

North Korea's Advanced Nuclear Weapons and US Extended Deterrence for South Korea: An Assessment based on Nuclear Deterrence Theory

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Abstract:

The purpose of this article is to assess the DPRK's advanced nuclear weapons' influence on the credibility of the US extended deterrence for the ROK from the perspective of nuclear deterrence theory. The structure of this article is firstly to review preceding works both on theories related to extended deterrence and on area studies in the regions having lived with nuclear weapons. Secondly, it will review the history and current state of extended deterrence in the US-ROK alliance and reveal the current evaluation of the advanced nuclear weapons developed under the Kim Jong Un regime as well as the history of how the US extended deterrent for South Korea has developed. Finally, the author will theoretically analyze its influences on the US's extended deterrent, focusing on the comprehensive US-ROK Deterrence System, thereby assessing the credibility of the US Extended Deterrence for South Korea. As a result of its verification, this article concludes that at present the credibility of the US's extended deterrent to the ROK has decreased when compared to the past seventy years, considering the ever longer spear of the DPRK, which is capable of reaching the US mainland including metropolitan cities, such as Washington D.C. and NYC, and able to break through the shield of the US-ROK alliance.

Keywords: *DPRK (North Korea), Nuclear Weapons, South Korean Security, The US-ROK Alliance, Nuclear Deterrence, Missile Defense, The US-DPRK Relations.*

1. Introduction

In June 2020, the Inter-Korean Liaison Office located in Gaeseong was demolished by the Democratic People's Republic of Korea (DPRK, North Korea), because they were angered at the flyers reportedly exclusively insulting Kim Jong Un and his regime, dropped from balloons by groups of

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North Korean defectors living in the Republic of Korea (ROK, South Korea)¹. According to the official statements, such as Kim Yo Jong's, what triggered the explosion was mainly the propagation of flyers insulting its supreme leader and an obvious breach of the prohibition to fly over the counterpart's soil, stated in the Panmunjom Declaration issued in the Inter-Korean summit in April 2018, which finally led them to agree on the Inter-Korean Military Agreement of two Koreas signed in September 2018.

However, the potential abrogation of the "9.19 Military Agreement" would certainly bring about a very dangerous situation in the East Asian security environment: the most plausible scenario of nuclear war in East Asia is that some low-intensified conflict (LIC) at the 38th parallel would occur between the two Koreas. Then as the regional tension rises, it would be inadvertently escalated to a phase where the DPRK could use its nuclear weapons in either a preemptive or retaliatory manner, in which case the battlefield might not be confined only to within the Korean Peninsula, especially regarding the advanced nuclear weapons the Kim Jong Un administration possesses that are capable of striking not just the US's allies but also the US mainland itself².

Furthermore, the author found several symptoms that the bond of US-ROK alliance has been upset considering several factors, such as the fact that the current US military force has been relatively declining compared to the one under its unipolar system due to the advancements in nuclear armament made by China, Russia and North Korea. The COVID-19 pandemic has also worsened not only the domestic circumstances that have been destabilized by the rapid lowering of its social solidarity level, but also by its lagging economy which would inevitably affect its military performance due to budgetary constraints. From the US perspective, both these waning factors could possibly make it feel a lack of commitment to the growing cost of maintaining the US-ROK alliance as it becomes more expensive.

Then, a research question emerges: can the US extended deterrent (ED) at present be credible enough to protect the ROK from the advanced nuclear weapons that the DPRK possesses? This article aims to answer this research question with a theoretical framework based on nuclear deterrence theory, focusing on the DPRK's advanced nuclear weapons and its influences on the US ED for South Korea.

The structure of this article is firstly to review preceding works both on theories related to ED and on area studies in the regions living with nuclear weapons. Secondly, it will reexamine the history and the current state of the US ED provided for South Korea. Thirdly, it will assess the North Korea's advanced nuclear weapons and their influence on the US ED.

2. Influences of the DRPK's Advanced Nuclear Weapons on the US Extended Deterrence for South Korea

(1) Literature Review of Preceding Works

In 1966, Thomas Schelling pointed out that the nuclear revolution with thermonuclear bomb-tipped intercontinental ballistic missiles (ICBMs) had occurred. The advancement of nuclear weapons influenced nation-states' behavior when being perceived as a risk threatening their own core national interests, such as the survival of the regime and the lives of their nationals in the homeland (Schelling, 2008). In this way, he created a new strategic notion, *compellence*, explaining it as "[t]o *compel* an

1 Gaeseong is located in the territory of DPRK.

2 The troubling 9.19 Military Agreement can function to prevent the occurrence of LIC at the early stage of a contingent nuclear conflict.

enemy's retreat, though by some threat of engagement, I have to be committed to move. ...The threat that compels rather than deters often requires that the punishment be administered *until* the other acts, rather than *if* he acts (Schelling, 2008, pp. 69-70)".

After clarifying the distinction between deterrence and compellence, he also mentioned that the influence of a nuclear threat changed the form of crisis escalations and diplomatic communications between nuclear-armed states into a more risk-aversion-oriented one. This was in order to prevent the occurrence of a nuclear war including a "limited and localized nuclear war (Schelling, 2008, p. 110)" that "was not, therefore, a 'tactical' war", which would be risky due to the uncertain contingency of escalating into all-out war, especially if there was no effective communications framework with hotlines working for arms control.

This common perception that nuclear-armed states can share to avoid escalation to a nuclear war has been established since the Korean War, the first *limited war* in the nuclear age. Schelling wrote that "the Korean War itself was decisive in the precedent it set, in its confirmation that the decision to use nuclear weapons was, in a real sense and not just nominally, a matter for presidential decision, and in making nuclear weapons the hallmark of restraint in warfare (Schelling, 2008, p. 157)³".

The influence of the possession of nuclear armament by a potential threat on a nuclear-armed state's behavior has been applied to consider the extended deterrence (ED) that nuclear-armed states can provide to their allies. For example, Kissinger mentioned that "[I]n the face of the new-found Soviet capability to inflict devastating damage on the United States, our reluctance to engage in an all-out war is certain to increase. ...The further development of Soviet rockets and missiles is certain to widen the line between what is considered 'vital' and what is 'peripheral' if we must weigh each objective against the destruction of New York or Detroit, of Los Angeles or Chicago (Kissinger, 2018, p. 151)". Thus, he concluded "[E]ven if nuclear weapons were employed against United States forces, say, in the Middle East or Southeast Asia, a last resort to all-out war by us would not be a foregone conclusion. It is difficult to believe that we would rush into the cataclysm of a thermonuclear war to prevent the defeat of a few conventional divisions (Kissinger, 2018, pp. 177-178)⁴".

In light of the influence of the possession of nuclear armament by a potential threat on ED, Schelling uses a novel technical term, *connectedness*, defining it as that "provides something of a scheme for classifying compellent threats and actions" and expressing it as "sometimes they lack connectedness. ...But it often lacks some of the credibility, through automatic involvement, that can be achieved by connecting the response physically to the provocation itself (Schelling, 2008, pp. 86-90)". According to Schelling, the physical connection in an alliance is sometimes guaranteed by putting troops on an ally's soil, such as the US troops stationed in Berlin. However, it is doubtful whether the US would actually become involved in a scenario where there was uncertainty about incurring a nuclear attack on its mainland.

