

CHAPTER 6

Deterring North Korea from Using WMD in Future Conflicts and Crises

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For nearly 60 years, North Korea has determinedly pursued the development of weapons of mass destruction (WMD) usually defined as involving chemical, biological, radiological and nuclear (CBRN) weapons. In recent years, North Korea has used its nuclear weapons to deter action against it and to coerce its neighbors in crises. As the North Korean regime continues to suffer many failures, it may someday lash out and cause a major war in Northeast Asia or the North Korean government may collapse into civil war and anarchy. With almost no chance of winning a conflict limited to conventional weapons, and having invested so much of their limited resources in WMD, North Korean leaders are likely to use these weapons in conflicts or further crises. North Korean WMD could cause immense damage to the populations and economies in Northeast Asia, potentially destabilizing the region for many years.

It is therefore incumbent on the United States and its allies to develop means to deter North Korean use of WMD. But doing so is not easy. The United States and the Republic of Korea (ROK) have clearly failed to deter multiple North Korean provocations associated with WMD. Moreover, the North Korean leaders appear insensitive to the kind of “assured destruction” nuclear weapon retaliatory threats against cities and industry that were the major basis for Cold War deterrence. Instead, deterrence of North Korean WMD use needs to be based more on the ability to defeat that use and deny its objectives, while still threatening retaliation that would undermine or destroy the North Korean regime.

This chapter describes such a deterrent approach. It first characterizes North Korea as a failing state, one which has used crises and may yet try to use conflict to strengthen the regime. It then addresses the nature of the North Korean WMD threat, how North Korea might use that threat, and the damage it could cause. This chapter concludes by

discussing how the United States and the ROK might deter the North Korean WMD threats in conflict and crisis.

“Know Thy Enemy”

The ancient Chinese philosopher/strategist, Sun Tzu, urged, “Know thy self, know thy enemy. A thousand battles, a thousand victories.” The situation in North Korea is serious, complicating efforts to deter North Korean use of WMD.

The Situation in North Korea

North Korea is a failing state. Its economy has had many failures. Its agricultural production is usually much less than its subsistence food requirements.¹ As a result, many North Koreans starve to death, while the rest of the population survives in part because of substantial foreign aid and in part because of market activities. But the North Korean regime fears that North Korean merchants are beyond the regime’s control, especially given the merchants’ extensive use of bribery. The regime therefore carried out a currency revaluation in late-2009 that allowed only minimal currency exchange and prohibited the use of foreign currency, seeking to wipe out the merchants’ capital. This currency revaluation also took away the savings of many North Korean elites, caused hoarding of goods (especially food) and resulted in hyperinflation.

Despite the North Korean efforts to control people’s lives, North Korea sees a lot of rebellious behavior. This includes refugee flows into China,² major black market activities, graft and corruption by North Korean authorities³ and even reported attacks on the North Korean leaders.⁴

Social unrest appears to be spreading in North Korea. The North Korean regime has tried to maintain its control of the country through the heavy use of propaganda. But “there is mounting evidence that Kim Jong Il is losing the propaganda war inside North Korea, with more than half the population now listening to foreign news, grass-roots cynicism undercutting state myths and discontent rising even among elites.”⁵

Meanwhile, North Korea's leader, Kim Jong-Il, is in bad health, may die, and his succession is not clearly resolved. His apparently designated successor, his third son Kim Jong-Un, is young and inexperienced. Trying to build his image, the regime credited him with the December 2009 currency revaluation, in the end making him appear to have caused a disaster.

The U.S. commander in South Korea, General Walter L. Sharp, has summarized this situation as the following: "Combined with the country's disastrous centralized economy, dilapidated industrial sector, insufficient agricultural base, malnourished military and populace, and developing nuclear programs, the possibility of a sudden leadership change in the North could be destabilizing and unpredictable."⁶

How Is North Korea Coping?

The North Korean leadership has a culture of empowerment to justify its legitimacy. As the regime has faced the many failures described above, it has used provocations to demonstrate it is still empowered and to create a diversionary conflict effect: the North Korean regime seeks to unify its elites against the common external adversaries, mainly the ROK and the United States, trying to steer the elites' displeasure away from the regime.

For example, in 2006 North Korea faced serious U.S. economic sanctions imposed because of illegal North Korean activities such as counterfeiting U.S. currency and goods. North Korea could have reversed these sanctions by admitting its illegal activities, apologizing for them and promising to stop them. But in the culture of empowerment, such North Korean action would make the leadership appear weak and subject to overthrow.

Instead, the leadership prepared for, and carried out, a series of provocations, including missile launches on July 4 (U.S. time), and escalating to a nuclear weapon test on October 8 (U.S. time). Kim Jong-Il had demonstrated his empowerment, and by February 2007, he had concluded an agreement with the United States and the other regional powers that reversed the U.S. economic sanctions and otherwise proved very advantageous to North Korea.

North Korea has continued its pattern of escalating brinksmanship to deal with its many challenges. North Korea used missile launches and a nuclear test again in 2009 to demonstrate Kim Jong-II's continued empowerment despite his very poor health, to support regime succession, to continue his use of diversionary conflict and to achieve other objectives discussed below. And in 2010 North Korea sank a ROK warship, escalating its pattern of provocations.

North Korean Asymmetric WMD Threats

As ROK and U.S. conventional military superiority developed over several decades, the North Korean economy could not keep pace. Instead, North Korea opted to pursue various asymmetric threats, especially WMD. This was a natural evolution from Kim Il-Sung's emphasis on special operations forces in World War II. This section describes the North Korean WMD component of its asymmetric capabilities.

How Much WMD Might North Korea Have?

Most experts in the United States assume North Korea has developed its nuclear weapon capabilities independently. For example, the CIA said North Korea produced enough plutonium by 1994 for one to two weapons,⁷ and North Korea did not produce any more plutonium until 2003. These experts typically argue North Korea could have roughly five to 10 nuclear weapons today,⁸ though given the limited testing of the weapons and their delivery means like missiles, only two to six of these would likely be deliverable and reliable.

However, a number of stories suggest North Korea has had external help. For example, in 1999 Dr. AQ Khan of Pakistan said he went to North Korea and was shown three plutonium weapons that could be assembled for use on ballistic missiles in one hour.⁹ If he was right, North Korea must have had an external source of plutonium.

Moreover, North Korea would not likely have put all of its weapons in one place at one time and shown them to a foreigner, as a security failure could have led to U.S. preemption. North Korea may thus

have had at least five to six nuclear weapons in 1999, consistent with what the defector Hwang Jong-Yup said he was told in 1996.¹⁰

If these stories are correct, North Korea may have developed more than 10 nuclear weapons. In particular, one story from Russian intelligence claimed that in 1992, North Korea got 56 kilograms of plutonium from the former Soviet Union.¹¹ If so, North Korea could have enough fissile material today for perhaps 20 nuclear weapons. And if some organizations risked giving North Korea fissile material, they may have also provided the technical expertise necessary to make ballistic missile warheads, as Dr. Khan asserted.

There are many reports on North Korean chemical and biological weapons. “We also assess Pyongyang has an active biological weapons research program, with an inventory that may include anthrax, botulism, cholera, hemorrhagic fever, plague, smallpox, typhoid and yellow fever.”¹² “North Korea has an assessed significant chemical agent stockpile that includes blood, blister, choking and nerve agents.”¹³ “In the assessment of U.S. intelligence services, their reserves, accommodated in perhaps half a dozen major storage sites and as many as 170 mountain tunnels, are at least 180 to 250 tons, with some estimates of chemical stockpiles run as high as 2,500-5,000 tons.”¹⁴ “In May 1996 ROK Foreign Minister Yu Chong-ha reported to the National Assembly that it was estimated that North Korea possessed approximately 5,000 tons of biological and chemical weapons. Given the extensive production facilities, this later estimate may constitute the low end of the actual stockpile.”¹⁵

In terms of delivery systems, “chemical weapons can be delivered by virtually all DPRK fire support systems. This includes most artillery, multiple rocket launchers (including those mounted on CHAHO-type boats), mortars, FROG and SCUD missiles, and some bombs.”¹⁶ “The North has about 600 SCUD missiles capable of hitting targets in South Korea, and possibly also of reaching Japanese territory. There are a further 200 Nodong-1 missiles which could reach Tokyo.”¹⁷ North Korea would likely use its special operations forces (SOF) to deliver biological weapons. “Military authorities in Seoul estimate that North Korea's special operations forces currently exceed 200,000 soldiers.”¹⁸ “North Korea has recently deployed about 50,000 special forces along its border with South Korea.”¹⁹

Potential North Korean Uses of WMD

In peacetime, North Korea regularly uses its nuclear weapons to threaten neighbors, hoping to coerce them and/or deter their actions. For mainly internal purposes, North Korea has used nuclear weapon possession and tests to illustrate the strength or formidability of its regime and to claim North Korea is one of the most powerful (and respected) countries in the world. It has also used nuclear weapons as a bargaining chip to secure goods and agreements from other countries. North Korea generally does not use chemical and biological weapons for these strategic purposes.

