Effective Unilateral Deterrence in Conflicts: Strategic Interaction in the Context of Arms Acquisition

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Abstract
What do conventional weapons transfers do for states in potential conflicts? Conventional weapons transfers can constitute credible international signals, and the signals can illustrate political alignments. The paper develops a game-theoretical model using perfect deterrence theory to examine the effectiveness of conventional weapons transfers in potential conflicts. As a proxy to calibrate a state’s credibility, Challenger can believe Defender would carry out the threat if Defender announces arms acquisition and imports weapons; therefore, the Challenger’s threat can be deterred.
Arms Transfers in Conflicts

Existing research explores various facets of these questions, including: (1) how superpowers leverage their power in regional competition (Sanjian 2001; Kinsella 1995); (2) how arms transfers are related to the outbreak of conflicts (Sherwin 1983; Diehl and Kinston 1987; Rider, Findley, and Diehl 2011); and (3) how arms transfers affect importers economic growth and technology development (Looney 1989; Frederiksen 1986; Yakovlev 2007).

From the realists’ perspective, the understanding of security and arms lies on the assumption that a coercive military response is required to preserve security. In other words, arms are traditionally perceived as a primary tool in a defense strategy against a threat to enhance security (Azar and Moon 1984; Ayoob 1991; von Clausewitz, 1976/1832). In the defensive realists’ argument, although military power is a major consideration to maintain security, awareness of intention is more important for states to obtain security in anarchy. They think arms buildups may not necessarily lead to conflicts if the utility of weapon can be distinguished. That said, the uncertainty between states can be relieved through differentiating between offensive and defensive weapons. Glaser (1998) argues that the offense-defense balance can be applied to the restriction and security cooperation of the arms race. With this division of arms, states can achieve cooperation and secure their security by purchasing defensive weapons from others. However, Schelling (1960) and Jervis (1976) argue that there is in practice not much distinction between offensive and defensive weapons. Even if a state constructs military buildup for defensive purposes, these armaments will make other states feel less secure. Therefore, the suspicion that a state may arm itself, for whatever purpose, makes other states more likely to arm in self-defense, creating an arms race spiral which makes everyone worse off. This is the well-known security dilemma or spiraling model (Jervis 1976, 1978), thereby generating inconclusive results about the role of arms procurement in deterring conflicts. In addition, knowing why states might purchase certain weaponry does not explicate how they might do so. We are still unable to estimate how the state could envision what outcome would be brought about after an acquisition.
The Signaling Mechanism and Response Strategy

In order to deter threats, states can convey information about their preference and determination through the use of threats, or shows of force (Schelling 1960; Fearon 1992). The mechanism of signaling lies in two perspectives (Table 1): weapon types targeting Challenger and a commitment from an ally. I assume Defender is in an asymmetric alliance, which means Defender is dependent on its Ally to achieve security, creating an anxiety of entrapment in the ally. At the same time, Ally faces an alliance dilemma. If Ally fears entrapment, it will not convey a strong commitment by providing arms, and prevent any latent conflicts from escalating (Cha 2016, 24). On the contrary, if Ally does not fear entrapment, it will convey a strong commitment by providing arms.

For the first stage, Defender requests arms acquisition from its Ally. Depending on the types of Defender (Hard or Soft), it will decide whether to acquire weapons that target Challenger. If the arms that Defender imports from its Ally targeting Challenger, then this will derive credible signals of Defender’s determination in potential conflicts. Otherwise, if the arms do not specifically target toward Challenger, this will not derive credible signals of Defender’s determination. For the second stage, Ally has to decide whether to provide arms to Defender to show strong determination, signaling credible signaling to help Defender deter the threat. Therefore, based on the effectiveness of deterrence, we can derive four types of signaling from the highest to the lowest credible signaling.
TABLE 1  
The Signaling Mechanism

