Learning it the hard way: Conflicts, economic sanctions and military aid*

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Abstract

An attacker and a defender engage in a conflict being uncertain about the attacker's strength. The conflict conveys information about this strength and if the attacker wins, its aggressiveness goes up. A third party fears the attacker's aggressiveness and it can intervene to help defeat it. This intervention is risky: if the attacker wins despite the external support, its aggressiveness increases even further. We show that the optimal intervention of the third party is non-monotonic in the attacker's expected strength. We also show that boosting patriotism is a defensive strategy because resolve to fight forces third party intervention.

Keywords: Conflict, third party intervention, military aid, economic sanctions.

JEL Codes: D74, D80.

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1 Introduction

The Russian invasion of Ukraine in February 2022 ignited a heated debate on the role of the international community in this conflict. Should the US and the EU side with Ukraine? If so, should they stop at levying economic sanctions against Russia or should they also provide military aid to Ukraine? Should NATO expand its boundaries to cope with Russian aggressiveness?

These questions are not new. Throughout history, third parties intervened in interstate disputes with various tools (e.g., diplomacy, economic sanctions, or military aid) and with different degrees of engagement (from appeasement to defense alliances and/or direct military engagement). These interventions contributed to determine the winning side in the dispute.

When disputes escalate into armed conflicts, the winning side depends on the military strength of the countries involved and the outcome of conflicts conveys information about this strength. Third party intervention thus affects not only the winning odds of countries, but also what countries learn from the battlefield about their strength. This learning has important consequences on their aggressiveness and willingness to engage in further disputes.

In this paper, we study third party intervention in favor of a country threatened by a potential attacker when there is common uncertainty about the attacker's military strength. We show that the learning of the attacker about its own strength shapes the level of engagement of the third party and the tools it adopts. We find that the engagement of the third party in the conflict is first increasing and then decreasing in the attacker's expected strength. We further find that the country under threat benefits from boosting its patriotism to obtain third party military aid.

In our model, an attacker and a defender engage in a dispute over an indivisible prize that they both value. The attacker must decide whether to attack or to remain peaceful. When there is an attack, the defender must decide whether to fight back or to surrender. If the defender fights back, a costly armed conflict ensues. The outcome of the conflict depends on the military strength of the attacker, which is either high or low. This military strength is uncertain to all countries, including the attacker itself. The relative strength of an army is difficult to evaluate ex-ante, especially if the army seldom engages in conflicts. In authoritarian regimes, leaders receive overly optimistic reports concerning the quality of their army, while other countries lack reliable information due to secrecy and censorship. Hitler's military campaign against Soviet Union in 1941 and the Russian disastrous war against Japan in 1904-1905 showcase the relevance of this uncertainty.

The outcome of the conflict provides a noisy public signal about the attacker's military strength. The probability the attacker assigns to its military strength being high is its *military confidence*. A victory in the conflict inflates the military confidence above the prior belief; a defeat dampens it below the prior.

A third party can intervene in the dispute to help the defender. The payoff of the third party depends negatively on the attacker's military confidence. This negative impact is increasingly more severe as the military confidence of the attacker grows. Third party payoff is then decreasing and concave in the attacker's confidence. Indeed, countries with a high military confidence are more aggressive and demanding in their interactions with the international community. Constraining the future aggressiveness of a country was a key motive behind third party intervention (or lack thereof) in several interstate disputes (e.g., the Crimean War in XIX century or the Munich Conference in 1938). The attacker can also undergo a regime change with a moderate and peaceful leadership replacing an aggressive one. The payoff of the third party is increasing in the probability of the regime change.

The third party has two tools at its disposal: economic sanctions and military aid. Economic sanctions are often the result of a public discussion (e.g., a parliamentary debate) and they constitute a burden for the countries that levy them in terms of reduction in trade flows. Furthermore, although sanctions weaken the long-run industrial production of the target country, they do not significantly disrupt its short-run military capability. Low and intermediate forms of military aid (e.g., military training, sharing of intelligence information, supply of some military equipment) are less costly. In addition, the specific details of military aid are often classified and difficult to observe before the conflict's onset. Finally, military aid directly helps the defender prevail in the conflict. We model these features assuming that economic sanctions are perfectly observable and costly for the third party, they do not affect the outcome of the conflict, but they increase the likelihood of a regime change. Military aid, instead, is not observable, has a negligible cost for the third party, and it increases the probability the defender wins the conflict. The assumptions on military aid (specifically, their negligible cost and unobservability) fit well settings in which the potential engagement of the third party in the conflict is limited and does not involve the deployment of troops. In Sections 2.1 and 5.2, we discuss extensions of our model in which military aid is costly and partially observable. These extensions are a better fit for settings in which the third party's engagement takes more extreme forms.

The provision of military aid affects the payoff of the third party through two channels. First, as highlighted above, it increases the probability the attacker loses the conflict. When the attacker loses, its military confidence goes down and the payoff of the third party increases. Second, after an increase in military aid, the updated military confidence of the attacker increases by a larger amount after a victory and it decreases by a smaller amount after a defeat. These changes in the belief updating lower the expected payoff of the third party. For instance, consider the victory of the Red Army in the Russian civil war between 1917 and 1922. Such victory occurred despite the international support given to the opposing side (the White Army). This boosted the morale of the Bolsheviks and contributed to their aggressiveness and to the spreading of revolutionary ideas across Europe (see Gerwarth, 2016). Or consider the victory of the Sierra Leone government against the Revolutionary United Front (RUF) in 1995. This victory occurred thanks to the support of a private militia and it failed to discourage further conflicts. Shortly after a peace treaty and the dismissal of the militia, the RUF recommenced hostilities (Bara and Kreutz, 2022).

When the attacker does not observe the level of military aid, belief updating depends on countries' conjectures about such level. This poses a commitment problem. Holding the conjecture of the attacker constant, the third party wants to secretly increase the level of military aid. A higher level of aid improves the third party's payoff through the first channel above, and it does not affect the second channel. The attacker must then believe that the level of military aid is the highest possible, which hurts the third party. To overcome this problem, the third party publicly commits to a maximum level of military aid at the beginning of the dispute.[1] This commitment to an upper bound on the level of military aid coexists with a commitment to a lower bound aimed at deterring attacks. Defense alliances such as the NATO serve this latter purpose.

Our analysis shows that the third party intervenes in the conflict in one of three ways. When the attacker's cost of fighting is high enough, the third party commits to a level of military aid that deters the attack and preserves peace. This is the deterrence logic behind strong and credible military alliances.

When the attacker's cost from the armed conflict is low, deterrence is not a viable strategy. Two cases are then possible. The first case arises when the defender surrenders unless it receives a sufficiently high level of military aid. In this situation, we deem the defender *yielding*. If the defender is yielding, the third party must choose whether to provide enough military aid to push the defender to fight back, or to let it surrender. The former option is a risky gamble for the third party: with some probability, the conflict ends with a victory (defeat) of the attacker and its military confidence goes up (down). The latter option is safe: the attacker does not learn anything from the conflict and the military confidence remains equal to the prior. Because its payoff is decreasing and concave in the attacker's confidence, the third party chooses the latter option. As a result, the defender surrenders, the attacker does not learn anything and economic sanctions are set to favor a regime change on the basis of the prior military confidence. This is an appeasement strategy. The third party does not provide military aid and lets the defender surrender. From the point of view of the third party, this appeasement avoids gambling over the

[1] Examples of these commitments abound. For instance, while pledging the US support to Ukraine, President Biden publicly declared: "We will not fight a war against Russia in Ukraine. Direct confrontation between NATO and Russia is World War Three, something we must strive to prevent" (Source: The White House Briefing Room, March 11, 2022, shorturl.at/DRYZ6).

attacker's military confidence. The fear to engage in a conflict for which they felt unprepared and that could boost Hitler's aggressiveness, was one of the main reasons behind Britain and France's lack of support to Czechoslovakia and the Munich agreement in 1938 (see Charmley, 1999 and the references therein).

The second case arises when the defender fights back even if the third party provides no military aid. In this situation, we deem the defender *not yielding*. Since the conflict between the attacker and the defender (hence, the gamble over the attacker's military confidence) is unavoidable, the third party intervenes in the conflict with a level of military aid that trade-offs the increase in the attacker's probability of losing the conflict against the risk of inflating military confidence. The military conflict is still a risky gamble that hurts the third party in expectation. To compensate for this, the third party sets the level of economic sanctions above the case of a yielding defender. The third party is dragged to war: the attacker's aggressiveness and the defender's readiness to fight back force the third party to intervene.

Our model highlights a novel channel through which the uncertainty about military capabilities affects the onset of conflicts; that is, it constrains the level of military aid deployed by the third party. When the defender is yielding, this channel leads to no provision of military aid and the defender then surrenders. Hence, no armed conflict ensues.

The mechanism described above yields important implications concerning the behavior of countries involved in a dispute. First, the level of economic sanctions and of military aid deployed in the conflict are positively correlated. When the third party sets a high level of military aid, the military confidence of the attacker jumps up significantly after a victory. The third party hedges against this risk by increasing the level of sanctions so as to favor a regime change.

Second, the third party's engagement in the conflict is higher when the defender is willing to fight back; that is, when the defender is not yielding. This has an important corollary. To obtain military aid and thus to improve the likelihood of preserving its independence, the defender must be willing to fight back even without such aid. To this goal, it can adopt a rhetoric that highlights the value of fighting for the homeland and that reinforces national identity. This boost in patriotism turns the defender from yielding to not yielding and forces the third party to provide military aid.

Third, the level of military aid is non-monotonic in the expected military strength of the attacker. When the defender is not yielding, the level of military aid increases with the attacker's expected strength. In this case, the third party aims at dampening the attacker's confidence through a defeat. If the attacker becomes stronger, the third party then raises the level of military aid accordingly. When the expected military strength of the attacker exceeds a certain threshold, though, the defender becomes yielding and the level of military aid drops. The third party prefers to avoid the conflict and it adopts an appeasement strategy. This non-monotonic behavior can explain why the international community does not always play an active role in disputes and it sometimes disregards (or pays little attention to) conflicts in which the defender is weak.[2]

As a final step, we extend the model to account for the possibility that the efficacy of sanctions in overthrowing the attacker's regime depends on the outcome of the conflict. In particular, the efficacy is lower when the attacker wins the conflict compared to when it loses it. In this case, the optimal intervention of the third party involves less economic sanctions and more military aid. The level of economic sanctions is lower because sanctions are (in expectation) less effective. In response to this lower efficacy, the third party increases the level of military aid. A higher level of military aid improves the winning odds of the defender and thus helps preserve the efficacy of sanctions.

