War as an Enforcement Problem:
Interstate Conflict over Rebel Support in Civil Wars

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Abstract

This paper explores the strategic problems that arise when a state seeks to use military force to compel changes in another state's policies. Although the costs associated with military action mean that there generally exist compromises that both sides prefer to conflict, bargaining may fail if such deals are not enforceable in the face of temptations to renege on policy concessions. I develop a model which shows that inefficient conflict can occur when states bargain over policies that one of them can change unilaterally and covertly. I then show that this theory is useful for understanding a common, but under-appreciated, source of international conflict: conflicts that arise when one state supports rebel groups engaged in a civil war with another state. The theory leads to several empirical predictions about the onset and management of such conflicts. Two main results emerge: (1) episodes of rebel support are associated with a larger increase in the probability of a militarized interstate dispute than are territorial disputes and (2) agreements to limit rebel support are most likely to reduce interstate violence if they are coupled with concessions by the target state and/or monitoring mechanisms that can deter cheating.

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Many international conflicts arise when one state challenges policies that are enacted by and wholly under the control of another state. The United States has recently been involved in efforts to compel a number of states— including Iraq, Iran, North Korea, and Libya—to limit or abandon their (alleged) nuclear weapons programs. The United States is also trying to coerce Iran and Syria to end support for militant groups in Iraq. In each of these cases, U.S. demands entail a call for some level of policy restraint on the part of the target. That is, they require each state to stop enacting a policy that is under its own unilateral control. Partly as a result, each of these cases is also bedeviled by some uncertainty about what the target states have done or are doing. At various times, the United States' information about the policies in question has proven to be wrong or incomplete. There has been a great deal of uncertainty about what nuclear activities the states have engaged in and the extent to they have given active support to militant groups. This uncertainty raises an important barrier to conflict resolution: given the ability of states to pursue weapons programs or support militant groups in a covert manner, any agreement to limit these activities must necessarily overcome the problem of ensuring compliance. The target states must have incentives not to renege, and the United States must have assurances that any bargain will be kept. Absent such assurances, the United State could decide that militarized action is the only way to bring an end to the offending policies—as it did in the case of Iraq.

Given that the threat of military force is often used to coerce policy restraint, an explicit examination of the strategic issues that arise in this context is overdue. Standard models of crisis bargaining assume that states are attempting to divide up some good that they both value. The set of possible bargains is generally depicted by a line, with the two

states' ideal points on opposite ends. The allocation of the good can be changed either by mutual consent or by imposition through military force, and the main interest is generally the conditions under which the states can arrive at a mutually acceptable bargain without going to war. The most natural interpretation of this set-up is to see the line as depicting a piece of contested territory, and any point on the line representing the placement of border that divides the territory into shares (e.g., Powell 1999).

As with all modeling assumptions, this set-up focuses the analyst's attention on some issues and abstracts away from others. In particular, models in the war literature focus on the bargaining problem: whether and how states allocate the gains from peace between them. By contrast, most models in the literature on international cooperation focus on a different problem: that of enforcing a deal once it is made. They view cooperation not as a problem of distribution but rather as a problem of mutual policy adjustment (e.g., Keohane 1984). Rather than dividing a good between them, the states are each assumed to have control of their own policies, such as tariff levels or investments in armaments. These models generally focus on the question of whether states can make reciprocal adjustments in policies in a strategic environment in which unilateral defection may be advantageous. The primary concern in this literature has been on enforcement: given an agreement on mutual policy adjustment, can the agreement survive in the face of temptations to cheat? Fearon (1998) stands out as an exception in this literature, modeling both the bargaining and enforcement stages.

In this paper, I argue that the literature on war can benefit by incorporating elements from the cooperation literature, particularly by taking seriously the enforcement problems that can arise in disputes over policy. Unlike in territorial disputes—in which

the status quo can only be changed by mutual consent or military action—in disputes over policies, there is another way that the status quo can be altered: through unilateral action of the state whose policies are being contested. In such cases, arriving at a mutually acceptable bargain is not enough to ensure that the deal avoids conflict; there must also be incentives for the states to live by the agreement. This is particularly true if the policy in question can be pursued covertly, so that there are delays or imperfection in the monitoring of compliance. Under these conditions, the threat of force must serve not only to affect the allocation of benefits but also to enforce the deal.

This paper develops a model in which the threat of force is used not only to coerce policy concessions but also to enforce compliance with those concessions. I show that there are conditions under which, even if there is a policy compromise that both sides prefer to costly conflict, an inability to enforce those concessions can prevent such a deal from being concluded. The model shares some essential features of those used in the literature on cooperation; in particular, the model builds in an assumption that a state can profit from unilateral defection, as in a Prisoner's Dilemma. At the same time, the game incorporates some features that are common to models of crisis bargaining, particularly the option of engaging in costly conflict and the possibility that a state can impose a military solution that ends the game. The results of the model depart in important ways from standard findings. Unlike in the repeated Prisoner's Dilemma, it is not the case that cooperation can always be enforced as long as the states place sufficient value on the "shadow of the future." In particular, I show conditions under which no enforceable deal exists even as the states' discount factor goes to one.

The literature on war has not ignored the issue of enforcement, but neither has it dealt with the manifestation of the problem considered here. In static versions of the standard models, a deal is assumed to be self-enforcing if both states derive more benefit from it than they expect to be able to get from war. In dynamic versions, some additional problems of commitment and enforcement have been considered. As Fearon (1995) and Powell (1999, 2004, 2006) have shown, an enforceable deal often requires states to make a credible commitment not to exploit a first-strike advantage, a large exogenous shift in power, or a shift in power that derives from possession of the disputed good. If such commitments cannot be made and enforced, then there can be no deal that prevents war. This paper contributes an additional way in which commitment problems can cause costly conflict: the inability of states to commit not to unilaterally renege on policy concessions.

After developing this argument theoretically, I derive and test some hypothesis about the origins and management of interstate conflict that arises out of external support for rebel groups in civil wars. As we will see, a common, and under-appreciated, source of interstate military conflict arises from states' efforts to compel their neighbors to stop harboring or aiding rebel groups (see Salehyan 2007). For example, white minority governments in Rhodesia (1965-1980) and South Africa (1979-1990) regularly engaged in cross-border raids against their neighbors in part to disrupt rebel activities, but also coerce those states into abandoning their support for black nationalist groups. Similarly, the Sandinista government in Nicaragua frequently launched attacks in Honduras and Costa Rica in order to compel those states to stop harboring Contra rebels. A substantial portion of the militarized conflict between Israel and its Arab neighbors also has this

quality. From the 1950s until the 1990s, Israel enacted a policy of "reprisal" against Arab states that aided and harbored Palestinian guerillas (Blechman 1972). Egypt, Jordan, and Lebanon experienced repeated incursions by Israel in response to attacks launched from their territories. All of these cases involve efforts by states to coerce policy restraint by their neighbors, and the repeated use of force in these episodes suggests that it can be difficult to find an efficient deal that would avoid costly conflict.

The empirical section of this paper seeks to show that insights from the theory developed here are useful for thinking about this substantively important problem. In particular, I show two main results. First, outside support of rebel groups greatly increases the probability that a civil war will lead to interstate militarized conflict. Most strikingly, episodes of rebel support are associated with a large increase in the probability of a militarized interstate dispute—larger, in fact, than the increase associated with territorial disputes. This finding confirms that policies of rebel support are highly likely to generate costly conflict between states. Second, I show that agreements to limit rebel support are most likely to succeed when coupled with concessions by the target state and/or monitoring mechanisms that can detect, and thereby deter, reneging.

1. The Basic Model

Assumptions

Consider a game between two states, A and B. State A is assumed to have control over some policy from which it derives benefit but which harms state B. For example, the policy could be the level of support that state A gives rebels fighting the government in B, or it could be the level of effort that state A invests in its nuclear program. Let

$x_t \in [0,1]$ denote the policy enacted in period *t*, and assume that A's utility in period *t* is given by $u_A(x_t) = x_t$, while B's utility in period *t* is given by $u_B(x_t) = 1 - x_t$. Hence, A's ideal point is to implement $x = 1$ in every period, and B's ideal point is $x = 0$. For now, we leave unstated why the policy is valuable to A and harmful to B. In a later section, the model is extended to consider a case in which the policy is useful for obtaining some other good, such as influencing internal politics in B.