Connectedness is relevant to the fear of entrapment and abandonment in alliance politics. Glenn

3 He explains its mechanism in detail: the Korean War "was *fought* with restraint, conscious restraint, and the restraint was on both sides. On the American side the most striking restraints were in territory and weapons. The United States did not bomb across the Yalu (or anywhere else in China) and did not use nuclear weapons. The enemy did not attack American ships at sea (except by shore batteries), bases in Japan, or bomb anything in South Korea, especially the vital area of Busan (Schelling, 2008, pp. 128-131)".

4 His reluctance to be involved with any conflict that can be escalated to all-out nuclear war can be clearly found in the case of the fourth Arab-Israeli war.

Snyder found that “the risks of abandonment and entrapment tend to vary inversely. ...Thus, the resolution of the alliance security dilemma, (that is) the choice of strategy, requires chiefly comparison and trade-off between costs and risks of abandonment and entrapment (Snyder, 1984, p. 467)”, which has to be carefully considered when evaluating the credibility of the ED.

The vital point on the US ED is that its credibility has been fluctuating as and when the situation of mutual nuclear deterrence among nuclear-armed states has changed. For example, Robert McNamara, the former US secretary of Defense, initiated a new nuclear policy called the Flexible Response Strategy to prevent the US from becoming involved in any automatic escalations to all-out nuclear war by deciding that the communist's invasion with conventional weapons should be dealt with proportionally, not with nuclear weapons, but with conventional ones, regarding that the Soviet nuclear projectile capabilities was successfully proven in 1957 when the USSR tested its first ICBM. Moreover, with the emergence of an almost equal nuclear equilibrium between the US and the USSR in around 1965, the US shifted to MAD (Mutual Assured Destruction) putting priority on retaliation-oriented mutual deterrence. These changes in US nuclear doctrines made its allies, such as France, skeptical of the credibility of the US ED.

In addition, Shinichi Ogawa theoretically analyzed the credibility of the nuclear umbrella in a symmetric nuclear equilibrium. Generally, whether a nuclear-armed state is strategically able to deter nuclear-armed adversaries depends on whether providing nuclear ED to its non-nuclear-armed ally can make those adversaries believe that it would probably use its nuclear weapons to defend its ally, and they would be uncertain of its will to escalate to an all-out nuclear war that would end up with massive costs and risks for those adversaries. Next, he contemplated two cases of the US ED, NATO and Japan, to evaluate how credible the US's nuclear umbrellas were during the Cold War by contrasting their regional differences and revealing a common factor between them, which was that the emergence of the USSR's strategic nuclear weapons capable of attacking either military facilities or major cities on the US mainland had unsettled the credibility of the US ED from the perspective of its allies.

On the US ED provided to South Korea, there are great preceding works on the Korean War researched by Henry Kissinger, Bruce Cumings, Glenn Paige, David Halberstam, Anatoly Torkunov, Zhu Jianrong, Kamiya Fuji, Magosaki Ukeru, and so on. While they have opposing insights on what brought about the war, they share the common view that the Korean War was a defining moment in history, strengthening the US's commitment to defend the ROK from possible communist's expansion in the wake of the establishment of the Cold War.

As for the development of ED in the US-South Korean alliance during the post-Korean-War period, Victor Cha and Chaibong Hahm, Sue Mi Terry, Sunghan Kim, etc., analyzed it. There are also the latest researches on the US ED for South Korea, such as Chuck Hagel, Malcolm Rifkind, Kevin Rudd and Ivo Daalder, and Ian Bowers and Henrik Stålhane Hiim. On the other hand, the excellent previous studies on the advancement of North Korean nuclear weapons have been done by Ankit Panda and Jeffrey Lewis.

(2) History of Extended Deterrence in the ROK-US Alliance

1) After World War II

Extended deterrence (ED) itself is a simple mechanism; the US extends its deterrent to originally protect itself to a third party that most importantly is its ally and partner (Anderson and Larsen, 2013, pp. 4-6), and this ED consists of two parts, extended nuclear deterrence and extended conventional deterrence (Ogawa, 2016, p. 28).

There are three main purposes for the United States to provide ED to its allies. Firstly, to deter the expansion of its enemies that can erode the US's national interests. Secondly, it has positive effects in terms of the alliance policy, strengthening its ties with those allies by giving the assurance such a commitment brings to the ally so that even when the US's commitment is questioned, then the ally can perceive the level of its safety increases. Finally, US ED fulfills the non-proliferation purpose.

The first turning point in US ED occurred with the Korean War. On January 12, 1950, US Secretary of State Dean Acheson under President Harry Truman announced the so-called Acheson Line. This line may have been interpreted as the exclusion of the ROK was officialized, while it implied that the US could commit to protect the ROK under the UN Charter when a potential communist invasion had been initiated. Furthermore, Truman implemented a withdrawal of its troops from South Korea on June 29, 1949, leaving only its 5,000 personnel-sized military advisory group stationed there instead.

These US signals were misperceived as the decline of the US ED by North Korea, and eventually the Korean War broke out, putting the Korean peninsula into a state of a civil war, which meant that the US ED did not function. However, the Truman administration at last exerted its resolve to commit to defend South Korea by dispatching its troops to fight against North Korea in a manner of “the commitments of the entire civilized world under the Charter of the United Nations”, so that it ended up not only establishing its worldwide military intervention strategy more aggressively than the containment strategy George Kennan advocated, but also solving a “commitment problem” where its allies had become skeptical as to whether the US could really save them if they were threatened by a communist invasion.

The US military intervention invoked the Mao-Zedong-led PRC to in turn cooperate militarily with North Korea, which finally turned the inter-Korean civil war into an international conflict that could have evolved into the World War Three whose possibilities Truman clearly pointed out (Truman, 1966, pp. 284-288, 338, 342). The fear Truman had about an escalation into a third World War was shared by Stalin and Mao, which led them to make a meticulous harmony of powers not infringing upon each other's core interests, or a limited war, as Schelling sketches out. On the other hand, another influence of nuclear weapons during the Korean War appeared by way of compellence in the latter stage. The Eisenhower administration that embarked in January 1953 with a manifesto to finish the unpopular Korean War, attempted to use its nuclear arsenal to get the war to come to an end by threatening China (Dingman, 1988-1989).

Despite the ceasefire of the Korean War⁵, the US ED, proven trustworthy for its western-side allies including the ROK then, did not vanish throughout the Cold War. Rhee Syngman, the ROK President, had keenly required the US, originally isolationist-oriented and inclined to making the armistice agreement with the DPRK and China, to conclude an official treaty that would guarantee the US's commitment to defend South Korea from a potential communist invasion. On June 18, 1953, he forcefully tried to get the US's reassurance by releasing about 26,000 prisoners of war controlled by the US, who were subject to a negotiation over an armistice agreement with its counterparts.

The Eisenhower administration was angered at the incident Rhee had initiated, and yet they finally signed a “Mutual Defense Treaty Between the US and the ROK⁶”, which meant that South

5 Rhee refused to sign the armistice agreement because he wanted to pursue the reunification by means of the US-led military force.