1.1 Literature Review

Third party interventions aimed at ending conflicts and achieving long lasting peaceful settlements have been extensively studied. The literature identified three main instruments to achieve these goals: mediation, economic sanctions, and military interventions (including military aid

[2] For instance, Russia experienced a very weak international opposition after its attack against Georgia in 2008 and Crimea in 2014.

or peace-keeping operations). Rohner (2022) offers a recent and comprehensive review of this literature with a specific focus on civil conflicts. Our paper fits in this broad literature and focuses on two of the three tools mentioned above: economic sanctions and military intervention. In this respect, it complements Meirowitz et al. (2019) that focuses on mediation.[3] In Meirowitz et al. (2019), a third party collects and optimally releases information to the parties involved in a dispute. This form of mediation can bring peaceful settlements, but it can also promote militarization by removing the penalty associated with this action, namely war. As a result, the likelihood of conflicts can increase.[4]

When it comes to evaluate the effectiveness of international interventions in conflicts, there are two opposing views. Some scholars believe that interventions (or their mere threat) can avoid wars and atrocities by discouraging aggressive behaviors (Zagare and Kilgour, 2006). Others counterargue that the help from a third-party encourages weak minorities to fight and it thus prolongs conflicts (Rowlands and Carment, 1998 and Kuperman, 2008). Kydd and Straus (2013) builds a model that encompasses these two opposite views and provides conditions under which the intervention of a third party reduces the likelihood of a conflict (see also Leeds, 2003, Spaniel, 2018, and Abu-Bader and Ianchovichina, 2019). In our paper, the commitment to military aid can deter aggressive behavior and preserve peace. This is similar to Spaniel (2020) where the provision of military aid to a potentially weak defender reduces the temptation of an uninformed attacker to be aggressive. When deterrence is not possible, however, we show that the provision of military aid can backfire and inflate the attacker's future aggressiveness.

In our setting, the third party chooses the optimal combination of military aid and economic sanctions to dampen the attacker's aggressiveness. This distinguishes us from Powell (2017) and Mattozzi and Michelucci (2019) that study the choice of a third party deciding which contender to support in a contest.

[3] Other papers that study the role of mediators to avoid conflicts are Kydd (2003), Fey and Ramsay (2007) and Hörner et al. (2015). Baliga and Sjöström (2004) and Ramsay (2011), instead, study the role of direct communication as a tool to avoid costly conflicts.

[4] On the interplay between militarization and the probability of conflict, see also Meirowitz et al. (2008) and Jackson and Morelli (2009).

We model the international community as a unitarian agent that benefits from a regime change in the attacker's country.[5] Eguia (2022) studies how multilateral interventions (or lack thereof) affect the stability of a regime. Insofar we focus on the role of external agents to favor regime changes, we complement Bueno de Mesquita (2010), Morris and Shadmehr (2018) and Shadmehr and Bernhardt (2019) that focus on internal revolutionary vanguards.

We show that the defender can force the third party to provide military aid by boosting its own patriotism. This links our paper to Smith (2019) that highlights how the aggressiveness of a country can drag its allies to war. For the same reason, our paper is also related to the literature that highlights how external threats favor the raise of patriotic and nationalistic sentiments (see, for instance, Baum, 2002, Hjerm and Schnabel, 2010, Helms et al., 2020 and Gehring, 2022). We contribute to this literature by putting forward a novel strategic mechanism behind the raise in patriotism: boosting patriotic sentiments is a viable defensive strategy to obtain military assistance.

One of our main implications is that the uncertainty about the attacker's military strength can reduce third party's incentives to intervene in the conflict. This relates our work to the extensive literature on the role of uncertainty in conflicts and crisis bargaining (see Fearon, 1995 for a fundamental contributions and Bas and Schub, 2017 for a recent review).[6] Within this literature, we are particularly related to Powell (2004) that studies a bargaining model in which learning about military strength occurs as conflict unfolds. We differ from Powell (2004) in several respects. First, we assume that all players are uncertain about the military strength of the attacker. Second, we let military aid affect the learning process. Third, we show that uncertainty concerning the attacker's strength can push a third party to avoid conflicts and can thus reduce the length of conflicts at the expenses of the defender.[7]

[5] On the role of the international community to weaken an hostile regime, see also De Bassa et al. (2021) and Shadmehr and Boleslavsky (2022).

[6] The role of uncertainty in bargaining models is also the focus of an extensive theoretical literature. See, among many others, Gul and Sonnenschein (1988), Cho (1990), Cramton (1992),Yildiz (2003), Yildiz (2004), Feinberg and Skrzypacz (2005).

[7] See Spaniel and Bils (2018) for a model in which contestants learn about their military strength during the conflict. War-of-attrition models also investigate this type of learning. See Abreu and Gul (2000) for a

Meirowitz et al. (2022) studies the link between third party intervention and militarization. In Meirowitz et al. (2022), militarization is a hidden action and third party intervention can increase the probability of conflicts by lowering the destructiveness of wars. Furthermore, increasing the cost of arming can make destructive wars more likely. We share with Meirowitz et al. (2022) the idea that the deployment of military aid is not fully observable and can be counterproductive.[8] Yet, we differ from it because we model the third party as a strategic agent who uses sanctions and military aid to affect the attacker's belief updating and to constrain its aggressiveness.

In our model, the third party commits to a maximum level of military aid to avoid inflating the attacker's military confidence. This links our paper to Fearon (1997) and to the literature on signaling in international disputes. We differ because we assume that all countries are equally uninformed and we highlight that commitment can discipline belief updating.

Our paper also discusses the role that military aid and defense pacts can play to deter aggressive behaviors. In this respect, we are close to the literature on strategic deterrence (see Snyder, 1984 for an early contribution and Yuen, 2009, Benson, 2012, Benson et al., 2014 for more recent work). In this literature, an excessive level of military aid is counterproductive because it induces opportunistic behavior on the defender's side. In our model, military aid can be counterproductive (for the third country) because it turns the defender from yielding into not yielding. This can induce a costly conflict and boost the attacker's aggressiveness. Other papers that study deterrence are Chassang and Padró i Miquel (2010) that studies deterrence with and without strategic risk using a global game, and Di Lonardo and Tyson (2022) that shows that the political instability of the attacker's regime can dampen the efficacy of deterrence.

The explicit account of economic sanctions relates our work to the extensive literature that regards them as a tool to weaken the stability of hostile regimes (see, among others, Marinov, 2005, and, specifically for authoritarian regimes, Escribà-Folch and Wright, 2010).[9] A recent

fundamental theoretical contribution and Ghosh et al. (2019), Krainin et al. (2020), and Menuet and Sekeris (2021) for applications to political economy.

[8] On a related note, Baliga et al., 2020 study a model in which the identity of the attacker is also unobservable.

[9] Foreign economic interventions can also occur via rewards rather than sanctions or military intervention. See, for instance, Aidt and Albornoz (2011), Bonfatti (2017), and Aidt et al. (2021).

paper that investigates the role of sanctions in interstate disputes is Baliga and Sjöström (2022). In Baliga and Sjöström (2022), sanctions can be of two types. Targeted sanctions (e.g., blocking financial assets) hurt the leadership of a country, while comprehensive sanctions hurt citizens and create social turmoil. Because targeted sanctions align the interests of the leadership with those of the citizens, they generate a "rally 'round the flag" effect and reduce social turmoil. Comprehensive sanctions, instead, increase social turmoil, but entail political and moral costs.[10] Targeted sanctions are then optimal when social unrest is unlikely as it happens, for instance, in totalitarian regimes. Our model differs because it focuses on the interaction between (comprehensive) sanctions and military aid.[11]

Finally, McCormack and Pascoe (2017) study how economic sanctions can weaken the future military power of a country. We share with McCormack and Pascoe (2017) the idea that sanctions have long-run effects, but we include in our analysis another policy tool (military aid) that has a short-term impact on conflicts.

2 The model

An attacker (country A) and a defender (country D) are on the verge of a military conflict. A third party (country I) can intervene to support the defender.

At time $t = 0$, country I publicly commits to a range of possible levels of military aid in favor of country D, $[\underline{m}, \overline{m}] \subseteq [0, M]$, where M is the highest feasible level. Military aid can take different forms: country I can train country D's army, share intelligence briefings, supply military equipment, or include country D in a military alliance.[12] The commitment of country

[10]The literature highlighted how sanctions dampen living standards in the target country (Cortright et al., 1997) and increase violence (see Peksen, 2019 and Wood, 2008).

[11]We differ from Baliga and Sjöström (2022) also in the source and the role of incomplete information. In Baliga and Sjöström (2022), citizens are imperfectly informed about the aggressiveness of a foreign country and this creates a conflict of interest with their own leader. When the foreign country is peaceful, citizens prefer an agreement, while their leader can still prefer to fight. In our model, instead, there is incomplete information about the attacker's military strength and military aid affects belief updating.

[12]In the recent conflict between Russia and Ukraine, NATO's public declarations against the enforcement of a no-fly zone or the deployment of troops set an upper bound $\overline{m}$, while the commitment to supply military equipment (e.g., drones) set a lower bound $\underline{m}$.

I becomes common knowledge as soon as it occurs.

At time $t = 1$, country A decides whether to remain peaceful ($a = 0$) or to attack country D ($a = 1$). If country A remains peaceful, the game ends. Country A and country I get a payoff of 0, while country D gets a payoff of $\Psi > 0$, the *value of country D's independence.*

If country A attacks, the game moves to time $t = 2$. Country I chooses a level of economic sanctions $s \in [0, 1]$ to levy against country A and a level of military aid $m \in [\underline{m}, \overline{m}]$ to deploy in the conflict. Note that the level of military aid is constrained by the previous commitment. Sanctions and military aid differ in two dimensions. First, the level of sanctions is observable and common knowledge, while the level of military aid is observed by country D, but not by country A. We let $\widetilde{m}$ denote the belief of country A about m.[13] Second, sanctions and military aid have different effects. Sanctions do not directly affect the outcome of the conflict and they are costly for country I. We represent the cost of sanctions through function $s \mapsto \frac{\kappa}{2}s^2$ with $\kappa \geq 1$. The provision of military aid, instead, directly affects the outcome of the conflict (see below) and it does not entail any cost for country I (see Section 2.1 for a discussion of what happens when military aid is costly).

At time $t = 3$, country D observes the pair (s, m) and decides whether to surrender ($d = 0$) or to fight back ($d = 1$). If country D fights back, a conflict ensues. Country A wins the conflict with probability $\max\{0, \theta - m\}$, where $\theta \in [0, 1]$ denotes the military strength of country A. With complementary probability, country A loses the conflict.

The conflict is costly for both countries. We let $c_A > 0$ and $c_D > 0$ denote the cost of the conflict for country A and D. If country A wins the conflict, it gets a payoff of $1 - c_A$ and country D gets a payoff of $-c_D$. If country A loses the conflict, country A gets a payoff of $-c_A$ and country D gets a payoff of $\Psi - c_D$; that is, the value of its independence net of the cost of fighting. Finally, if country D surrenders, country A gets a payoff of 1 and country D gets a payoff of 0. In this case we say there is an *annexation.* Country I gets no payoff from the

[13]The belief $\widetilde{m}$ is thus a cdf over the interval $[\underline{m}, \overline{m}]$.

conflict.[14] Throughout, we focus on the interesting case in which country D's value of freedom is higher than its cost of fighting; that is, $\Psi > c_D$.[15]

The military strength of country A is uncertain: it is equal to $\overline{\theta}$ with probability p and to $\underline{\theta} < \overline{\theta}$ with probability $1-p$ (θ can also be interpreted as the relative strength of country A against country D; see Section 2.1 for details). The expected strength of country A is then equal to $\mathbb{E}[\theta] \equiv p\overline{\theta} + (1-p)\underline{\theta}$. The *military confidence* of country A is the probability that country A assigns to its military strength being $\overline{\theta}$. The initial military confidence of country A is p. We assume that the outcome of the conflict is always uncertain: the probability that country A wins the conflict, $\theta - m$, is greater than 0 and lower than 1 no matter what θ and m are.

Assumption 1. *Independently of country A's military strength, the outcome of the conflict is uncertain:* $0 < M < \underline{\theta} < \overline{\theta} < 1$.