As in Fearon (1998), I assume that the game starts with a bargaining phase and then moves on to an enforcement phase. In the bargaining phase, the states come to an agreement on some level of policy, which we label π. In the enforcement phase, state A decides in every period what level of the policy to enact; in practice, this choice amounts to a decision either to abide by the agreement or to defect and enact the most preferred policy.[1] I do not explicitly model the bargaining phase of the game. Instead, I model the enforcement stage to determine the conditions under which an enforceable agreement exists—that is, whether there exists some $\pi \in [0,1]$ that B can compel A to enact in every period. If such an agreement exists, then I assume it can be reached in the bargaining phase. If no such agreement exists, then bargaining is clearly irrelevant. Hence, by construction, if no deal is reached in this game, the problem lies in enforcement, not bargaining.

State B does not have direct control over A's policy, but it can threaten or use military force against A to compel a change of policy. In each period of the enforcement phase, B chooses either to attack or not attack. An attack does two things. First, it imposes costs on both sides. Let $c_i > 0,\ i \in \{A, B\},$ denote the cost incurred by each state

[1] Although in theory state A could defect and enact policy levels less than its ideal level, in the equilibria considered here, such a strategy is always dominated by defection to *x*=1.

in a period in which B attacks. In addition, there is some probability, *p*, that B's attack will destroy A's ability to pursue its policy. For example, an attack against rebel bases in A might eliminate the rebel threat and render A's assistance useless. Or a strike on a country's nuclear facilities has some chance of eliminating the program (e.g., the Israeli attack on Iraq's nuclear reactor in 1981).[2] In the event this outcome is realized, the enforcement game ends, and A cannot enact nonzero values of *x* for the remainder of time. Hence, if B "wins" in any period τ, then $x_t = 0$ for all $t \geq \tau$. At that point, further attacks have no additional value. It will be useful to let $\Delta = \frac{1}{1-\delta}$ denote the present discounted value of an infinite sequence of ones, which is state B's payoff in the event of a successful attack.

The sequence of moves in each period of the enforcement stage is depicted in Figure 1. I assume that state B moves first and that, in the event of an attack, the outcome of the attack is realized before state A makes its policy decision. The purpose of this assumption is two-fold. First, making A the second-mover means that state B makes its decision not knowing what policy level state A will set in that round. As a result, state A can defect on an agreement and enjoy the benefits of that defection for at least one period before state B can react. This assumption captures the idea that the policy is such that state A can switch its level without being immediately detected. As in the repeated PD, this delay creates a temptation for unilateral defection. The second implication of the assumed sequence is that, while A may profitably defect from a deal for at least one

[2] None of the basic results depend on the assumption that state B can defeat state A, but not vice versa. One could imagine a slightly modified game in which there is some probability that an attack leads to the destruction of B's military capacity, in which case state A is free to enact its most preferred policy in every period thereafter. Although this modification would affect specific expressions below, none of the fundamental findings would change.

period, state B cannot. In the event that state B chooses to attack, state A can immediately adjust the policy level to its desired level. Whether or not this assumption is realistic, it means that the model focuses primarily on the problem of enforcing policy restraint by A, and it holds aside the challenge of deterring unprovoked attacks by B.[3]

Equilibrium Behavior

In any single stage of the game, state A has a dominant strategy to enact $x = 1$. Conditional on this, B prefers attack if and only if $p\Delta - c_B > 0$. Hence, the Nash equilibrium of the stage game is {Not Attack, $x = 1$} if $p\Delta \leq c_B$ and {Attack, $x = 1$} if $p\Delta > c_B$. In the single-shot enforcement game, the cooperative strategy pair {Not Attack, $x = \pi < 1$} is not an equilibrium. What happens when the enforcement stage is repeated, potentially for infinitely many periods?[4] Can the threat of attack by B be used to enforce compliance with some agreed upon policy compromise?

The first thing to note is that, when the enforcement stage is infinitely repeated, war is an inefficient outcome in the sense that there always exists a compromise solution that both sides prefer to it. In this context, define "war" as a sequence of periods in which the states play {Attack, $x = 1$} until B prevails. Consider each state's expected value for this event. In each period of war, state A pays a cost, c_A, and with probability p, state A is forced to accept a payoff of zero for the rest of time. With probability $1 - p$,

[3] All of the basic results still hold if we were to assume that the states move simultaneously, in which case both states can defect from a deal for one period before the other reacts.

[4] It should be noted that the enforcement stage is not technically an infinitely repeated game in the usual sense that there is a stationary stage game that is played an infinite number of times. Because an attack by B has some chance of ending the enforcement stage, there is always a chance, on or off the equilibrium path, that the game will terminate. Hence, the enforcement stage is called a "stochastic game", rather than a repeated game (see, e.g., Powell 2004, 235).

state A gets to enjoy its ideal policy level, and the war continues for at least one more period. The present expected value of war that starts in the current period is therefore:

$$\begin{aligned} w_A &= (1-p)(1+\delta w_A) - c_A \\ &= \frac{1-p-c_A}{1-\delta(1-p)} \end{aligned} \tag{1}$$

For state B, every period of war entails a cost, c_B, but with probability p, state B wins the war and enjoys a payoff of 1 in that period and forever after. With the complementary probability, B incurs the ill effects of A's policy, and the war continues for at least one more period. Hence, the present value of war is given by

$$\begin{aligned} w_B &= p\Delta + (1-p)\delta w_B - c_B \\ &= \frac{p\Delta - c_B}{1-\delta(1-p)} \end{aligned} \tag{2}$$

The total present value of the policy "pie" to be divided is Δ. It is easy to show that the sum of the war payoffs is less than the total benefits that can be divided, or $w_A + w_B < \Delta$, as long as the sum of the cost terms, $c_A + c_B$, is greater than zero. Hence, we start with the usual finding that there always exists some compromise that both sides prefer to war in expectation.

The question is whether such a compromise can be enforced in equilibrium. We know that state A faces a short-term temptation to defect and enjoy the fruits of its policy for one period before B has a chance to retaliate and start a war. Hence, the existence of a deal that both sides prefer to war does not ensure the existence of a deal that is enforceable in the face of these incentives.

To determine whether an enforceable deal exists, we assess whether a cooperative equilibrium can be supported by the most vindictive punishment mechanism available: a

Grim Trigger strategy. In such an equilibrium, the states cooperate in every period, but if either state deviates from this deal, the other switches to its conflictual strategy as soon as possible and in all subsequent periods. In particular, the equilibrium strategies are as follows:

1. State B plays Not Attack in every period *t* as long as state A has never played $x > \pi$ in any previous period. If state A plays $x > \pi$ in any period *t*, then state B plays Attack in all subsequent periods.
2. In every period, state A plays $x = \pi$ in response to Not Attack and $x = 1$ in response to Attack.

Notice that, while state A in theory has a continuous choice over the policy space, in practice, its choice boils down to complying ($x = \pi$) or defecting ($x = 1$). Given B's strategy, any other policy level is strictly dominated by one of these two. The central question is: when does there exist some deal π such that cooperation can be sustained in equilibrium?

The first thing to notice is that, if $p\Delta \leq c_B$, then state B's threat to resort to war in response to defection is not credible, since state B prefers the zero payoff associated with A's defection to a war. As a result, implementation of the Grim Trigger strategy is not subgame perfect. The only way to sustain a cooperative equilibrium is to set the agreed policy level is at state A's ideal point—in which case, the outcome is indistinguishable from unilateral defection. War is impossible when this condition holds, because B is never willing to attack. However, because the left-hand side goes to infinity as $\delta \to 1$, there must exist some value of δ above which the threat of war becomes credible.

To determine whether a cooperative equilibrium exists when $p\Delta > c_B$, we need to show the conditions that must hold so that neither side prefers to deviate from its prescribed strategy, under the assumption that the other side plays the equilibrium strategy. In particular, we need to show that neither state can profitably deviate from the equilibrium for a single period and then return to equilibrium play thereafter. All of the analysis in this stage is conditional on some policy level, π, which was agreed to in the bargaining phase.