6 This treaty was signed in Seoul on August 8, 1953 and J. Dulles signed it in Washington D.C. on October 1.

Korea was officially included into the US defense line in Northeast Asia. Additionally, in November of 1954, the US and the ROK adopted "Agreed Minutes Relating to Continued Cooperation in Economic and Military Matters" that specified the 720,000-personnel-size South Korean troops were militarily and financially supported by the US.

However, the quality of US ED for South Korea was altered in line with the revision of the US nuclear doctrine. On January 12, 1954, the Eisenhower administration advocated a "Massive Retaliation Strategy". This new nuclear strategy Eisenhower adopted was aimed at a budgetary cut in defense-related expenses, which had sharply increased during the Truman administration, by decreasing the military budget for its conventional military force, and prioritizing the role of the nuclear deterrent instead, which is called the "New-Look" policy with a slogan of "Security and Solvency"⁷. Finally, Eisenhower and Rhee came to an agreement where the US promised to continue stationing its troops in South Korea and to introduce new cutting-edge US weapons onto the ROK soil, while South Korea admitted its troops' size to be 630,000⁸ and required the US to introduce tactical nuclear weapons into its territory to be able to make up the military deficit with North Korea⁹.

Furthermore, what should be referred to in the US decision embracing Rhee's petition to introduce the US's tactical nuclear weapons was the "Sputnik Shock" in 1957: the USSR, a sponsoring state for the DPRK, had steadily developed its ballistic missile technology. In 1953, the theatre ballistic missile, R-5, was tested and in August 1957 the first ICBM, R-7, was launched for a flight test, which led the Soviet to make an unprecedented breakthrough by getting the Sputnik-1 into orbit. The emergence of a Soviet ICBM that yielded the possibility that the US mainland could be targeted by nuclear bombs, must have weakened the credibility of its ED for South Korea (An, 2015, pp. 21-58)¹⁰.

In these complicated surroundings, the US steered to introduce its tactical nuclear weapons, such as M442 atomic cannons and MGR-1 Honest Johns, into the US Force Korea (USFK) between late 1957 and early 1958, while not making it public because an introduction of new weapons into the Korean Peninsula was prohibited in the Article 2, Paragraph 13(d) of the armistice agreement (Lee, 2009).

However, the credibility of the US ED for the ROK was further reduced when China conducted its first nuclear test in October, 1964. The fact that China had directly intervened in the Korean War and had then become a nuclear-armed state was perceived as a substantial threat by Park Chung Hee, the new ROK President. Park named it as a "new threat" in his new-year speech in January 1965 (PARK, 1965).

The anxiety South Korea had about the US ED was accelerated by two additional phenomena: Firstly, Robert McNamara stated in September 1967 that the US would deploy ABMs (Anti-Ballistic Missiles) to protect the US mainland from the Chinese nuclear force, which could be viewed as an

7 In the wake, the US suggested downsizing of South Korean troops to 620,000 from 1956 while the number of US troops stationed in South Korea that had peaked at about 325,000 in 1950 also shrank to about 85,500 in 1955

8 The strength of the Army: 565,000 troops, that of the Navy: 16,000, that of the Air Force: 22,400, and that of Marines: 26,000.

9 Rhee argued that it could allow the US to reduce the size of the US stationing troops if the US would deploy nuclear weapons in 1957.

10 National Defense Scientific Research Institute (NDSRI) of the RoK successfully launched the first experimental rockets on October 10, 1958.

acknowledgment that China possessed de-facto ICBM capability¹¹. Secondly, in November 1969, Richard Nixon officialized the “Nixon Doctrine” where the US determined to establish détente with the PRC, thereby decreasing the tension between the US and China by a low-profile policy lowering its commitment level in East Asia. This doctrine was embodied by the full or partial withdrawals of the “trip-wire” US troops stationed in Viet Nam, Taipei, and South Korea, while the US preemptively established the non-proliferation regime, such as NPT in 1968, which has effectively prevented the occurrence of a nuclear domino effect in East Asia including the ROK¹².

Since the US phased withdrawal plan was steadily realized in East Asia, Park determined to go for a more independent defense policy to secretly develop nuclear weapons in the early 1970s so as to overcome the situation where the US ED would have possibly malfunctioned. Until his death, Park had aspired to have a self-reliant defense policy by pursuing nuclear development. He revealed this when he was interviewed by the Washington Post on June 12, 1975, mentioning the ROK would develop its own nuclear weapons if the US nuclear umbrella were removed (Evans and Novak, 1975). This declaratory strategy forced the US to take several follow-up actions to strengthen the waning credibility of its ED from the ROK. James Schlesinger, Secretary of Defense, admitted its deployment of tactical nuclear weapons in the ROK for the first time, and then clarified that the US would consider the use of its nuclear tactical weapons deployed in South Korea if it is deemed necessary in an interview on June 20, 1975 (Yu, 2016, pp. 34-35)¹³.

In addition, the US invented a new method to enhance the credibility of its ED, that is, the US-ROK Combined Military Exercises, such as Ulchi Focus Lens and Team Spirit began in 1976. This brought about the establishment of the ROK-US Combined Forces Command (CFC) in 1978 that is responsible for USFK-led leadership and planning of all combined exercises since authorized to own the peacetime and wartime operational control (OPCON) over South Korean troops, while the joint statement of the 11th US-ROK Security Consultative Meeting held in the same year included the term “nuclear umbrella” that the US would provide to protect South Korea when necessary for the first time.

In the 1990s, the dissolution of the USSR meant that the US became the only superpower. In this unipolar structure the US military force overwhelmed other nation-states in both nuclear and conventional weaponry. Under this disarmament-oriented situation the US declared its intention to remove all the tactical and theater nuclear weapons from the world including the ROK in September 1991, which means the US shifted its deterrence strategy from nuclear-based to conventional-weapon-based. However, a turning point for the US conventional-based ED for South Korea was a new regional threat instead of the USSR, in the form of North Korea. The first nuclear crisis between the US and the DPRK arose, and the tension between them was escalated in line with the North Korean moves, which might have been defined as a military buildup for nuclear development in the US’s perception, whereas North Korea perceived it as justifiable under the name of a peaceful use of nuclear energy.

11 In the summit between the US and RoK held in August 1968, R. Nixon pointed out that China would possess 25-30 ICBMs by 1976 and the potential Chinese nuclear blackmail of South Korea had to be deterred by an ABM.

12 South Korea signed the IAEA safeguard in January 1968 and declared the signing of the NPT in July of the same year.

13 Also please refer to “Defense - Schlesinger Interviews” (Nessen, 1975).

2) Shield and Spear: The Comprehensive US-ROK Deterrence System and Advanced Nuclear Weapons of North Korea

a) Enhancing Shield with Spear

Since the first nuclear crisis, the nuclear threat of North Korea has been steadily growing for the past thirty years: the DPRK conducted six nuclear tests: it also successfully conducted the missile tests including three ICBM tests, which could have reached the US mainland.

To deter nuclear-armed DPRK and relieve its allies in Northeast Asia concerning the credibility of the US ED, firstly, the US has reaffirmed to provide its traditional ED for its allies, such as keeping its forward-deployed troops strategically stationed to play the role of a tripwire by which the US automatically intervenes in a conflict when it is activated, while publicly ensuring its commitment to provide its ED to defend the ROK through the SCM Joint Communiqué since 2006 (US embassy in ROK, 2020).