When the conflict is over or when there is an annexation, the game moves to time $t = 4$. Country D gets no additional payoff, while country A and country I do. In particular, country A can experience a regime change. If this happens, both country A and country I get an additional payoff equal to 0. The probability of a regime change depends on the level of sanctions and it is equal to ϕs. The parameter $\phi \in \mathbb{R}_+$ represents *the efficacy of sanctions*.

Assumption 2. *Sanctions cannot guarantee a regime change:* $\phi \in [0, 1)$.

Throughout the paper, we assume that Assumptions 1-2 hold.

If there is no regime change, the additional payoff of country A and country I depends on the updated military confidence of country A, denoted with $\hat{p}$. The payoff of country A is equal to $v(\hat{p})$ for some positive and increasing function v. The payoff of country I is equal to $-\hat{p}^2$ (see Section 2.1 for a discussion of this payoff structure).

[14]The third party has thus no direct stake in the conflict (including a humanitarian one). We make this assumption to best highlight that role played by the attacker's learning process in shaping the third party behavior. It is straightforward to include a direct motive behind the third party intervention in the conflict.

[15]If the opposite inequality holds, country D surrenders no matter how high the level of military aid is. The analysis is then straightforward.

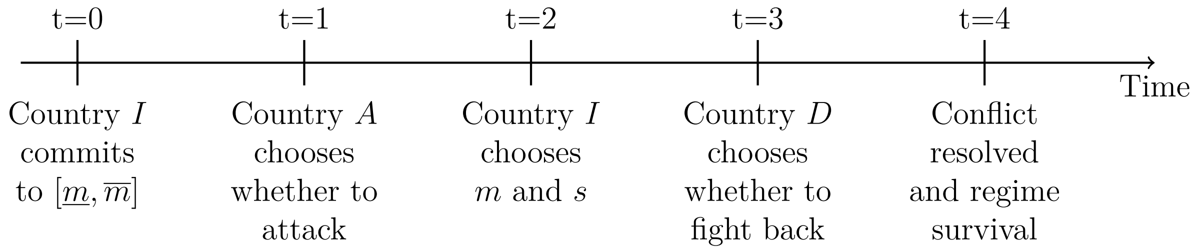

Figure 1: Timeline.

The overall payoff of the countries are then the sum of the payoff obtained during the dispute between country A and country D and the payoff obtained after the conflict is over or after an annexation. (Table A.1 in the Appendix summarizes the payoffs).

The outcome of the conflict is informative about the military strength of country A. Let $\hat{p}_0(m)$ and $\hat{p}_1(m)$ be the updated military confidence of country A when it loses the conflict and when it wins it. Bayes rule implies that

$$\hat{p}_0(m) = \frac{1 - \overline{\theta} + m}{1 - \mathbb{E}[\theta] + m} p \qquad \text{and} \qquad \hat{p}_1(m) = \frac{\overline{\theta} - m}{\mathbb{E}[\theta] - m} p. \tag{1}$$

A victory in the conflict boosts country A's military confidence above the prior level, while a defeat dampens it below the prior level; that is $\hat{p}_1(m) > p > \hat{p}_0(m)$. Also, $\hat{p}_0(m)$ and $\hat{p}_1(m)$ are both increasing in m. If country D surrenders, there is no learning and military confidence remains equal to the initial level p.

Figure 1 summarizes the timeline of the model. We use Perfect Bayesian Nash Equilibrium as a solution concept and we refer to it simply as the equilibrium of the game.[16]

2.1 Discussion

The military strength of country A. The military strength of country A is its probability of winning against country D, absent any military aid. This formulation simplifies the algebra

[16]Given the structure of the game, beliefs can always be computed through Bayes rule.

and enables us to derive a closed form solution for the optimal commitment of country I at time $t = 0$. Yet, the equilibrium characterization discussed in Section 3 extends to any setting in which (i) the probability country A wins the conflict increases with its military strength, and (ii) country I cannot guarantee the victory of country D through military aid (see Assumption 1).[17] For instance, we can use a Tullock contest function. In this case, country A's probability of winning in the conflict would be equal to: $\theta_A/(\theta_A+\theta_D+m)$, where $\theta_A \in \{\underline{\theta}, \overline{\theta}\}$ is the (uncertain) military strength of country A and θ_D is the military strength of country D. With complementary probability country A loses. The interpretation of the parameter θ also deserves some discussion. Because θ captures the probability country A wins the conflict, we can interpret it as the *relative* strength of country A against country D. In this way, we can incorporate uncertainty about the military capabilities of both country A and country D. The interpretation of θ as a measure of relative strength is feasible as long as country A's relative strength against country D is informative (at least to some extent) about its relative strength against country I.[18] This is a mild requirement. For instance, it holds when there exists some genuine uncertainty about country A's military capabilities. As discussed in the Introduction, this type of uncertainty is common in many settings; Levy (1983) and Johnson et al. (2004) discuss uncertainty about military capabilities and provide several historical examples.

The payoffs of country A and country I. At time $t = 4$, country A and country I get an additional payoff at time $t = 4$ which depends on the military confidence of country A. The payoff of country A is increasing in confidence, while the payoff of country I is decreasing and quadratic in it. The quadratic functional form for country I ($-\hat{p}^2$) provides analytical tractability, but our analysis extends to any other strictly decreasing and strictly concave function. The concavity of the payoff of country I in the military confidence of country A is sensible. Country A demands increasingly higher concessions from country I as its military confidence increases. Or it can

[17]If military aid could guarantee the victory of country D against country A, country I would set $\underline{m}$ high enough to deter country A's attack.

[18]If this was not the case, the payoffs at time $t = 4$ would not depend on the belief updating following the conflict and the trade-offs described in Section 3.2 would not arise.

become increasingly more aggressive. The risk of an increase in the attacker's aggressiveness resonates into Winston Churchill's words shortly after the 1938 Munich Agreement: "Our loyal, brave people should know [...] that the consequences [of this defeat] will travel far with us along our road. And do not suppose that this is the end. This is only the beginning of the reckoning."[19] In Appendix C, we provide a simple model of conflict that justifies the concavity of country I's payoff in country A's military confidence.[20]

The cost of military aid. In our model, we assume that military aid has no monetary cost. Nonetheless, they are potentially harmful for country I because they affect country A's updating. In this respect, we provide a non-monetary and strategic rationale for the limited military intervention of the international community in conflicts. If military aid was costly, this cost would provide an additional reason to bound the level of military assistance. Our insights, though, would remain valid as long as country I cares about country A's military confidence. In the model we also assume that country A does not observe the level of military aid deployed by country I. Section 5.2 extends our analysis to the case in which the level of military aid is partially observable.

Commitment of country I Country I can commit both to a lower bound and to an upper bound on the level of military aid. Both types of commitment occur in practice. The commitment to a lower bound happens, for instance, through contracts for the supply of military equipment, active sharing of intelligence reports, or international alliances. The commitment to an upper bound, instead, happens by setting clear bounds on one's engagement in a conflict. This can occur formally, through votes in legislative assemblies, or informally, through public declarations that entail a popularity cost if reneged (see footnote 1). We assume that commitment is full:

[19]Source: UK Parliament Hansard from the October 5th 1938 (`https://cutt.ly/YBoOJtK`).

[20]If the payoff of country I at time $t = 4$ was linear (respectively, strictly convex) in the military confidence of country A, our proofs techniques would extend. Differently from the results we derive below, country I would now be indifferent between deploying military aid and not doing so (respectively, would strictly prefer to deploy military aid) when country D is yielding (see Definition 1 below). Furthermore, the level of sanctions would be the same (higher) after an annexation than after the conflict.

country I cannot choose a level of military aid outside $[\underline{m}, \overline{m}]$. Our analysis extends to the case in which country I can renege on its previous commitment but the cost of doing so is sufficiently high.

3 Equilibrium Analysis

We now analyze the model proceeding backward from the last period. Note that the payoff of country D does not depend on what happens at time $t = 4$, while the payoffs of country A and country I do (see Table A.1 in the Appendix).

The expected payoff of country A is increasing in its updated confidence and it is decreasing in the level of sanctions. The expected payoff of country I is decreasing and concave in the updated confidence of country A and it is first increasing and then decreasing in the level of sanctions.[21]

3.1 The choice to fight back

If country A attacks, country D decides whether to fight back after observing the levels of sanctions and of military aid set by country I. Country D then compares the cost of fighting, c_D, with the expected benefit from fighting. Such benefit depends on the level of military aid, on the value of independence, and on the expected strength of the attacker.

Proposition 1. *Suppose country I chooses a pair (s, m). Then, in equilibrium, country D fights back if and only if $(1 - \mathbb{E}[\theta] + m)\Psi \geq c_D$,*[22] *or alternatively if and only if*

$$m \geq \max\left\{\frac{c_D}{\Psi} - 1 + \mathbb{E}[\theta], 0\right\} := m^{\dagger}.$$

All proofs are in the Appendix. Proposition 1 implies that we can classify country D in one

[21]This latter inverse U-shaped behavior follows from $s \in [0, 1]$, $\kappa > 1$, and $\phi < 1$

[22]We assume that, whenever indifferent, country D fights back. This tie-breaking rule plays no role in our analysis.

of two groups. When $m^\dagger = 0$, country D fights back independently of the level of military aid it receives. In this case, we say that country D is not yielding. When $m^\dagger > 0$, country D fights back if and only if the level of military aid it receives is sufficiently high. In this case, we say that country D is yielding.

Definition 1. *Country D is not yielding if $m^\dagger = 0$. Country D is yielding if $m^\dagger > 0$.*

3.2 The level of sanctions and of military aid.

Country I's choice concerning the level of sanctions $s \in [0, 1]$ and of military aid $m \in [\underline{m}, \overline{m}]$ depends on whether country D is yielding or not yielding. We start characterizing the equilibrium behavior of country I when country D is not yielding; that is $m^\dagger = 0$.

Proposition 2. *Suppose that country I committed to a range of military aid equal to $[\underline{m}, \overline{m}]$, and that country D is not yielding. Then, in equilibrium, country I chooses the pair $(\overline{m}, s_w^*(\overline{m}))$, where*

$$s_w^*(\overline{m}) = \frac{\phi}{k}\left[(\hat{p}_1(\overline{m}))^2(\mathbb{E}[\theta] - \overline{m}) + (\hat{p}_0(\overline{m}))^2(1 - \mathbb{E}[\theta] + \overline{m})\right].$$

When country D is not yielding, country I sets the level of military aid as high as possible; that is, $m = \overline{m}$. To understand why, note that military aid affects country I's payoff through two channels. First, military aid increases the probability that country A loses the conflict. After a defeat, the military confidence of country A goes down. This improves country I's expected payoff. Second, military aid modifies the magnitude of the belief updating after the conflict. The updated military confidence of country A jumps up after a victory in the conflict and jumps down after a defeat. The size of the jump up is increasing in the level of military aid, while the size of the jump down is decreasing in it. This second channel thus lowers the expected payoff of country I. Because military aid is not observable, the first channel responds to the actual level of military aid, m, while the second channel responds to the beliefs of country A

about such level, $\tilde{m}$. In equilibrium, country I then deploys a level of military aid equal to $\overline{m}$. Otherwise, country I could improve its payoff by deviating to $\overline{m}$: by secretly deploying a higher level of military aid, country I would decrease the winning odds of country A without affecting the magnitude of the updating.