First consider state A's incentives to abide by the deal. On the equilibrium path of play, A's present value for the game is:

$$u_A(\text{Comply in all periods}) = \frac{\pi}{1-\delta}. \tag{3}$$

What is the value of a single period deviation to defection? In that first period, A gets a payoff of 1 from enacting its preferred policy. In all subsequent periods, A continues to enact its preferred policy, but it comes under attack from B—in other words, war ensues. Formally,

$$\begin{aligned} u_A(\text{Defect in all periods}) &= 1 + \delta w_A \\ &= \frac{1-\delta c_A}{1-\delta(1-p)}. \end{aligned} \tag{4}$$

Comparing (3) and (4), we can determine the minimum value of π such that state A prefers cooperation to defection:

$$\underline{\pi} = \frac{(1-\delta)(1-\delta c_A)}{1-\delta(1-p)}. \tag{5}$$

Expression (5) gives us a lower bound on the policy levels that A would be willing to abide by, given B's threat of retaliation.

Now we turn to B's calculation. Given π, B's present value for the game on the equilibrium path of play is:

$$u_B(\text{Don't Attack in all periods}) = \frac{1-\pi}{1-\delta}. \quad (6)$$

What is the value of making an unprovoked attack in one period followed by rounds of conflict until B ultimately prevails? Because, by construction, state A can implement its ideal policy level immediately in response to B's attack, an unprovoked attack effectively starts a war. Hence, state B's payoff from defection is exactly the same as its war payoff, w_B. Comparing (6) with (2), we can solve for the maximum value of π that will induce B not to attack:

$$\bar{\pi} = 1 - \frac{p - (1-\delta)c_B}{1-(1-p)\delta}. \quad (7)$$

The bounds described in expressions (5) and (7) determine whether or not there exists some policy compromise, π, that can be sustained in equilibrium. Any such compromise must satisfy the condition that $\bar{\pi} > \pi > \underline{\pi}$. Clearly, for such a compromise to exist, the lower bound implied by (5) must be lower than the upper bound specified in (7). If this is not true, then there is no policy compromise that state A prefers to abide by and that state B prefers to war. Comparing these expressions, we find that a deal exists if and only if

$$\delta > \frac{p - c_B}{c_A} \equiv \delta^*. \quad (8)$$

Because δ must be between zero and 1, this expression suggests that there are three possible scenarios:

1. If $p \leq c_B$, then the condition is always met, and a peaceful deal always exists.
2. If $c_A + c_B > p > c_B$, then a deal exists for values of δ greater than δ^*.
3. If $p > c_A + c_B$, then the condition can never be met, and an enforceable deal does not exist for any value of δ.

Figure 2 shows some numerical simulations that illustrate the second and third scenarios. Both panels show the upper and lower bounds as a function of the discount factor. In both panels, p is set to 0.4 and c_B is set to 0.2. The costs of war to A, c_A, are set to 0.5 in panel (a) to 0.1 in panel (b). In the first panel, the sum of the costs is greater than p, so enforceable deals become available once the discount factor exceeds $\delta^* = 0.4$. In the second panel, the sum of the costs is less than p, so the upper bound is below the lower bound for all values of δ, and no deal is possible.[5]

War and the "Shadow of the Future"

One implication of these results is that the model developed here, though like a repeated Prisoner's Dilemma in some respects, does not exhibit the familiar "folk theorem" result that cooperation can always be sustained if the discount factor is sufficiently high. In other words, a sufficiently long "shadow of the future" does not guarantee that a deal can be enforced in the face of short-term temptations to cheat. This effect stems from the fact that, while the game has infinitely many periods, it is not an

[5] Notice that, in all cases, the bounds converge on zero as the discount factor goes to one. This stems from the fact that, in the event of a war, state B is sure to prevail in some finite number of periods (from the law of large numbers). If the states do not discount this future at all, then the inevitable, infinitely long future in which B enjoys a payoff of one and A endures a payoff of zero swamps any costs incurred in the short-term. As a result, B will not accept any policy compromise greater than its ideal point, 0, and A has no choice but to give in to this maximal demand. Hence, in the limit as $\delta \to 1$ both bounds converge on zero.

infinitely repeated game, in the sense that an identical stage game is played in every period. Rather, the outcome in one stage of the game can radically change the nature of the interaction in all subsequent periods. In particular, there is some chance that state B can impose a once-and-for-all outcome at its ideal point (cf. Powell 1999, 72-73).[6]

To see how this feature of the interaction matters, let us first recall why a high discount factor ensures cooperation in the infinitely repeated PD. Using standard notation, let *R* denote the reward from mutual cooperation, *T* denote the temptation payoff associated with unilateral defection and *P* denote the punishment for mutual defection, with $T > R > P$. If the states are playing a grim trigger strategy, then each compares its payoff from cooperating in every period with its payoff from a one-period unilateral defection following by infinitely many rounds of mutual defection:

$$u(\text{Always cooperate}) = \frac{R}{1-\delta}$$
$$u(\text{Defect}) = T + \frac{\delta P}{1-\delta}.$$

Comparing these expressions and rearranging shows that cooperation can be sustained if

$$\frac{\delta}{1-\delta}(R-P) \geq T-R.$$

This expression requires that the future discounted gains from cooperation ($R-P$) exceed the one-period temptation to defect ($T-R$). Since the left-hand side goes to infinity as δ goes to one, then there must exist some discount factor less than one for which this condition is true. Hence we get the familiar result that cooperation can be sustained as long as the discount factor is high enough.

[6] As noted above, though, this result does not depend on the assumption that only state B can prevail militarily.

Now consider the analogous calculation in the present game. Here, the total gains from peace equal the total present value of the payoffs available, Δ, minus the total present value of war, or

$$\Delta - w_A - w_B = \frac{c_A + c_B}{1 - \delta(1-p)}. \tag{9}$$

Although this expression is increasing in the discount factor, it does not go to infinity as $\delta \to 1$. Instead,

$$\lim_{\delta \to 1}(\Delta - w_A - w_B) = \frac{c_A + c_B}{p}.^{7} \tag{10}$$

The gains from peace in this game do not go to infinity because, even though the pie to be divided becomes infinite as $\delta \to 1$, so too does state B's expected value for war, w_B. This is because B is certain to prevail at some point, and the infinite benefits of its eventual victory swamp the finite, short-term costs of war at high values of δ. Indeed, as long as at least one state has a chance of imposing a once-and-for-all settlement at its ideal point, the net gains from peace are finite.[8]

This observation matters because, if the gains from peace are finite even at high discount factors, then there is no guarantee that they are large enough to ensure cooperation, as they are in the repeated PD. For an enforceable deal to exist, it must be the case that the net gains from peace outweigh the potential payoffs from deviation, which equal 1, the gain that state A obtains from a one-period defection. In the limit as $\delta \to 1$, this requirement becomes

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[7] This expression has a natural interpretation. The expected duration of a war that has probability p of ending in each period is $\sum_{t=1}^{\infty} tp(1-p)^t = 1/p$. The peace dividend thus equals the per-period cost of war times its expected duration, or the total expected costs of war.

[8] Hence, this result remains even if state A also has a chance of prevailing militarily (see fn. 2).

$$\frac{c_A + c_B}{p} \geq 1. \qquad (11)$$

Hence, a deal exists in the limit if and only if $p \leq c_A + c_B$, which is the same result that we had above.

2. Policy as an Instrument: An Extension to the Basic Model

The basic model treated state A's policy as an end in and of itself without regard to why the policy was valuable to A and harmful to B. In reality, policies are generally means to some other desired end. A state supports rebels groups in another state in order to influence the other's form of government or to promote the independence of ethnic kin. A state pursues a nuclear program because doing so will increase its regional influence and permit it to have leverage over other issues. When policies are means rather than ends, an analysis of the interstate bargaining must consider the possibility of compromise, not just on the policy level, but also on the underlying issues which the policies seek to influence. Doing so raises the possibility that policy restraint by state A might be supported, not simply by the threat of military action, but also by substantive concessions on the part of state B.

In this section, I extend the basic model to evaluate whether adding such a dynamic alters the previous finding that enforcement problems can lead to war. The main result is that, even when we add a good over which the states compete, this change does not eliminate the challenge of deterring defection by state A. In particular, I show that there continue to exist conditions under which no enforceable deal can be found, even though war is inefficient.