It is less clear how North Korea would use WMD in wartime. North Korea has threatened to use nuclear weapons against the cities and military facilities of neighbors. An “unofficial spokesman” talks of North Korea using nuclear weapons to: (1) create electromagnetic pulse (EMP) effects to disable electronic systems, (2) attack nuclear power plants (causing wide-spread nuclear fallout), and (3) attack cities in various ways.²⁰

While the use of nuclear weapons against cities would be horrific, the United States planned a similar concept during the Cold War with its so-called “assured destruction” concept of threatening Soviet cities. As early as 1945, the U.S. Joint Chiefs of Staff explained the concept of targeting Soviet cities: “The atomic bomb, in the foreseeable future, will be primarily a strategic weapon of destruction against concentrated industrial areas vital to the war effort of an enemy nation. In addition, it may be employed against centers of population with a view to forcing an enemy state to yield through terror and disintegration of national morale.”²¹

North Korea is likely to view the survivability of its nuclear forces as limited, pushing it to use them relatively early in a conflict. This attitude would be strengthened by a belief the United States will use nuclear weapons early,²² and nuclear weapons would provide greater, potentially conflict winning leverage early on. For example, North Korea might hope appropriate nuclear weapon use would convince Japan to not become involved in the conflict, and thereby deny the United States the use of Japan to support U.S. deployments and operations.²³

North Korea might alternatively wait until an invasion of the ROK fails and the ROK/U.S. start a counteroffensive before using North Korean nuclear weapons. The North Korea regime would know it had to stop the counteroffensive or not survive, and would be prepared to take very risky actions to survive, including nuclear attacks on cities. Many analysts argue this would be the most likely kind of North Korean nuclear weapon use.

North Korea is more likely to use its chemical and biological weapons to achieve specific operational objectives. These objectives would likely include causing breakthroughs on the battlefield, disrupting airfield and port operations and disrupting the flow of US forces into Korea. Such attacks would most likely support North Korean objectives if done very early in a conflict. Given the potency of biological weapons, North Korea may prefer to use them at some significant geographical distance from the Korean peninsula, such as in Japan or the United States.

Nuclear Effects on People and Things

Table 1 evaluates the *expected* effectiveness of North Korean nuclear attacks delivered by ballistic missiles against ROK ground forces, airfields and population centers. This analysis assumes an airburst weapon to maximize prompt effects and eliminate most fallout. The Republic of Korea today, in peacetime, has 47 Army divisions, 15 major military airfields and a population of 48,500,000.

Table 1
Approximate North Korean Nuclear Weapon Effects
on ROK Target Types

| Weapon Performance (60 % delivery) | Weapons Launched Per Target | Army Divisions Lost to Prompt Casualties | Airfields Lost to Prompt Casualties | ROK City Prompt Casualties* |
|---|--|---|--|--|
| 10 Kt, 1.5 km CEP | 20 | 1.40 of 47 | 5.7 of 15 | 3,100,000 |
| 10 Kt, 1.5 km CEP | 15 | 1.05 of 47 | 4.7 of 15 | 2,400,000 |
| 10 Kt, 1.5 km CEP | 10 | 0.70 of 47 | 3.1 of 15 | 1,700,000 |
| 10 Kt, 1.5 km CEP | 6 | 0.42 of 47 | 1.9 of 15 | 1,100,000 |
| 10 Kt, 1.5 km CEP | 3 | 0.21 of 47 | 0.93 of 15 | 600,000 |
| 10 Kt, 1.5 km CEP | 1 | 0.07 of 47 | 0.31 of 15 | 200,000 |
| 50 Kt, 0.5 km CEP | 1 | 0.25 of 47 | 0.70 of 15 | 850,000 |

*Expected casualties, including reliability/delivery probability. Thus a 10 Kt weapon launched at a city like Seoul will cause an expected 200,000 fatalities and serious casualties (assuming a baseline reliability/delivery probability of 60 percent); if it actually detonates in the middle of the city, it will cause an expected 340,000 fatalities and serious casualties.

Thus, if North Korea uses one 10 kiloton (Kt) weapon against a ground force division (the second to last row), prompt effects would cause an expected 7 percent attrition, whereas the same weapon would cause an expected attrition of 31 percent at a typical airfield or nearly 200,000 expected casualties in a city like Seoul. A high effectiveness warhead (the last row) with higher explosive yield (50 Kt), accuracy (0.5 km CEP), and delivery probability (70 percent) would cause several times as much damage, depending upon the target type, suggesting the value North Korea might place on improving nuclear weapon capabilities.

The earlier rows of Table 1 show multiple nuclear weapons would do even more damage. For example, if North Korea uses (launches) three

nuclear weapons against ground forces, 21 percent of a division would be damaged, while three weapons (spread across three airfields) would create an expected damage of 31 percent at each of three airfields, or casualties equivalent to 93 percent for a single airfield. At the extreme, 20 nominal North Korean nuclear weapons launched against these targets would affect about 3 percent of the ROK ground forces, or almost six ROK major airbases, or about 3 million ROK civilians. The very high potential damage to the civilian population suggests why North Korea might focus its attacks on cities as targets.

The Effects of Chemical and Biological Weapons

Chemical and biological weapons (CBW) can also cover large areas with their effects. Consider a 12.5 Kt nuclear air burst will cause fatalities over perhaps 8 km², a large area in a city. In contrast, chemical and biological weapons are carried by the wind; their effects are a function of the original dispersal pattern, wind direction and speed, and atmospheric conditions. If dispersed across a wide base, 1,000 kgs of sarin might cause lethal effects over 0.7 to 8 km², depending upon these various factors. Similar dispersal of 10 kgs of anthrax might cause lethal effects over 5 to 30 km².²⁴ These areas suggest that possible quantities of chemical and biological weapon could affect similar areas to those shown for nuclear weapons in Table 1.

The other key difference between the chemical and biological weapons and nuclear weapons is the fraction of people in these areas most likely affected. With an airburst nuclear weapon, most people in the lethal area would be affected. Even those inside buildings would see their buildings collapse or seriously damaged, contributing to the injuries the people would suffer. With chemical and biological weapons, the buildings in these areas may provide some degree of shelter from weapon effects. This would be especially true of buildings without central air conditioning and having many floors, as is typical in Seoul. Thus, only a fraction of the people in these areas would be affected depending upon the time of year and building ventilation, leading to somewhat fewer casualties if a similar area is affected. Still, even if the casualties are only half or a quarter as much as with nuclear weapons over a similar amount of area, these

quantities of chemical and biological weapons could cause tens of thousands of casualties or more in ROK cities.

Against military targets, chemical and biological weapons would tend to cause far less damage than is shown for nuclear weapons in Table 1. Military personnel tend to have protective clothing, medicines and other counters to chemical and biological weapons, protections that would significantly reduce casualties. Still, these military forces would need timely warning to apply many of these protections, and thus warning of WMD use would become a key determinant of the damage North Korean chemical and biological weapons could do to military forces.

Deterrence Theory

Deterrence occurs when an adversary expects the benefits of an action are less than the costs. The *Deterrence Operations Joint Operating Concept* (JOC) is the official Defense Department statement on deterrence. It says: “Deterrence operations convince adversaries not to take actions that threaten U.S. vital interests by means of decisive influence over their decision-making. Decisive influence is achieved by credibly threatening to deny benefits and/or impose costs, while encouraging restraint by convincing the actor that restraint will result in an acceptable outcome.”²⁵

Basic Deterrence Concepts

The *Deterrence Operations JOC* uses a rational deterrence theory framework.²⁶ This theory examines the adversary’s perception of the net benefits (benefits minus costs) of any action as well as the probabilities of these net benefits to determine the utility of the action. It then compares the utilities of the alternative actions; if the utility of restraint (the status quo) is greatest, then deterrence is achieved.²⁷ This assessment does not require an adversary to find an action that is clearly beneficial. In some situations, all of an adversary’s choices (even the status quo) may have negative utility, as appears to be the case with North Korea. In such cases, the adversary looks for the “least miserable option.” Said differently, a noted deterrence expert, Robert Jervis, has argued, “It is rational to start a

war one does not expect to win ... if it is believed that the likely consequences of not fighting are even worse.”²⁸

Rational deterrence theory assumes the adversary is risk neutral: The adversary’s decision is based upon expected value calculations, and neither takes nor avoids risk.²⁹ The alternative theory considered by the *Deterrence Operations JOC* is called prospect theory, which assesses risk differently. It argues that when an adversary faces serious losses, as in the North Korean conditions described above, the adversary becomes a risk taker, ready to try actions that avoid or reduce its losses even if there is serious risk in those actions. Deterrence of risk takers is a much more difficult effort, as US experience with North Korea has illustrated.