Secondly, the US has introduced a Missile Defense (MD) system, deterrence by denial, by which it is able to strengthen its credibility of ED in this region. When it comes to alliance policy, MD largely depending on conventional weapons was one of the best choices for the US, which did not prefer the further proliferation of nuclear weapons.

For example, reintroducing tactical nuclear missiles may have provided an excuse for North Korea to justify its plausibly undergoing nuclear development, which could trigger a nuclear domino effect among the US allies in Northeast Asia. Nonetheless, the introduction of MD, not reintroducing a tactical nuclear force, to the ROK was less stimulating to North Korea's motivation to possess a nuclear deterrent against the US, and could even get South Korea to refrain from having the motivation to become a nuclear-armed state against North Korea, rather making its allies depend more on the US military weaponry and its military related facilities and devices, because the warning about missiles bound for its allies in Northeast Asia largely come from the US assets such as early warning satellites (Green and Cronin, 2001, p. 177, pp. 191-192).

While Japan accepted to be fully integrated into the US-led MD system, the ROK has chosen to be a bit more independent than Japan in missile-counter capability-building since the Kim Dae Jung government, by mapping out its own "triad defense system", or "three-K" defense policy to cope with the emerging nuclear threat, in parallel with enhancing its cooperation with the USFK. The three-axis defense system consists of the Kill Chain, the Korea Air and Missile Defense system (KAMD), and Korea Massive Punishment and Retaliation (KMPR)

The Mun Jae In government decided to rename the three-axis defense system as "Nuclear-WMD Response System (NWRS)", Kill Chain and KMPR to "strategic target strike (STS)" and "overwhelming response (ORE)" respectively, and KAMD to the "Korea-style missile defense (KMD) (Yonhap News, January 10, 2019)" after sorting them out into two parts, namely the "KAMD" and the "strategic strike system" through the "concepts of the alliance's comprehensive counter-missile operations (4D Operational Concept)" that the US and the ROK have agreed since the 46th the US-ROK Security Consultative Meeting (SCM) according to the 2018 Defense White Paper.

Yet the essence of NWRS has stayed unchanged to encounter the DPRK's advanced nuclear and conventional weapons, thereby mixing deterrence by denial and punishment: STS and KMD belong to a denial strategy "seek to deter an action making it infeasible or unlikely to succeed, thus denying a potential aggressor confidence in attaining its objectives (Mazarr, 2020)¹⁴"; ORE is one of the

14 The USFK stationed in the ROK can be seen as a denial strategy.

punishment strategies “threatens severe penalties if an attack occurs (Mazarr, 2020)¹⁵.”

When detecting some indications that North Korea would probably attack South Korea with its missiles and rockets, firstly NWRS would work with the idea of “prompt hard-target capability¹⁶.” In other words, the ROK plans to use its “spear” first. The STS seeks to preemptively destroy hard targets, such as fixed satellite launching stations and movable ballistic missile launchers, before they are fired from launch pads and Transporter, Erector, Launchers (TELs). The ROK-version Kill Chain South Korea has envisioned is a preemptive attack platform against North Korean WMD.

This STS can basically work as follows: Find→Fix→Track→Target→Engage→Assess: the US and ROK early warning satellites detect that the DPRK is about to engage in attacks to South Korean Soil; Next, reconnaissance aircrafts and drones fix the information of targets; these early warning and reconnaissance assets track the location of target; Korea Joint Command & Communication System (KJCCS), Korean-version C4I (Command, Communication, Control, Computer, and Intelligence) System, decides how to preemptively attack the target; selected stealth fighters, such as F35, and/or missiles, such as Hyunmoo series, attack the target; all these military assets report the result of the attack and assess it. This STS process aims to be finalized within 30 minutes.

After the scheme of spear fails, the shield would be triggered. The main shield South Korea has imperfectly owned is KMD, which plans to intercept enemy’s missiles such as ballistic missiles and fighters at various heights in the terminal phase. South Korea has focused on establishing a low-layer (less than 40 km altitude) missile defense with MIM-104 Patriot missiles (PAC-2 GEM-T, range: 20 km. altitude: 20-30 km), which are going to be replaced by PAC-3 MSE missiles and domestically produced M-SAM missiles (KM-SAM/Chungung Block-1&2: range: 40km, altitude: 10-25 km). The mid-layer of missile defense can be covered by L-SAM missiles that are able to intercept missiles flying between 40 and 60 km altitude, which are expected to be developed by the mid-2020s, while enemy missiles flying at a high altitude may be caught by SM-3 (Standard Missile-3) launched from Aegis destroyers in the near future.

So far, the KMD has not, however, been as independently functioning as the RoK has intended. It has to be backed up by the US MD assets. The USFK has introduced PAC-3s with ranges of 20 km radius and less than 30 km altitude since 2004, and Terminal High Altitude Area Defense (THAAD¹⁷) with AN/TPY-2 radar for intercepting the DPRK missiles flying in a 200 km radius and between 40 and 150 km height since 2017.

The key is whether the KMD “Find” (detection) process can successfully work or not: space-based sensors put on early-warning satellites, such as ANASIS-II, land-based (AN/TPY-2: X-band, EL/M-2080 Green Pine: L-band) and sea-based (SPY-1D(V): S-band) radars, and reconnaissance aircraft can detect the sparks when an enemies’ missile is launched, and then the “Find” assets begin to chase the trajectory of the missiles while land and sea-based radars, and reconnaissance aircraft track it as well. Nevertheless, South Korea has not possessed as many fully-fledged satellite combinations as has been envisioned¹⁸, so that it has needed to largely rely on the US defense support program (DSP)

15 What should be noticed here is military assets for ensuring deterrence by either denial or punishment can be used for prevention or invasion from the enemies’ perception.

16 It is one of the counter force capabilities and pursues to destroy hard targets within 30 minutes out of enemy’s missile launches.

17 The ROK has not purchased a THAAD system to deploy its artillery brigade yet since China has been against it.

18 South Korea has moved forward the “425 Project” where five spy satellites would be integrated by 2023. Yet the 425 Project would likely fall behind schedule due to the COVID-19 pandemic (Kim, D., October 26, 2020).

early warning satellites for the detection process at the present time.

Finally, these collected data for calculating the more accurate trajectory inputs to the interceptors shown above should be made use of for deterrence by punishment as well. If some enemy's missiles penetrate KMD and hit any cities in South Korea, the ROK would immediately retaliate to the enemy's military commands and facilities at least in accordance with ORE where C4I is used for determining how and where to retaliate, which means even in this third-axis phase of the NWRS, the ROK should be principally dependent on the information that comes from the US satellite installation engaging in the "Find" operation. More fundamentally, the wartime operational control of South Korean troops has not been transferred from the CFC to the ROK government since 1978¹⁹. Any operation on the NWRS should be collaboratively implemented with the USFK.

b) Advanced Spear to Destroy the Shield

Above all, since the emergence of the new nuclear threat after the collapse of the USSR, the US extended deterrent (ED) for South Korea has consisted of a two-fold military force: the forward-deployed US troops and the US-led conventional weapons, collaborating with the ROK military force.

