Assessment of deterrence and missile defense in East Asia: A power transition perspective

Article *in* International Area Studies Review · July 2015

DOI: 10.1177/2233865915595762

2 authors:

Kyungkook Kang

University of Central Florida

11 PUBLICATIONS **20** CITATIONS

SEE PROFILE

Jacek Kugler

Claremont Graduate University

73 PUBLICATIONS **873** CITATIONS

SEE PROFILE

Article

International Area Studies Review
1–17

DOI: 10.1177/2233865915595762
ias.sagepub.com

Assessment of deterrence and missile defense in East Asia: A power transition perspective

Kyungkook Kang
University of Central Florida, USA

Jacek Kugler
Claremont Graduate University, USA

Abstract

This paper explores the stability of deterrence in East Asia and the effects of missile defense on regional security. In particular, we evaluate the policy implications derived from the power transition perspective for the development of the US missile defense system in the Asia-Pacific region. Over the short term, we anticipate that the stability of deterrence in East Asia will be increased by the deployment of ballistic missile defenses that creates a power preponderance of satisfied challengers against potential regional challengers. The long-term horizon is, however, tenuous because the rapid expansion of US-led missile defense systems may significantly alter the trajectory of China's missile strategy by increasing its dissatisfaction with the status quo. One fundamental implication is that, without further restrictions, long-term deployment stability in East Asia will become increasingly fragile.

Keywords

Deterrence, missile defense, East Asia, power transition, stability

Introduction

During the first foreign speech of his presidency on 5 April 2009 in Prague, Barack Obama outlined his vision for strengthening the global effort to limit the spread of nuclear weapons. A year later, the United States and Russia signed the New Strategic Arms Reduction Treaty (START) to reduce their deployed strategic nuclear weapons on 8 April 2010. More recently, Iran has come close to a comprehensive agreement with the United States, Russia, the U.K., France, and Germany

Corresponding author:
Dr. Kyungkook Kang, Assistant Professor, Department of Political Science, University of Central Florida, Orlando, FL 32816, USA.
Email: kyungkook.kang@ucf.edu

(called P5+1). If successful, this agreement would curb Tehran's nuclear program, despite attempts by Israel and Saudi Arabia to thwart the deal. Observing such stirring moments, many would probably expect that we have been taking concrete steps toward "a world without nuclear weapons" as described in the Prague speech.

However, Obama's ambitious plan meets a different geopolitical reality on the other side of the world. Over the last decade, the proliferation and modernization of ballistic missiles and their related technologies in East Asia have posed a growing threat to regional stability.

North Korea is widely believed to be capable of making crude nuclear warheads and is developing mobile intercontinental ballistic missiles that could one day strike the United States. Progress on this goal is apparent. On 12 December 2012, Pyongyang successfully launched a long-range rocket that could deliver a nuclear payload beyond Japan (Chance, 2012). Despite repeated warnings from the international community over its earlier failed missile launches, North Korea persists in its goal to acquire viable nuclear capabilities. Surprisingly, on 9 May 2015, North Korea, sanctioned by the United States and United Nations for its previous tests, conducted an underwater test-firing of a submarine ballistic missile, which could threaten the United States directly (Ripley and Castillo, 2015).

China has also been engaged in a steady nuclear buildup, expanding both the size and type of ballistic missiles. A recent report estimates that China has approximately 250 nuclear warheads with long-range missile capabilities (Kristensen and Norris, 2013). Most recently, on 13 December 2014, China conducted the flight tests of its longest-range intercontinental ballistic missiles along with the first test of multiple warhead capabilities, deliverable to any part of Russia, Europe, or the continental United States (Gertz, 2014). Indeed, as the recent Annual Report to Congress highlights: "China's military modernization has the potential to reduce core US military technological advantage" (US Office of the Secretary of Defense, 2015: 5).[1]

As a response to such an expansion of their missile forces, the United States has maintained a strong interest in the anti-ballistic missile (ABM) system. The Ballistic Missile Defense Review Report of the US Department of Defense (2010) declared a policy of maintaining strategic stability in East Asia by pursuing the deployment of regional ballistic missile defense (BMD) programs and encouraging its Asian allies to acquire the necessary hardware and software for robust defensive capabilities. Undoubtedly, China has expressed strong concerns about such US-led BMD initiatives, as Russia reacts to Europe. The recent Chinese government's public opposition to the US-backed deployment of a Terminal High Altitude Area Defense (THAAD) system in South Korea explicitly indicates its growing threat perception and strategic posture over the United States' latest missile defense strategy. Six years since the Prague speech, obstacles still loom in East Asia.

It is important to note that such serious competition between nuclear-armed rivals occurs in the name of nuclear deterrence (Colby and Denmark, 2013). The modernization of nuclear weapons and the deployment of defensive systems are still playing crucial roles in power competition in political rivalries. Although the possible weapons of mass destruction (WMD) threats of non-state actors has acquired further salience in the wake of 9/11, the significance of the deterrence paradigm at the state-actor level should not be overlooked in theory or practice.

One purpose of this article is to understand the prospects of the current strategic relationship between the United States and China by assessing the short-term and long-term stability of deterrence. We also examine the implications of the current US missile defense policy in East Asia. While US missile defense initiatives and the transatlantic debates about them are hardly new, the proliferation of sophisticated ballistic missiles and related defense technologies in the Asia-Pacific region have become central policy priorities for the foreseeable future within the region and for the United States.

In strategic planning to improve stability in the region, it is important to evaluate the strategic implications offered by well-established theories concerning the potential use and proliferation of nuclear weapons in the context of rivalry in East Asia. We start with a review of existing work to show the differences between our approach and previous efforts. Thereafter, we generalize insights to a variety of conceivable deterrence environments in East Asia. We find that alternate perspectives suggest very different policy choices.

We suggest that the logic of deterrence persists, although much changed due to technological progress and evolution of the international order. Deterrence is still one of the most useful theoretical frameworks that offers analytical insights into how states act when in a position of destructive nuclear capability. However, the recent political tension in East Asia following the Russian pivot toward China warrants serious reexamination of "classical" deterrence models based on the Cold War experience.

The nature of effective missile defense capabilities plays an important role in altering the underpinnings of stable deterrence. Given all these considerations, this paper also explores the policy implications of the development of the US missile defense system in terms of the regional stability of deterrence, focusing on the recurring debate in East Asia. We build on past work, but depart fundamentally from earlier conceptualizations of deterrence to examine the effects of BMD on the security dynamics.

We start with a review of existing work to show the differences between our approach and previous efforts and then generalize these insights to a variety of conceivable deterrence environments in East Asia. While the existing literature on this topic is quite extensive, we review three major competing perspectives: (1) disarmament; (2) classical deterrence; and (3) power transition as theoretically relevant postures of our interest. Then we rely on the theoretical derivations from the power transition perspective to provide an integrated picture of the likely conditions for deterrence stability and instability in East Asia.