Assumptions

The refined model is similar to the basic model in most respects. In this case, however, we assume that the underlying issue in dispute is a policy controlled by state B. Assume that, as before, this policy, *x*, takes values on the unit interval and that $u_A(x_t) = x_t$ and $u_B(x_t) = 1 - x_t$. This represents the good that is the object of the international dispute. To make the presentation less abstract, we could interpret this policy as the share of power that the government in B gives to some rebel group supported by state A, or the level of autonomy it gives some region populated by the rebels. State A wants the rebels to receive more power or greater autonomy, while state B would prefer to make few concessions.

State A, for its part, controls a policy instrument that can be useful for acquiring concessions from B on the underlying issue. In each period, state A chooses a policy level $s_t \in [0, \bar{s}]$ with $\bar{s} \leq 1$. This policy works as follows: in each period *t*, state A will win the good with probability s_t. That is, with probability s_t, state A will win the contest with B, and *x* will be set at A's ideal point, 1, for the rest of time. We could interpret A's policy as reflecting its level of support for the rebel group in B, ranging from active suppression to direct military intervention on its behalf. This level of support maps into a probability that the rebels will prevail in the civil war in each period and thereby seize all the power or win independence for their region.

As before, to concentrate on the problem of deterring defection by state A, we make state A the second-mover in each period of the enforcement game, meaning that B makes its decision to attack and sets the level of *x* before A sets *s*. As in the basic model,

an attack by B has probability *p* of destroying A's ability to pursue its policy and imposes costs on both sides.

Equilibrium Behavior

As before, we look for whether there exists a cooperative equilibrium supported by a Grim Trigger threat of retaliation. In this context, a deal represents a bargain on both policy dimensions—that is, a settlement on the underlying good, π, and a policy level, σ. Given some bargain (π, σ), the equilibrium strategies in the enforcement game are as follows:

1. State B plays {Not Attack, $x = \pi$ } in all periods t as long as state A has played $s \leq \sigma$ in all previous periods. If state A plays $s > \sigma$ in any period, then state B plays {Attack, $x = 0$ } in all subsequent periods.
2. In every period, state A plays $s = \sigma$ in response to {Not Attack, $x \geq \pi$ } and $s = \bar{s}$ in response to anything else.

As before, we first calculate the present value of war to both sides, where war is defined as a sequence of periods in which state A plays $s = \bar{s}$ and state B plays {Attack, $x = 0$ } until one of the states wins. For state A, every period of war entails a cost and a probability, *p*, that it will lose and become incapable of coercing concessions on the underlying good. In each period that A survives, there is probability $\bar{s}$ that it will prevail and win the good forever; with the complementary probability, the war continues. Putting all this together, we can solve for A's value for war recursively:

$$\begin{aligned} w_A &= p \cdot 0 + (1-p)\left[\bar{s}\Delta + (1-\bar{s})\delta w_A\right] - c_A \\ &= \frac{(1-p)\bar{s}\Delta - c_A}{1-(1-p)(1-\bar{s})\delta} \end{aligned} \quad . \qquad (12)$$

The calculation is the analogous for state B, except that it enjoys the full benefits of being able set the underlying policy at its ideal level as long as the war continues and if it wins:

$$\begin{aligned} w_B &= p \cdot \Delta + (1-p)\left[\bar{s} \cdot 0 + (1-\bar{s})(1+\delta w_B)\right] - c_B \\ &= \frac{p\Delta + (1-p)(1-\bar{s}) - c_B}{1-(1-p)(1-\bar{s})\delta} \end{aligned} \quad . \tag{13}$$

It is easy to show that the sum of the war values is less than the total value of the pie that can be divided, Δ.

For the cooperative strategies to constitute an equilibrium, neither state can have an incentive to deviate from them for one period. For state A, the present value of cooperating in every period, r_A, is

$$\begin{aligned} r_A &= \sigma\Delta + (1-\sigma)(\pi + \delta r_A) \\ &= \frac{\sigma\Delta + (1-\sigma)\pi}{1-(1-\sigma)\delta} \end{aligned} \quad . \tag{14}$$

In the event that state A defects, it prevails in the current period with probability $\bar{s}$, and otherwise a war starts in the following period. Hence, the expected payoff from defection is:

$$d_A = \bar{s}\Delta + (1-\bar{s})(\pi + \delta w_A) \, . \tag{15}$$

The equilibrium condition that $r_A \geq d_A$ yields an expression for the minimum level of π that A must obtain for any given value of σ, or $\underline{\pi}(\sigma)$.

For state B, the present value of cooperating in every period is

$$\begin{aligned} r_B &= \sigma \cdot 0 + (1-\sigma)(1-\pi + \delta r_B) \\ &= \frac{(1-\sigma)(1-\pi)}{1-(1-\sigma)\delta} \end{aligned} \quad . \tag{16}$$

In the event that state B deviates to {Attack, $x = 0$}, then, by construction, state A can respond in the current period, and a war starts immediately.[9] Hence, the value of defection for state B is its war value, w_B. The equilibrium condition that $r_B \geq w_B$ leads to an expression for the maximum value of π that B will agree to for any given σ, or $\bar{\pi}(\sigma)$.

As before, whether or not a deal exists depends on whether or not the two sides' minimum demands are compatible. In this case, an enforceable deal exists if there is some pair (π, σ) such that $\bar{\pi}(\sigma) \geq \pi \geq \underline{\pi}(\sigma)$. Put another way, no enforceable deal exists whenever $\underline{\pi}(\sigma) > \bar{\pi}(\sigma)$ for all $\sigma \in [0, \bar{s}]$. The expressions for these thresholds are complicated, so it is hard to specify meaningful conditions under which deals exist. For our purposes, it is sufficient to demonstrate that there are conditions under which no deal exists, meaning that force will be used inefficiently.

Figure 3 depicts such a case. For the purposes of this figure, the parameters of the game were set as follows: $p = 0.4$, $c_A = 0.3$, $c_B = 0.1$, $\bar{s} = 0.3$, and $\delta = 0.4$. Notice that both upper and lower bounds decrease with σ. This is because, as the probability that state A will prevail in any period increases, the less state A will demand from the deal and the more state B will require to be willing to comply. Notice also that, as σ becomes

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[9] As in the basic model, there are conditions under which state B will be unwilling to use force to enforce the deal. Under such conditions, the only punishment it can wield is to revoke the concessions on the underlying issue—that is, to set $\pi = 0$. To state B, the present value of a conflict in which both states always set their policies to their preferred levels, but state B never uses force, is

$$w'_B = \bar{s} \cdot 0 + (1 - \bar{s})(1 + \delta w'_B)$$
$$= \frac{1 - \bar{s}}{1 - (1 - \bar{s})\delta} \quad .$$

State B will use this punishment strategy instead of an actual war if $w'_B > w_B$. In this case, the threat of war to enforce a deal is not credible. As in the basic game, war is the preferred punishment strategy when the discount factor is sufficiently high and possibly for all discount factors, if the costs of war are relatively low. Since we are interested in cases in which the threat of force is credible, the rest of this discussion assumes this condition is met.

large, the upper bound can fall below zero, in which case there is no division of the good such that state B prefers the deal to war. With these parameter values, the sum of the war payoffs is $w_A + w_B \approx 1.2$, while the total value of the disputed pie is $\Delta = 1.67$. Hence, war is ex post inefficient. Nevertheless, the upper bound characterizing state B's minimum demand is below the lower bound characterizing A's minimum demand for all feasible value of σ. Hence, there is no pair (π, σ) that is enforceable in equilibrium. Moreover, with the other parameters set as they are, the absence of an enforceable deal holds for any value of the discount factor. As before, then, a long shadow of the future does not necessarily ensure that cooperation will take place.