Understanding Deterrence Leverage

As suggested, deterrence is achieved by affecting the benefits and costs perceived by an adversary, as well as the adversary’s perceptions of the probabilities it will experience these costs and benefits. The literature talks about two kinds of deterrence efforts: deterrence by threat of punishment and deterrence by threat of denial.³⁰

Deterrence by threat of punishment usually seeks to increase the costs an adversary will suffer from an unwanted action, while deterrence by denial seeks to reduce the benefits the adversary hopes to achieve. For example, if the United States wants to deter a North Korean missile test, it could threaten economic sanctions if North Korea proceeds with the test (punishment) or it could threaten to preemptively destroy the missile on the launch pad (denial).

Deterrence is in the eye of the adversary. What does he perceive to be the benefits and costs of particular actions, and what does he believe the probabilities of each outcome are? Those perceptions are in turn based on U.S. capabilities for denial and punishment and U.S. will to impose denial and punishment. When adversaries perceive the U.S. lacks will (e.g., the U.S. fails to act against the bad behavior of an adversary), they may discount other U.S. denial and punishment threats (they perceive lower probabilities of costly outcomes, and higher probabilities of beneficial outcomes).

Each U.S. deterrent action has consequences for both sides. For example, a U.S. preemptive attack on a missile launch pad could destroy the missile and potentially embarrass the North Korean leadership, contributing to deterrence. But this action would likely lead to further escalation, something the United States would usually prefer to avoid but which North Korea may be prepared to accept to rally its military and other elites around a failing regime. North Korea's escalation might be to an artillery attack on the ROK, an attack the ROK would want to avoid. Thus, the ROK might pressure the United States not to carry out a preemptive attack to avoid this escalation.

Many in the international community would also likely communicate their view that U.S. preemptive action was unnecessary and inappropriate, hence reducing the probability of such U.S. action. If the United States has strong incentives not to carry out a preemptive attack, the adversary may conclude that the probability of such a U.S. action, despite U.S. capabilities, is extremely low.

In addition, if the United States cannot fully prove bad behavior by an adversary, it will normally be reluctant to take action. For example, despite assertions by then-President Bush in 2006 he would hold North Korea accountable for nuclear proliferation, no serious US action was taken against North Korea when its assistance in building a Syrian nuclear reactor was discovered the following year, assistance the United States could not prove beyond a reasonable doubt.

To the extent that U.S. adversaries can keep their WMD activities covert, the United States will have difficulty responding against them. Adversaries may thus feel undeterred from pursuing covert WMD development and proliferation efforts.

Finally, there is a difference between U.S. efforts to deter an attack upon the United States and U.S. efforts to deter attacks on U.S. allies. Most adversaries will perceive the United States would respond very seriously to an attack on the United States. But deterrence that supports U.S. allies—so-called extended deterrence—often appears less probable to draw a serious U.S. response, given the lower level of U.S. interest. To counter this concern, the U.S./ROK Presidential Summit in June 2009 declared a *Joint Vision for the Alliance of the United States of America and the Republic of Korea*. This *Joint Vision* said in part, “The Alliance is adapting to changes in the 21st century security environment. We will

maintain a robust defense posture, backed by allied capabilities that support both nations' security interests. The continuing commitment of extended deterrence, including the US nuclear umbrella, reinforces this assurance."³¹

Applying the Theory

In practice, few decision makers explicitly calculate the costs and benefits of each possible outcome, estimate the probability of that outcome and calculate the preferred action based on precise calculations. Instead, consideration of these factors is more subjective and approximate. Moreover, it is difficult to estimate these factors for Kim Jong-II and his regime, given how the regime strives to deny information on its attitudes and decision making to the outside world. Nevertheless, North Korean behavior does give some baselines against which to examine this framework and at least try to understand the tradeoffs North Korea might perceive.

Consider the case of the April 2009 North Korean missile test provocation.³² Why did Kim Jong-II select this action? To keep this example simple, assume there were three alternative North Korean courses of action at that time: (1) restraint (the status quo), (2) the use of artillery to fire into the ROK, and (3) the North Korean missile test.

The long-range missile launched on April 5, 2009, was likely seen as Kim Jong-II's best course of action for creating the appearance of regime empowerment, while not causing much chance of retaliatory actions that could threaten regime survival nor giving the appearance of weakness to his internal or external enemies. Doing nothing in his regime's deteriorating position was likely seen as unhelpful, and doing too much—such as a North Korean artillery attack on Seoul—was likely viewed as unleashing a concatenation of escalation responses that could destroy the Pyongyang regime.

With the missile test Kim Jong-II probably hoped to counter the appearance of regime weakness associated with its many failures and his recent illnesses. He likely also hoped to create a "diversionary conflict" where his military and other elites focused on the United States and the ROK as their enemies, responsible for North Korea's problems, thereby creating an environment where his son had the best chance to succeed

him. While his past provocations have invariably led to the United States and the ROK imposing some form of costs in return, usually economic sanctions, Kim Jong-Il has turned these costs to political benefit by unifying his military and other elites against their external enemies and in support of the regime.

Kim's missile test in April 2009 might have backfired if the United States had shot down the missile during the boost phase, preventing Kim Jong-Il from demonstrating his missile capability.³³ Alternatively, a North Korean artillery fire provocation could have failed due to effective ROK counter battery fire that quickly silenced the North Korean artillery, demonstrating North Korean weakness rather than strength. Further, North Korean artillery fire into the ROK was clearly too escalatory and dangerous, and thus an unacceptable action.

The United States might have deterred a second North Korean missile launch if it had prepared to intercept the missile. The United States could have announced that it would not allow North Korea to launch another intercontinental-range ballistic missile.³⁴

The U.S. announcement could have said, "If North Korea launches, the U.S. will use the opportunity to test its missile defenses against the target missile kindly provided by North Korea. Of course, since this would be an initial ballistic missile defense (BMD) test against this kind of threat, there would be a significant potential that the missile intercept would fail. But even then, the United States would gain significant experience in, and data about, intercepting real North Korean missiles."³⁵

Kim Jong-Il might have viewed such a U.S. BMD threat as posing a good probability of making the regime look weak (by successfully intercepting the missile), plus some chance the launch episode could have escalated out of control toward full-scale war if the United States was prepared to be so aggressive. Under those conditions, Kim Jong-Il could have preferred the status quo to the outcome of a second missile launch.³⁶

This simple example illustrates many of the characteristics of deterrence. In particular, it suggests Kim Jong-Il might be deterred by U.S. efforts to deny his provocations. Historically, much of the deterrence literature, and especially the nuclear deterrence literature, has focused on deterrence by the threat of punishment: An adversary could be deterred from taking an action because of the punishment threatened if it takes the

action. But the United States and the ROK also need to apply denial threats and find punishments that deter North Korean provocations like missile launches.³⁷

Deterring WMD Use

When trying to deter North Korean WMD use, what is the relative utility of deterrence by denial and deterrence by punishment? Is there sufficient leverage in these two approaches combined to somehow control or prevent North Korean WMD use?

Options for Deterrence by Punishment Threats and Deterrence by Denial Threats

During the Cold War, the United States focused its deterrence of the Soviet Union on punishment. Deterrence by the threat of punishment can be achieved by threatening various assets of an adversary. Early in the Cold War the United States recognized nuclear weapon attacks against adversary cities were a serious deterrent threat (as noted above). The United States also discussed targeting adversary military forces and/or adversary leadership to achieve deterrence by threat of punishment (and also a significant level of deterrence by denial).

There are four basic actions that support deterrence by denial: counterforce, active defense, passive defense and consequence management. Counterforce attacks seek to destroy adversary WMD forces (both weapons and delivery means) to prevent their use, and may also target command and control capabilities as well as adversary leaders to prevent WMD launch. Active defenses seek to intercept WMD when en route to targets, and include air and missile defenses as well as border control against Special Operations Forces. Passive defenses seek to protect people and assets from WMD effects once the weapons detonate or are otherwise released. Consequence management seeks to deal with the effects of WMD after people/assets have been exposed, providing medical care and other kinds of damage recovery.