However, the advancement of the North Korea's nuclear weapons has cast doubt on the credibility of the US ED for the ROK not only tactically but strategically. Would the current US ED be credible enough to relieve South Korea's anxiety about whether the US could immediately intervene to protect them in a strategic view, even though North Korea already possesses intercontinental missiles (ICBMs) which can deliver thermonuclear bombs to the US mainland?

(i) The Advancement in Strategic Weapons

First of all, the DPRK has made a breakthrough in the development of nuclear detonation technology by its sixth nuclear test on September 3, 2017. According to the statement issued by the Nuclear Weapons Institute, it tested a "two-staged²⁰" thermonuclear bomb to be inserted as the payload of an ICBM and its every process was successfully confirmed, while Kim Jong Un directly guided its test (KCNA, September 3, 2017). This was accomplished with the largest magnitude seismic shock, M6.1-6.3²¹, ever recorded and is translated to 250-300kt in yield, 17 times greater than the Little Boy dropped on Hiroshima.

Another point here is that in the official statement on the sixth nuclear test, the DPRK clearly stated its H-bombs "can be detonated even at high altitudes for a super-powerful EMP (Electromagnetic Pulse) attack according to strategic goals (KCNA, September 3, 2017)", from which we can infer that it is no longer disputable whether North Korea has the intention to implement an EMP attack that can cause a black-out in the enemies' metropolitan cities and can possibly negatively affect enemies' satellites and even the Van Allen belts surrounding the Earth.

Another significant piece of scientific data on the North Korean nuclear weapons indicates how many nuclear weapons the DPRK possesses. The US intelligence agency reportedly tends to estimate that the number of nuclear weapons is 20 - 60 or more (Sangar, March 9, 2018; Albert, 2018), and so

19 The peacetime operational control was transferred to South Korean in December 1994.

20 It means North Korea can create more powerful thermonuclear weapons, such as 3F(fission-fusion-fission) bombs.

21 USGS, CTBTO, Norsar, Columbia University analyzed its yield was approximately M6.1-6.3 by using seismic data, while ISOR published its satellite imagery-based analysis on the sixth nuclear test that it recorded 245-271kt, mentioning that the entire mountain used for the test have moved 54cm (An, November 18, 2019).

does South Korea (Yonhap News, October 1, 2018). Siegfried Hecker estimates the number would be approximately 30 based on the experiences of his four visits to North Korea (JTBC, September 28, 2018), while according to David Albright, “North Korea had about 14 - 33 nuclear weapons” at the end of 2017 (Albright, 2018). Now, the figure has probably been increasing since about three years have since passed²².

Next, North Korea succeeded in the ICBM tests, Hwasong-14(KN-20) and -15(KN-22), an unprecedented phenomenon that had not occurred before 2017, and this obviously displayed that its power projection capability could reach the US mainland. In particular, the Hwasong-15 launched on November 29, 2017 made a breakthrough in its delivery system. This two-stage ICBM was fitted with a new 80-ton-force Gimbal engine using a liquid propellant, and all its specifications were upgraded from the previous tests. It soared to 4475 km and flew a distance of 950 km with a flight time of 53 minutes, which indicates that North Korea aimed to conduct a more pragmatic drill that night and “has sufficient range to drop a nuclear bomb on any point in the US (Rubin. 2020)”.

Though some analysts have argued that the reentry vehicle would not work adequately, the CIA evaluated the DPRK’s reentry technology is “likely sufficiently advanced to pose no performance problem²³” and the CIA assessment is “supported by analysis of data gathered from ground, sea, and air-based sensors by the US National Air and Space Intelligence Center (NASIC)”. Furthermore, these test launches used TELs whose invulnerability undoubtedly strengthened the survivability of ICBMs against any US preventive attack that could be facilitated by its MD system.

The DPRK’s military parade held on October 10, 2020 revealed that the delivery system had been steadily upgraded; TELs have become domestically-produced, which means North Korea can be viewed as entering into its mass-production phase; the Hwasong-15 “mode-2²⁴” (or Hwasong-16), with 11 axis TELs seems to be capable of carrying three to four nuclear warheads simultaneously because its length and diameter has been made longer and wider than the mode-1, having a post-boost vehicle (PBV) added, and capable of being used as a satellite launch vehicle (SPV) for the Fractional Orbital Bombardment System (FOBS)²⁵.

These facts indicate that the current US Ground-Based Midcourse Defense (GMD) having 44 interceptors is viewed to still be ineffective if over four ICBMs carrying three nuclear warheads mounted with H-bombs that could be detonated at various altitudes are simultaneously fired at the US mainland, several of which would probably be set off at an altitude of 150-400 km, a height suitable to evade THAAD system and generate an EMP. To overcome such a threat, the US had planned to increase the number of GBIs to 64, but even if they do so, 64 GBIs cannot shoot down over six ICBMs each carrying an MRV with three nuclear warheads. Moreover, the US have decided to cancel this plan in order to create a new version of the GBIs that would be deployed in 2030 at the earliest (McNicoll,

22 The RAND Corporation and the Asan Institute for Policy Studies jointly published a report in April 2021, arguing the possibilities its nuclear stockpiles would be 67-106 as of now, and can reach 151-242 in 2027 with the assumption that the DPRK annually produced 12-18 nuclear warheads (Bennett, Choi, Go, Bechtol, Park, Klingne, and Cha, 2021).

23 This view was recently reconfirmed by the “2021 Index of US Military Strength” issued by the Heritage Foundation on November 17, 2020.

24 The nuclear-armed states, such as the US and USSR, developed different modes of the same line in ICBMS.

25 Kim Jong Un described the Hwasong-15 mode2/Hwasong-16 as a global strike rocket at the Eighth Congress of the Workers’ Party of Korea, while conducting research into perfecting MIRV technology at the final stage (KCNA, January 9, 2021).

November 12, 2019)²⁶.

The emergence of the domestically-produced TELs that are movable both by overground and underground roads makes boost-phase defense hard to implement. The early-warning satellites and radars need to detect infrared produced by the sparks of rocket engines in order to locate the exact position of the enemy's rockets and missiles but mobile missile launch systems make this difficult.

Moreover, there are some possibilities that North Korea would be able to strike US soil, using satellite bomb technology as the Sputnik used to. The Hwasong-15 mode-2/Hwasong-16, which seems to have combined two revolutionary 3.18 engines (four chambers) that appear to have been developed on the basis of RD-250 engines, three of which the USSR combined when developing the R-36 for the FOBS, would be able to deliver satellite bombs on its south satellite orbit, and there are currently no effective countermeasures to intercept the rockets with satellite bombs.

From the view of nuclear deterrence theory, if the US decision-makers have perceived the risk not only to its military facilities but also its metropolitan cities as shown above, the US would never sacrifice its "vital national interests", metropolitan cities such as Washington D.C. and New York City, in order to protect the "peripheral" Seoul in this situation.

(ii) The Advancement in Tactical Weapons

In addition to the decline of the strategic credibility of the US ED, the advancement of DPRK nuclear weapons has also made it doubtful whether the US-led NWRS where the ROK has inevitably still relied on the US military assets and command, would tactically protect South Korea from potential North Korean attacks including nuclear first use (NFU) (KCNA, October 10, 2020). The second military innovation in the DPRK's nuclear missile capability development is new short and medium-range missiles and rocket systems tested after the first US-DPRK summit held in 2018.