The optimal level of sanctions equates the marginal benefit of imposing sanctions to its marginal cost. Sanctions are beneficial because they induce a regime change. The marginal benefit of sanctions is thus higher when their efficacy (ϕ) is higher or when the expected harm that the attacker inflicts to the third party (the squared bracket in the expression for $s^*_w(\overline{m})$) is high. The marginal cost of sanctions, instead, is linear in s with coefficient κ.

Suppose now that country D is yielding; that is, $m^\dagger > 0$. The optimal behavior of country I then depends on its previous commitment. When $\overline{m} < m^\dagger$, country D surrenders no matter which level of military aid country I deploys. Because military aid is costless, country I is indifferent among every $m \in [\underline{m}, \overline{m}]$. We break this indifference assuming that country I chooses the lowest possible level of military aid, $m = \underline{m}$.[23] Because country D surrenders, the marginal benefit of sanctions depends on the prior military confidence of country A, p. When $\overline{m} < m^\dagger$, country I then chooses a level of military aid equal to $\underline{m}$ and a level of sanctions equal to $s^*_\emptyset = \frac{\phi}{\kappa}p^2$.

When $\underline{m} \geq m^\dagger$, country D always fights back. The logic of Proposition 2 applies: country I chooses a level of military aid equal to $\overline{m}$, and a level of sanctions equal to $s^*_w(\overline{m})$.

Finally, when $m^\dagger \in (\underline{m}, \overline{m}]$, country I's choice of m determines the behavior of country D. If country I deploys enough military aid (i.e., $m \in [m^\dagger, \overline{m}]$), country D fights back. Otherwise (i.e., $m \in [\underline{m}, m^\dagger)$), country D surrenders. What is the optimal behavior of country I? From country I's perspective, the conflict between country A and country D is a risky gamble. This gamble pays off with expected probability $1 - \mathbb{E}[\theta] + m$. In this case, country A loses the conflict,

[23] We can justify this tie-breaking rule in several ways. For instance, we can impose some (small) cost on the provision of military aid. Or we can assume that when country D surrenders, country A seizes all military aid and uses it to inflate its military strength. Other tie-braking rules would make the statements of our results more cumbersome without affecting their qualitative insights.

its military confidence falls below the prior p, and the expected payoff of country I increases. The gamble is not successful with complementary probability, $\mathbb{E}[\theta] - m$. In this case, country A wins the conflict, its military confidence jumps above the prior p, and the expected payoff of country I decreases. When country D surrenders, instead, the military confidence of country A remains constant and equal to the prior p. Proposition 3 states that country I prefers this latter safe option to the risky gamble.

Proposition 3. *Suppose that country I committed to a range of military aid equal to $[\underline{m}, \overline{m}]$ and that country D is yielding. Then, in equilibrium, country I chooses the level of sanctions and military aid as follows:*

1. *If $m^\dagger > \underline{m}$, then $(m, s) = (\underline{m}, s^*_\emptyset)$ where $s^*_\emptyset = \frac{\phi}{k}p^2$.*
2. *if $m^\dagger \leq \underline{m}$, then $(m, s) = (\overline{m}, s^*_w(\overline{m}))$.*

Proposition 3 delivers a clear message: country I prefers country D to surrender than to fight back and, whenever possible, it intervenes in the conflict so that its preferred outcome occurs. Unless its previous commitment forces it to do so, country I never deploys a level of military aid that induces country D to fight back. This happens even though military aid is costless and it decreases the probability that country A wins the conflict. As discussed above, country I regards the conflict as a gamble that can either inflate or dampen the military confidence of country A. Bayesian updating implies that the expected military confidence after this gamble is equal to the prior. The payoff of country I is decreasing and strictly concave in the military confidence of country A. Jensen inequality then implies that country I is worse off under the gamble than under the safe option in which country A maintains its prior confidence.

Combining Proposition 2 and Proposition 3, we can summarize the behavior of country I as follows. Whenever possible, country I chooses a level of military aid below $m^\dagger$ and a level of sanctions equal to $s^*_\emptyset$. In this case, our tie-breaking rule yields $m = \underline{m}$. This behavior is feasible when country D is yielding and country I's previous commitment guarantees that $m^\dagger > \underline{m}$. In all other cases, country I chooses the highest possible level of military aid and sets the level of sanctions equal to $s^*_w(\overline{m})$.

Finally, in equilibrium, country I levies a lower level of sanctions when country D surrenders than when it fights back; that is, $s^*_\emptyset < s^*_w(\overline{m})$. This is because the expected marginal benefit of sanctions is higher after the conflict than after an annexation.[24]

Corollary 1. *Country I levies a higher level of sanctions when it expects a conflict compared to when it expects an annexation.*

3.3 The choice to attack.

Country A decides whether to attack or to remain peaceful taking into account the optimal behavior of country I and country D described above.

Proposition 4. *Suppose country I committed to range of military aid equal to $[\underline{m}, \overline{m}]$. Country A attacks with certainty if country D is yielding and $\underline{m} < m^\dagger$. In the other cases, country A attacks if and only if:*

$$(\mathbb{E}[\theta] - \overline{m}) + [1 - \phi s^*_w(\overline{m})] \left[(\mathbb{E}[\theta] - \overline{m})v(\hat{p}_1(\overline{m})) + (1 - \mathbb{E}[\theta] + \overline{m})v(\hat{p}_0(\overline{m})\right] > c_A \qquad (2)$$

Country A attacks when it expects country D to surrender. This happens when country D is yielding and the previous commitment allows country I to deploy a level of military aid below $m^\dagger$. Otherwise, country A decides whether to attack or not balancing out the expected benefit of an attack against its cost. The expected benefit of an attack is the sum of two components: the expected benefit associated to the conflict, $\mathbb{E}[\theta] - \overline{m}$, and the expected benefit country A obtains once the conflict is over, $[1 - \phi s^*_w(\overline{m})] \left[(\mathbb{E}[\theta] - \overline{m})v(\hat{p}_1(\overline{m})) + (1 - \mathbb{E}[\theta] + \overline{m})v(\hat{p}_0(\overline{m})\right])$. The cost is instead equal to c_A.

[24] Formally, Jensen inequality implies:

$$\left[(\hat{p}_1(\overline{m}))^2(\mathbb{E}[\theta] - \overline{m}) + (\hat{p}_0(\overline{m}))^2(1 - \mathbb{E}[\theta] + \overline{m})\right] > \left[\hat{p}_1(\overline{m})(\mathbb{E}[\theta] - \overline{m}) + \hat{p}_0(\overline{m})(1 - \mathbb{E}[\theta] + \overline{m})\right]^2 = p^2.$$

3.4 The optimal commitment of country I.

At the beginning of the game, country I commits to a range of levels of military aid. The first best for country I is to deter the attack of country A. In this case, it does not incur any cost from levying sanction and country A's aggressiveness does not constitute a problem. Deterrence is feasible if there exists a level of military aid $m_d \in [m^\dagger, M]$ such that inequality (2) fails. For instance, if $v(\hat{p}) = \hat{p}$, deterrence is feasible if and only if $c_A \geq (\mathbb{E}[\theta] - M) + [1 - \phi s_w^*(M)]p$. When deterrence is feasible, country I optimally commits to a singleton $\underline{m} = \overline{m} = m_d$. This is the logic behind defense alliances like the NATO. The allies commit to provide strong military support to a country in case it is attacked. Such commitment deters the attack and guarantees a peaceful outcome.

When deterrence is not feasible, we can have one of two possible cases. When country D is yielding, country I commits to a set of military aid that leads country D to surrender. Without loss of generality, we can assume that $\underline{m} = \overline{m} = 0$. This is the logic behind *appeasement strategies* like the one enacted by European countries with Germany in 1938. The third party does not intervene with military aid. An aggressive attacker easily achieves its expansionary goals and its only punishment comes from economic sanctions of moderate amount, $s = s_\emptyset^*$.

Instead, when country D is not yielding, country I commits to an upper bound on the level of military aid equal to what it will deploy in the conflict. We can then assume $\underline{m} = \overline{m} = \overline{m}^*$. The optimal commitment $\overline{m}^*$ balances two countervailing forces. On the one hand, a high level of military aid helps country D win the conflict and this increases the expected payoff of country I by dampening country A's confidence. On the other hand, the gamble over beliefs induced by military aid decreases country I's expected payoff. These two forces exist only if country A is uncertain about its strength. Without this uncertainty, the intervention (or lack thereof) of country I would be determined by other (e.g., monetary or humanitarian) considerations. In this case, country I is *dragged to war*: it intervenes in the conflict with military aid because if it did not, the attacker would win with higher probability and this would boost its confidence.

A high level of economic sanctions complements military aid, $s = s_w^*(\overline{m}^*)$.

The next proposition summarizes the three types of intervention described above and concludes the equilibrium analysis.

Proposition 5. *Consider the following inequality:*

$$(\mathbb{E}[\theta] - m) + [1 - \phi s_w^*(m)] \left[(\mathbb{E}[\theta] - m)v(\hat{p}_1(m)) + (1 - \mathbb{E}[\theta] + m)v(\hat{p}_0(m)\right] \leq c_A. \tag{3}$$

In equilibrium, country I's commitment is as follows.

1. ***Deterrence.*** *If inequality (3) holds for some $m = m_d \in [m^\dagger, M]$, then country I commits to $\underline{m} = \overline{m} = m_d$.*

2. ***Appeasement.*** *If inequality (3) fails for all $m \in [m^\dagger, M]$ and country D is yielding, then country I commits to $\underline{m} = \overline{m} = 0$.*

3. ***Dragged to war.*** *If inequality (3) fails for all $m \in [m^\dagger, M]$ and country D is not yielding, then country I commits to $\underline{m} = \overline{m} = \min\left\{\max\left\{0, \mathbb{E}[\theta] - \frac{1}{2}\right\}, M\right\} := \overline{m}^*$*

4 Implications

Public opinion often regards the provision of military aid as an extreme type of third party intervention. Countries should provide military aid only when the attacker is particularly aggressive and other softer tools like economic sanctions cannot restrain it (see Huth, 1998, for scholarly work along these lines). Our analysis suggests that this view is too simplistic. The provision of military aid varies with both the attacker's cost of fighting and the defender's resolve to fight back. If the attacker's cost of fighting is high, the commitment to a high level of military aid (e.g., a defense pact between the third party and the defender) deters the attack. Instead, when the attacker's cost of fighting is low, the optimal behavior of the third party depends on the defender's resolve. If the defender is yielding, the third party adopts an appeasement strategy:

it allows an annexation without providing military aid. If the defender is not yielding the third party provides military aid to minimize the probability that the attacker's prevails, while also taking into account the effect that this aid has on the attacker's belief updating.

Furthermore, economic sanctions complement military aid. The third party levy higher sanctions against the attacker when a conflict starts than when there is an annexation (see Corollary 1). When the conflict starts, the payoff of the third party decreases in expectation. The third party reacts with a high level of sanctions to favor the overthrown of the attacker's regime and to reduce the negative impact of the conflict on its payoff. On the contrary, when there is an annexation, the payoff loss of the third party is lower. The level of sanctions is thus lower as well.