These denial means provide different levels of leverage against WMD use. Counterforce can be powerful if preemptive action is possible

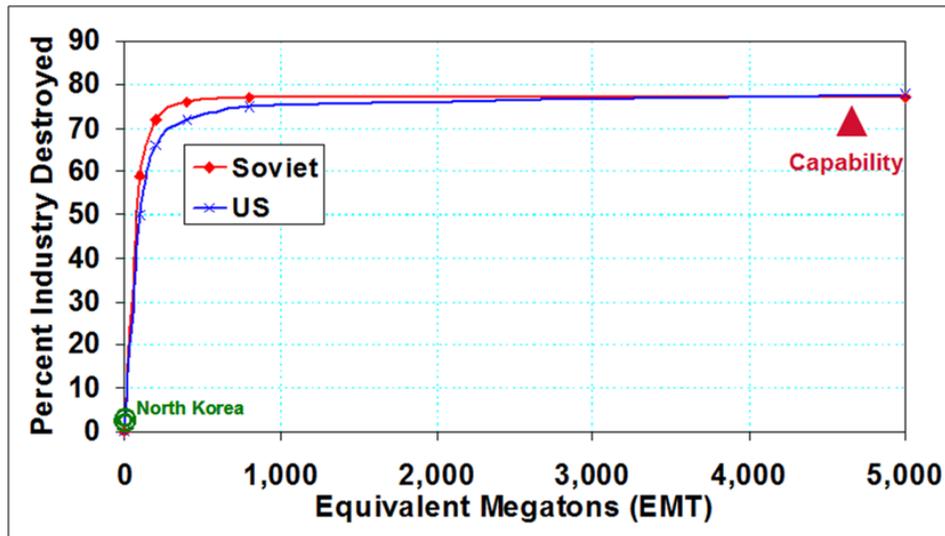
and if the locations of the WMD forces are known. Active defense can be technologically challenging but potentially very effective as technologies mature. Passive defenses are relatively more effective against chemical, biological and radiological weapons, having a more limited role against nuclear weapons (though sheltering and evacuation/dispersal can still be important). And consequence management is important for dealing with WMD effects, but consequence management capabilities have generally not been considered very effective in achieving deterrence of WMD use.

The Historical Approach to Deterrence by Punishment

Nuclear deterrence was a major international issue during the Cold War. For much of the period, the United States talked about strategic nuclear deterrence almost interchangeably with the concept of assured destruction: The United States deterred Soviet nuclear attacks on the United States by threatening to destroy Soviet cities with their associated population and industry (imposing a high punishment cost). Many in the United States felt that if the Soviet cities were destroyed then most of their society would also be destroyed, and the risk averse Soviet leadership would not take that chance since their power flowed from the talents and productivity of their people.

In the 1970s, the abilities of the United States and the Soviet Union to destroy each other's cities were assessed in the terms shown in Figure 1.³⁸ At the time, both the United States and the Soviets had thousands of equivalent megatons (EMT) of nuclear weapons,³⁹ as suggested by the "capability" mark at the right.

Figure 1
Deterring Nuclear Weapon Use: Cold War vs. North Korea



The curves in Figure 1 indicate even if the Soviets could have somehow destroyed most of the U.S. nuclear forces, the United States could still have destroyed most of the Soviet industrial capacity,⁴⁰ since even a “small” city attack (a few hundred EMT) would have been devastating.⁴¹ And the same was true for the Soviets: They also deterred U.S. nuclear attacks by threatening U.S. cities. Moreover, the cost of adding one more warhead to the attack to insure damage would always be much less than the adversary’s cost of destroying one more warhead. Thus, there was little leverage achieved by the capability for counterforce attacks or active defenses: Not enough of the opposing threat could be denied to make a difference.

But the North Korean nuclear threat is a different problem because it is on the part of the curve with steep returns. A North Korean force of five to 20 nuclear weapons of 10 Kt yield each would amount to about 0.25 to 1 equivalent megatons (EMT). Because North Korea has relatively few nuclear weapons, serious US/ROK efforts to destroy those weapons combined with effective active defenses could significantly reduce the

damage North Korea could cause against its possible nuclear targets in ROK and Japanese cities and elsewhere.

Deterring of Chemical and Biological Weapon Use

During the Cold War, the U.S. approach to deterring chemical and biological weapon use was less clear. The United States carried out a serious chemical and biological weapons defense program (passive defenses), seeking protection against the use of these weapons and deterrence of their use by being able to deny their effects. U.S. counterforce and active defense capabilities would also have helped deny chemical and biological weapon effects and thereby had some role in deterrence.

Early in the Cold War, the United States developed its own chemical and biological weapons to allow it to retaliate in kind against any Soviet chemical or biological weapon attack. Effectively, the United States was prepared to use these weapons to deny the Soviets any advantage from having employed similar weapons; in addition, research on offensive chemical and biological weapon capabilities significantly aided passive defense efforts against those threats.

Eventually, the United States joined the Biological and Toxin Weapons Convention (BWTC) in 1972 and the Chemical Weapons Convention in 1993 in the hopes of precluding these weapons from future conflicts. But toward the end of the Cold War, the United States learned that the Soviet Union had not given up its biological weapons efforts despite having joined the BWTC. Lacking biological weapons at that point, the United States implied it would employ nuclear retaliation against the use of these weapons.

But in the 2010 *Nuclear Policy Review Report (NPRR)*, the United States declared, “With the advent of U.S. conventional military preeminence and continued improvements in U.S. missile defenses and capabilities to counter and mitigate the effects of CBW, the role of U.S. nuclear weapons in deterring non-nuclear attacks – conventional, biological or chemical – has declined significantly. The United States will continue to reduce the role of nuclear weapons in deterring non-nuclear attacks.”⁴² This statement does not preclude a nuclear response to

adversary chemical and biological weapon use, but it makes such a response unlikely (a low probability), potentially reducing the deterrence of such attacks unless highly effective conventional force responses are guaranteed.

Detering North Korean Use of WMD in a War

Deterrence of North Korean WMD use in war requires understanding what North Korea would think it could gain from war and from using WMD. Given North Korea's circumstances, a North Korean invasion of the ROK would most likely be an act of desperation for a regime losing control, a "diversionary war" used to secure support from the North Korean military for a near-failed regime.

At that point, the regime may even have some evidence of military plotting to overthrow the regime. Facing serious survival risks if it does nothing, the North Korean regime may decide that a general war will restore military support for the regime and give it a chance for survival, despite all the other risks.

Such a North Korean decision to invade the ROK would not be easy. North Korea has been deterred from invading the ROK since 1953, suggesting that the North Korean leadership already doubts its prospects in a major war. Indeed, the current U.S. Commander in South Korea, General Walter Sharp, has said, "I'm absolutely confident that if they [North Korea] came south, the ROK-U.S. Alliance would be able to defeat them."⁴³ If the North Korean regime concludes that war is necessary for political reasons, it must thus also find a way to win or achieve some kind of "draw" in the conflict.

North Korean asymmetric means — its WMD — likely provides the only option for a favorable outcome. By using WMD, North Korea may feel there is some chance it could break Japanese support of the United States, and also overcome U.S. and ROK technological advantages. It has put considerable investments into WMD capabilities: investments that could have been spent on other weapons had North Korea not truly valued WMD. This is especially true for chemical and biological weapons. It has paid the price to develop these weapons almost entirely for wartime utility.

Moreover, if the North Korean regime expects U.S. nuclear weapon use in a war regardless of North Korean actions, it may view WMD use as just part of a war with the United States. While the North Korean prospects for success in such a war would be poor, in challenging circumstances the regime may perceive the prospects of war would be better than the prospects of outright regime failure. Thus, the key to deterring North Korean WMD use is to deter a North Korean invasion of the ROK in the first place, to convince the North Korean regime war is not an alternative for handling its internal problems.

Deterring North Korean WMD Attacks by Punishment

Some military analysts argue that if North Korea ever uses a nuclear weapon (or perhaps other forms of WMD), the United States will launch a large nuclear weapon response to massively damage North Korea. Some even talk of turning North Korea into a “sea of glass,” reminiscent of the Cold War assured destruction logic. Would such a threat against mainly innocent civilians deter the North Korean regime’s use of WMD?

The regime has shown little value for the North Korean common people, allowing the starvation of at least hundreds of thousands, and also allowing the massive societal disruption associated with a failing North Korean economy. The regime is unlikely to perceive much cost to a Cold War-like assured destruction threat.