Interstate Conflict over the Support for Rebel Groups: An Empirical Application

In this section, I test some implications of the theoretical models in the context of interstate conflicts over rebel support. As noted by Gleditsch, Salehyan, and Schultz (2007), civil wars are an important, but largely neglected source of interstate conflict. In particular, they show that dyads in which at least one state is experiencing a civil war are about twice as likely to experience a militarized interstate dispute as dyads with no civil wars. Moreover, Salehyan (2007) shows that an important determinant of whether civil wars lead to interstate conflict is whether rebel groups operate from bases in other states. Both of these papers suggest a number of reasons why civil wars create conflicting interests between states. As the rationalist literature on war suggests, however, interest conflicts are not, on their own, sufficient to explain the costly use of force (Fearon 1995). States generally have incentives to find peaceful bargains that allow them to avoid those

costs. Understanding why certain disputes lead to force requires an explanation of the strategic mechanisms that can cause bargaining to fail.

The theory developed here suggests that inefficient conflict can arise due to problem of enforcing compromises over policies that are under the unilateral control of one state, such as a policy of supporting rebels. The purpose of this empirical section is not to "test" the models per se. Rather, it is show that their theoretical insight into the strategic problem facing states in these situations is useful for understanding the origin and management of interstate conflict associated with civil wars.

Hypotheses

The first hypothesis stems from the models' general insight that international disputes over policies such as rebel support are particularly prone to violence because of the strategic difficulties of negotiating peaceful compromises. In addition to the informational and commitment problems discussed in the existing literature, states may fail to reach efficient solutions to such disputes due to the enforcement problem identified above. This suggests that periods in which one state supports rebel groups engaged in a civil conflict with another state are associated with a higher probability of militarized interstate conflict. The challenge in testing this hypothesis in a meaningful way is to answer the question "compared than what?" It is trivial to show that dyads experiencing rebel support are much more likely experience militarized conflict than dyads that are not. The problem is that the latter include many dyads that have no reason to engage in conflict with one another. When one state supports rebels against another, this is a clear indicator that there is some contentious issue in their relationship. How can we be sure

that the higher incidence of militarized conflict among such dyads is not artifact of the relative absence of contentious issues in the rest of the sample?

I address this issue in two ways. First, we can express the hypothesis as dealing purely with inter-temporal variation within dyads. That is, recognizing that dyads vary quite considerably in their underlying potential for militarized conflict, we focus only on changes in the level of militarized conflict over time within dyads. This suggests:

> **Hypothesis 1a:** Controlling for the overall level of conflict within the dyad, the states are more likely to experience militarized conflict during periods of rebel support than in periods without rebel support.

Stated in this way, the answer to the question "compared to what" is: compared to the same dyad in periods without rebel support. As we will see, testing this hypothesis requires the use of a fixed-effects or "within" estimator.

A second way to present a meaningful test of this logic is to compare the incidence of militarized conflict in dyads experiencing rebel support with that in dyads that are known to have some other contentious issue in them. It is well-known, for example, that states involved in territorial disputes are very likely to experience militarized conflict (e.g., Huth 1996; Huth and Allee 2002). Hence, we can compare the conflict rates in dyads experiencing rebel support to that in dyads with territorial disputes. I do so with some hesitation. The logic developed here suggests that cases of rebel support are susceptible to an enforcement problem that is generally lacking in territorial disputes. This suggests that, all other things being equal, the former should be harder to resolve peacefully than the latter, leading to a higher incidence of militarization. It is difficult to know, however, if the *ceteris paribus* claim is satisfied in this comparison. If the value of the objects at stake varies significantly, then this variation could swamp the

strategic effects. Nonetheless, the comparison is instructive, if for no other reason than to show how the disputes surrounding civil wars compare as a source of international conflict to territorial disputes, which have received far greater attention in the literature. Hence,

> **Hypothesis 1b:** Dyads experiencing rebel support experience a higher level of militarized conflict than dyads with territorial disputes.

In addition to predicting high levels of conflict in these cases, the theory suggests a causal mechanism: states that are targeted by rebel support have incentives to use force to compel policy restraint. Thus, we are particularly interested in showing that states that suffer from the negative effects of others' policies initiate militarized action in response. If, on the other hand, the militarized conflict in these dyads is typically initiated by the state supporting rebels, this would suggest an alternative causal mechanism: that interstate violence complements intervention in support of rebel groups. The theory presented here does not rule out that high levels of support (i.e., high s) entail direct intervention, but the logic does require that the targets of rebel support have an increased probability of initiating military action. For the reasons given above, this hypothesis is best assessed by focusing on inter-temporal variation in conflict initiation rates. That is,

> **Hypothesis 2:** Any given state B is more likely to initiate military conflict against any state A when state A is supporting rebels in B than when state A is not supporting rebels, holding constant the overall rate of conflict initiations by B against A.

The second set of hypotheses deal with the management of interstate conflicts that arise out of rebel support. As we will see, states engaged in such conflicts have at times reached agreements to limit rebel support and/or grant concessions on the substantive issues at the root of conflict. The models presented here do not technically predict that states will reach agreements after some spell of conflict. The assumption of complete

information and the absence of exogenous shocks to the parameters mean that a deal is either reached or not at the outset, and then the enforcement stage runs its course. Nevertheless, the models make some suggestions about the conditions under which agreements to limit rebel support are more or less likely to be effective in reducing militarized conflict.

As we have seen, the primary challenge to reaching an enforceable deal over policy is the ability of state A to renege on its commitments. It can profitably do so since, by design, the model assumed that there was a delay in detection, so that state A can enjoy the fruits of defection for one period before suffering retaliation. If, however, state B could immediately detect and react to defection, then the temptation to do would vanish, thereby mitigating the enforcement problem. This suggests that agreements to curb rebel support are more likely to work if they are accompanied by provisions that allow monitoring of state A's compliance. One such provision would be the naming of third parties to help monitor the agreement. Fortna (2004a, 2004b) shows that monitoring by United Nations or other peacekeepers can have a beneficial effect on compliance with cease-fire agreements in interstate and civil wars. Here, we consider whether third party monitors—generally, but not always, the United Nations or regional security organizations—can have a similar effect on agreements to limit rebel support in civil wars. This suggests:

> **Hypothesis 3:** Agreements to curb rebel support are more effective at reducing interstate violence if they make provision for monitoring by third parties than if they do not.

Finally, the models suggest that agreements to limit rebel support are more likely to work when they are combined with substantive concessions by the targeted state. All other

things equal, state A has less incentive to defect from an agreement to set $\sigma = 0$ if state B offers some concessions in return, or $\pi > 0$. This leads to:

> **Hypothesis 4:** Agreements to curb rebel support are more effective at reducing interstate violence if they are coupled with substantive concessions (e.g., power sharing, regime change, territory) by the targeted state than if they are not.

Data

The dependent variable in all tests comes from the Militarized Interstate Dispute data set, specifically the dyadic version created by Maoz (2005). MIDs are events that involve at least two states in which at least one state threatened, displayed, or used military force against the other (Jones, Bremer, and Singer 1996). Except in the case of hypothesis 2, the unit of observation in each test is the dyad year. The dependent variable records, for each dyad year, whether a MID started in that year.[10] Following standard practice, the sample is restricted to politically relevant dyads, in which states are either territorially contiguous or at least one is a major power. In the case of hypothesis 2, which considers the issue of MID initiation, the unit of observation is the directed dyad year. In this kind of set-up, each state in a dyad has a chance to be the initiator against the other in each year. This method allows us to consider not simply whether a dyad experiences a MID, but also which side initiated the conflict. For each directed-dyad year, the dependent variable indicates whether the potential initiator actually initiated a

[10]The dependent variable was also coded as missing in dyad years with ongoing MIDs, as we are mainly interested in onset. It generally makes sense to consider only MID onsets, since observations with ongoing MIDs are not independent of onset in a previous observation. However, many of the MIDs that accompany civil wars are quite long and consist of multiple attacks strung out over a period of years. For example, the MID between South Africa and Angola over their support for rebel groups lasts 13 years (1975-88). The MID aggregation rules say that related militarized incidents are grouped into a single MID if less than six months passes between them. This means that a series of hot pursuit raids or military strikes at rebel bases could generate one long MID or many short MIDs depending on how closely they are spaced in time. Hence, it can make sense to include ongoing MIDs along with new MID onsets. All tests were performed treating ongoing MIDs that same as MID onsets, and the results were all the same.

MID against the potential target in that year. Following convention, if state A initiates against state B in a given year, then the dependent variable in the B-A dyad is coded as missing in that year. Years with ongoing MIDs are coded as missing for both directed dyads.