Status of the field

Nuclear disarmament

Disarmament, proliferation, and deterrence are interrelated outcomes derived from the same goal-oriented behavior aimed at reducing the likelihood of war. The simple and obvious way to avoid war is to eliminate these weapons through disarmament; a more complex process is to reduce proliferation and deter the use of such weapons by nuclear nations.

In May of 1946, Einstein famously highlighted in a telegram: "the unleashed power of the atom has changed everything save our modes of thinking and we thus drift toward unparalleled catastrophe" (Einstein, 1946). The logic of disarmament is flawless: if nuclear weapons are removed, then nuclear war is impossible. Disarmament advocates prescribe arms control measures targeted toward eventual disarmament coupled with a robust international verification regime (Blair et al., 2011; Perkovich and Acton, 2009; Sagan, 1994, 2010). They further argue for "Global Zero" as the ultimate workable policy. Disarmament suggests that the only way to forestall the use of nuclear weapons is to eliminate nuclear arsenals outright. Recently, a number of scholars concluded that conventional deterrence is not sufficiently reliable to ensure peace, because it is impossible to police the production of WMD by rogue actors (Paul et al., 2009; Sagan, 2012).

A reevaluation of disarmament theory is required because, in practice, during the last three decades, the potential for nuclear war has not been reduced; rather, it may have increased. Indeed, as Figure 1 shows, the estimated arsenal sizes that assure massive destruction among the nuclear powers have dramatically increased since 1945. Today, there are two acknowledged

global nuclear powers, the United States and the Russian Federation, with the capabilities and reach to destroy any nation or group of nations. This dyad has achieved global mutual assured destruction (MAD). Underneath these global powers lie regional nuclear powers such as China, the U.K., France, Israel, India, and Pakistan. Relative to global nuclear powers, these states are far less capable, but all can reach MAD within their regions. North Korea can threaten South Korea and perhaps portions of Japan, but does not have the capability to confront China, Russia, or the United States. Apparently, global disarmament has not taken place despite the persistent political rhetoric of peace.

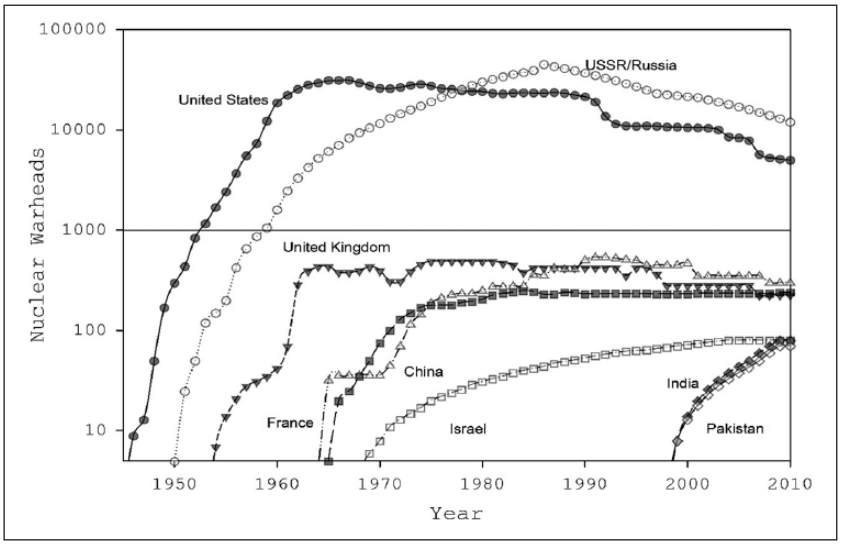

Figure 1. Estimated deployed assured destruction 1945–2010.[2]
Source: Norris and Kristensen (2010).

At the global level, the first and only disarmament attempt early in the nuclear era failed. In 1946, the United States, Great Britain, and Canada proposed the Baruch Plan to the United Nations Atomic Energy Commission. This plan called for an exchange of basic scientific information for peaceful ends, the creation of controls for nuclear power to ensure its use only for peaceful purposes, the elimination of atomic weapons, and the establishment of effective inspections to protect all states against violations and evasions (Rumble 1985: 219). The Baruch Plan, however, was rejected by the USSR and never proposed again by the United States. Soon after the original rejection, the USSR acquired nuclear weapons. Implementing global disarmament or transferring such weapons to the care of the United Nations became far more difficult. Neither the United States nor the USSR was willing to trust that their opponent would comply with proposed restrictions. Simply stated, President Reagan's admonition based on a Russian proverb "Trust but verify" implies that there is no trust, just fear.

A major obstacle to any disarmament proposal is directly linked to technological advances. Nuclear knowledge has now dispersed widely and many more nations outside the nuclear club could now acquire or threaten to acquire nuclear capabilities. Eliminating nuclear weapons completely in non-cooperative environments is not feasible. However, limited disarmament efforts may succeed. Historically, nuclear disarmament found success in Latin America. On 28 November

1990, Argentina and Brazil signed a historic agreement to fully implement the 1967 Treaty of Tlatelolco, which established a nuclear weapon free zone across Latin America. Before this Argentine-Brazilian nuclear rapprochement, both countries were suspected of wanting to acquire nuclear capabilities during the 1970s and 1980s (Reiss, 1995: 45). After the cooperation agreement was signed, both countries halted their nuclear weapons programs. Subsequently, Latin American economic cooperation and political coordination rose, while confrontations between nations in the region generally diminished.

For disarmament to work, universal regional compliance is required, as even a single defection can disrupt a stable regional situation. This is the reason why – despite its optimistic internal logic – nuclear disarmament has not been adopted in the Middle East. Nations in the region are highly distrustful of each other, and the presence of a nuclear Israel drives its neighbors to acquire similar capabilities. Without a major change in their attitudes toward the regional status quo, all attempts to limit, delay, or forcefully prevent nuclear proliferation in this region are likely to fail. The second option to prevent nuclear war is deterrence.

Classical deterrence

Bernard Brodie (1946, 1959) was the first theorist to advocate that the threat of unacceptable nuclear retaliation would ensure stability. Following Brodie's original assessment, the evolution of deterrence has been linked to shifts in theoretical structures that affected policy postures according to changes in international politics.

Classical deterrence theory is a theoretical extension of realist theory, which holds balance of power as the robust condition of the international order. Further, the probability of war decreases, as the absolute costs of war between contending parties increase. Consequently, as nuclear proliferation proceeds and MAD is achieved, conflict is least likely. War becomes unthinkable once nuclear power is balanced, because every rational actor perceives that the costs of war must exceed the possible gains (Claude, 1962; Waltz, 1993). Indeed, as Mearsheimer (1990) argues: "the more horrible the prospect of war, the less likely it is to occur" (Mearsheimer, 1990: 19).