In addition, it is unlikely that either the ROK or the United States would want to devastate North Korean society with nuclear weapons. The ROK government wants the unification of Korea, a unification that would be immensely complicated by extensive nuclear damage. Moreover, the United States would find massive societal destruction to be morally repugnant. The 2010 *Nuclear Posture Review Report* said the United States, “... would only consider the use of nuclear weapons in extreme circumstances to defend the vital interests of the United States or its allies and partners.”⁴⁴ Massive societal damage to North Korea would do relatively little to defend US and allied vital interests.

Retaliation against the North Korean military or the North Korean political leadership would be alternative punishment approaches. These targets would also provide denial effects. But a North Korean leadership

worried about instability might welcome attacks on its military, attacks which would likely increase military support for the political leadership.

Thus, the best punishment approach would be to threaten the North Korean political leaders themselves. Kim Jong-Il and his other leaders must come to feel their prospects for surviving a war are much less than their prospects of surviving a failing regime. A threat to target those leaders could provide much of the leverage needed to deter a North Korean invasion if the North Korean leaders believe that: (1) the U.S./ROK can effectively target them, and (2) the U.S./ROK have the will to execute such an attack.

The greatest difficulty in effectively targeting the North Korean leadership is in locating that leadership. Indeed, Kim Jong-Il has regularly “disappeared” from public view when he has committed provocations,⁴⁵ likely hoping to avoid the possibility of being targeted. The North Korean leaders may therefore perceive they can avoid damage even from nuclear attacks, undermining deterrence of their actions. In addition, North Korean leaders would likely locate underground in a conflict situation, making it difficult to cause them damage. The United States must demonstrate to the North Korean leaders that it does regularly find them when they are “hiding” and can cause destruction even against underground facilities, seeking to erase any perception of the North Korean leaders that they could survive a retaliatory attack.

Kim Jong-Il may also wonder: “Would the United States have the will to attack me, personally?” Many in the United States talk about avoiding such targeting of adversary leaders, which may give the North Korean regime hope. The United States needs to disabuse the regime of this notion through clear strategic communications. In particular, it should consider practicing attacks on the North Korean leaders as part of its exercises in Korea, demonstrating that a decision to pursue them has already been made.

The quotes above from the 2010 *Nuclear Posture Review Report* raise the question of whether punishment for North Korean WMD use, and nuclear weapon use in particular, should be done with conventional or nuclear weapons. There are several reasons for preferring the U.S. use of nuclear weapons in such punishment:

- The North Korean leaders will likely have much greater fear of U.S. nuclear weapon use. According to an East German report in 1986, “Comrade Kim Il Sung affirmed that the Democratic People's Republic of Korea (D.P.R.K.) does not intend to attack South Korea, nor could it. More than 1,000 U.S. nuclear warheads are stored in South Korea, ostensibly for defense, and it would take only two of them to destroy the D.P.R.K.”⁴⁶ To the extent that such a view persists in North Korea, U.S. nuclear weapon threats will be far more effective in deterring the North Korean leaders’ use of WMD and invasion of the ROK.
- If North Korea uses nuclear weapons early in a conflict and the United States does not answer with a U.S. nuclear response, the North Korean leaders will likely conclude that they can continue to use nuclear weapons without a U.S. nuclear weapon response. This would effectively reinforce their peacetime impression of U.S. threats lacking substance, thereby undermining transwar deterrence.
- The United States has promised a nuclear umbrella to both the ROK and Japan, which is a commitment of a U.S. nuclear response to North Korean nuclear weapon use. But the purpose of the nuclear umbrella commitment is to deter adversary nuclear weapon use. Once an adversary has used nuclear weapons, the U.S. nuclear umbrella has failed, and may be questioned globally. The United States would therefore need to reestablish (or abandon) the credibility of its global nuclear umbrella commitments, commitments that many would not perceive as being met by a conventional weapon response. The U.S. nuclear umbrella commitments are intended to persuade both U.S. adversaries and U.S. allies not to pursue nuclear weapon development. A failure to act consistently with these commitments could spur both US adversaries and U.S. allies to develop their own nuclear forces, something not in the U.S. interest.

In summary, the United States should threaten nuclear attacks against the North Korean leaders as punishment for North Korean nuclear weapon use and prepare to employ those threats. The North Korean

leaders need to be convinced there is no chance they would survive an invasion of the ROK and associated WMD use. Other punishment threats are much less likely to deter North Korean WMD use, while punishment threats against the North Korean military may actually aid the diversionary strategy of the North Korean leaders.

Deterring North Korea by Threat of Denial

As argued above, deterrence by denial involves primarily possessing effective capabilities for counterforce attacks, active defenses and passive defenses.

Counterforce

In wartime, U.S. and ROK counterforce efforts would be launched to attempt to destroy the North Korean WMD forces (both weapons and delivery means) and potentially the associated command and control. While the United States and the ROK have many capabilities to destroy such targets, they must first identify each target's location. Since the United States and the ROK do not even know how much WMD North Korea possesses, they likely do not know all of the locations necessary to be attacked to destroy the North Korean WMD and associated delivery means.

The ROK Minister of National Defense has indicated that, "There are about 100 sites related to the nuclear program in North Korea."⁴⁷ Many of these are likely underground and destroying each could require a large force, much more than would likely be available early in a conflict when other targets would also need to be struck and when standoff attack forces would be limited. Still, whatever North Korean WMD is destroyed by counterforce attacks reduces the burden on active and passive defenses. Unfortunately, any incomplete effort to destroy the North Korean WMD could push the North Korean leaders into a "use them or lose them" approach, prompting WMD attacks on the ROK and/or Japan, an unwanted consequence.

Better intelligence on North Korean WMD, delivery means and leaders would help facilitate counterforce efforts. North Korean defectors could provide such intelligence, much as Russian defectors from its

biological program provided the United States critical intelligence on that program toward the end of the Cold War. Dissatisfaction among the North Korean elites⁴⁸ may make such defections more possible now than ever before.

Active Defenses

Active defenses seek to destroy WMD after it has been launched and before it arrives on target and detonates/or is dispersed. US ROK and Japanese air defenses would likely deny effective WMD attacks by North Korean aircraft, and thus few experts expect North Korea to deliver WMD bombs. But ballistic missile defenses provide only limited protection in Japan and especially in the ROK today. This means some North Korean missiles could leak through the missile defenses, and the missile defenses could also be exhausted by initial North Korean missiles strikes.

Broader deployment of missile defenses around potential targets plus the addition of more broad area defenses (like the U.S. Navy SM-3 interceptor and the U.S. Army THAAD system) could increase the effectiveness of the defenses and, to the degree of North Korean leaders appreciate these capabilities, thereby enhance deterrence of North Korea's aggressive actions.

In addition, enhanced control of immigration into Korea⁴⁹ and surveillance of ROK coastal areas could reduce the ability of North Korean Special Operations Forces (potentially carrying biological weapons) to infiltrate the ROK.

Passive Defenses

Passive defenses seek to protect people and assets from the effects of WMD once those weapons detonate or are dispersed.

Because nuclear weapons are so powerful, the best passive defenses against them involve evacuation of likely target and fallout zone areas and dispersal of assets to less likely target areas. In addition, the hardening of some target areas can be helpful, using blast protected shelters and underground facilities to avoid fallout casualties. The Soviets attempted such an approach to overcome U.S. assured destruction during the Cold War, and the North Koreans have made similar efforts with vast

numbers of underground facilities. But building such shelters would be prohibitively expensive in the ROK, Japan or the United States for all but modest-sized groups. And evacuation would also prove challenging and difficult to sustain.

As noted earlier, passive defenses would be far more powerful against North Korean chemical and biological weapons. The United States and the ROK should use strategic communications to convey the level of passive defenses they have developed, including advanced medical measures, to convince North Korea that these weapons will not yield the leverage the North would seek in a war. Such U.S. and ROK efforts should describe the level of protection afforded by these defenses without divulging the details of the defenses, seeking to avoid North Korean work on counters.

Conclusions on Deterring North Korean WMD Use

Deterrence of WMD use would clearly be very difficult when the North Korean leaders become desperate. The United States and its allies would need to convince the North Korean leaders that they are more likely to survive with peace (facing rebellion) than with war (facing destruction): peace is still the least miserable option.

Key would be the denial component of deterrence, the ability to prevent North Korea from perceiving any chance of achieving victory. Focusing punishment on the North Korean leaders would also be important: they must be convinced they will not survive a war, even if North Korea uses WMD for leverage. In short, the United States and the ROK should focus on deterring North Korea from invading the ROK and thereby deter North Korean WMD use.