<table>
<thead>
<tr>
<th>Defender</th>
<th>Ally</th>
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<tbody>
<tr>
<td>Targeting Challenger</td>
<td>Offer Assurance</td>
</tr>
<tr>
<td></td>
<td>The Strongest Signaling</td>
</tr>
<tr>
<td>Not Targeting Challenger</td>
<td>The Mediocre Signaling</td>
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The first one is the Strongest signaling. Defender decides to import arms targeting Challenger, and Ally is willing to respond to Defender’s request. The second is the Mediocre Signaling. Defender still decides to acquire arms despite not targeting, and Ally is willing to respond to Defender’s request. The third is Cheap Talk, in which Defender decides to import arms targeting Challenger, but Ally is not willing to respond to Defender’s request and show its commitment. The last one is the Weakest Signaling, in which Defender decides not to import arms that target toward Challenger, and Ally is not willing to respond to Defender’s request.

Unilateral Deterrence Following Arms Acquisition

In order to deter a potential threat, the Defender releases the information about weapons acquisitions from its allies. I assume the game is under complete information. Perfect deterrence theory highlights the importance of credibility and capability. Before a potential dispute outbreak, the Defender who unilaterally sends the signal of receiving arms from its allies is deterring the threat imposed by the Challenger. Being dissatisfied with the current state of affairs, the Challenger, the recipient of the signals, has an incentive to challenge the status quo. According to the contents of the signals, the Challenger would believe Defender’s threat is credible.

In perfect deterrence theory, credibility is determined by a state’s preference between conflicts
and backing down (Quackenbush 2015, 184). To examine these types of signaling after arms acquisition, I apply the unilateral deterrence game of perfect deterrence theory (Zagare and Kilgour 2000, chap. 5), shown in Figure 1. In a potential outbreak of dispute, Defender moves at first at Node 1.

**FIGURE 1**

**Unilateral Deterrence Following Arms Acquisition**

There are three actors: Defender (the importer of weapons), Ally and Challenger (the recipient of signals). At Node 1, Defender decides whether to import arms targeting Challenger. At Node 2, Ally can choose whether to provide arms or not. If Defender does not import arms targeting Challenger, and Ally choose not to provide. This leads to the Weakest Signal. Challenger fails to be deterred. If Ally chooses to provide, then the Mediocre Signal can be sent. Challenger has an opportunity to respond at Node 3. If Defender imports arms targeting Challenger, Ally chooses not to provide arms. This leads to Cheap Talk. Challenger fails to be deterred. In other words, Defender fails to receive a positive response from its allies, so it can not send credible to deter Challenger. If Ally chooses to provide, then the Strongest Signal can be sent to Challenger.
Then Challenger can be deterred, and the Status Quo remains unchanged. At Node 3, Challenger can choose whether to concede or defy. Since at Node 3, the Mediocre Signaling is not credible enough to deter Challenger. To make decisions, Challenger has to see gauge if the expectations about the outcome of war is larger than the cost of concession. Let $a$ denote the cost that Challenger incurs for backing down from a threat, with $a > 0$. $W_c$ reflects expectations about the outcome of war. If $W_c > -a$, Challenger would choose to stand firm rather than back down. If Challenger concedes after receiving the Mediocre Signal, the outcome is Status Quo, and if Challenger defies, the outcome is Conflict.

Let $p$ denote the probability with which the challenger will win the war, $C_C$ and $C_D$ represent the costs that Challenger and Defender, respectively, expect to incur in the event of war, $x$ denote the proportion of the good that is transferred, $e$ denote the benefit that Defender gains assurance from its Ally and $t$ denote the trust that Ally gains after provide commitment.

Defender is assumed to prefer a concession by Challenger, since it has an interest in maintaining the status quo without additional costs with a payoff of (1). If Challenger concedes, Defender would maintain the status quo without incredible signal, leading to Cheap Talk and the Weakest Signal, by its Ally (1-$p$-$c$-$e$). The costs to Defender when Challenger concedes after receiving the Strongest Signal are minimal, and the gains from remaining status quo along with receiving Ally’s assurance are large. Hence, the benefits associated with Challenger Concedes after receiving the Strongest Signal certainly outweigh the costs. Challenger prefers Conflict to alter Status Quo when the signal is not credible, with a payoff of ($p$-$c$). The payoff to Challenger when receiving credible signal and decide to back down is (1-$x$-$a$).

