}{2v_c} - q + p)v_t - c_t \), and we find \( \frac{\partial H}{\partial v_t} = -1 \). So, the probability of war decreases in \( c_t \).

There still exists a gap between \( \frac{k_c}{v_t} + \frac{k_c}{2v_c} + \frac{c_t}{v_t} < \frac{q}{2} \) and \( \frac{k_c}{v_t} + \frac{k_c}{2v_c} \geq q - \frac{p}{2} \). If neither condition holds, the optimal solution is \( x^{(3)} \) and the analysis is the same in the previous paragraph.

In sum the probability of war decreases in \( c_t \) for all cases. \( \square \)
Proposition 3 (Restraint or Entrapment). If the ally values the alliance relationship highly, then a restraining effect will contribute to a peaceful outcome, and war will result from an entrapment effect.

Proof. Proposition 5 case 1.

If the ally does not value the alliance relationship highly, a restraining effect will contribute to a peaceful outcome, and war will result from the target’s willingness to fight the challenger alone.

Proposition 4 (Restraint or Abandonment). If the ally does not value the alliance relationship highly, a restraining effect will contribute to a peaceful outcome, and war will result from the target’s willingness to fight the challenger alone.

Proof. Proposition 5 case 2.
References