According to classical deterrence theory, the advent of nuclear weapons has altered the nature of warfare. A balance of terror is inherently stable, because the massive costs of conflict make any nuclear war unwinnable and unthinkable. Accordingly, the logic asserts that to ensure stability in an anarchic world, both states must possess the means to destroy one another.

As a result of its consistency and parsimony, for the last three decades, the balance of terror, bolstered by MAD, has been recognized as the cornerstone of stable deterrence. Its policy prescription is simple and straightforward: building larger and more complex arsenals increases security. A credible threat of a devastating second-strike retaliation that is larger than the initial nuclear strike was thought to persuade a potential opponent to cease and desist. This theoretical structure postulates that the threat of massive losses from punitive retaliation prevented nuclear conflict between the two superpowers when both sides acquired second-strike capabilities and assured retaliation during the Cold War (Intriligator and Brito, 1984).

Note that the basic assumptions and implications of classical deterrence are generally congruent with those of a chicken game (Brams, 1975; Rapoport, 1964; Schelling, 1960). In this scheme, every rational actor has symmetric payoffs to hostile interaction. Each player prefers not to yield to the other, but the mutually worst outcome (i.e., war) occurs if both players choose the high-risk option of confrontation. As no rational actor is assumed to consider war as a wanted outcome, this setup does not leave a possibility for intentional conflict. Indeed, this is the theoretical origin of "the stability of deterrence equilibrium" (Brams and Kilgour, 1988). Later theorists, such as Fearon (1995) and Powell (1987), fully embrace the key implications of classical deterrence and the

chicken game with more sophisticated frameworks. In their setups, actors are assumed to be risk-averse. Logically, a risky military challenge under the balance of power that yields 50–50 odds is strictly inferior to a certain status quo ex ante. This is especially so when the risk of war increases with the advent of nuclear weapons.[3]

From this perspective, deterrence automatically becomes much safer whenever another nation acquires nuclear weapons with effective delivery systems, regardless of who has such capability. Whereas the chief assertion of classical deterrence is that the balance of nuclear power is ultra-stable, which conditions warrant concerns about deterrence failure? Classical deterrence theorists posit two such conditions: either an "irrational" command authority or the unintended use of nuclear weaponry. According to Powell (1987), nuclear war can result from an accident that cannot be anticipated.[4] Fearon (1995) rejects the possibility of war among informed, rational actors.[5] Lebow and Stein (1989) concur, but they explain nuclear failures as "irrational" acts that can be recognized only retrospectively. Classical deterrence thus proposes systematic stability and only allows accidental or irrational initiation, whether that initiation results from the intent of irrational leadership or a failure of procedural safeguards within a rational command authority. As Zagare (2004) notes: "the only way to explain the remarkable stability of the Cold War period is to assume that the players are at once rational and irrational" (Zagare, 2004: 116).

Classical deterrence has a number of hidden implications. The most controversial deduction is that nuclear proliferation, particularly among regions in conflict, would induce stability, particularly if MAD were secured. During the early 1990s, for instance, Mearsheimer (1990, 1993) suggested the pacifying effects of the potential nuclear capability of Germany and the retention of a Ukraine nuclear force. This logic continues to be advocated. Controversially, Waltz (2012) recently argues in *Foreign Affairs* that Iran should be allowed to develop and deploy nuclear weapons, contending that the Middle East region is unstable because it lacks a nuclear balance. He further claims that a nuclear Iran would not risk providing nuclear weapons to terrorists for fear of a retaliatory strike by the target. In summary, Israel's nuclear weapons' monopoly is the destabilizing factor, and a nuclear-armed Iran (and possibly joined by Saudi Arabia, Turkey, and perhaps, Iraq) would bring stability to the Middle East. There are some nagging doubts. Despite the theoretical consistency of its internal logic, classical theory suffers from a fundamental deficiency in terms of empirical policy actions. Two shortcomings are manifest.

First, if MAD produces maximum stability, why is it current US policy to develop and deploy BMDs in East Asia and Central Europe? According to classical deterrence, the addition of missile defense systems generates potential instability by undermining opponents' retaliatory capabilities. In reality, policymakers have exhibited a general discomfort with classical deterrence theory's deduction that MAD ensures stability since the Reagan administration proposed the Strategic Defense Initiative (SDI) (Gibilterra, 2015). Clearly, the fact that the United States seeks to achieve a nuclear advantage rather than preserve MAD challenges the validity of classical deterrence theory.

Second, global actions do not subscribe to the predictions of classical deterrence that nuclear proliferation stabilizes contested environments. Classical deterrence posits that stability is maximized when additional nations, through nuclear arms, possess veto power over potential opponents. Consequently, classical deterrence rejects the notion of international counter-proliferation, including the Proliferation Security Initiative. Apparently, it is even logically inconsistent to prevent rogue states such as North Korea from acquiring WMD and their delivery systems, while advancing the virtues of increasing nuclear arsenals in the Middle East with impunity. Classical deterrence tends to sidestep the problem.

Classical deterrence is selective, underspecified, and biased toward stability (Zagare and Kilgour, 2000). The key deductions from classical deterrence may cause policymakers to be overly optimistic regarding the prospects for stable nuclear deterrence. Past nuclear stability does not guarantee, however, that all future wars will be waged with conventional weapons. As even Zagare and Kilgour (2000) observe: "nuclear war has been avoided not because of nuclear weapons, but in spite of them" (Zagare and Kilgour, 2000: 25).

It is hardly surprising that such a lack of consistency in classical deterrence has led many to question the insights of classical deterrence (Huth and Russett, 1984; Kugler, 1984; Lebow and Stein, 1989; Organski and Kugler, 1980; Solingen, 2007; Zagare and Kilgour, 2000).[6] To overcome such theoretical and practical limitations, we turn to an alternative perspective based on the principles of power transition positing that deterrence is "tenuous". Adding risk and dissatisfaction to power parity generates unstable situations in nuclear environments. It is to these arguments that we now turn.

Power transition deterrence and East Asia

In this section we outline an alternative approach to deterrence, power transition theory, and generalize its insights to a variety of conceivable deterrence environments in East Asia. To understand the tenuous stability of deterrence, we first assess its conditionality. In this theoretical assessment, we pay special attention to the recent deployment of US-coordinated missile defense shields in the East Asian region.