Remark 1. *When deterrence is not feasible, the level of military aid deployed by the third party is increasing in the defender's resolve to fight back. Furthermore, the level of economic sanctions is positively correlated with the level of military aid.*

Remark 1 has an important implication for the behavior of the defender. A country threatened by a hostile adversary can find optimal to boost its level of patriotism through propaganda or other tools. This would result in an increase in Ψ or a decrease in c_D. These behaviors fuel the defender's resolve and increase the probability that a costly conflict ensues. However, the ultimate goal of these policies is actually defensive: the resolve to fight back that patriotism generates forces the third party to provide military aid in case of an attack. The recent conflict between Russia and Ukraine aligns with this implication. Following the Russian invasion of Crimea in 2014, Ukraine government boosted patriotic sentiments in the population, and emphasized the cultural and historical differences with Russia (see Tamilina, 2021 and Yakymenko et al., 2019). In line with the implications of our analysis, while the international community did not provide substantial military assistance to Ukraine during the invasion of Crimea, the situation changed drastically in 2022. Our model thus highlights a strategic and non-psychological explanation for the raise in patriotic sentiment in the shadow of external threats (on the role of external threats on identity and patriotism, see Baum, 2002, Helms et al., 2020, and Gehring, 2022).

Remark 2. *A viable defensive strategy for the defender is to increase its patriotism and willingness to fight (higher* Ψ*).*

How do the levels of sanctions and of military aid vary with the attacker's military strength? Previous research shows that the international community is less likely to intervene when the attacker is stronger than the defender (see Altfeld and Bueno De Mesquita, 1979, Werner and Lemke, 1997 and Corbetta, 2010). Our model replicates this finding, but it also portrays a more complex picture. The third party deploys a positive level of military aid in the conflict when the defender is not yielding; that is, $m^{\dagger} = 0$. In this case, the level of economic sanctions is equal to $s_w^*(\overline{m})$. As the expected military strength of the attacker, $\mathbb{E}[\theta]$, increases, the defender eventually becomes yielding, $m^{\dagger} > 0$. When this happens, the third party stops providing military aid and it also reduces the level of economic sanctions to $s_{\emptyset}^*$. Hence, in line with previous literature, the third party engagement in the conflict decreases when the military strength of the attacker increases. However, as long as the defender remains not yielding and the conflict ensues (i.e., as long as $m^{\dagger} = 0$), the levels of sanctions and of military aid are both increasing in the expected military strength of the attacker. When the third party intervenes in the conflict with military aid, its goal is to dampen the attacker's confidence by defeating it. As the military strength of the attacker grows, the third party must increase the level of military aid to achieve this goal. Our model thus portrays an overall non-monotonic relationship between the aggressor's strength and its level of engagement in the conflict: such engagement is first increasing and then decreasing in the attacker's military strength. This non-monotonicity can explain why the international community engages in lengthy and costly conflicts in some cases and it avoids to intervene in others. As such, it can guide further empirical research on third party intervention.

Remark 3. *When deterrence is not feasible, the level of military aid and the level of economic sanctions deployed by the international community are non-monotonic in the attacker's expected* *military strength: they first increase and then decrease with* $\mathbb{E}[\theta]$.

Finally, our model highlights two separate reasons why the third party wants to commit to a certain level of military intervention. First, the commitment to a lower bound on the level of military aid enables the third party to credibly deter attacks. Second, the commitment to an upper bound on the level of military aid disciplines the aggressor's updating when the level of military aid is not observable. This twofold role of commitment rationalizes not only the existence of defense alliances, but also public statements by international leaders that, while promising military assistance to a country under attack, explicitly bound the extent of such assistance. In particular, our model suggests that commitments to upper bounds on the level of military aid should occur when the provision of military assistance is not observable and has a low cost.

Remark 4. *Commitments to a minimum level of military aid deter attacks. Commitments to a maximum level of military aid constrain the attacker's updated military confidence when military aid is not observable.*

5 Extensions

5.1 The efficacy of sanctions

In our model, economic sanctions induce a regime change with probability ϕs, where $\phi \in (0, 1)$ measures the marginal efficacy of sanctions. A low value of ϕ corresponds to a situation in which an increase in the level of sanctions has little impact on the probability of a regime change. The regime of country A is thus stable.

The stability of a regime can also depend on its foreign policy successes or failures. Foreign policy successes make a regime more stable, while failures have the opposite effect. We can capture this feature as follows. Let ϕs be the probability of a regime change when the level of sanctions is s and country A loses the conflict. Instead, let $\frac{\phi}{\lambda}s$ with $\lambda > 1$ be the probability of a regime change when the level of sanctions is s and either country D surrenders or country A wins the conflict. The parameter λ captures *the stability boost* of a foreign policy success. The higher the stability boost is, the less effective sanctions are. The model in Section 2 corresponds to the special case in which $\lambda = 1$.

Appendix B provides a complete description and analysis of the model with $\lambda \geq 1$. The equilibrium behavior of the countries follows the same logic highlighted in Section 3 with one important difference: country I can now push country D to fight back even when country D is yielding. This happens only if the stability boost of a foreign policy success is sufficiently large. The proof of Proposition 6 below follows from the analysis carried out in Appendix B.

Proposition 6. *If λ is sufficiently large, in equilibrium, country I can deploy military aid to country D even though it is yielding. Furthermore, the level of military aid deployed by the third party, $\overline{m}^*(\lambda)$, is increasing in λ.*

If foreign policy successes boosts the stability of the attacker's regime ($\lambda > 1$), sanctions are more effective when country D wins the conflict compared to when either country A wins it or there is an annexation. For sufficiently large values of the stability boost, country I can then push a yielding country D to fight back so as to preserve the efficacy of sanctions. Furthermore, when the conflict starts, sanctions lose their efficacy exactly when they are needed the most; that is, sanctions are less likely to induce a regime change when country A wins the conflict and its military confidence is the highest. The optimal response of country I is to improve the winning odds of country D through an increase in the level of military aid deployed in the conflict.

5.2 Partially Observable Military aid

In Section 2 we assume that the level of sanctions is observable, while the level of military aid is not. Country I must then commit to an upper bound on the level of military aid. Without such commitment, if the conflict ensues, country A would believe that military aid is high ($\hat{m} = M$). This would inflate country A's military confidence and negatively impact country I's payoff.

Do our results extend to the case in which military aid is partially observable? To answer this question, suppose that at time $t = 3$, country A observes the level of military aid m deployed by country I with probability $\chi \in [0, 1]$. With complementary probability, $1 - \chi$, country A does not observe m. Everything else is as described in Section 2.

When χ is small, country I still sets the level of military aid as high as possible given its previous commitment; that is, if it initially commits to $[\underline{m}, \overline{m}]$, it then chooses $m = \overline{m}$. To understand why, suppose that there exists an equilibrium in which country I committed to $[\underline{m}, \overline{m}]$ and it then chooses a level $m' < \overline{m}$.[25] In equilibrium, country A's beliefs must be correct. Thus, if the conflict between country A and country D ensues (which happens if $m' \geq m^{\dagger}$), $(m', s_w^*(m'))$ must solve:

$$\max_{(m,s)\in[\underline{m},\overline{m}]\times[0,1]} -\chi\Big[(1-\phi s)\left((\hat{p}_1(m))^2(\mathbb{E}[\theta]-m)+(\hat{p}_0(m))^2(1-\mathbb{E}[\theta]+m)\right)\Big]$$
$$-(1-\chi)\left[(1-\phi s)\left((\hat{p}_1(m'))^2(\mathbb{E}[\theta]-m)+(\hat{p}_0(m'))^2(1-\mathbb{E}[\theta]+m)\right)\right]-\kappa\frac{s^2}{2}.$$

The derivative with respect to m of the χ-term in the previous objective function is everywhere lower than the one of the $(1-\chi)$-term, which is positive. If $m' < \overline{m}$ and χ is sufficiently small, the previous discussion implies that country I could then improve its payoff by marginally increasing m above m' (and keeping the level of sanctions constant). In equilibrium, country I must then choose a level of military aid equal to $\overline{m}$. All the other steps in Section 3 immediately extend and our insights remain true even when the level of military aid is observable with a sufficiently low probability.

If the level of military aid is observable with a high likelihood (i.e., χ is large), country I does not necessarily choose $m = \overline{m}$. Country I can choose a level of military aid $m < \overline{m}$ fearing that country A will observe m and update its confidence accordingly. For instance, in the extreme case in which military aid is perfectly observable ($\chi = 1$), the commitment to an upper bound

[25] In what follows, we assume that country I plays a pure strategy. We can extend the argument to mixed strategies at the cost of an increase in notational complexity.

on the level of military aid is useless.[26] The third party then chooses m to solve

$$\max_{(m,s)\in[\underline{m},\overline{m}]\times[0,1]} -\Big[(1-\phi s_w^*(m))\Big((\hat{p}_1(m))^2(\mathbb{E}[\theta]-m)+(\hat{p}_0(m))^2(1-\mathbb{E}[\theta]+m)\Big)\Big]-\kappa\frac{(s_w^*(m))^2}{2}.$$

The other results and insights in Section 3 continue to hold. In particular, country I still deploys military aid only when country D is yielding. In response, country D still has an incentive to boost its patriotism and resolve to fight back. Finally, when country I intervenes in the conflict, it still chooses the level of military aid trading off the increase in the likelihood of defeating country A against the risk of increasing its military confidence through Bayesian updating. The optimal level of military intervention is then still equal to $\overline{m}^*$, but, differently from the baseline model, the third party does not need to commit to this level in advance through the choice of $\overline{m}$.

6 Conclusion

Third countries often intervene in interstate dispute to help a defender under aggression. This paper studies the optimal intervention of a third party in a dispute between an attacker and a defender when (i) the relative military strength of the attacker is unknown to all countries including the attacker itself, and (ii) the third party uses economic sanctions and military aid to constrain the attacker's military confidence, hence its future aggressiveness.

We show that the third party intervenes in the dispute in one of three possible ways. Whenever possible, it deters the attack by committing to a high level of military aid in favor of the defender. This is the logic behind defense pacts. When deterrence is not effective, the third party still wants to avoid the dispute between the attacker and the defender from escalating into an armed conflict. The third party regards the armed conflict as a risky gamble that can boost the attacker's military confidence and thus lower its own payoff. If its military aid is key

[26] The commitment to a lower bound on the level of military aid still credibly deters country A's attack.

to induce the defender to fight back, the third party withholds it, even though this means to let the defender lose its independence. Finally, if deterrence is not effective and the defender fights back no matter what the third party does, escalation into an armed conflict is unavoidable. The third party then deploys military aid to help the defender defeat the attacker, while taking into account that this aid can backfire and increase the attacker's aggressiveness.

Our paper highlights a novel channel through which uncertainty concerning military strength affects the evolution of interstate disputes: it shapes the intervention of the third party in support of the defender.

The model delivers important implications on the behavior of the countries involved in a dispute. First, when an armed conflict starts, the levels of economic sanctions and of military aid chosen by the third party are positively correlated. Second, the adoption of a patriotic rhetoric that boosts its resolve to fight represents a viable defensive strategy for the defender. This strategy forces the third party to provide military aid and thus improves the defender's odds in the conflict. Third, the engagement of the third party in the conflict is first increasing and then decreasing in the expected strength of the attacker.

Appendix

A Omitted Proofs

To ease the analysis, we summarize the payoffs of the countries in the table below.