The main independent variables in these analyses are indicators of civil conflict, external support for rebel groups, and agreements to curb such support. The civil conflict data come from the Uppsala Armed Conflicts Database (see Gleditsch et al. 2002). These data include all conflicts in the period 1946-2001 that generated at least 25 deaths per calendar year. Civil conflicts, including those that became internationalized, were identified using the coding in the data base. These data are used to code, for each dyad year, whether or not at least one state in the dyad was experiencing a civil conflict in that year.

Information on external support for rebel groups within these conflicts comes from a new data set compiled by David Cunningham, Kristian Gleditsch, and Idean Salehyan.[11] For each civil conflict identified in the Uppsala data, these data provide information on the rebel groups involved, including whether they received support from foreign states. In cases with external support, the data set further classifies whether the support entailed the use of troops (i.e., direct intervention), military aid in the form of training and/or arms, and non-military aid, such as money and food.[12] Finding evidence of such support is obviously quite challenging, as states often deny the accusation that they are aiding rebels. In some cases, the data set notes that the support is "alleged" rather than explicit, but such allegations cannot come solely from the targeted state and

[11] I am grateful to them for sharing these data with me prior to its public release.
[12] Some cases of support involve nothing more than explicit endorsement of the rebels' cause. For our purposes, these cases were not included in the analysis.

must have been confirmed by another source. The data set also distinguishes between cases in which the rebels simply had a presence in another state and cases in which that state is actively giving them support. There are, after all, cases in which rebel groups take advantage of porous borders and weakly governed regions to set up bases in foreign states without the latter's help or consent. For the purposes of this analysis, these cases were not coded as entailing rebel support; see Salehyan (2007) for an analysis of the relationship between MIDs and external rebel bases. These data were used to create a coding, for each dyad year, indicating whether one state was supporting a rebel group in the other.[13] In some dyad years, both states supported rebels against the other, so a variable was created indicating dyads with reciprocal support.

The final key variable captures agreements to limit rebel support. After identifying the episodes of rebel support, the author and a team of research assistants tried to identify all interstate agreements to curb or end such support. To be clear, we identified these agreements only for dyads in which at least one state was coded as supporting rebels against another. Hence, these data are useful for looking at the role of these agreements in managing interstate conflicts once one state has decided to support rebels against another. They cannot be used to look at the role of agreements in preventing rebel support in the first place. This means that we are looking for the effect of agreements in hard cases: cases in which a state has already shown a desire to engage in the behavior proscribed by the agreement. If there are cases in which states signed agreements and never supported rebels, it would be difficult—if not impossible—to know

[13] For the purposes of these codings, cases of support which lasted for less than one year were not counted. These cases almost always involve support for a coup attempt, many of which last only a matter of days.

if these agreements prevented rebel support or simply codified the pre-existing desire not to get involved (see Downs, Rocke, and Barsoom 1996).

The data collection relied on a variety of sources, including news accounts and secondary sources. The agreements identified varied somewhat in their form. Some are formal agreements, such as treaties while others are more informal, such as joint communiqués issued after official meetings. There were a few cases in which we saw reports that a state leader had verbally promised to reign in rebel activity, but these were not coded as agreements. Given that we relied on public sources, it is possible that there were secret agreements that we were unable to identify. If it is the case that there are many secret agreements that were effective at managing conflict in these cases, then their omission would lead us to understate the effect of the public agreement we did identify.

To qualify for the data set, the agreements had to include explicit provisions that sought to limit rebel support. In particular, a state had to agree to terms such as:

- not to harbor or support groups engaged in hostilities against the other state,
- not to permit its territory to be used for planning or launching attacks on the other state,
- to prevent and/or not participate in acts of subversion against the other state,
- to engage in joint military operations against groups engaged in subversion,
- not to interfere in the internal affairs of the other state.

It should be noted that many regional security organizations, such as the ASEAN, the OAS, and the OAU have such provisions in their charters. Though we collected information on membership in these organizations, such agreements are not included in the tests done here.

Given these specifications, we identified 49 cases in which states agreed to limit rebel support against others. There are fewer than 49 separate treaties, however, since some treaties are multilateral, and consequently they appear in more than one dyad. For example, the 1987 and 1989 Central American peace agreements covered Costa Rican and Honduran support for the Contra rebels in Nicaragua as well as Nicaraguan support for the FMLN in El Salvador. For each treaty, we collected a number of variables. For our purposes here, two in particular are important. First, we coded whether or not the treaty was coupled with substantive concessions by the state experiencing the civil war. Such concessions generally entailed a domestic power-sharing agreement or a pledge to hold elections, but they might also include other policy or even territorial concessions.[14] Second, we also noted whether the treaty provided a role for third parties in monitoring or enforcement. These third parties were often the United Nations or some regional security organization, but in some cases they were third-party states or special commissions, such as the International Commission for Supervision and Control that was created to monitor the 1962 Geneva accords over Laos. Of the 49 dyadic agreements identified, 20 involved a substantive concession, and 25 made provisions for a third party role. These two attributes were, perhaps not surprisingly, correlated: 85 percent of the agreements with concessions made provisions for third-party monitoring, while just over a quarter of agreements without concessions did so.

Since we are interested in whether agreements and their provisions have an effect on the level of conflict in a dyad, variables were created, for each dyad year, indicating whether there was an agreement in the dyad in some previous year. Similar variables

[14] In some cases, domestic power-sharing agreements were not in the same document as the limits on rebel support but rather in separate treaties signed at or near the same time. These were still coded as concessions accompanying the inter-state agreement.

were created for whether there was a previous agreement that included concessions and whether there was a previous agreement providing for third party monitoring. These variables will permit us to compare the likelihood of MIDs in pre- and post-agreement periods, taking into the specific provisions of the agreement. Obviously, there are some limitations to assuming that an agreement should have an effect in all years after it was signed. It might be useful, for example, to have information on the duration of third party monitoring arrangements or the durability of the domestic power-sharing agreements. Such information may be included in a subsequent version of this paper.

In addition to these main variables of interest, the tests in this section also include controls for other factors that are known to influence the probability of MID in a dyad: [15]

- Territorial contiguity: A dummy variable indicates whether or not the two states were territorially contiguous, defined as sharing a land border or being separated by no more than 400 miles of water.
- Territorial dispute: For tests of hypothesis 1b, data from Huth and Allee (2002) are used to indicate whether or not the dyad was involved in a territorial dispute in the given year. These data end in 1995, which slightly reduces the sample size for these tests.
- Colonial contiguity: A dummy variable indicates whether or not the two states were territorially contiguous through colonial holdings or dependent territories, taken from the COW project's Colonial/Dependency Contiguity data.

[15] These data were obtained and merged using EUGene version 3.1 (see Bennett and Stam 2000).

- Regime type: Using the Polity IV data set, a dummy variable indicates whether both states in the dyad were democratic, where democracy is defined as a score of 6 or greater on the 21-point scale.[16] The directed dyadic analysis also includes dummy variables indicating whether or not the potential initiator and/or target was democratic by the same scale.
- Ratio of capabilities: Two different variables were created using the COW project's National Material Capability scores. For the dyadic analysis, we measure the log of stronger state's capabilities over the weaker state's capabilities. A value of zero indicates perfect balance in capabilities, while higher values indicate a greater advantage for the stronger side. In the directed dyadic analysis, this variable indicates the share of dyadic capabilities possessed by the potential initiator.
- Alliance portfolio similarity: This variable measures the similarity of the two states' alliance portfolios using the weighted S-score developed by Signorino and Ritter (1999).

Following standard practice, all independent variables are lagged by one year.