The theoretical framework of power transition theory was first suggested by Organski (1958) and amended by Organski and Kugler (1980) after empirical evaluation. Unlike realism's emphasis on anarchy, power transition sees the international system as a hierarchy of nations with varying status quo evaluations. The dominant state (e.g., the United States after World War II) and its allies are generally content with the status quo and agree that the established net gains from cooperative solutions are superior to the potential net gains from conflict. Of course, not all states are satisfied with the existing rules of the international system. Power transition theory identifies the challengers as the most powerful states conceivably able to challenge the dominant defender. Some states believe they are not receiving benefits equal to their expectations or long-term aspirations. When dissatisfied states manage to catch up with dominant states, the conditions for power parity and overtaking establish the preconditions for conflict. The powerful and dissatisfied challengers perceive that the timing of power transition confers a fair chance of winning a war against the satisfied dominant defender. The most dangerous and war-prone situation is one in which a challenger and a preeminent defender reach the stage of relative equivalence of power, especially when the challenger is dissatisfied with the status quo (Kugler and Lemke, 1996; Organski, 1958; Organski and Kugler, 1980; Tammen et al., 2000).

It is important to note that, from power transition theory, the basic mechanisms of war and peace have not changed with the advent of nuclear weapons (Kugler and Zagare, 1990; Organski, 1958; Organski and Kugler, 1980).[7] In contrast with classical deterrence, nuclear war is not an accident, rather an outcome of goal-seeking behavior. Thus, without adjusting the central assumptions or reformulating the framework in the nuclear era, power transition theory provides a general theoretical underpinning to evaluate diverse deterrence relationships across time and space. Under power parity, the decision to go to war takes place under conditions of high risk, as no party can be certain of the prospects of victory once war begins. Notice that maintaining the status quo reduces risk compared to launching a war, but abiding by the status quo produces no additional returns for a dissatisfied party. Modifying the status quo, even when immensely risky, may produce positive

returns. This idea brings us to the specific consideration of the salient strategic characteristics that identify the conditions of success and failure in nuclear deterrence.[8]

Following the fundamental logic of power transition, formal extensions specify the dynamics of core elements by incorporating: (1) relative capability, which determines the odds of winning and losing; and (2) relative assessment of the status quo, which determines the maximum willingness of the challenger to risk the possible consequences associated with war in its calculus of war (Alsharabati and Kugler, 2008; Kang and Kugler, 2010, 2011; Kugler and Zagare, 1990).

The implications of power transition sharply contrast with outcomes of classical deterrence. First, a shift in the distribution of capabilities toward parity is a critical precondition for war, as it opens the window of opportunity for the challenger. Given such preconditions, the odds of winning and losing a war are estimated on the basis of anticipated relative killing capacities. This calculation process is inherently dynamic. The strength of one nation relative to its opponent changes over time with the proliferation of nuclear capabilities and, at the same time, the estimated likelihood of winning changes with levels of dissatisfaction and risk propensity. This means that the potential challenger decides the best timing of initiating a challenge when the defender may wish to yield while the challenger seeks to maximize its interests. Contrary to classical deterrence, the critical point of deterrence failure is the phase in which the challenger matches the defender's killing capacities under MAD.

Second, from this perspective, the dynamic of dissatisfaction with the status quo drives the potential challenger to adopt risk postures. Once the odds of winning and losing are approximately equal, the challenger with a negative assessment of the status quo perceives a risky confrontation as an "opportunity" rather than a "danger." In other words, the dissatisfied party is willing to challenge the satisfied defender, because it perceives that the unfavorable status quo can now be altered. Thus, under MAD, dissatisfied nations are tempted to choose the riskier option, which potentially escalates when a "decisive" victory is possible. For this reason, the deterrent effect of a nuclear arsenal is tenuous when the stakes are very high (Alsharabati and Kugler, 2008; Kang and Kugler, 2010, 2011; Kugler, 1984; Kugler and Zagare, 1987). Recall that in classical deterrence theory, where states are generally thought of as undifferentiated actors attaching the same value to the status quo, the stability induced by MAD is universal, because there is no variation in the utility or disutility that states derive from maintaining or challenging the existing order (Zagare 2004; Zagare and Kilgour, 2000). By contrast, in power transition deterrence theory, the subjective value of the status quo is a critical variable that defines the conditions of deterrence success and failure.

At this point, we recognize that the deployment of effective defensive missile systems by the satisfied power can increase stability over the short term. Recall that power transition theory suggests nuclear preponderance by the satisfied defender is the key to deterrence stability. Given the availability and affordability of a missile defense system, it is possible to strategically fortify power preponderance by dramatically reducing the ability of the potential challenger to inflict damage on the defender (Gibilterra, 2015; Quackenbush and Drury, 2011). This implication, however, does not generalize to the challenger side, because the dissatisfied challenger could use its defensive capabilities to advance its goals to overturn the status quo. Once the challenger gains the advantage by developing effective missile systems, stability is threatened in this murky area of credibility in deterrence.

Let us now bring these elements together in a comprehensive representation of deterrence consistent with power transition theory.[9] Figure 2 reflects the analytical results in terms of the stability of deterrence between the dissatisfied challenger and the satisfied defender. In Figure 2, the horizontal axes represent each nation's killing capacity, which inflicts economic and population losses on the opponents. The third vertical axis corresponds to the probability of war.

It will be informative to briefly highlight some of its salient strategic conditions:

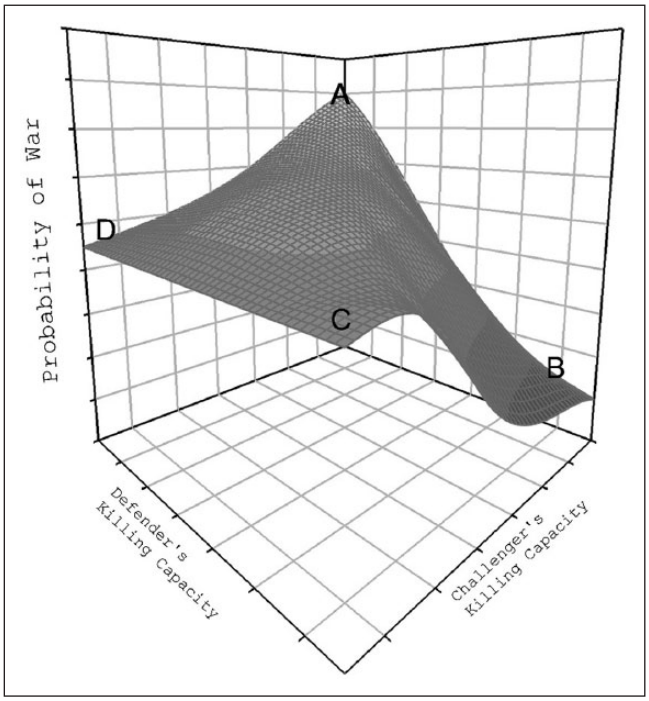

Figure 2. Power transition deterrence assessment of possible nuclear interactions in East Asia.