	A does not attack	A attacks		
		D surrenders	D fights back	
			A wins	D wins
Country A	0	$1+[1-\phi s]v(p)$	$1-c_A+[1-\phi s]v(\hat{p})$	$-c_A+[1-\phi s]v(\hat{p})$
Country D	Ψ	0	$-c_D$	$\Psi-c_D$
Country I	0	$-[1-\phi s]p-\frac{\kappa}{2}s^2$	$-[1-\phi s]\hat{p}^2-\frac{\kappa}{2}s^2$	$-[1-\phi s]\hat{p}^2-\frac{\kappa}{2}s^2$

Table A.1: Payoffs of countries.

A.1 Proof of Proposition 1

Country D is uncertain about the strength of country A. It assigns probability p to country A being strong ($\theta=\overline{\theta}$) and probability $1-p$ to it being weak ($\theta=\underline{\theta}$). Country D then expects to win the conflict with probability $1-p\overline{\theta}-(1-p)\underline{\theta}+m=1-\mathbb{E}[\theta]+m$. If country D wins, it enjoys a payoff equal to $\Psi-c_D$. If it loses, it enjoys a payoff equal to $-c_D$. Country D fights back if $[1-\mathbb{E}[\theta]+m]\,\Psi>c_D$, it surrenders if the opposite inequality holds, and it is indifferent if the two sides of the inequality are equal to each other. In this latter case, we assume that it breaks indifference by fighting back. □

A.2 Proof of Proposition 2

Suppose country D is not yielding. Let $\tilde{m}$ be a cumulative density function over the set $[\underline{m},\overline{m}]$ representing the beliefs of country A about the level of military aid deployed by country I. When the beliefs of country A are $\tilde{m}$ and country I deploys a level of military aid equal to m, the expected payoff of country I is equal to:

$$\int_{\underline{m}}^{\overline{m}} -\left((1-\phi s)\left[(\hat{p}_1(x))^2(\mathbb{E}[\theta]-m)+(\hat{p}_0(x))^2(1-\mathbb{E}[\theta]+m)\right]\right)\tilde{m}[x]dx-\kappa\frac{s^2}{2}$$

This expression is increasing in m because $\hat{p}_0(x)<\hat{p}_1(x)$ for every x. Country I then sets m as high as possible; that is, $m=\overline{m}$.

The convexity of function $s\mapsto\kappa\frac{s^2}{2}$ implies that the payoff of country I is convex in s for every level of military aid m. The first order condition with respect to s is

$$\phi\left[(\hat{p}_1(\overline{m}))^2(\mathbb{E}[\theta]-\overline{m})+(\hat{p}_0(\overline{m}))^2(1-\mathbb{E}[\theta]+\overline{m})\right]=\kappa s.$$

The left-hand side of this expression is positive (by Assumption 1) and lower than 1. To see this last point, observe that

$$\begin{aligned}&\phi\left[(\hat{p}_1(\overline{m}))^2[\mathbb{E}[\theta]-\overline{m}]+(\hat{p}_0(\overline{m}))^2[1-\mathbb{E}[\theta]+\overline{m}]\right]<\\&\qquad<\phi\left[\hat{p}_1(\overline{m})[\mathbb{E}[\theta]-\overline{m}]+\hat{p}_0(\overline{m})[1-\mathbb{E}[\theta]+\overline{m}]\right]=\phi p<1,\end{aligned}$$

where the equality follows from beliefs obtained through Bayesian updating being a Martingale, and the second inequality from $\phi<1$. Because $\kappa>1$, the optimal level of sanctions is given by the solution of the first order condition above. □

A.3 Proof of Proposition 3

Suppose country D is yielding. If $\overline{m}<m^{\dagger}$, country D always surrenders. The tie braking-rule then implies that country I sets military aid as low as possible, $m=\underline{m}$. In this case, sanctions are set so as to maximize $V_I(s\mid p)=-[1-\phi s]\,p^2-\kappa\frac{s^2}{2}$. This function is concave in s. We can thus take the first order condition and conclude that the optimal level of sanctions is $s^*_{\emptyset}=\frac{\phi}{\kappa}p^2\in(0,1)$.

Suppose $\underline{m} \geq m^\dagger$. Country D then always fights back. The same logic of Proposition 2 implies that country I chooses the pair $(\overline{m}, s_w^*(\overline{m}))$.

Consider now the case in which $m^\dagger \in (\underline{m}, \overline{m}]$. In this case, country D fights back if $m \geq m^\dagger$ and surrenders if $m < m^\dagger$. Country I must then decide whether to induce country D to fight back or to let it surrender. If country I decides to let country D surrender, our tie-breaking rule implies $m = \underline{m}$ and we can replicate the steps of the case in which $\overline{m} < m^\dagger$ to show that $s = s_\emptyset^*$. In this case, the payoff of country I is equal to

$$V_I(s_\emptyset^* \mid p) = -\left[1 - \phi s_\emptyset^*\right] p^2 - \kappa \frac{(s_\emptyset^*)^2}{2}.$$

If country I decides to push country D to fight back, then the same logic we used in the proof of Proposition 2 implies that country I optimally chooses $m = \overline{m}$ and $s = s_w^*(\overline{m})$. In this case, the expected payoff of country I is equal to:

$$\mathbb{E}_{\hat{p}}[V_I(s_w^*(\overline{m}) \mid \hat{p})] = -\left(1 - \phi s_w^*(\overline{m})\right)\left[(\hat{p}_1(\overline{m}))^2(\mathbb{E}[\theta] - \overline{m}) + (\hat{p}_0(\overline{m}))^2(1 - \mathbb{E}[\theta] + \overline{m})\right] - \kappa \frac{(s_w^*(\overline{m}))^2}{2}$$

Observe that $s_w^*(\overline{m}) = \frac{\phi}{\kappa}\Big[(\hat{p}_1(\overline{m}))^2(\mathbb{E}[\theta] - \overline{m}_d) + (\hat{p}_0(\overline{m}))^2(1 - \mathbb{E}[\theta] + \overline{m}_d)\Big] > \frac{\phi}{\kappa}\Big[\hat{p}_1(\overline{m})(\mathbb{E}[\theta] - \overline{m}_d) + \hat{p}_0(\overline{m})(1 - \mathbb{E}[\theta] + \overline{m}_d)\Big]^2 = \frac{\phi}{\kappa} p^2 = s_\emptyset^*$, where the inequality follows from Jensen inequality, the first and third equalities are true by definition, and the second equality is true because, under Bayes rule, the expectation of the posterior is equal to the prior. The level of sanctions is then higher when country D fights back than when it surrenders. Hence, we can write

$$\begin{aligned}
&\mathbb{E}_{\hat{p}}[V_I(s_w^*(\overline{m}) \mid \hat{p})] = \\
&\quad = -\left(1 - \phi s_w^*(\overline{m})\right)\left[(\hat{p}_1(\overline{m}))^2(\mathbb{E}[\theta] - \overline{m}) + (1 - \phi s'')(\hat{p}_0(\overline{m}))^2(1 - \mathbb{E}[\theta] + \overline{m})\right] - \kappa \frac{(s_w^*(\overline{m}))^2}{2} < \\
&\quad < -\left(1 - \phi s_w^*(\overline{m})\right) p^2 - \kappa \frac{(s_w^*(\overline{m}))^2}{2} < -\left(1 - \phi s_\emptyset^*\right) p^2 - \kappa \frac{(s_\emptyset^*)^2}{2} = V_I(s_\emptyset^* \mid p),
\end{aligned}$$

where the first inequality follows Jensen inequality and the second inequality follows from the optimality of $s^*_\emptyset$. Thus, if $m^\dagger \in (\underline{m}, \overline{m}]$, country I sets $m = \underline{m}$ and $s = s^*_\emptyset$. □

A.4 Proof of Proposition 4

Suppose that country D is yielding and that $\underline{m} < m^\dagger$. Propositions 1 and 3 imply that if country A attacks, country I sets $m = \underline{m}$ and country D surrenders. In this case country A gets a payoff equal to $1 + \left(1 - \phi s^*_\emptyset\right) v(p)$. This payoff is greater than zero, namely the payoff from remaining peaceful. Country A thus always attacks.

Suppose instead that either country D is not yielding or $\underline{m} \geq m^\dagger$. Then, Propositions 1, 2 and 3 imply that country I sets $m = \overline{m}$ and country D fights back. If country A attacks, it wins the conflict with probability $\mathbb{E}[\theta] - \overline{m}$ and it loses it with complementary probability. The expected payoff from attacking is thus equal to

$$(\mathbb{E}[\theta] - \overline{m}) \left[1 + (1 - \phi s^*_w(\overline{m}))\, \hat{p}_1(\overline{m})\right] + (1 - \mathbb{E}[\theta] + \overline{m})\, (1 - \phi s^*_w(\overline{m})) v(\hat{p}_0(\overline{m})) - c_A$$

Country A attacks if the previous expression is strictly positive and it remains peaceful if the previous expression is non-positive.

A.5 Proof of Proposition 5

The payoff of country I after an attack is bounded below 0 (see Table A.1). Instead, the payoff of country I when country A remains peaceful is equal to 0. Then, the first best for country I is to deter the attack of country A. This is feasible, if there exists a level $m_d \in [0, M]$ such that inequality (3) in the main text holds. In this case, we can assume without loss of generality that country I sets $\underline{m} = \overline{m} = m_d$.

When the cost of conflict for country A is sufficiently low, inequality (3) fails for all $m \in [0, M]$. In this case country I knows that country A attacks independently of its commitment. When country D is yielding, Proposition 3 implies that country I can optimally commit to $\underline{m} = \overline{m} = 0$. When country D is not yielding, the conflict between country A and country D

is unavoidable. Proposition 2 implies that if country I commits to a set $[\underline{m}, \overline{m}]$, it then chooses $(\overline{m}, s_w^*(\overline{m}))$. We can then assume without loss of generality that the optimal commitment of country I takes the form of $\underline{m} = \overline{m} \in [0, M]$. Substituting the expressions for $\hat{p}_1(\overline{m})$ and $\hat{p}_0(\overline{m})$ in country I's payoff, we conclude that country I chooses $\overline{m}$ to maximize:

$$-\left(1 - \phi s_w^*(\overline{m})\right) \frac{p^2(\overline{\theta} - \overline{m})^2}{\mathbb{E}[\theta] - \overline{m}} - \left(1 - \phi s_w^*(\overline{m})\right) \frac{p^2(1 - \overline{\theta} + \overline{m})^2}{1 - \mathbb{E}[\theta] + \overline{m}} - \frac{\kappa(s_w^*(\overline{m}))^2}{2},$$

In what follows, we proceed minimizing the opposite of this expression.

