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Confronting an enemy with unknown preferences: Deterrer or provocateur? ☆

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A B S T R A C T

Nation 1 is seeking to join the nuclear club. Nation 2, its enemy, would like to prevent this, and has the potential to destroy 1's bomb-making facilities. It is uncertain whether 1 has a bomb. So are its intentions. 1 could be seeking to deter an attack. Alternatively, if no bomb is present, 1 might wish to provoke one as a means to secure support at home and abroad. Lacking a bomb, 1 can avoid an attack by allowing inspections. If it refuses inspections, 2 must rely on its imperfect intelligence system to determine whether to attack. This game has a unique sequential equilibrium, possibly separating, possibly pooling. At that equilibrium there is a positive probability that: No bomb is built; 2's intelligence system accurately detects no bomb; 1 refuses inspections; nevertheless 2 attacks. Present and past experiences from Iraq, Iran, Syria, and North Korea illustrate the analysis.

1. Introduction

Kim Jung Un launched an intermediate-range missile into the sea on February 12, 2017, the day after President Trump met with Prime Minister Abe of Japan. Prime Minister Abe and Jens Stoltenberg, Secretary General of NATO, and other world leaders quickly condemned the test, essentially framing it as a provocation. As Stoltenberg stated, North Korea “must refrain from further provocations.” Such provocations have hardly stopped, despite warnings and implorations from many nations, including China, its predominant trading partner and only consequential friend. By summer 2017, North Korea had carried out further weapons tests, including intermediate range and intercontinental ballistic missiles, and a missile test from a submarine. Indeed, Kim threatened a nuclear strike at the heart of the United States. Why would the Supreme Leader of North Korea engage in such activities when he knows that his nation could be subject to devastating attack by the United States, possibly in conjunction with a nearby Asian ally, with regime change almost inevitable? One possible answer is that he thinks it highly unlikely that there would be an attack. Before Iran reached agreement with the six nations comprising P5+1 to curtail its nuclear weapons development, it had risked just such an attack, but that attack never happened. But confidence against attack would seem risky with an often threatening and difficult-to-predict President Trump. A second possible answer is that he believes that although an attack is possible, it would be designed as a pin-point attack on his weapons facilities, that collateral damage would be kept to a minimum, and that his nation and regime would survive, although his military capabilities would be severely impaired. This second answer seems plausible. Regime change has turned out extremely poorly for the United States in Iraq, where the announced justification was wiping out weapons of mass destruction.

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Kim Jung Un may have concluded that as opposed to stopping all missile and bomb testing, i.e., knuckling under, i.e., giving up his missiles and bombs, was inferior to risking a surgical strike on his weapons facilities. The North Korean economy is in a shambles, and significant food shortages are reported. Presumably these happenings have weakened the regime. An attack on his weapons facilities by his hated enemy might lead his populace to rally to his support. No doubt somewhat equivalent reasoning led the Iranian regime led by Ayatollah Ali Khomeini not to knuckle under and thereby risk attack while it bought time for weapons development and a more favorable deal.

This paper studies a situation where a nation seeking weapons of mass destruction (WMDs), nation 1, is vulnerable to attack by a much stronger enemy, nation 2. The state of 1's weapons development is unclear, as it is for North Korea. No one outside that nation knows about the true state of its missile capabilities, or its ability to mount a nuclear weapon on an operational missile. Its July 2017 test of an ICBM was initially judged a success. Some sources ultimately deemed it a failure since fortuitous video footage from a Japanese TV station showed its reentry vehicle splintering into pieces. Similarly, no one knew where Iran stood in developing its nuclear weapons in the standoff before the treaty was signed.

The analysis posits that any attack would be targeted on weapons facilities, not on a nation or a regime. A war weary United States would not be seeking the extensive involvement that could bring about regime change. Moreover, the aftermaths of recent experiences in Iraq, Libya, and Syria has dimmed the enthusiasm of even hawkish officials for deposing autocratic regimes.

This paper analyzes the interaction between two enemy nations. Henceforth we use the terminology *Player* rather than *nation*. Player 1 wants to possess weapons of mass destruction, or for simplicity the bomb, and has the capability to build it. Player 2 wants to prevent Player 1 from securing the bomb, and is capable of and willing to destroy Player 1's bomb(s) if it exists. Player 1 is treated as male, and Player 2 as female.