A. ***Conventional conflict.*** Neither side can inflict unacceptable damage on its opponent, and for that reason, the probability of war is high when both sides are balanced. Risk and dissatisfaction trigger war, as they did in World Wars I and II (Kugler and Lemke, 1996).

B. ***Stable nuclear deterrence.*** The satisfied power is preponderant, while the dissatisfied opponent is relatively weak. This situation is stable, because the satisfied power does not wish to risk altering the status established under its leadership and supported by its status quo allies. This is the condition over the post-World War II period when NATO dominated the Warsaw Pact.

C. ***Tenuous MAD.*** This is a tenuous deterrence situation. As the two sides approach nuclear and conventional parity, the opportunity for conflict will emerge. This is the condition we now anticipate at the global level as China overtakes the United States. Conflict will only emerge if the overtaking is confrontational and both sides fail – as Britain and Germany did before World Wars I and II – to find an agreement regarding global leadership.

D. ***Highly unstable nuclear deterrence.*** This is a condition where the dissatisfied challenger gains nuclear preponderance. At the global level, this condition has not emerged, because the satisfied United States has always held a lead in nuclear capabilities until MAD was reached. Theoretically, regional contests could take place if a future dissatisfied Iran faces a dissatisfied Saudi Arabia or perhaps Turkey. These conditions are unlikely to emerge given the relative size of the contenders in Southeast Asia.

A central point of divergence from classical deterrence is that the probability of war is high under MAD. Indeed, when both parties possess massive nuclear capabilities, despite the fact that they are exposed to possible second-strike retaliation from the opponent, war is still likely

(Condition C). Note that, unlike classical deterrence, the power transition model indicates that the increasing anticipated costs of war may somewhat reduce the probability of conflict if policymakers act prudently in a high-stakes situation, but they are not sufficient to prevent major war. Elites are still expected to behave in the same manner without a major behavioral transformation despite the introduction of nuclear weapons (Kugler and Lemke, 1996: 244; Tammen et al., 2000). Rather, a large arsenal can allow a dissatisfied challenger to escalate a conflict to all-out war even when a possible nuclear exchange looms large. To date, we (fortunately) have little relevant data for this scenario. During the Cold War, deterrence remained cold, because the USSR did not have a sufficient capability to pose a credible challenge to conventionally preponderant NATO led by the United States. If the USSR had approached the conventional capabilities of NATO when nuclear parity was reached in the 1960s, the likelihood of a nuclear exchange would have been very high.

For this reason, we are concerned that deterrence may prove unstable when China overtakes the United States in the mid-21st century. Unlike the USSR, China is expected to achieve conventional and nuclear parity (Kugler, 2006; Tammen et al., 2000). Furthermore, these two giants in fact disagree with the status quo – as seems to be evident following the Ukraine crisis that forced a dissatisfied Russia to pivot toward China and away from the EU and US coalition. China is now pressing its own claims for further maritime accommodations from Japan and its neighbor in the South China Sea. China has also made heavy investments in developing offensive ballistic missile systems. China's rise will certainly be the most dramatic change in East Asia. The recent progress of its armed forces is assessed as possessing the potential to be truly global (US Office of the Secretary of Defense, 2009: 24).

Despite the paucity of empirical cases for such tenuous conditions, policymakers recognize and accept the proposition that the likelihood of nuclear war looms large under conditions of MAD associated with political dissatisfaction. The rise of ABM technology was one answer to this concern. Since the Reagan administration proposed SDI, US policymakers have intuitively understood that maintaining a balance of terror cannot deter the use of nuclear weapons when facing a dissatisfied opponent. This anticipation is logically consistent with arguments derived from power transition theory. As illustrated in Figure 2, the probability of war in the right corner (Condition B) is much lower than under MAD (Condition C) when the satisfied defender enjoys preponderance, with its massive retaliation capabilities and a secure missile defense system to minimize exposure to retaliation. Conversely, when the dissatisfied challenger is preponderant, the likelihood of war is still high (Condition D). This is an unlikely condition, however, because stability would already be preimposed by the dissatisfied challenger with successful compellence to restructure the status quo. The weaker country cannot deter the stronger.

Our assessment explicitly portrays a prospect of deterrence relationships in East Asia once the United States successfully completes its plans for defensive shields. Controlling technical and economic concerns,[10] power preponderance, supported by both offensive and defensive capabilities, leads to stable deterrence. South Korea and Japan are fully exposed to North Korea's nuclear arms systems with the range to strike their major cities and military assets. The US-led layered missile defense system under its nuclear umbrella will deflect any North Korean large-scale strike by intercepting missiles headed for critical assets.

The question of China is a bit more complex. Over the short run, the US missile defense system associated with offensive nuclear capabilities will not permit China to project power to challenge US dominance beyond its geographical borders in the near future. The successful deployment of missile defenses can provide useful insurance in terms of the United States and its allies' regional strategy. It is clear that the successful deployment of credible missile shields by the satisfied defenders increases stability in the region. Over the long term, however, US capabilities will not be able to insure safety for its allies or itself. Once a dissatisfied challenger, such as China, acquires

an equivalent defensive shield and sufficient offensive capabilities to match those of the defender, the United States, deterrence begins to destabilize. Indeed, under anticipated conventional and nuclear power parity by the mid-21st century between the United States and China, deterrence based on building large defensive and offensive arsenals will be very tenuous (Condition A). In this situation, the dissatisfied challenger is highly likely to launch military attacks that may lead to prolonged high-end conventional conflict more destructive than either World War.

For this reason, the proliferation of missile defense technology to the dissatisfied challenger would be as dangerous as the buildup of offensive nuclear arsenals. In terms of managing the transition, the US technological dominance in its defensive shield can be a critical asset for peace. While the SDI altered the nature of Cold War competition, transferring technology to China has the potential to break a competitive deadlock in the opposite way. The Western monopolies in military technology will erode and the United States' privileged position will diminish in the future. Sharing missile defense technology may change the course of great power interactions.

Let us remember that the only flawless secure environment is one in which disarmament takes place. However, given current technology, this option is not feasible at the global level. Over the past decade (2004–2013), China's military expenditure increased by 167%, a rate far exceeding that of any other major power, while the US budget decreased by 0.4% (SIPRI, 2015). This trend should be interpreted as a serious signal of the future US-China rivalry.

What remains feasible is US-China nuclear cooperation in which both sides assure their regional partners of security, and share technology to defend against potential attacks from rogue nations, such as North Korea, or terrorists. Military cooperation at this level is risky indeed, but it is far more risky to preserve the current move toward a new Cold War where the contenders have the potential for nuclear and conventional parity – the very preconditions identified as precursors of global war.