Recall that $s_w^*(\overline{m}) = \frac{\phi}{k}\left[\frac{p^2(\overline{\theta}-\overline{m})^2}{\mathbb{E}[\theta]-\overline{m}} + \frac{p^2(1-\overline{\theta}+\overline{m})^2}{1-\mathbb{E}[\theta]+\overline{m}}\right]$. To study the optimal commitment of country I, it is convenient to define the auxiliary function $m \in [0, \underline{\theta}] \mapsto \varsigma(m) \in (0, 1)$, where

$$\varsigma(m) = \frac{p^2(\overline{\theta} - m)^2}{\mathbb{E}[\theta] - m} + \frac{p^2(1 - \overline{\theta} + m)^2}{1 - \mathbb{E}[\theta] + m} = (p_1(m))^2 \Pr(\text{A wins} \mid m) + (p_0(m))^2 \Pr(\text{D wins} \mid m). \tag{A-1}$$

The fact that $\varsigma(m) < 1$ for every m follows from the fact that

$$\begin{aligned}\varsigma(m) = \Big[(\hat{p}_1(m))^2 \cdot \Pr(\text{A wins} \mid m) + (\hat{p}_0(m))^2 \cdot \Pr(\text{D wins} \mid m)\Big] < \\ < \left[\hat{p}_1(m) \cdot \Pr(\text{A wins} \mid m) + \hat{p}_0(m) \cdot \Pr(\text{D wins} \mid m)\right] = p < 1\end{aligned}$$

Exploiting this auxiliary function and the expression for $s_w^*(\overline{m})$, we can write the objective function of country I as

$$\begin{aligned}\left(1 - \frac{\phi^2}{\kappa}\varsigma(m)\right) \frac{p^2(\overline{\theta} - \overline{m})^2}{\mathbb{E}[\theta] - \overline{m}} + \left(1 - \frac{\phi^2}{\kappa}\varsigma(m)\right) \frac{p^2(1 - \overline{\theta} + \overline{m})^2}{1 - \mathbb{E}[\theta] + \overline{m}} + \frac{\phi^2}{2\kappa}\left(\varsigma(m)\right)^2 = \\ = \left(1 - \frac{\phi^2}{2\kappa}\varsigma(m)\right)\varsigma(m).\end{aligned}$$

The first order condition of this objective function is:

$$\frac{\partial \varsigma(m)}{\partial m}\left(1 - \frac{\phi^2}{\kappa}\varsigma(m)\right) = 0,$$

which holds in two cases. Either $\frac{\partial \varsigma(m)}{\partial m} = 0$ or $\frac{\phi^2}{\kappa}\varsigma(m) = 1$. The second case is not possible because $\phi < 1$, $\kappa > 1$, and $\varsigma(m) \in (0,1)$. The second derivative of the objective function is:

$$\frac{\partial^2 \varsigma(m)}{\partial m^2}\left(1 - \frac{\phi^2}{\kappa}\varsigma(m)\right) - \frac{\phi^2}{\kappa}\left(\frac{\partial \varsigma(m)}{\partial m}\right)^2.$$

Note that $\partial\varsigma(m)/\partial m = 0$ if $m = \mathbb{E}[\theta] - \frac{1}{2} := \overline{m}_1^*$ and $\partial\varsigma(m)/\partial m$ is negative (positive) for values of m below (above) $\overline{m}_1^*$. When $m = \overline{m}_1^*$, the second derivative of $\varsigma(\cdot)$ is positive. Hence, $m = \mathbb{E}[\theta] - 1/2$, is a local interior minimizer for our objective function. To prove that $\overline{m}^*$ is a global minimizer, we need to rule out corner solution; that is, we need to show that the objective function is lower at $\overline{m}^*$ than at $m = 0$ or $m = \underline{\theta}$. Pick $m_c \in \{0, \underline{\theta}\}$. The previous discussion implies that $\varsigma(\overline{m}^*) < \varsigma(m_c)$. We want to show that $\left(1 - \frac{\phi^2}{2\kappa}\varsigma(\overline{m}^*)\right)\varsigma(\overline{m}^*) < \left(1 - \frac{\phi^2}{2\kappa}\varsigma(m_c)\right)\varsigma(m_c)$. Because $\varsigma(m_c) > \varsigma(\overline{m}^*)$, $\phi < 1$, and $\kappa > 1$, the previous inequality holds if $\varsigma(m_c) - \varsigma(\overline{m}^*) > \frac{\phi^2}{2\kappa}\left[(\varsigma(m_c))^2 - (\varsigma(\overline{m}^*))^2\right]$. This is always the case because the auxiliary function is everywhere lower than 1. Hence, the objective function of country I is maximized setting $\overline{m}$ equal to $\overline{m}_w^* = \min\left\{\max\left\{\mathbb{E}[\theta] - \frac{1}{2}, 0\right\}, M\right\}$. □

B The efficacy of sanctions and the conflict

In this section, we solve the model in which foreign policy successes affect the stability of country A's regime. We assume that the probability of a regime overthrown is equal to ϕs if country A loses the conflict, and it is equal to $\frac{\phi}{\lambda}s$ with $\lambda > 1$ if either country D surrenders or if country A wins the conflict.

The payoffs of country A and I at time $t = 4$ are reported in Table B-1. The behavior of country D at time $t = 3$ does not depend on the stability boost λ and it is identical to the one described in Section 3.1. At time $t = 2$, we can still distinguish between two cases: the one in which country D is not yielding and the one in which country D is. When country D is not yielding, the same logic of Proposition 2 implies that country I optimally sets $m = \overline{m}$ and

	Payoff country A	Payoff country I
if $d = 0$	$\left[1 - \frac{\phi}{\lambda}s\right] v(p)$	$-[1 - \frac{\phi}{\lambda}s](p)^2 - \kappa\frac{s^2}{2}$
if $d = 1$ and country D wins	$[1 - \phi s]\, v(\hat{p}_0(m))$	$-[1 - \phi s]\,(\hat{p}_0(m))^2 - \kappa\frac{s^2}{2}$
if $d = 1$ and country A wins	$\left[1 - \frac{\phi}{\lambda}s\right] v(\hat{p}_1(m))$	$-[1 - \frac{\phi}{\lambda}s](\hat{p}_1(m))^2 - \kappa\frac{s^2}{2}$

Table B-1: Expected payoffs after the conflict when the stability boost is λ.

$s = s^*_{w,\lambda}(\overline{m})$, where

$$s^*_{w,\lambda}(\overline{m}) = \frac{\phi}{k}\left[\frac{1}{\lambda}(\hat{p}_1(\overline{m}))^2(\mathbb{E}[\theta] - \overline{m}) + (\hat{p}_0(\overline{m}))^2(1 - \mathbb{E}[\theta] + \overline{m})\right] \tag{B-1}$$

Coeteris paribus, the level of economic sanctions is now lower. If country D is not yielding, the conflict between country A and country D is unavoidable and country A wins with positive probability. When country A wins the conflict, sanctions are less effective and thus their marginal benefit is lower. Because the marginal cost of sanctions is unchanged, country I sets a lower level of sanctions, $s^*_{w,\lambda}(\overline{m}) < s^*_w(\overline{m})$

When country D is yielding, the previous commitment still constraint the equilibrium behavior of country I. If $\underline{m} > m^\dagger$, country I behaves as if country D was not yielding: $m = \overline{m}$ and $s = s^*_{w,\lambda}(\overline{m})$. When $\overline{m} < m^\dagger$, country D surrenders with certainty. Country I then sets $m = \underline{m}$ and $s = s^*_{\emptyset,\lambda} = \frac{\phi}{\kappa\lambda}p^2$. Also in this case the stability boost lowers the efficacy of economic sanctions and the optimal level of sanctions is then lower.

Consider now the case in which $m^\dagger \in [\underline{m}, \overline{m}]$. When the stability boost λ is not too high, country I behaves as in the baseline model. It let country D surrender by providing a low level of military aid, $m = \underline{m}$, and it sets sanctions accordingly, $s = s^*_{\emptyset,\lambda}$. When λ is large, however, country I can prefer to push country D to fight back by deploying a level of military aid above $m^\dagger$. The reason behind this intervention is simple. When λ grows, the choice of country D to surrender makes sanctions less effective. Sanctions preserve their effectiveness when country A

loses the conflict. The desire to preserve the efficacy of sanction provides country I an incentive to deploy a level of military aid above $m^\dagger$. The third country deploys a level of military aids above $m^\dagger$ if its expected cost from the conflict is not too high; that is if

$$\Big[(\hat{p}_1(\overline{m}))^2(\mathbb{E}[\theta]-\overline{m})+(\hat{p}_0(\overline{m}))^2(1-\mathbb{E}[\theta]+\overline{m})\Big]<\frac{\mathbb{E}[\theta]-\overline{m}}{(\overline{\theta}-\overline{m})^2}p^2. \tag{B-2}$$

To summarize, when $m^\dagger \in [\underline{m},\overline{m}]$ and country D is not yielding, country I chooses $m=\underline{m}$ and $s=s^*_{\emptyset,\lambda}$ if either $\lambda\in[1,\underline{\lambda}]\cup[\overline{\lambda},\infty)$, where $\underline{\lambda}$ is possibly equal to $+\infty$,[27] or inequality (B-2) fails (or both). Otherwise, country I chooses $m=\overline{m}$ and $s=s^*_{w,\lambda}(\overline{m})$ (see the proof of Proposition B-1). In the former case, we say that *country I does not want to trigger the conflict*; in the latter case we say that *country I wants to trigger the conflict.*

We can then adapt the proof of Proposition 4 and show that country A attacks with certainty in one of two cases. First, if $\overline{m}<m^\dagger$, so that country D surrenders with certainty. Second, if $m^\dagger\in(\underline{m},\overline{m}]$, country D is yielding, and country I does not want to trigger the conflict. In the other cases, country A remains peaceful if and only if

$$(\mathbb{E}[\theta]-\overline{m})+\phi\left(1-\frac{1}{\lambda}\right)s^*_w(\overline{m})(\overline{\theta}-\overline{m})\left[(\mathbb{E}[\theta]-\overline{m})v(\hat{p}_1(\overline{m}))+(1-\mathbb{E}[\theta]+\overline{m})v(\hat{p}_0(\overline{m})\right]+$$
$$+(1-\phi s^*_w(\overline{m}))\left[(\mathbb{E}[\theta]-\overline{m})v(\hat{p}_1(\overline{m}))+(1-\mathbb{E}[\theta]+\overline{m})v(\hat{p}_0(\overline{m})\right]\leq c_A. \tag{B-3}$$

and it attacks otherwise.

The optimal commitment of country I is summarized in Proposition B-1 below. Proposition 6 in the main text is an immediate corollary of it.

Proposition B-1. *The equilibrium commitment of country I is as follows.*

[27] For high values of λ ($\lambda>\overline{\lambda}$) providing no military aid is again optimal. The choice to deploy a level of military aid $m\geq m^\dagger$ must be paired with high and costly sanctions to hedge against the risk of a defeat. As λ increases, sanctions become less and less effective after a victory of country A and, to preserve their hedging value, their level must go up. Country I can then again find optimal to choose $m<m^\dagger$, setting a lower level of sanctions and not gambling with the military confidence of country A.