Hypotheses 1a and 1b

To test hypotheses 1a and 1b, we examine the probability that a politically relevant dyad will experience a MID as a function of whether or not at least one state in the dyad is supporting rebels against the other. One possible concern here is that the

[16] In the empirical literature on international conflict, it is standard practice to drop cases in which one or both states are coded as having transitional or interregnal polities. However, states experiencing civil conflicts are particularly likely to have such codings. Hence, these cases remain in the data, and they have a zero on the shared democracy dummy variable.

influence of rebel support on MIDs may be inflated by cases of direct intervention—that is, cases in which the rebel support entails direct military action by one state against another, which is, by definition, a MID. To avoid inflating the estimates due to possible reverse causation, the rebel support variable is lagged by one year. This specification means that we are estimating the probability of a MID in year *t* given that state A was supporting rebels in year *t*-1.[17]

For hypothesis 1a, which focuses on inter-temporal variation within dyads, the proper estimator is Chamberlain's conditional logit with dyadic fixed effects (see, e.g., Greene 1997, 899-901). The estimates are presented in Table 1. As is evident from this table, there is a strong positive association between rebel support and MIDs. Holding constant the overall level of conflict in the dyad, the probability of a MID increases significantly during episodes of rebel support.

The best way to give substantive meaning to this result is to turn to hypothesis 1b, which compares the effect of rebel support on militarized conflict to that of territorial disputes. Three different estimators were used: a probit model, a probit model with controls for time dependence in the observations (Beck, Katz and Tucker 1998), and a conditional logit with dyadic fixed effects. The results are presented in Table 2. As is evident from this table, episodes of rebel support and territorial disputes both increase the probability of a MID, but the estimated coefficient on the former is larger. Moreover, since rebel support always accompanies civil conflicts, the combined effect of the two is larger still. To determine the substantive effect of these estimates, we can use the estimates from column (1) to calculate the predicted probability of a MID for a dyad whose independent variables are set at the sample mean or mode. Table 3 reports the

[17] Estimates obtained without lags are virtually identical.

predicted probability of a MID, and their associated 95% confidence intervals, under four different scenarios: (1) a baseline case in which there is no civil conflict and no territorial dispute, (2) a dyad with a civil conflict, (3) a dyad with a civil conflict involving rebel support, and (4) a dyad with a territorial dispute and no civil conflict.[18] As is evident from this table, episodes of rebel support have a larger predicted effect on the probability of MID than do territorial disputes. The predicted probability of MID is a third larger in the former case than in the latter. This supports the contention in hypothesis 1b that cases of rebel support are dangerous even in comparison to territorial disputes.[19]

Hypothesis 2

We have seen that dyads in which one state is support rebels against the other are highly likely to experience militarized conflict. Of course, if this conflict was initiated primarily by the state supporting the rebel groups—i.e., by state A in the model—then these estimates would not tell us much about the use of force coerce policy restraint. After all, the model predicts that rebel support by state A will be associated with the use of force by state B, as noted in hypothesis 2. To determine whether or not this is the case, we turn to a model of MID initiation that uses directed dyads years as the unit of observation. The main independent variable of interest is whether the potential target was supporting rebels in the other state in the previous year. Hypothesis 2 suggests a positive coefficient on this variable. We also control for whether the potential initiator was

[18] Predicted probabilities and their confidence intervals were calculated using Clarify (see King, Tomz, and Wittenberg 2000).

[19] Notice that, in all models, civil conflicts have a positive effect on the probability of a MID even if they do not involve rebel support. This is because there are other mechanisms through which civil conflicts can lead to MIDs, such as the presence of external bases (Salehyan 2007; Gleditsch, Salehyan, and Schultz 2007).

supporting rebels. If states use military force as a complement to supporting rebels, then this coefficient will be positive. For reasons discussed earlier, the estimation technique is a conditional logit with directed dyad fixed effects. This method examines the inter-temporal effect of rebel support on the probability of MID initiation within a directed dyad, controlling for the overall number of initiations.

The results, shown in Table 4, show very clearly the probability of that a state will initiate a MID increases if it is supporting rebels against the other state or is the target of such support. Hence, the dyadic effect demonstrated earlier arises from both the use of force to complement rebel support and the use of force by the afflicted state in response. Consistent with hypothesis 2, rebel support by external actors generates a substantial risk that targeted states will respond with militarized action.

Testing Hypotheses 3 and 4

In testing the hypotheses on agreements, several considerations shape our choice of sample and estimator. The data on agreements were only collected for states involved in episodes of rebel support. As a result, the test sample is confined to dyads that experienced rebel support. Each such dyad enters the sample in the first year of the rebel support episode. It is not entirely obvious how long to keep the dyad under observation. The tests here were done two ways. First, all dyad were kept in the sample until 2001, even if the civil conflict ended long before. In this case, we control for whether or not the civil war was ongoing. The rationale for this method is that it permits us to estimate the effect of the civil war's termination on the likelihood of MIDs in the dyad. In the second set of tests, each dyad was kept in the sample only as long as the civil war was ongoing.

This technique presents a hard test of the effect of interstate agreements, assessing whether they reduce interstate conflict even as the underlying civil conflict continues.

A second consideration is that, when looking for the effects of agreements on conflict management, we are interested entirely in inter-temporal variation within a dyad: is the probability of a MID lower after an agreement than before? Given this, it is once again appropriate to use the conditional logit estimator with dyadic fixed effects. By controlling for cross-sectional variation in MID probabilities, we sidestep the problems created by the enormous heterogeneity across dyads—heterogeneity in the stakes of the civil conflict, the extent of rebel support, and the existence of other issues that might also create MIDs (e.g., a territorial dispute unrelated to the civil conflict). If we did not control for this heterogeneity, there is a danger that estimated effects of agreements would be driven, not the by effect of an agreement within a dyad, but rather by differences in the kinds of dyads that sign agreements. For example, if agreements are only signed in relatively peaceful dyads, then estimates that include cross-sectional variation might mistakenly attribute peace in post-agreement periods to the agreements rather than to the underlying level of conflict in the dyad. Alternatively, if agreements tend to arise in the most disputatious dyads, we might mistakenly infer that agreements increase the probability of a MID even if their actual effect is to decrease the incidence of MIDs in the dyads that sign them.

The estimates are presented in Tables 5 and 6.[20] In table 5, dyads were kept under observation until 2001, while in table 6 they were kept under observation only while the civil wars was ongoing. The results are similar in both cases. Column (1)

[20] In these tests, the independent variables other than shared democracy have small and insignificant coefficients. Hence, they were dropped for the sake of economy.

shows that, conditional on the underlying conflict in the dyad, MIDs are less likely after agreements to limit rebel support than before those agreements. Column (2) shows that this effect is driven by those cases in which the agreement includes concessions by the target state. The specification in column (3) adds an indicator for agreements that include third party monitoring. Not surprisingly, given the high correlation between concessions and third party monitory, the coefficient on both of these variables, while negative, are individually significant at only the 10 percent level. Nonetheless, a likelihood restriction test shows that they are jointly significant at the 1 percent. Hence, while the effects of concessions and third party monitoring are hard to tease out separately, the estimates support hypotheses 3 and 4: agreements that seek policy restraint are more likely to work when coupled with substantive concessions by the target and/or monitoring mechanisms that can detect, and thereby deter, cheating.[21]

In all, then, the empirical results suggest that the theoretical insights of the model give us purchase in understanding international conflicts that arise out of external support for rebels in civil wars.

[21] Notice in table 4 that, even controlling for the effect of agreements, the end of a civil conflict leads to a reduction in the probability of a MID. This means that, if interstate agreements hasten the probability that the civil conflict will end—a conjecture that will require further testing—then there is a second, indirect mechanism by which these agreements reduce interstate violence.