Implications

Total global wars require very rare structural preconditions that have not been met since 1945 (Organski and Kugler, 1980; Tammen et al., 2000). To enhance the stability of deterrence in East Asia, therefore, US offensive and missile defense policies should be carefully evaluated in a valid framework of new deterrence theory. In the security of environment of the 21st century, sole reliance on the threat of inflicting absolute costs is no longer valid.

It is clear that the proliferation of ballistic missiles will undermine stability in East Asia. A dissatisfied aggressor, such as North Korea, with a significant nuclear capability and effective delivery system, would be willing to initiate greater political or military threats. Recently, the United States has been upset over the reported test of North Korea's submarine-launched ballistic missile (SLBM), which would reach targets beyond the range of land-based missiles. The growing North Korean threat, potentially capable of reaching US territory at some point in the future, is now a matter of direct deterrence rather than extended deterrence from Washington's perspective. It is the principle obligation of the US government to provide for the common defense of its own population and territory against a nuclear strike. Given that North Korean nuclear ambition is beyond China's control, intensifying tensions associated with the substantial increase in the number of North Korean missile tests has led to the active involvement of the United States in the potential deployment of a THAAD system on the Korean Peninsula.

Over the short term, therefore, we anticipate that the stability of deterrence in the region will be strengthened by the deployment of BMDs that bolster power preponderance against North Korea, which is fully exposed to massive retaliation. From the perspectives of South Korea and Japan, the time for forcing the deployment of missile defenses could not be more opportune. It is important

to note that the stability of deterrence can be undermined, even under power asymmetry, when the defender fails to signal credible threats of massive retaliation (Zagare and Kilgour, 2000). In addition to strengthening physical deterrent effects, the deployment of the US-led layered missile defense system signals a credible threat of punishment from the security provider by the establishing of a direct link between the homeland security of the United States and the defense of its allies in East Asia. The Obama administration seems to be acting consistently with this postulate, but is stopping short of cooperating with other regional powers.

The long-term horizon remains tenuous. The rapid expansion of US BMD systems may significantly alter the trajectory of China's missile strategy unless an initiative to joint efforts is made. The unilateral addition of a missile defense technology by one state may lead to the other state's dissatisfaction with the status quo. It is important to note that: "most Chinese experts reject the notion that missile defense is a defensive system" (Urayama, 2007: 125) and believe it has the potential to become a strategically offensive system. China already has an HQ-9 missile system with a limited ABM capability. In 2013 the HQ-9 was selected as Turkey's air defense system in 2013 despite NATO's concern about security. In April 2015 China finalized a long-awaited and sizeable deal with Russia for the S-400, Russia's most advanced air and missile defense system. This acquisition would provide substantial missile defense capabilities against possible aerial operations and missile attacks against the Chinese mainland. We can expect that China will be capable of developing an extensive missile defense system by reverse-engineering Russian systems for the foreseeable future. If the increasingly dissatisfied states decide to invest greater resources into developing other weapons to evade an existing missile shield or their own missile blocking platforms, the long-term horizon will be far from clear.

A clear path toward stability – cooperation, not confrontation – has not yet been identified, although the opportunity still exists to manage and potentially avoid a conflictual overtaking. One possible prescription is the inclusion of China along with Russia into more cooperative security arrangements to aggregate nations in East Asia with similar evaluations of the status quo. As long as China does not enter into such a binding international security agreement, its level of satisfaction will remain low. While a NATO-like security membership is still lacking in East Asia, perhaps this would occur under a different name or configuration. A mixture of trade and alliance provides the strongest links to peace, whereas stability is tenuous even among trading partners without strong political agreements based on common security interests (Kugler and Tammen, 2004).

Acknowledgment

We would like to thank all participants of the 2015 Workshop Program of Power Transition Theory and the Rise of China at Peace Research Institute Oslo (PRIO), the editor, and three anonymous referees for helpful comments and suggestions.

Funding

This work was supported by NRF Joint Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (Grant Number: 20142208001).

Notes

1. According to the annual report, China have persistently developed a credible submarine-based second nuclear strike capability and the fleet of nuclear-powered ballistic missile submarines (SSBN) is getting ready to conduct its first nuclear deterrence patrol in the very near future. China currently possesses 5 nuclear attack submarines, 4 SSBNs, and 53 diesel attack submarines. Over the next decade, China is

expected to construct a new type of SSBN, associated with a new SLBM that has an estimated range of 7,400km (US Office of the Secretary of Defense, 2015: 9).

2. The number of warheads is represented with log-transformed data. The global MAD line of approximately 1,000 warheads indicates the central goal of strategic warhead limit the Obama administration is seeking to establish by the New START follow-up agreement (Kristensen, 2013).
3. For extensive critical accounts on the limitations of the chicken game specification in deterrence, see Zagare (1985) and Zagare and Kilgour (2000).
4. Deterrence failure is not selected by the players but by nature, which imposes the sanction probabilistically (Powell, 1987: 725).
5. Risk-acceptant leaders are excluded, although Hitler is noted as a "possible exception" (Fearon, 1995: 388).
6. In particular, a major theoretical problem for classical deterrence theory arises in explaining whether the possession of nuclear weapons has directly affected the outcomes of extreme crises through its deterrent effects (Kugler, 1984). Empirically, the United States failed to roll back China's actions in Korea 1950 as well as the Soviet invasion of Hungary in 1956 despite commanding a nuclear arsenal. Huth and Russett (1984) demonstrate that there is no clear evidence that deterrence added stability to relations between the nuclear powers. In an extensive study of US diplomatic records, Lebow and Gross Stein (1989) illustrate how US and Soviet deterrence strategies "nearly failed" during the Cuban missile crisis in 1962 and the crisis in the Middle East in 1973.
7. This logic is empirically supported by Huth and Russett (1984) and Kugler (1984), who report that nuclear weapons have, in fact, failed to exhibit the posited deterrent effects.
8. Theoretically, power transition deterrence is connected to the expected utility theory of international conflict developed by Bueno de Mesquita (1981) and perfect deterrence theory by Zagare and Kilgour (1993, 2000) in that those theories have congruent underlying specifications and utilize similar variables to calculate the marginal gains anticipated from a conflict and consider similar variables.
9. Because rigorous formal demonstration is not the focus of this article, to save space we do not fully characterize the formal analysis of the model here. Instead, in the appendix, we provide a sketch of the proof for a simple game-theoretical solution. Based on derivations, Figure 2 depicts the analytical presentations of the defined thresholds for categorizing possible empirical expectations. For extended theoretical treatments using a general bargaining framework with complete proofs, see the authors' other work (Kang and Kugler, 2010) and the citations therein.
10. The expenditure on missile defense amounts to less than 2% of the US defense budget, or close to $700 billion, at an approximate cost of $10 billion per year (Gibilterra, 2015).