1. ***Deterrence.*** *If inequality* (B-3) *holds for some* $m = m_d \in [m^\dagger, M]$*, then country* I *commits to* $\underline{m} = \overline{m} = m_d$*.*

2. ***Appeasement.*** *If inequality* (B-3) *fails for all* $m \in [m^\dagger, M]$*, country* D *is yielding and country* I *does not want to trigger the conflict, then country* I *commits not to provide military aid:* $\underline{m} = \overline{m} = 0$*.*

3. ***Dragged to war.*** *If inequality* (B-3) *fails for all* $m \in [m^\dagger, M]$ *and either country* D *is not yielding or country* I *wants to trigger the conflict (or both), then country* I *commits to* $\underline{m} = \overline{m} = \overline{m}^*_{w,\lambda} > \overline{m}^*_w$*. Furthermore,* $\overline{m}^*_{w,\lambda}$ *is increasing in* λ*.*

Proof. We start providing a proof of the equilibrium choice of (m, s) when country A committed to $[\underline{m}, \overline{m}]$ and country D is not yielding. The same steps of Proposition 3 show that country I chooses $m = \overline{m}$ and $s = s^*_{w,\lambda}(\overline{m})$ when $m^\dagger \leq \underline{m}$, and $m = \underline{m}$, $s = s^*_{\emptyset,\lambda} = \frac{\phi}{\lambda k} p^2$ when $m^\dagger > \overline{m}$. When $m^\dagger \in (\underline{m}, \overline{m}]$, country I can decide whether to deploy a level of military aid $m < m^\dagger$ and let country D surrender, ot to deploy a level of military aid $m \geq m^\dagger$ and push country D to fight back. The same logic of Proposition 3 implies that in the former case $m = \underline{m}$, $s = s^*_{\emptyset,\lambda} = \frac{\phi}{\lambda k} p^2$, and country I's expected utility is equal to:

$$V_I(s^*_{\emptyset,\lambda} \mid p) = -\left[1 - \frac{\phi}{\lambda} s^*_{\emptyset,\lambda}\right] p^2 - \kappa \frac{(s^*_{\emptyset,\lambda})^2}{2},$$

while in the latter case $m = \overline{m}$, $s = s^*_{w,\lambda}(\overline{m})$, and country I's expected utility is equal to:

$$\mathbb{E}_{\hat{p}}[V_I(s^*_{w,\lambda}(\overline{m}) \mid \hat{p})] = -\left(1 - \frac{\phi}{\lambda}(s^*_{w,\lambda}(\overline{m}))\right)(\hat{p}_1(\overline{m}))^2(\mathbb{E}[\theta] - \overline{m}) - \\ - (1 - \phi(s^*_{w,\lambda}(\overline{m})))(\hat{p}_0(\overline{m}))^2(1 - \mathbb{E}[\theta] + \overline{m}) - \kappa \frac{(s^*_{w,\lambda}(\overline{m}))^2}{2}$$

Consider the difference between these two quantities: $V_I(s^*_{\emptyset,\lambda} \mid p) - \mathbb{E}_{\hat{p}}[V_I(s^*_{w,\lambda}(\overline{m}) \mid \hat{p})]$. Proposition 3 in the main text implies this difference is positive when $\lambda = 1$. The derivative of the difference with respect to λ is equal to:

$$\frac{\partial}{\partial\lambda}\left[V_I(s^*_{\emptyset,\lambda}\mid p)-\mathbb{E}_{\hat{p}}[V_I(s^*_{w,\lambda}(\overline{m}))\mid\hat{p})]\right]=$$
$$\frac{\phi^2}{k\lambda^3}p^2\left[\frac{(\overline{\theta}-m)^2}{\mathbb{E}[\theta]-m}\Big((\hat{p}_1(\overline{m}))^2(\mathbb{E}[\theta]-\overline{m})+\lambda(\hat{p}_0(\overline{m}))^2(1-\mathbb{E}[\theta]+\overline{m})\Big)-p^2\right]$$

The term in squared bracket is increasing in λ. Thus, if such term is positive at $\lambda=1$, country I is always be better off not pushing country D to fight back. This is the reversed inequality compared to (B-2).

If condition (B-2) holds, $V_I(s^*_{\emptyset,\lambda}\mid p)-\mathbb{E}_{\hat{p}}[V_I(s^*_{w,\lambda}(\overline{m})\mid\hat{p})]$ starts positive and it first decreases and then increases in λ (this follows from the fact that the squared bracket is increasing and unbounded in λ). As $\lambda\to+\infty$, such difference further converges to:

$$(\hat{p}_1(\overline{m}))^2(\mathbb{E}[\theta]-\overline{m})+(\hat{p}_0(\overline{m}))^2(1-\mathbb{E}[\theta]+\overline{m})-p^2-\frac{\phi^2}{2\kappa}(\hat{p}_0(\overline{m}))^4(1-\mathbb{E}[\theta]+\overline{m})^2,$$

where we replaced for the optimal level of sanctions. If this expression is negative, there exists a threshold $\underline{\lambda}$ such that country I chooses $m=\underline{m}$ and $s=s^*_{\emptyset,\lambda}$ if $\lambda\leq\underline{\lambda}$ and $m=\overline{m}$ and $s=s^*_{w,\lambda}(\overline{m})$ if $\lambda>\underline{\lambda}$. If the previous expression is not negative, there exists a range $[\underline{\lambda},\overline{\lambda}]$ such that country I chooses $m=\overline{m}$ and $s=s^*_{w,\lambda}(\overline{m})$ if $\lambda\in[\underline{\lambda},\overline{\lambda}]$ and it chooses $m=\underline{m}$ and $s=s^*_{\emptyset,\lambda}$ otherwise.

We now turn to the proof of the statement of the proposition. The proof of the cases 1 and 2 follows the same steps used in the proof Proposition 3. The only difference is that now, we need to explicitly take into account that the appeasement strategy (case 2) occurs when country I does not want to trigger the conflict. We thus focus our attention on case 3.

Define the auxiliary function $m\in[0,\underline{\theta}]\mapsto\varsigma_\lambda(m)=$, where

$$\varsigma_\lambda(m)=\frac{1}{\lambda}\frac{p^2(\overline{\theta}-m)^2}{\mathbb{E}[\theta]-m}+\frac{p^2(1-\overline{\theta}+m)^2}{1-\mathbb{E}[\theta]+m}. \tag{B-4}$$

Obviously $\varsigma_1(m)$ is equal to the auxiliary function $\varsigma(m)$ we defined in the proof of Proposition 5. Note that $\varsigma_\lambda(m) \in (0,1)$ for every m:

$$\varsigma_\lambda(m) = \left[\frac{1}{\lambda}(\hat{p}_1(m))^2 \cdot \Pr(\text{A wins} \mid m) + (\hat{p}_0(m))^2 \cdot \Pr(\text{D wins} \mid m)\right] <$$
$$< \left[\frac{1}{\lambda}\hat{p}_1(m) \cdot \Pr(\text{A wins} \mid m) + \hat{p}_0(m) \cdot \Pr(\text{D wins} \mid m)\right] < p < 1.$$

The objective function of country I when $m \geq m^\dagger$ is equal to

$$-\left(1 - \frac{\phi}{\lambda}s^*_{w,\lambda}(\overline{m})\right)\frac{p^2(\overline{\theta} - \overline{m})^2}{\mathbb{E}[\theta] - \overline{m}} - (1 - \phi s^*_w(\overline{m}))\frac{p^2(1 - \overline{\theta} + \overline{m})^2}{1 - \mathbb{E}[\theta] + \overline{m}} - \frac{\kappa(s^*_{w,\lambda}(\overline{m})^2}{2},$$

Exploiting the auxiliary function and the expression for $s^*_{w,\lambda}(\overline{m})$, we can rewrite the objective function as

$$-\left(1 - \frac{\phi^2}{2\kappa}\varsigma_\lambda(m)\right)\varsigma_\lambda(m) - \left(1 - \frac{1}{\lambda}\right)\frac{p^2(\overline{\theta} - m)^2}{\mathbb{E}[\theta] - m}$$

Instead of maximizing this objective function, we proceed minimizing its opposite. To this goal, note that the first derivative with respect to m can be written as

$$\left(1 - \frac{\phi^2}{\kappa}\varsigma_\lambda(m)\right)\frac{\partial\varsigma_\lambda(m)}{\partial m} + \left(1 - \frac{1}{\lambda}\right)\frac{\partial}{\partial m}\left(\frac{p^2(\overline{\theta} - m)^2}{\mathbb{E}[\theta] - m}\right) =$$
$$\left(1 - \frac{\phi^2}{\kappa}(A_\lambda(m) + B(m))\right)\left[\frac{\partial A_\lambda(m)}{\partial m} + \frac{\partial B(m)}{\partial m}\right] + \left(1 - \frac{1}{\lambda}\right)\frac{\partial A_1(m)}{\partial m},$$

where $A_\lambda(m) = \frac{1}{\lambda}\frac{p^2(\overline{\theta}-m)^2}{\mathbb{E}[\theta]-m}$ and $B(m) = \frac{p^2(1-\overline{\theta}+m)^2}{1-\mathbb{E}[\theta]+m}$. Note that $A_1(m)$ is first decreasing and then increasing in m, wile $B(m)$ is everywhere increasing. Moreover, $\frac{\partial A_\lambda}{\partial m} = \frac{1}{\lambda}\frac{\partial A_1(m)}{\partial m}$; thus the derivative of the objective function with respect to m can be written as

$$\left(1 - \frac{1}{\lambda}\frac{\phi^2}{k}(A_\lambda(m) + B(m))\right)\frac{\partial A_1(m)}{\partial m} + \left(1 - \frac{\phi^2}{k}(A_\lambda(m) + B(m))\right)\frac{\partial B(m)}{\partial m} \qquad \text{(B-5)}$$

Derivative (B-5) also applies to the case in which $\lambda = 1$. In particular, when $\lambda = 1$ and $\overline{m}^* > 0$

(B-5) is negative at $m = 0$. When $\lambda > 1$, the derivative is still negative at $m = 0$ because the first term in (B-5) (the $\frac{\partial A_1(m)}{\partial m}$-term) receives a higher weight than the second term (the $\frac{\partial B(m)}{\partial m}$-term). For the very same reason, when $\lambda > 1$, (B-5) is still negative at $\overline{m}^*$. Steps similar to those in Proposition 5 allows us to conclude that the problem has a unique interior solution. We conclude that the optimal commitment when $\lambda > 1$ and country I is dragged to war, $\overline{m}^*_\lambda$, is greater than the optimal commitment when $\lambda = 1$. In other words, $\overline{m}^*_{w,\lambda} > \overline{m}^*$. The same logic immediately yields that $\overline{m}^*_{w,\lambda}$ is increasing in λ. □

C Expected payoffs after the conflict

In Section 2 we posit that the expected payoff of country I is decreasing and concave in country A's military confidence. Here, we provide a simple model of conflict between country A and country I that delivers these properties.

Suppose that if the regime in country A survives, country A can decide whether to escalate the conflict against country I at cost $C_A > 0$. If country A does not escalate, both countries get a payoff equal to zero. We assume that C_A is ex-ante unknown and that it is distributed uniformly over the unit interval. Escalation is successful if the military strength of country A is $\overline{\theta}$; in this case country A enjoys a payoff equal to 1. Escalation is not successful if the military strength of country A is $\underline{\theta}$; in this case country A enjoys a payoff equal to 0. If country A escalates, country I pays a cost equal to $\ell \in [0, 1)$. Country A's expected payoff from choosing to escalate depends on its military confidence $\hat{p}$, and it is equal to $V_A(s|\hat{p}) = \hat{p} - C_A$. The uniform distribution implies that the probability that country A escalates is equal to its military confidence, $\hat{p}$. Hence, $v(\hat{p}) = \hat{p}$.

Next, we describe the expected payoff of country I. If country A escalates, country I incurs a cost equal to ℓ. Moreover, if there is an escalation, country I gets a payoff of -1 if the escalation is successful and a payoff of 0 if the escalation is not successful. Then, when the country A's military confidence is $\hat{p}$, the expected payoff of country I is equal to $\hat{p}\,[\hat{p}(-1-\ell) + (1-\hat{p})(-\ell)] =$

$-(\hat{p})^2 - \hat{p}\ell$. This expression is decreasing and concave in the military confidence, $\hat{p}$. In particular, it is equal to the quadratic function in the main text if we set $\ell = 0$.

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