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Table 1. Rebel Support and the Probability of a MID: Inter-temporal Variation

Variable	**Coefficient (Standard Error)**
Civil conflict	0.229
	(0.090)*
Rebel support	1.034
	(0.140)**
Reciprocal rebel support	0.763
	(0.349)*
Democratic dyad	-0.358
	(0.169)*
Contiguous	0.425
	(0.515)
Colonial contiguity	1.620
	(0.227)**
Ln (Capability ratio)	-0.354
	(0.080)**
Alliance similarity	-0.613
	(0.222)**
Observations	14,204
χ^2	171.07**

* significant at 5%; ** significant at 1%

Table 2. The Effects of Rebel Support and Territorial Disputes on MIDs

Variable	(1) Probit	(2) Probit w/time	(3) Conditional logit
Civil conflict	0.174	0.137	0.191
	(0.057)**	(0.046)**	(0.103)
Rebel support	0.830	0.542	1.001
	(0.099)**	(0.078)**	(0.161)**
Reciprocal support	-0.047	-0.178	0.527
	(0.181)	(0.146)	(0.413)
Territorial dispute	0.701	0.447	0.761
	(0.092)**	(0.067)**	(0.188)**
Democratic dyad	-0.480	-0.377	-0.155
	(0.090)**	(0.067)**	(0.204)
Contiguous	0.783	0.577	0.436
	(0.085)**	(0.065)**	(0.705)
Colonial Contiguity	0.374	0.314	1.631
	(0.091)**	(0.067)**	(0.249)**
Ln(Capability ratio)	-0.105	-0.100	-0.396
	(0.018)**	(0.013)**	(0.095)**
Alliance similarity	-0.701	-0.529	-1.050
	(0.116)**	(0.082)**	(0.278)**
Constant	-1.768	-0.846	
	(0.104)**	(0.105)**	
Observations	39789	39789	11344
χ^2	582.72**	1530.47**	136.82**

Note: In columns (1) and (2) standard errors corrected for clustering on dyads. In column (2), time dependence variables were included, but not reported.

* significant at 5%; ** significant at 1%

Table 3. Comparing Rebel Support and Territorial Disputes on MID Probabilities

Scenario	Predicted Pr(MID)	95% Confidence Interval
Baseline	0.091	[0.061, 0.13]
Civil war	0.12	[0.082, 0.17]
Civil war with rebel support	0.37	[0.27,0.47]
Territorial dispute	0.26	[0.19,0.33]

Table 4. The Effects of Rebel Support on the Probability of a MID Initiation

Variable	Coefficient (Standard Error)
Civil conflict in initiator	0.463
	(0.099)**
Civil conflict in target	0.314
	(0.103)**
Initiator supporting rebels	0.593
	(0.181)**
Target supporting rebels	0.730
	(0.170)**
Initiator democratic	0.197
	(0.155)
Target democratic	0.324
	(0.147)*
Both democratic	-0.626
	(0.212)**
Contiguous	1.169
	(0.552)*
Colonial contiguity	1.839
	(0.240)**
Initiator's share of capabilities	0.442
	(0.601)
Alliance similarity	-0.370
	(0.218)
Observations	17509
χ^2	167.64**

* significant at 5%; ** significant at 1%

Table 5. The Effects of Agreement on the Probability of MIDs

	(1)	**(2)**	**(3)**
Civil conflict ongoing	1.233	1.207	1.191
	(0.218)**	(0.219)**	(0.220)**
Shared democracy	-0.683	-0.625	-0.609
	(0.438)	(0.440)	(0.441)
Post agreement	-1.063	-0.381	-0.206
	(0.247)**	(0.338)	(0.357)
Post agreement with concessions		-1.331	-0.897
		(0.471)**	(0.543)†
Post agreement with third party			-0.912
			(0.552)†
Observations	1994	1994	1994
Chi^2	69.97**	78.19**	80.95**

† significant at 10% * significant at 5%; ** significant at 1%

Table 6. The Effects of Agreement on the Probability of MIDs during Civil Conflict

	(1)	**(2)**	**(3)**
Shared democracy	-1.216	-1.207	-1.212
	(0.652)	(0.654)	(0.653)
Post agreement	-1.080	-0.345	-0.137
	(0.253)**	(0.339)	(0.360)
Post agreement with concessions		-1.512	-1.044
		(0.493)**	(0.557)†
Post agreement with third party			-1.084
			(0.576)†
Observations	1254	1254	1254
Chi2	23.16**	32.97**	36.61**

† significant at 10% * significant at 5%; ** significant at 1%

Figure 1. Sequence of Moves in Each Period of the Enforcement Stage

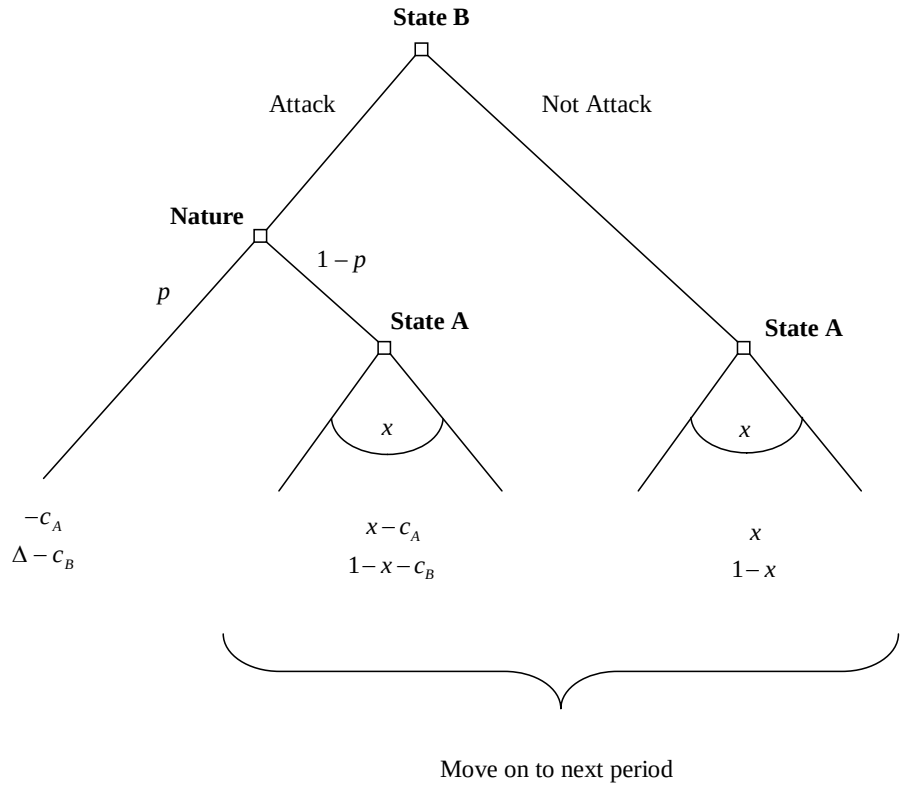
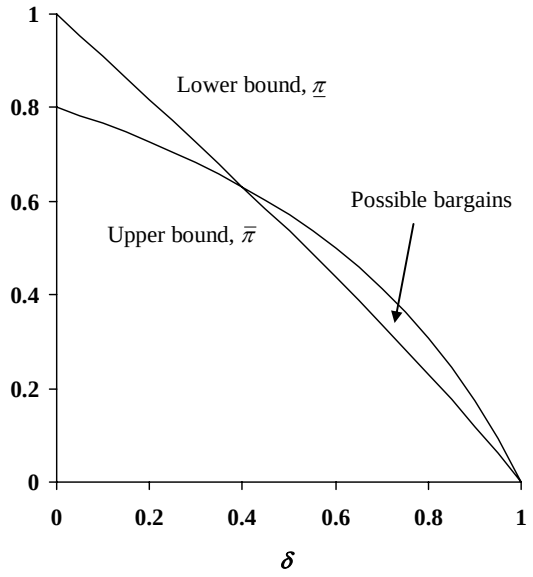
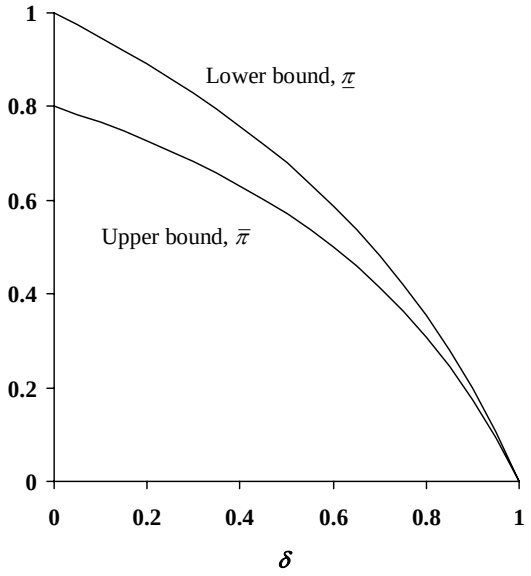


Figure 2. Examples of the Bargaining Range as a Function of the Discout Factor



(a)



(b)

Figure 3. An Example of Incompatible Bargaining Demands in the Revised Game