References

Alsharabati C and Kugler J (2008) War initiation in a changing world. *International Interactions* 34(4): 358–381.

Blair B, Brown M, Burt R, Joffe J and Davis JW (2011) Can disarmament work? Debating the benefits of nuclear weapons. *Foreign Affairs* 90(4): 173–178.

Brams S (1975) *Game Theory and Politics*. New York, NY: Free Press.

Brams S and Kilgour DM (1988) *Game Theory and National Security*. New York, NY: Basil Blackwell.

Brodie B (1946) *The Absolute Weapon: Atomic Power and World Order*. New York, NY: Harcourt, Brace.

Brodie B (1959) *Strategy in the Missile Age*. Princeton, NJ: Princeton University Press.

Bueno de and Mesquita B (1981) *The War Trap*. New Haven, CT: Yale University Press.

Chance D (2012) For North Korea, next step is a nuclear test. *Reuters* 13 December. Available at: http://www.reuters.com (accessed 15 June 2015).

Claude IL Jr (1962) *Power and International Relations*. New York, NY: Random House.

Colby E and Denmark A (2013) *Nuclear Weapons and U.S.-China Relations*. Washington, DC: Center for Strategic and International Studies.

Einstein A (1946) Telegram to prominent Americans 24 May 1946. In Ratcliffe, S (ed) *Oxford Essential Quotations*. Oxford, UK: Oxford University Press. Available at: http://www.oxfordreference.com/view/10.1093/acref/9780191735240.001.0001/q-oro-00003988 (accessed 15 June 2015).

Fearon J (1995) Rationalist explanations for war. *International Organization* 49(3): 379–414.
Gertz W (2014) China tests ICBM with multiple warheads. *The Washington Free Beacon* 6 June. Available at: http://freebeacon.com (accessed 15 June 2015).
Gibilterra J (2015) Conditional deterrence and missile defense. *Comparative Strategy* 34(1): 64–73.
Huth P and Russett B (1984) What makes deterrence work? Cases from 1900–1980. *World Politics* 36(4): 496–526.
Intriligator M and Brito D (1984) Can arms races lead to the outbreak of war? *Journal of Conflict Resolution* 28(1): 63–84.
Kang K and Kugler J (2010) Deterring nuclear challenges: A formal analysis of extreme war mechanisms. Paper presented at the annual meeting of International Studies Association, New Orleans, LA, Feb 17, 2010. Available at: http://citation.allacademic.com/meta/p413753_index.html (accessed 15 June 2015).
Kang K and Kugler J (2011) Nuclear weapons: Stability of terror. In: Clark S and Hoque S (eds) *Debating a Post-American World: What Lies Ahead?* New York, NY: Routledge.
Kristensen H (2013) New nuclear weapons employment guidance puts Obama's fingerprint on nuclear weapons policy and strategy. *Federation of American Scientists: Strategic Security Blog* 20 June. Available at: www.fas.org (accessed 15 June 2015).
Kristensen H and Norris R (2013) Chinese nuclear forces, 2013. *Bulletin of the Atomic Scientists* 69(6): 79–85.
Kugler J (1984) Terror without deterrence: Reassessing the role of nuclear weapons. *Journal of Conflict Resolution* 28(3): 470–506.
Kugler J (2006) The Asian ascent: Opportunity for peace or precondition for war? *International Studies Perspectives* 7(1): 36–42.
Kugler J and Lemke D (1996) *Parity and War*. Ann Arbor, MI: University of Michigan Press.
Kugler J and Tammen RL (2004) Regional challenges: China's rise to power. In: Rolfe J (ed.) *The Asia-Pacific: A Region in Transition*. Honolulu, HI: Asia-Pacific Center for Securities Press.
Kugler J and Zagare FC (1987) *Exploring the Stability of Deterrence*. Boulder, CO: Lynne Rienner Publishers.
Kugler J and Zagare FC (1990) The long-term stability of deterrence. *International Interactions* 15(3): 255–278.
Lebow R and Stein JG (1989) Rational deterrence theory: I think, therefore I deter. *World Politics* 41(2): 208–224.
Mearsheimer J (1990) Back to the future: Instability in Europe after the Cold War. *International Security* 15(1): 5–56.
Mearsheimer J (1993) The case for a Ukrainian nuclear deterrent. *Foreign Affairs* 72(Summer): 50–66.
Norris R and Kristensen H (2010) Global nuclear weapons inventories, 1945–2010. *Bulletin of the Atomic Scientists* 66(4): 77–83.
Organski AFK (1958) *World Politics*. New York, NY: Alfred A. Knopf.
Organski AFK and Kugler J (1980) *War Ledger*. Chicago, IL: University of Chicago Press.
Paul TV, Morgan P and Wirtz J (2009) *Complex Deterrence*. Chicago, IL: University of Chicago Press.
Perkovich G and Acton J (2009) *Abolishing Nuclear Weapons: A Debate*. Washington, DC: Carnegie Endowment for International Peace.
Powell R (1987) Crisis bargaining, escalation, and MAD. *American Political Science Review* 81(3): 717–735.
Quackenbush SL and Cooper Drury A (2011) National missile defense and (dis)satisfaction. *Journal of Peace Research* 48(4): 469–480.
Rapoport A (1964) *Strategy and Conscience*. New York, NY: Harper and Row.
Reiss M (1995) *Bridled Ambition: Why Countries Constrain Their Nuclear Capabilities*. Washington, DC: Woodrow Wilson Center Press with Johns Hopkins University Press.
Ripley W and Castillo M (2015) *North Korea Tests Ballistic Missile*. CNN 9 May. Available at: http://www.cnn.com (accessed 15 June 2015).
Rumble G (1985) *The Politics of Nuclear Defence: A Comprehensive Introduction*. Cambridge, UK: Polity Press.
Sagan S (1994) The perils of proliferation: Organization theory, deterrence theory, and the spread of nuclear weapons. *International Security* 18(4): 66–107.