Deterring North Korean WMD Crises/Provocations

From February through July 2009, North Korea created a number of serious crises with WMD-related provocations. These provocations were apparently motivated by the conditions in North Korea described at the beginning of this chapter, some rising to the crisis level inside North

Korea even before the provocation. Such crises jeopardize regime control and could eventually imperil the regime.

The provocations appear to reflect the regime's view of its jeopardy: serious enough to take modest risks with provocations, but not so serious as to justify an invasion of the ROK or major attacks on it. The North Korean sinking of the ROK warship *Cheonan* and the artillery shelling of Yeonpyeong Island in 2010 escalated this pattern to unprovoked, limited attacks. This escalation makes North Korea appear even more dangerous.

Can the United States and the ROK deter such provocations? Thus far, the United States has failed to deter a number of North Korean provocations, but it has likely deterred others. It is important to recognize while little is known for certain about North Korea, such uncertainty should not prevent purposeful US/ROK action.

Understanding the North Korean Provocations

The underlying instability in North Korea in 2009 was Kim Jong-Il's bad health. He apparently suffered a stroke in August 2008, was slow to recover and has not fully recovered. Indeed, he may not ever fully recover. This serious illness undermined his appearance of empowerment needed for leadership in North Korea. Reports of his bad health had started even before the reported stroke, with some claims that he had heart surgery in May 2007. By the spring of 2009, there were many reports of North Korea speeding succession efforts for his third son because Kim Jong-Il's health was so serious;⁵⁰ by September 2010, Kim Jong-Il had put his son in positions that made his succession appear likely. His son's previous lack of such positions and his mid-20s age made him an unlikely ruler by North Korean leadership standards.

To solve his appearance of weakness and support potential succession, Kim Jong-Il needed to create an image that the North Korean regime is powerful, and he and his son are responsible for that power. His 2009 provocations showed North Korea is close to acquiring a space launch capability and intercontinental ballistic missiles and has produced nuclear weapons, capabilities few other countries possess.

While the North Korean regime likely anticipated U.S. efforts to implement sanctions in response, the United States made no specific

sanction threats, failing to reinforce deterrence. And the previous UN sanctions had not been particularly harmful to North Korea because they were largely unimplemented.⁵¹

Indeed, the regime likely planned to use any sanctions to once again claim that the United States and its allies are the enemies of the North Korean people and responsible for everything wrong in North Korea. Still, the regime apparently hoped to extort further aid and recognition from the United States and the regional powers, using escalatory brinksmanship until rewarded for de-escalating tensions.

North Korea's second nuclear test in late-May 2009 was a major North Korean escalation. While many in the West had criticized the first North Korean nuclear test in 2006 as a likely failure, the second test had a much higher yield (at least several kilotons), about 10 times the first test. North Korea apparently had mastered the basics of nuclear weapons, increasing its appearance of empowerment as well as its ability to deter action by the United States and others. It had also increased its ability to market nuclear expertise. And North Korea had reached the threshold at which it may have hoped to be considered a nuclear power. "There was a sense that every North Korean escalation was intended as a bargaining chip. Now there's an alternative view taking hold: that Kim Jong-Il wants to force the world to acknowledge it as a nuclear power before he dies."⁵²

Immediately after the North's nuclear test, the ROK announced it would join those nations supporting the Proliferation Security Initiative (PSI). But before the test, the ROK had refused to threaten to join PSI in response to North Korean provocations, and thus its joining PSI likely had little impact on the North Korean decision to do a nuclear test. The UN also implemented fairly serious economic and military/nuclear test sanctions against North Korea in UN Security Council Resolution (UNSCR) 1874, but no specific sanctions threats were made prior to the nuclear test, seeking to deter the test.

Especially with a risk-taking state like North Korea, threats need to be explicitly stated before the state takes an action or the threats will have little credibility and thus little deterrent value. And the United States had already failed to take action against North Korea for its nuclear proliferation to Syria, as noted earlier; the North Korean regime likely felt there was little probability it would pay serious costs for a nuclear test. In

summary, the United States and its allies did not use, or poorly used, the means they had for deterring the North Korean provocations.

This is not to say the United States totally failed in deterring North Korean provocations in 2009. Just after the North Korean second nuclear test, North Korea appears to have moved intercontinental-range missiles to both its east and west coast launch facilities.⁵³ It appeared to be preparing for another ICBM/space launch test, similar to its April test. North Korea was likely trying to continue its escalating brinksmanship, as done in 2006, hoping to achieve a major payoff from the United States.

Shortly after the second nuclear test, President Obama announced, “We are not intending to continue a policy of rewarding provocations. I don’t think that there should be an assumption that we will simply continue down a path in which North Korea is constantly destabilizing the region and we just react in the same ways by, after they’ve done these things for a while, then we reward them.”⁵⁴ He was joined in such comments by several other members of the U.S. administration. The consistency and strength of these statements suggested North Korea’s escalatory brinksmanship campaign would not pay off like its similar campaign did in 2006/7.

It is impossible to know whether these statements changed North Korean plans, but North Korea did not launch an ICBM with its missile launches on July 4, 2009. North Korea may have chosen to launch only short- to medium-range missiles then, trying to stay below a provocation threshold that might have triggered a major U.S. response. Within North Korea, the regime could still claim it had: (1) violated the UN sanctions after its second nuclear weapon test, (2) defied the U.S./UN, and (3) deterred a significant U.S./UN response.

Then former President Bill Clinton went to Pyongyang to free a U.S. woman jailed by North Korea. According to the North Korean secret police agency, “Thanks to Commander Kim Jong-Un’s cleverness, former U.S. President Clinton crossed the Pacific Ocean to apologize to the General (Kim Jong-Il).”⁵⁵ For North Korean audiences, this provided Kim Jong-Il the appearance that the United States had surrendered, and he was very much empowered; the Clinton visit also supported Kim Jong-Un’s succession. The regime could accept such an outcome as a very adequate end state for the 2009 provocations.

U.S./ROK Options for Deterring North Korean Provocations

How should the United States and the ROK try to deter/counter future North Korean provocations? For example, how should they have acted to deter the North Korean sinking of the warship *Cheonan*? Threats of economic sanctions have generally proven inadequate to deter North Korean provocations, and U.S./ROK threats of military actions have very little likelihood of being carried out.

Indeed, even with fairly strong evidence of North Korean culpability in the *Cheonan* sinking, the United States and the ROK did not pursue military responses, in part because of the escalatory danger of such responses.

There are two key parts of a strategy to deter North Korean provocations, corresponding to deterrence by threat of denial or retaliation.

Deterrence by Denial

The ROK has already recognized the *Cheonan* sinking reflected gaps in its military capabilities. ROK President Lee has committed to, "...make sure such an incident does not occur again."⁵⁶ The ROK needs to fill the gaps in its military preparations against provocations and limited warfare threats, with US help, and appears to be proceeding to do so. This means not only developing capabilities to detect and counter North Korean submarines in ROK territorial waters, but also addressing North Korea missile, artillery, SOF and other limited threats. Poor ROK military capabilities on Yeonpyeong Island undoubtedly contributed to North Korea feeling it could fire artillery at the island in November 2010; the ROK has greatly reinforced the ROK Marine forces on all of the Northwest Islands since then.

The ROK has singled out North Korean asymmetric threats as a particular area of focus, within which North Korean WMD falls.⁵⁷ Thus, the earlier discussion of counterforce, active defense and passive defense against WMD is equally relevant here. North Korea is unlikely to execute provocations which it anticipates will fail, causing the regime to look weak.

Deterrence by Punishment

As with major warfare, U.S./ROK efforts to punish North Korean provocations via limited attacks on its military would be unlikely to do immediate, significant damage to North Korean military power, but would likely drive the North Korean military to be more supportive of the regime, exactly the opposite of the desired response. Instead, punishment needs to focus more on the North Korean regime's political weaknesses, where the regime would likely perceive a major cost being imposed.

This approach needs to start by recognizing that North Korea is a failing state, and that sooner or later, the North Korean government will collapse. If a collapse were to occur today, the United States and the ROK are woefully unprepared to handle the consequences⁵⁸ (as is China, the other major player in such a collapse). This lack of preparation could be extraordinarily costly to these countries if collapse were to occur in the short term. Thus, they need to prepare for a collapse and shape the North Koreans to reduce the potential negative outcomes.