These new missiles and rockets demonstrated their much stronger capabilities to intrude the US-led NWRS. The first one is the Iskander-type short-range missiles (KN-23), which were tested four times on May 4 and 9, July 25, and August 6, 2019, and displayed during the previous military parade, demonstrating a velocity recorded at over Mach 6.9 with a flight of 450-690 km, whose guided trajectories were kept at a low altitude (30-50km height) and which were maneuvered during their flights so that the US-led NWRS could not calculate their landing points. In the history of missile development, this missile technology with a Maneuverable Reentry Vehicle (MaRV), pulling it up in the terminal phase enables the accuracy (circular error probable: CEP) to be rapidly increased. Additionally, KN-23 is solid-fueled and launched from TELs (there were two new TELs in the 2020 military parade) so that their invulnerability to US-ROK prevention is quite high. Furthermore, in March of 2021, its extended version delivering a 2.5-ton warhead was successfully tested, flying 600 km at an apogee of around 60 km (KCNA, March 26, 2021).

Secondly, North Korea drilled with large-caliber multiple launch rocket systems (LC-MLRS), having six large caliber, approximately 400 mm diameter canisters transported by TEL, twice on July 31 and August 2, 2019,²⁷; they flew very fast at over Mach 6.9 maintaining very low trajectories of about

26 As for the development of MRVs, what is important is that in retrospective, the emergence of MRVs could accelerate rapidly increasing the number of nuclear warheads in the nuclear-armament history between the US and USSR. Additionally, as producing a GBI costs 70-100 million dollars or more, it cannot be regarded as cost-effective to keep increasing the number of GBIs to deal with saturation attacks and MRVs.

27 South Korean Government misunderstood the flight test on July 31 as they were short-range ballistic missiles.

20-25km altitude, while changing course using their grid fins during the 220-250km long test flights. In addition, the DPRK mentioned their guidance capability was successfully confirmed in the drills.

Thirdly, ATACMS (Army Tactical Missile System)-like short-range missiles (KN-24) were tested twice, on August 10 and 16, 2019, and March 21, 2020. The KN-24 tests showcased the range of 230-400km, the low-altitude (30-48 km height) flight, the launch from TELs, and over 6.1 times the speed of sound, which outnumbered the capabilities of the original US ATACMS. Also, they have a high accuracy as they could successfully hit their target, a small rock, and would carry submunitions to more widely strike enemies' territories.

Fourthly, the DPRK conducted tests to verify its super-large-caliber (about 600mm diameter), multiple rocket launcher, KN-25, on August 24, September 10, October 31, and November 28, 2019. It is estimated to be capable of both conventional and nuclear use, with the mobility of TELs, achieving a 330-380 km long flight while keeping on a depressed trajectory from 50km to 97km altitude and flying at 6.5 times the speed of sound. Another striking feature is the ability to rapidly fire two rockets in a low trajectory at 30-second intervals by which its invulnerability can be enhanced shortening the time to hit-and-away²⁸. In addition, three kinds of multiple launchers (four, five, and six launchers) in KN-25 appeared while loaded on wheeled and tracked TELs during the 2020 military parade.

Finally, the new type of SLBM, Pukguksong-3(PGS-3/KN26), also emerges as a strengthened threat through its test on October 2, 2019. It was launched almost vertically with solid-fuel and cold launch technology from a barge, and flew on a lofted trajectory reaching about 910km altitude and 450km parallel flight, which shows it can have a 2000-3000km range when fired with a minimum energy trajectory. Furthermore, it has a round nose cone that implies it can carry MRVs, while the grid fins that were mounted on previous models have disappeared. Since SLBMs are launched from the ocean, the PGS-3 becomes invulnerable to any US preventive attacks as well as rendering the US-led NWRS incapable of finding the launching point. This means that the US-led NWRS will now be required to monitor the DPRK's SLBM-related to moves 24/7, which would result in the diffusion of the MD's capabilities.

Additionally, new 3000t-class submarines having three to four launch pads are seemingly under construction according to KCNA's report in July 2019, and the PGS-3 is suitable for developing its longer-range solid-fueled missiles launched from land, considering the case of the PGS-2 that was a spin-off version of the PGS-1. During the 2020 military parade, the new version of SLBM, PGS-4 made its debut, showcasing the shorter length and bigger diameter which would fit into the new submarines North Korea has developed²⁹.

These newly appeared missiles and rockets have significantly decreased the chance that the US-led NWRS would be able to shoot them down, which means the increased probability that North Korea could penetrate the US-centered MD system to strike not only the US mainland but also South Korea's soil in which a part of the MD assets has been deployed, because of the following reasons.

Firstly, at the present time, the missiles and rockets flying on a depressed trajectory cannot be intercepted by THAAD and even SM-3, whose presumed apogee to be able to intercept is over 40km, while also making it hard for the MD radars to catch them. In this case, PAC-3s would have to intercept them in the terminal phase. However, the range of the PAC-3, thirty-four of which have been deployed in South Korea is limited to within a 50km radius. In other words, all the US-led NWRS assets probably

28 North Korea conducted two more flight tests of KN-25 in March 2020, showcasing 20-sec launch interval.

29 The PGS-5's nose cone containing warheads gets larger than that of PGS-3(Kim, J. Y., February 28, 2021).

will not work until the North Korean advanced missiles and rockets enter into their terminal phase.

Secondly, in the terminal phase, however, the PAC-3 probably will not be able to sweep all of the saturation attacks made by North Korea's missiles and rockets such as MLRSs, Scuds, and SRBMs. Moreover, these saturation attacks would be a mixture of various kinds of the above.

Thirdly, the US-led NWRS interceptors should necessarily input estimated data about the trajectory including the landing points of the enemy's missiles and rockets. The estimated data is calculated based on the law of inertia, regarding when and where the missiles and rockets were launched and when the burning time of rocket engines ended so that the early warning satellites and radars can detect them individually. Nonetheless, the advanced mobility of the North Korean missile program, not only by developing its land and sea-based mobile launchers but also with the MaRVs, delays this calculation³⁰. The solid-fueled missiles and rockets transported by TELs and submarines make the above calculations more complicated by hiding their launching points, while augmenting their survivability to the US preventive attacks. The same logic is also applied to STS as well.

Fourthly, the velocity of over Mach 6 becomes vitally problematic for the MD system because the longer delay in calculating the point where MD can appropriately shoot it down becomes critical in the case of South Korea, as missiles fired from Pyongyang to Seoul take just 1-2 minutes, and from Pyongyang to Busan take about 3 minutes, on the preconditions that the missiles' speed is Mach 6 or 122.5km per minute for the KN-23, -24, and -25 as recorded during the tests. Simply put, South Korea would be unlikely to have sufficient time to compute the trajectory of the DPRK's missiles under actual warfare conditions. As a matter of fact, the US and ROK's MD assets could not catch several trajectories of the new types of the DPRK's missiles and rockets, one of which was KN-23³¹.

Fifthly, the missiles for attacking South Korea would be mounted with nuclear warheads and so highly accurate that they could conduct pinpoint attacks on all the US bases in the ROK, its metropolitan cities, and nuclear power plants. Even the DPRK's new MLRS would likely deliver nuclear warheads allowing for the US atomic canon invented in 1953 and Putin's testimony that Kim Jong Il mentioned A-bombs that were able to be simply delivered to Seoul by its rocket system (Sputnik, October 4, 2017)³².