Sagan S (2010) *Shared Responsibilities for Nuclear Disarmament: A Global Debate*. Cambridge, MA: American Academy of Arts and Sciences.
Sagan S (2012) A call for global nuclear disarmament. *Nature* 487(7405): 30–32.
Schelling T (1960) *The Strategy of Conflict*. Cambridge, MA: Harvard University Press.
SIPRI (2015) Trend in World Military Expenditure, 2014. *SIPRI Fact Sheet* April 2015.
Solingen E (2007) *Nuclear Logics: Contrasting Paths in East Asia and the Middle East*. Princeton, NJ: Princeton University Press.
Tammen RL, Kugler J, Lemke D, Stam AC, Alsharabati C, Abdollahian MA, Efird B and Organski AFK (2000) *Power Transitions: Strategies for the 21st Century*. New York, NY: Chatham House.
Urayama K (2007) China debates missile defense. *Survival* 46(2): 123–142.
U.S. Department of Defense (2010) Ballistic Missile Defense Review Report 2010. Available at: http://www.defense.gov/bmdr/ (accessed 15 June 2015).
U.S. Office of the Secretary of Defense (2009) *Military Power of the People's Republic of China 2009*. Annual Report to Congress. Available at: http://www.defense.gov/pubs/ (accessed 15 June 2015).
U.S. Office of the Secretary of Defense (2015) *Military and Security Developments Involving the People's Republic of China 2015*. Annual Report to Congress. Available at: http://www.defense.gov/pubs/ (accessed 15 June 2015).
Waltz K (1993) The emerging world structure of international politics. *International Security* 18(2): 44–79.
Waltz K (2012) Why Iran should get the bomb. *Foreign Affairs* 91(4): 2–4.
Zagare F (1985) Toward a reformulation of the theory of mutual deterrence. *International Studies Quarterly* 29(2): 155–169.
Zagare F (2004) Reconciling rationality with deterrence: A re-examination of the logical foundations of deterrence theory. *Journal of Theoretical Politics* 16(2): 107–141.
Zagare F and Kilgour DM (1993) Asymmetric deterrence. *International Studies Quarterly* 37(1): 1–27.
Zagare F and Kilgour DM (2000) *Perfect Deterrence*. Cambridge, UK: Cambridge University Press.

Author biographies

Kyungkook Kang is an Assistant Professor in the Department of Political Science at the University of Central Florida. Areas of specialization include international relations theory, positive political economy, and mathematical modeling, with particular reference to interstate conflict processes.

Jacek Kugler is the Elisabeth Helm Rosecrans Professor of World Politics at Claremont Graduate University, California, and a former president of the International Studies Association and the Peace Science Society (International). Recently, he has been working on new approaches to understand the preconditions for war or integration in the global arena.

Appendix. Sketch of the proof for solutions of deterrence success and failure

To examine the conditions of deterrence success and failure, we model deterrence as a strategic risk-taking process. The complete equilibrium analysis of the sequential bargaining game is provided in our recent work (Kang and Kugler, 2010). In this appendix, we provide a simple sketch of the proof for solutions by highlighting a particular condition under which the players are likely to experience impasses, because of the disappearance of the possible settlement range.

Consider two players, challenger and defender, who confront each other in a distribution game. They are disputing the division of a one-dimensional issue. Each player has a predetermined value of the status quo (SQ) w^{SQ}. For a particular value of x, the player is assumed to have a constant absolute risk aversion (CARA) class utility function such that:

$$U(x) = \frac{1 - e^{(x + w^{SQ})\rho}}{1 - e^{\rho}} \quad (1)$$

where ρ denotes the risk-propensity parameter, and higher values of this parameter indicate a greater risk acceptance propensity.

If the player chooses to go to war instead of reaching settlement, the value of postwar outcome x is stochastically realized according to a continuous probability distribution $f(x)$. Subsequently, the expected utility of war is defined as:

$$EU^{War} = E\left(\frac{1-e^{(x+w^{SQ})\rho}}{1-e^{\rho}}\right) = \int_x \frac{1-e^{(x+w^{SQ})\rho}}{1-e^{\rho}} f(x)dx \tag{2}$$

Suppose there exists a certainty equivalent (CE) welfare w^{CE} of a possible bargaining outcome that is equally attractive as going to war. In the context of war bargaining, the CE that is greater than the status quo ($w^{CE} > w^{SQ}$) denotes the "threat point", which indicates the minimum value the challenger would be willing to accept as a bargained settlement. If $w^{CE} < w^{SQ}$, then the CE indicates the "reservation point", which indicates the maximum value the defender would be willing to concede.

Using a linear approximation, we derive the CE as a linear function of key parameters of interest:

$$\frac{1-e^{w^{CE}\cdot\rho}}{1-e^{\rho}} = \frac{1-e^{\left(\mu+w^{SQ}\right)\rho+\frac{1}{2}\sigma^2\rho^2}}{1-e^{\rho}} \text{ by} U\left(w^{CE}\right) = EU^{War} \tag{3}$$

Specifically, we explore how the actor's expectation of the war payoff, $E(x) = \mu$, determined by the relative capabilities and variance of the war payoff σ^2, refer to the level of strategic risk associated with war.

Then, the challenger prefers the settlement that yields non-negative benefit d (i.e., the concession from the defender) to the option of war when:

$$U_{Challenger}\left(w^{SQ}_{Challenger} + d\right) \geqslant EU^{War}_{Challenger} \tag{4}$$

$$w^{SQ}_{Challenger} + d \geqslant w^{SQ}_{Challenger} + \mu_{Challenger} + \frac{1}{2}\sigma^2\rho_{Challenger} \tag{5}$$

The minimum value the challenger would be willing to accept instead of fighting (i.e., the threat point) is defined as:

$$d^{\min}_{Challenger} = \mu_{Challenger} + \frac{1}{2}\sigma^2\rho_{Challenger} \tag{6}$$

Symmetrically, the maximum value the defender would be willing to concede to avoid the risk of war (i.e., the reservation value) is defined as:

$$d^{\max}_{Defender} = -\mu_{Defender} - \frac{1}{2}\sigma^2\rho_{Defender} \tag{7}$$

In this example, both actors are assumed to share common information regarding the variance of the war outcome, so the range of potential settlement is calculated as:

$$V = d^{\max}_{Defender} - d^{\min}_{Challenger} = -(\mu_{Defender} + \mu_{Challenger}) - \frac{1}{2}\sigma^2(\rho_{Defender} + \rho_{Challenger}) \quad (8)$$

For a political compromise (i.e., a Nash bargaining solution) to be reached, the defender's minimum concession should be greater than the challenger's maximum demand. In other words, if there exists a positive settlement range $V > 0$, then both parties are willing to avoid a bargaining impasse. By contrast, a negative value of the settlement range $V < 0$ is a necessary condition for the outbreak of war as a result of a bargaining impasse. As shown in Equation (8), the settlement range shrinks when: (i) the expected value of war payoffs approaches zero ($\mu = 0$, i.e., the odds of winning and losing are equal under power parity); (ii) the challenger has a sufficient killing capacity to generate a high level of risk ($\sigma > 0$); and (iii) the challenger shows a strong risk-acceptant propensity ($\rho > 0$).