Anything the United States or the ROK does to prepare for a North Korean government collapse would be offensive to the North Korean regime. These actions therefore become the perfect political threats that can be applied in trying to deter North Korean provocation. They would include simply talking about collapse and the subsequent ROK-led unification of Korea. Thus, the United States and the ROK should outline a unification strategy and plan and use some actions from them to punish North Korea for its provocations while threatening other (stronger) actions to deter further North Korean provocations.⁵⁹ Any US/ROK actions to shape North Korea for unification would impose costs on North Korea and directly undercut the benefits North Korea seeks in its provocations (a denial outcome).

But to correct earlier weaknesses in U.S./ROK deterrence efforts, the U.S./ROK would need to explicitly threaten North Korea with specific deterrent responses and then be prepared to execute them if necessary. Vagueness in making threats or showing little apparent U.S./ROK will to take these actions could thoroughly undermine deterrence of North Korea, especially as the regime feels more threatened internally and thus more willing to take risks.

For example, to respond to the shelling of Yeonpyeong Island, the United States and the ROK leaders could have announced that North Korean internal instability led to the shelling, and such instability forces the ROK to prepare for a North Korean collapse. As a first step in these preparations, the ROK president could ask the U.S. and ROK Marines to train to deliver humanitarian aid (especially food and medicine) along the North Korean coastlines.

Such an effort is needed because food and medicine are already in short supply in North Korea and would largely disappear in the aftermath of a collapse, leading to a humanitarian disaster. The roads across the demilitarized zone (DMZ) would be inadequate to transport all of the needed humanitarian aid into North Korea, making across-the-beach deliveries one appropriate option.

ROK and U.S. Marines would need to perform this task (as opposed to international humanitarian organizations--IHOs) because of the lack of security in a collapse environment and the danger posed by the North Korean military and black market criminals. IHOs could take over once a secure environment in specific areas of North Korea is achieved.

The North Korean regime would clearly hate such declarations and actions by the United States and the ROK, as these efforts would impose serious costs. The costs could be enhanced by training along the ROK coasts for humanitarian aid delivery, filming those exercises, and broadcasting those films and pictures into North Korea. The message to the North Korean people and even the elites would be clear: the United States and the ROK are not your enemies and are instead preparing to help you when the North Korean regime allows. By directly countering the propaganda of the North Korea regime leaders, a significant penalty could be imposed on them.

North Korea is likely to respond unfavorably to these U.S./ROK actions and could escalate, seeking to retain the appearance of empowerment but also to deter further ROK/U.S. actions of this kind. The potential for escalation compels the U.S./ROK into planning deterrence against a range of North Korean escalations, as well as other North Korean provocations.

The U.S./ROK actions that could be used for deterring further North Korean provocations could also be used to prepare North Korea for ROK-led unification. These measures could include: demonstrating high

technology ROK military capabilities, actively seeking North Korean defectors especially from the North Korean nuclear program and senior North Korean political/military leaders, a declaration that the U.S. will attempt to shoot down any North Korean missiles launched, development of counter-fire plans against North Korean artillery use, pursuit of laser or other weapons to destroy North Korean artillery in flight,⁶⁰ selective amnesty for the elites, and a discussion of ROK plans for retirement payments to be offered to senior North Korean elites. The ROK/U.S. should prepare these and then privately threaten to take some of these actions if the North Korean regime initiates any further provocations.

Proper Terminology with Nuclear Powers

The United States and the ROK must also deny North Korean efforts to achieve its objective of becoming a recognized nuclear weapon power. Such a designation would be a major accomplishment for the regime, strengthening its ability to deter external threats and coerce its neighbors, while demonstrating the empowerment of the regime and partially legitimizing North Korea's possession of nuclear weapons. Unfortunately, even the former "...head of the United Nations nuclear agency, has said that North Korea is a fully fledged nuclear power."⁶¹

It is neither accurate nor in the interest of the world to so recognize North Korea or to reward Kim Jong-Il. Eight other countries currently possess nuclear weapons, and even the country with the smallest nuclear arsenal in this group may have 10 times as many weapons as North Korea. In addition, each of these other countries has forces equipped to deliver nuclear weapons on targets. North Korea is just not in the same league. More importantly, the Nonproliferation Treaty (NPT) recognizes only five nuclear powers, and they are designated as the only states approved for possession of nuclear weapons.

To avoid rewarding North Korea and other aspiring nuclear weapon countries (like Iran or even Myanmar), the international community should develop new terminology associated with state possession of nuclear weapons. Appropriate terms might be:

- **A Compliant Nuclear Power:** One of the five countries recognized in the NPT as a nuclear power (the United States, Russia, China, Great Britain, and France).
- **A Noncompliant Nuclear Power:** Countries which have circumvented the NPT in fielding significant numbers of nuclear weapons, and organized nuclear forces for the delivery of those weapons. Today, the states in this category apparently would be India, Pakistan, and Israel.
- **A Noncompliant Nuclear Experimenter:** Countries which have circumvented the NPT and begun testing nuclear weapons but still have few such weapons and little delivery capability. Today, North Korea is the state in this category.

The U.S. 2010 *Nuclear Posture Review Report* makes a big issue of compliance with the NPT, and argues global policy should follow that precedent. But it is also important to characterize even a “noncompliant nuclear power” as a country that has done much more than just test nuclear weapons. The nuclear power designation should be reserved for those responsible states that:

- Field secure, transparent nuclear forces of a size appropriate for regional minimum deterrence.
- Establish nuclear weapon safety programs to prevent unauthorized use of nuclear weapons. These efforts would include weapon employment limits like the U.S. permissive action link (PAL).
- Limit nuclear testing and do not test nuclear weapons on delivery means like ballistic missiles

A state unwilling to meet these standards is either a non-compliant nuclear experimenter or a designation like a noncompliant nuclear rogue.

Speaking of North Korea as a non-compliant nuclear experimenter more accurately captures its nuclear weapon capabilities. It downgrades the recognition North Korea wants, which is a good thing, and discourages other states from thinking they can quickly improve their international standing by testing a nuclear weapon. While North Korea appears determined to pursue further nuclear weapon tests to demonstrate its

nuclear weapon status, these terms would reduce the incentive North Korea would have with further tests and leave it permanently designated as out of compliance with the Nuclear Non-Proliferation Treaty. This would reduce a major benefit North Korea has sought with its nuclear weapon tests (thereby increasing the disincentives for North Korean provocations in the future) and might dissuade other countries seeking to gain nuclear weapon capabilities.

Conclusions

North Korea appears to pose a serious WMD threat. In particular, its nuclear weapon threat is potentially greater than normally assumed. Because North Korea is a failing state, it will have considerable incentives to employ its WMD in crises and conflict.

The United States and the ROK need a deterrence strategy against this threat, addressing both North Korean provocations and potential WMD use. This strategy will be different from the Cold War nuclear deterrence strategy because of North Korean risk taking behavior and the nature of the North Korean WMD capability (especially the small number of its nuclear weapons). The U.S./ROK deterrence strategy must thus be based on a combination of their capabilities for denial and punishment, both of which need to be increased.

To prevent significant North Korean WMD use, the United States and the ROK need to focus on the internal threats the North Korean regime faces. They need to convince the North Korean regime it has no prospects of survival in war, and thus war is not an alternative for dealing with internal threats. Moreover, they need to convince North Korea its WMD use would often be thwarted by U.S./ROK denial capabilities, reducing the North Korean incentives to use WMD.

To prevent North Korean provocations and limited attacks, potentially including WMD use, the United States and the ROK must first work to resolve the ROK gaps in defenses against limited attacks. This is not just a naval issue after the sinking of the *Cheonan*, but rather a broader issue including North Korean missile, artillery and SOF attacks. The ability to deny North Korea success in these limited attacks will significantly strengthen deterrence against a regime wishing to avoid

embarrassment and the appearance of weakness. The United States and the ROK should also develop a strategy and plans for ROK-led unification of Korea and use key elements of such a strategy to punish and deter North Korean provocations. The North Korean regime is likely to see that these actions impose serious costs on the regime. And these actions will generally be within the feasible set of actions available to the United States and the ROK, thereby strengthening deterrence.

Notes

¹ North Korea needs about 5.4 million tons of grain to feed its people, and produced only about 4.1 million tons in 2009. See, for example, “Food shortage worsens in N. Korea: official,” *The Korea Herald* (Feb. 10, 2010), http://www.koreaherald.com.kr/NEWKHSITE/data/html_dir/2010/02/10/201002100069.asp.

² “Tens of thousands of North Koreans have crossed the border seeking a better life. Some 15,000 have successfully defected to the South, while an estimated 100,000 to half a million are in China seeking asylum.” Tae-hoon Lee, “NK Regards OPLAN 5029 as Declaration of Warfare,” *The Korea Times* (Nov. 8, 2009), http://www.koreatimes.com.kr/www/news/nation/2009/11/116_55089.html.