Finally, what is vital here is the current US government's attitude on these advancements of short- and medium-range missile development. They have noted these developments do not violate the spirit of the summit in which North Korea promised a moratorium on ICBM tests, so that D. Trump said that they were OK. As of May 2021, Joe Biden has followed the Trump administration's stance where it made a deal with North Korea in order to acquire a moratorium.

3) Evaluating the Credibility of US Extended Deterrence for South Korea

As shown above, North Korea has possessed "strategic and tactical³³" capabilities to attack the

30 All the US-MD tests have been conducted in the condition where the data on the launching time and point are input beforehand (Saito, September 9, 2019).

31 In reality, there are cases that South Korea and Japan miscalculated the 600-km flight of the extended version of KN-23 tested in March of 2021 as 450 km and their estimates of its launching points differed from each other. On April 28, 2021, the Ministry of Defense of RoK acknowledged that they could not trace its flight properly and that it flew about 600 km.

32 Pakistan has also possessed the similar type of MLRSs.

33 North Korea also possesses theater nuclear forces capable to attack the US and its allies' military force located in Japan and Guam.

US and any of its allies in Northeast Asia, including South Korea. Nuclear deterrence theory points out that deterrence takes place when the capability to be able to critically damage an enemy and the intention to be willing to use the capability if necessary, are perceived by the enemy.

The DPRK has signaled its intention to use the advanced military capability: the latest and most striking signal is Kim Jong Un's speech at the military parade of this past October 2020, when he stated that "Our war deterrent, which is intended to defend the rights to independence and existence of our state and safeguard peace in the region, will never be abused or used as a means for preemptive strike. But, if, and (only) if, any forces infringe upon the security of our state and attempt to have recourse to military force against us, I will enlist *all* our most powerful offensive strength in advance to punish them (KCNA, October 10, 2020)". Also, North Korea has intentionally leaked pictures containing maps showing us where the targets of its scud and ballistic missiles in the ROK, Japan, and the US mainland, are located. This capability and intention to threaten has been perceived by the US decision-makers, policymakers and think-tankers³⁴.

The North Korea's deterrent has seemingly got to the level of minimum deterrence. McGeorge Bundy stated that the critical factor compelling both sides to a political solution was "Given the survivable overkill on both sides, there is *a parity of mortal danger* that is not sensitive to this or that specific difference in numbers of warheads or megatons (Bundy, 1988, p. 606)"; McNamara pointed out that "in 1962 it would have made no difference in our behavior whether the ratio had been seventeenth to one, five to one, or two to one in our favor - or even two to one against us (McNamara, 1986, p. 45)³⁵"; China, India and Pakistan, employed to deter their counterparts who possessed superior conventional forces, and this worked out in the past. For example, India used to think sixty nuclear weapons were enough to deter both Pakistan and China; Pakistan might need twenty bombs to deter India; China possessed twenty ICBMs with H-bombs to deter its enemies by 2003 (Sagan and Waltz, 2003, pp. 109-116); and now the DPRK possesses H-bomb-tipped ICBMs movable with TELs.

First and foremost, in this situation where the nuclear-armed North Korea has obtained the capability with its minimum deterrent against the US, what Kissinger used to mention gets problematic on the credibility of the US extended deterrence (ED) for the ROK in terms of the nuclear deterrence theory: he mentioned that the US never sacrifices its vital national interests to protect a peripheral one. In a nutshell, the credibility of US ED for South Korea has been worsened.

Next, this phenomenon theoretically implicates two behavioral changes relating to the US ED for the ROK would follow according to the concepts of compellence and connectedness: there has been a lot of room for the US to compel North Korea to abandon its nuclear ambitions, but the diplomatic space for compellence for the US has relatively decreased, while the room for North Korea to exert compellence on the US has appeared for the first time since North Korea was founded in 1948. In other words, North Korea, which has had to remain passive to the US's coercive diplomatic policy for the past 72 years, can now employ a more active nuclear diplomacy in order to maximize its national

34 For example, in November, 2020, the Heritage Foundation issued a report, "2021 Index of US Military Strength" which clearly ranks North Korea as a highly capable threat for the US vital interest (The Heritage Foundation, 2021, p. 15). Plus, when it comes to other US establishment's perception on it, see my previous articles (Choi, 2019 and 2020).

35 What McNamara mentioned is based on his experiences in the Cuba nuclear crisis in which he was the US Secretary of Defense, and quantitatively indicates that a potential tipping point to establish a nuclear equilibrium between the US and North Korea would be when the figures of strategic nuclear weapons North Korea possesses reach around 100 if the US deployed nuclear warheads remain 1700.

interests, by exchanging something the US wants to get through deal-making.

In the wake of this new relationship, connectedness between the US and ROK could become weaker. Now that the connectedness between nuclear provocation and physical military capability in North Korea including power projection capability to the US mainland, has strengthened, the connectedness between the more active DPRK's behavior, seen as provocations from the view of the US and its allies, and the US responses to protect its allies based on the promise to provide its ED, will get increasingly blurred.

The symptoms of these expected changes have already appeared. When it comes to compellence, it has been found that the US sanction-based coercive diplomacy to claim the denuclearization of North Korea, for keeping the status-quo in Northeast Asia that has been quite advantageous for the only hegemonic superpower for the past thirty years, and they have just been waiting for some domestic changes in North Korea. However, the US aggressive attitude of not having literally made any concessions to the DPRK has been changing. The US has held summits with the DPRK twice during the D. Trump's presidency, although no former US presidents had held any summit with North Korea from 1948 to 2018.

Trump aimed to cap the further advancement of North Korea's nuclear weapons which became capable of attacking the US mainland by making deals, one of which is that the Trump administration has agreed to stop full-scale joint military drills and war games if North Korea maintains a moratorium on nuclear and ICBM flight tests. The deal resulted in the Trump administration ignoring the DPRK's missile tests except for ICBM ones, which had been seen as problematic from the views of the previous administrations. This is clearly a US concession that has never been given before in order to reduce the threat of a nuclear disaster taking place in its mainland if attacked by H-bomb-tipped ICBMs.

Would the current arms-control-based US diplomacy on the DPRK be set back when Joe Biden becomes the new president? In terms of nuclear deterrence theory, it seems that the new trend in the US-DPRK relationship will be continued, at least, in the early phase of Biden's presidency. In a debate for the US 2020 presidential election, he stated that he would meet Kim Jong Un "on the condition that he would agree that he would be drawing down his nuclear capacity (Herskovitz and Fabian, October 23, 2020)", while commenting about a lofty goal that the Korean Peninsula should be a nuclear-free zone and then acknowledging "they have much more capable missiles - able to reach U.S. territory - than they ever did before."

This kind of arms-control-based diplomatic idea has been shared by many policymakers and think-tankers in the US. The classic example is that of William Perry, the former Secretary of Defense in the Clinton administration that experienced the first nuclear crisis of the Korean Peninsula, who unambiguously pointed out that the US would need to negotiate with the DPRK, acknowledging it as a nuclear-armed state to normalize the US-DPRK relations (Jungang Daily, December 3, 2020). Also, "Some in the Biden camp would love to begin an arms-control dialogue with Pyongyang to manage the problem (Jeong, November 15, 2020)," says Evans Revere.