A threat is credible if Challenger believes that it would be worse off if the threat were carried out than if it were not. Therefore, if Defender has a credible threat such as the Strongest Signaling, Status Quo is the sole equilibrium outcome. If Defender is soft, credible signaling does not lead to an equilibrium outcome. And further, if there is a lack of credible threat, Conflict is the sole equilibrium outcome regardless of the types of Defender.
Empirical Analysis

I begin this section by conceptually tracing how empirical evidence is derived. More precisely, the theoretical model sheds light on the important mechanism that appears to work in the 1996 Cross-Strait Crisis and arms sales in the Trump administration.

1996 Cross-Strait Crisis

In the model, I use a year before the election to refer to "a potential crisis" in the model. When I look into each year of my interest, we can see 1995 and 2019 fit into the model, since the arms sales have time lags issues. In other words, the announcement of arms sales may extend from the previous administration.

In March 1996, rather than arms sales to signal credible deterrence to Taiwan, the U.S. deployed two aircraft carrier battle groups near Taiwan. To some extent, the Pentagon quietly expanded the sensitive military relationship with Taiwan to levels unprecedented since 1979 (Kan 2016). The crisis then prompted the Clinton administration to expand military cooperation with Taiwan through "software initiative," including discussions on training, logistics, and compatibility of the hardware sold from the U.S. However, the Clinton administration did not respond to Taiwan's request to provide Aegis destroyers (Kok and Firestein 2013). This response confirms the theory that arms transfers in a potential crisis can affect how Challenger gauges the situation and makes decisions based on that concern. When Ally decides whether to use arms transfers as a strong signal to demonstrate a commitment to Defender, Ally would consider whether arms transfers would send strong signals to Defender, and further irks Challenger, entrapping itself in an unwilling crisis.
A new arms sales pattern

Compared with the previous FMS package model, the Trump administration adopted a Case-by-case approach in military sales to replace the previous practices of big packages. Specifically, the execution process behind the arms sales in September 2018 has changed; the arms sales only include military components, which represents the U. S. is not accumulating military sales project that Taiwan requests and processing it once accepted. Essentially, this approach could be perceived as the same level as to how the general US allies would process: case review, notification, and the review release.1 This normalization could fit into the logic of the model that arms sales approved after request, exempting from the disturbance from the nature of different arms sales time frames.

2019 PLA jets cross median line

One critical question here is: Why did China not back down as the model illustrates, and what doves it toward that decision to stand firm?

In March 2019, the incident of PLA jets crossing the median line is mainly in response to U.S. warship sails through strategic Taiwan Strait for the past one year.2 Since 2019, the U.S. military has dispatched warships once a month and routinely, and even dispatched the U.S. Coast Guard (Maritime Police) to cross the Taiwan Strait. Put differently, the coercion is not merely a reaction to the previous arms sales but the return of the U.S. warships. Consequently, China’s attempt to change the status quo is not a piece of evidence to consider alternative arguments but illustrates how signals are mixed in reality. Indeed, since the approach of arms sales to Taiwan

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2 In the past, most of the warships are shipping through the Pacific Ocean on the east coast of Taiwan.
shifted to a novel pattern less than one year, we need more observable events to explore and theorize the application in arms sales to Taiwan.

Further work should evaluate the credibility mechanism and signals derived from this new arms sales pattern. How does Challenger interpret the receipt of these security goods? Does Challenger perceive different weapon systems as different signaling in potential crises? Does this arms sales pattern work out as an indicator for both Defender and Challenger to prevent misperception? If different types of weapons imply that the effect of weapons transfers on the political relationship would be divergent, signaling the degree of alignment commitment? These are essential questions that further theorizing and empirical testing.
References