We shall use the term "bomb" in our formulation to represent any WMD, or the combination of a WMD and a delivery system. The analysis could apply equally well if the critical uncertainty is not the possession of the weapon, but nation 1's intent to use it. Threats by various nations, such as Iran before its treaty and North Korea today, have become so widely employed that it is impossible for outsiders to discern such nations' true intentions. Here too, to gather strong support if attacked, nation 1 would have to be able to demonstrate that it never really intended to use its weapons, despite its past words.

Player 1 chooses whether or not to build the bomb. Player 2 chooses whether or not to attack. Hereafter, for expository ease, we will often refer to Player 1 as 1, and Player 2 as 2. 1 also has the capability to open his facility to reveal that he does not build the bomb, thereby avoiding any potential for an attack by 2. In determining whether or not to attack, 2 would like to assess whether 1 actively builds the bomb. To do so, she employs a spying or intelligence system (IS). The system has precision α , $\frac{1}{2} < \alpha < 1$, where α is common knowledge. In other word, the IS will correctly detect the presence or absence of a bomb, each with probability α , and incorrectly, each with probability $1 - \alpha$. Thus, the IS will yield either signal *b*, bomb present, or signal *nb*, no bomb present. Based on the signal it receives from the IS, 2 will decide whether or not (or with what probability) to attack. In most important respects, the set up this far parallels that of Jelnov et al. (2017), hereafter JTZ.

We make a major departure from JTZ by introducing and focusing on a second critical uncertainty, the preferences, i.e., the type of Player 1. 1 may be a Deterrier, *D*, or a Provocateur, *P*, and this is his private information. The critical difference between these two types is that *D*'s primary goal, whether or not he has built the bomb, is to avoid an attack. *P*, by contrast, prefers to be attacked when he did not build. Such an attack would bring support to 1 and blame to 2, since it would be perceived both domestically and abroad to be unjustified. 1 cannot directly reveal his type, even if he would like to. However, he can open his facility to reveal his innocence.

There are four possible outcomes, depending on whether or not the bomb is built, and whether or not 2 attacks. 1's potential actions are build, *B*, or not build, *NB*. He can also not build and open his facility, *NBO*, to reveal that fact. 2's potential strategies are attack, *A*, or not attack, *NA*.

Provocateurs may welcome attacks for several reasons, illustrated in the following two examples. ISIS is known to have and/or be in pursuit of both chemical and nuclear weapons. It could exploit a misguided attack on facilities for such weapons – particularly, as seems inevitable, if that attack killed a number of civilians – as a device to recruit fighters and money. Had the United States attacked the alleged Iranian nuclear facilities prior to the P5+1-Iran agreement, and had no smoking gun for a bomb been found, it would have been widely criticized. Moreover, the Iranian regime would have benefited for at least two reasons: 1. World-wide support for lifting sanctions would have increased. 2. Iran would have been freer to pursue nuclear weapons in the future, since the U.S. would be much more reluctant to attack. In short, there are good reasons to be a Provocateur.

We first address the Case where *D*'s payoff from the outcome (*NB,NA*) is relatively high. He will then choose *NBO* to avoid an attack. Since *P*, who prefers the outcome (*NB,A*) to the outcome (*NB,NA*), will never open his facility, a separating equilibrium results, where *D* opens and *P* does not. Thus, a failure to open reveals to 2 that she is playing against *P*. But she does not know whether *P* has chosen *B*, to build the bomb. The IS provides probabilistic information on this choice.

Even though 2 in a separating equilibrium knows 1's type, several results from this Case are surprising, at least without deep reflection. When IS is sufficiently accurate (α exceeds a critical threshold), 2 will not attack *P* if the signal is *nb*. No surprise. However, if the signal is *b*, 2 will not attack with significant probability even though her worst outcome is that 1 has the bomb and she does not attack, (*B,NA*). Interestingly, if IS is worse (α is below the critical threshold), 2 acts much more aggressively. If the signal is *b*,

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