As for connectedness, there have been some indications to reveal it has gotten weaker in the US-ROK alliance. In July 2020, the US Army War College's Strategic Studies Institute (SSI) issued a report called "An Army Transformed: USINDOPACOM Hypercompetition and US Army Theater Design" in which it analyzes North Korea as one of the three existential US rivals and threats in the Indo-Pacific region, mentioning that the DPRK's advanced weapons "will afford it significant potential coercive leverage over South Korea, Japan, and the United States" and "a lingering strategic concern for the United States and its northeast Asian Allies through the next decade and beyond (The

US Army War College's Strategic Studies Institute, 2020, p. 40).”

In this precondition, this report is concerned that the tight concentration of forward-deployed US forces in a relatively small number of facilities in South Korea and Japan “is at once cost-effective and irresponsible strategically” because “with the exception of the Hawaiian Islands, most of the forward-deployed forces are well within range of the PRC’s conventional ballistic and cruise missile capabilities (The US Army War College’s Strategic Studies Institute, 2020, p. 52)”, which is what North Korea’s advanced conventional and nuclear weapons can cover as well although they have been positioned for the efficient prosecution of a second Korean War³⁶.

Thus, it recommends “some combination of permanent, rotational, and expeditionary US force presence” in the region, pointing out that:

[T]heater mission command should be lean, flat, forward, and more widely distributed. At present, Army command relationships and organization in USINDOPACOM are ill-suited to hypercompetition. Most Army mission command nodes in USINDOPACOM are focused on the Korean peninsula. The limited number of non-Korea-focused mission command nodes are too senior, layered, reliant on cumbersome support infrastructure, far away to be relevant to hypercompetition. The Army’s Korea mission remains important, but no mission command-related adjustment exists to account for transformational change in the People’s Republic of China’s ability to strike a majority of the United States’ in-theater headquarters (The US Army War College’s Strategic Studies Institute, 2020, p. 84)³⁷.

Mike Milley, the incumbent chairman of the Joint Chiefs of Staff, backed the permanent, rotational, and expeditionary US force presence in the region (Yu, December 5, 2020). Plus, the Trump administration downsized the US-ROK joint military drill to maintain the US ED for South Korea and did not punish the short and medium-range missile tests North Korea conducted, which has not been invalidated as of May by the Biden administration that officially mentioned it had completed its DPRK policy review at the end of April³⁸.

These phenomena can be seen as the indicators that firstly, the US has remained reluctant to be entrapped by peripheral conflicts that can be escalated to all-out nuclear war where the precious lives of its soldiers and citizens in South Korea and US mainland would inevitably be lost; secondly, connectedness between the possibilities of the occurrence of an emergency threatening South Korea’s survival and the credibility of the US ED for ROK that it has been thought would be automatically triggered in any form of a potential emergency, has become obscure³⁹.

36 The former USFK Commander General Leon LaPorte condemned the term, tripwire, as a bankrupt concept, while stated the agreement between the US and the RoK on relocation of US forces in Yongsan, Seoul (Yun, April 21, 2003).

37 China is capable of intervening to the second Korean War with nuclear force in accordance with a treaty with the DPRK.

38 In accordance with statements made by Jacob Sullivan, the current US security advisor, Jennifer Psaki, Whitehouse press secretary, and Mun Jae In, the President of RoK, between April and May of 2021, the Biden administration’s policy on the DPRK would likely be a more calibrated, practical, measured approach than previous US administration’s in order to achieve the ultimate goal of de-nuclearization in the Korean Peninsula, based on the US-DPRK joint statement issued during the first summit in Singapore.

39 As a matter of fact, the US troops stationed in South Korea need the US Congress approval to militarily intervene in warfare that takes place on ROK soil according to the Mutual Defense Treaty between them, which implies that

3. Conclusion

Therefore, the credibility of the US extended deterrence (ED) for the ROK has relatively declined along with the advancement of the DPRK's nuclear weapon's capability from the standpoint of nuclear deterrence theory. This situation would likely make South Korea push to get the US supplementary countermeasures to make up for its "commitment-problem" anxiety about the US ED. A key point is whether or not the US will change their nuclear policy for the ROK, which is that the US has thought its provision of conventional weapons like MDs to its allies is the best strategic choice for implementing two tasks, to deter North Korea so far, and to prevent the occurrence of a nuclear domino effect in Northeast Asia by keeping the favorable status-quo.

However, now that North Korea's nuclear weapons have achieved the level of minimum deterrence against the US, an alternative, reintroducing low-yield tactical nuclear weapons to the ROK, would emerge⁴⁰. The reintroduction of low-yield tactical nuclear weapons for the ROK would probably be fully controlled by the US as it has been in the NATO structure as of now⁴¹. This US-led nuclear-sharing option may be replaced by a newly developed military innovation such as hypersonic glide vehicles that can be deployed at locations farther away than South Korea and would be capable of deterring North Korea in the future; yet the very close geographic proximity of the two Koreas seems to make it hard for the US to drastically reduce the time pressure that would force decision-makers of relevant nation-states to determine vital decisions on war in the short time available for immediate responses to North Korea's potential nuclear attacks with MLRSs and SRBMs.

A dilemma the US and South Korea would encounter if they determine to reintroduce low-yield tactical nuclear weapons for the ROK is the rise of crisis instability in the Korean Peninsula. In other words, they would probably increase the risk of a contingency nuclear war which would inevitably result in a worldwide nuclear disaster. Furthermore, the COVID-19 and China factors imply that the US could be going to take a buck-passing-oriented alliance policy by imposing more budgetary burden-sharing on its allies, to the extent that the US can satisfy both seizing the initiative to assist its allies and helping to mitigate the fear of entrapment for itself. This situation can be viewed as an alliance security dilemma. The bottom line is surely that the US cannot escape from these dilemmas by taking a status-quo-oriented policy on the DPRK's nuclear development anymore, since history tells us that the more it tries to escape the issue, the more advanced the North Korea's nuclear weapons will become.

Finally, my recommendation for policy-making at this point is that we should put our first priority on preventing the occurrence of an accidental nuclear war, and so it is vital to keep the hotlines working between the US and the DPRK, and the two Koreas respectively. Next, they should refrain from conducting large-scale military mobilization including drills that could be misperceived by counterparts as a preparation for an invasion, because misperception has been the main cause of many

the USFK, the tripwire, is not allowed to be automatically involved with any warfare South Korea enters into.

40 Trump pushed forward with developing and deploying low-yield nuclear weapons. Meanwhile, Biden called them a "bad idea" and said that their existence makes the U.S. government "more inclined to use them" so far, while K. Harris was among those to call for a ban on the deployment of these low-yield nuclear warheads (Trevithick, December 29, 2020).

41 The US-led nuclear sharing would not drastically change the situation where the US mainland would likely be attacked by the enemy's nuclear missiles if the US uses either its tactical nuclear or conventional weapons against the nuclear-armed enemy. In addition, the reintroduction of the US tactical nuclear weapons to South Korea can be seen as signaling that the denuclearization of the Korean Peninsula the US has aimed has disappeared.

crises and wars in the past.

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