³ “Survival of the Wickedest,” *Strategypage.com* (June 26, 2008), <http://www.strategypage.com/qnd/korea/articles/20080626.aspx>.

⁴ Sang-hyun Um, “N. Korea: Kim Jong-il's Distant Relative Tried to Kill Him With Chinese Blessing,” *Shin-Dong-A* (S. Korean Monthly, October 2004).

⁵ Blaine Harden, “Dear Leader Appears To Be Losing N. Koreans' Hearts And Minds,” *The Washington Post* (March 24, 2010), 11. See also “Millions of N.Koreans Listen to Foreign Radio Broadcasts,” *The Chosun Ilbo* (April 30, 2010), http://english.chosun.com/site/data/html_dir/2010/04/30/2010043001070.html.

⁶ “USFK commander warns of possible N.K. instability,” *The Korea Herald*, (Mar. 26, 2010), http://www.koreaherald.com.kr/NEWKHSITE/data/html_dir/2010/03/26/201003260041.asp.

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⁸ See, for example, David Albright, and Paul Brannan, “The North Korean Plutonium Stock,” Institute for Science and International Security (Feb. 20, 2007), <http://www.isis-online.org/publications/dprk/DPRKplutoniumFEB.pdf>.

⁹ Smith, R. Jeffrey, and Joby Warrick, “Pakistani scientist depicts more advanced nuclear program in North Korea,” *The Washington Post* (Dec. 28, 2009).

¹⁰ “Hwang Jang-Yop ... said that Jong Pyong-Ho, a senior party official in charge of military matters, had told Hwang in 1996 that North Korea had five plutonium-based nuclear weapons,” International Institute of Strategic Studies, *North Korea's Weapons Programmes: A Net Assessment* (Jan. 21, 2004), <http://www.iiss.org/publications/strategic-dossiers/north-korean-dossier/north-koreas-weapons-programmes-a-net-asses/north-koreas-nuclear-weapons-programme>.

¹¹ Larry A. Niksch, *North Korea's Nuclear Weapons Program*, Congressional Research Service, IB91141 (updated Aug. 27, 2003), p. 9, <http://fpc.state.gov/documents/organization/24045.pdf>.

¹² General Leon J. LaPorte, “Statement Before the Senate Armed Services Committee” (April 1, 2004), 5, http://www.globalsecurity.org/military/library/congress/2004_hr/040401-laporte.pdf.

¹³ *Ibid.*

¹⁴ GlobalSecurity.org, “North Korea: Chemical Weapons Program,” <http://www.globalsecurity.org/wmd/world/dprk/cw.htm>.

¹⁵ Federation of American Scientists, “North Korea: Chemical Weapons Program,” <http://www.fas.org/nuke/guide/dprk/cw/>.

¹⁶ Defense Intelligence Agency, *North Korea Handbook*, PC-2600-6421-94, (1994), 3-15 to 3-16.

¹⁷ “Longer-Range Seoul Missiles In The Works,” *Singapore Straits Times* (Oct. 9, 2009), 38.

¹⁸ “N.Korea Believed to Have 200,000 Special Forces Troops,” *The Chosun Ilbo* (October 11, 2010), http://english.chosun.com/site/data/html_dir/2010/10/11/2010101101081.html.

¹⁹ *Ibid.*

²⁰ Myong Chol Kim, “Nuclear war is Kim Jong-il's game plan,” *Asia Times* (June 12, 2009), <http://www.atimes.com/atimes/Korea/KF12Dg01.html>.

²¹ U.S. Joint Chiefs of Staff, “Over-All Effect of Atomic Bomb on Warfare and Military Organization,” J.C.S. 1477/1, (from the US National Archives) (Oct. 30, 1945).

²² For example, “Korea cannot be unified in a peaceful way. They [the North Koreans] are prepared for war. If a war occurs in Korea, it will be waged by nuclear weapons, rather than by conventional ones.” This quote is from a report by one of the Hungarian Foreign Ministry Staff, based on a 1976 conversation with one of the staff of the North Korean Embassy in Hungary, in Balazs Szalontai and Sergey Radchenko, “North Korea's Efforts to Acquire Nuclear Technology and Nuclear Weapons: Evidence from Russian and Hungarian Archives,” Woodrow Wilson International Center for Scholars, Cold War International History Project, Working Paper #53, (August 2006), Document No. 28, 55, www.wilsoncenter.org/topics/pubs/WP53_web_final.pdf.

²³ “North Korea threatened Thursday to turn Japan into a ‘nuclear sea of fire’ if the United States launches a nuclear war against the communist country.” See “Yonhap Cites DPRK Warning to Japan on U.S. Cooperation Causing ‘Nuclear Sea of Fire,’” *Seoul Yonhap in English*, FBIS translation KPP20040923000069 (Sept. 23, 2004).

²⁴ The areas compared here are from U.S. Congress Office of Technology Assessment, *Proliferation of Weapons of Mass Destruction: Assessing the Risks* (August 1993), 53-54.

²⁵ Department of Defense, *Deterrence Operations Joint Operating Concept*, Version 2.0, (December 2006), 3.

²⁶ “This is a stylized view of deterrence often associated with rational choice/expected utility deterrence models of the Cold War era. The DO JOC expands upon rational choice considerations and incorporates elements of prospect theory in its approach.” *Ibid.*, 20.

²⁷ Mathematically, the adversary’s utility (U) of each action (j) is assessed by combining the benefits (B) and costs (C) of each outcome (i) with the probability (P) of that outcome if the action is taken:

$$U(\text{Action } j) = \sum (B_{ji} - C_{ji}) * P_{ji}$$

The utilities are then compared and “restraint” is chosen if: $U(\text{restraint}) > \max(U(\text{Action } 1), U(\text{Action } 2), \dots, U(\text{Action } n))$

²⁸ Robert Jervis, “The Political Effects of Nuclear Weapons,” *International Security*, Vol. 13, No. 2 (Fall 1988), 80-81.

²⁹ By analogy, monetary gambling almost always involves a negative expected value payoff to the individual because the “house” takes a portion of the money bet. Gamblers are thus normally risk takers (unless they believe that they have a “system”), because while they may win a large amount of money, on average they will lose.

³⁰ These concepts were introduced in Glenn H. Snyder, *Deterrence and Defense: Toward a Theory of National Security*, (Princeton: Princeton University Press, 1961), 14-16.

³¹ “Joint Vision for the Alliance of the United States of America and the Republic of Korea” (June 16, 2009), http://www.whitehouse.gov/the_press_office/Joint-vision-for-the-alliance-of-the-United-States-of-America-and-the-Republic-of-Korea/.

³² On April 5, 2009, North Korea test launched a long-range missile that it described as a space-launch vehicle.

³³ There is, however, a risk to the United States in trying to shoot-down a North Korean missile: If the United States tries but then fails to shoot down the missile, the US missile defense capabilities would be discredited, and Kim Jong-Il would appear to be further strengthened and even more capable.

³⁴ On March 19, 2009, Admiral Keating, then commander of the U.S. Pacific Command, “said the U.S. is ‘fully prepared’ to shoot down the missile and added that the U.S. military has the capability to do it.” But Secretary of Defense Gates subsequently indicated that the United States would not attempt an intercept, likely fearing the escalatory implications and perhaps anticipating that the North Korean test would have likely failed. “Does Obama Have a N.Korea Policy?” *The Chosun Ilbo* (March 31, 2009), <http://english.chosun.com/w21data/html/news/200903/200903310031.html>.

³⁵ Of course, North Korea would claim that such a missile launch was actually of a space launch vehicle, allowed by international law. Thus, the United States would have to carry out a strategic communications plan to preemptively discredit such a North Korean claim and to focus on the destabilizing implications of operational North Korean ICBMs.

³⁶ This is an extremely simple example for illustrative purposes. In practice, U.S. strategic planners need to be developing more sophisticated assessments, including potential escalations, and also sensitivity testing the uncertain factors, seeking robust counters to North Korea’s threats.

³⁷ In trying to deal with the sinking of the South Korean warship Cheonan, U.S. Secretary of Defense, “Gates, who met counterparts from Japan and South Korea ... admitted Washington and its allies had limited options.” Dan De Luce, “Gates warns of more N.Korea ‘provocations,’” *Agence France-Presse* (June 6, 2010), http://www.google.com/hostednews/afp/article/ALeqM5j2tSpWVOSgH_J-qS1H874U1CMSQg.

³⁸ The Soviet cities curve shown here is derived from Alain C. Enthoven and K. Wayne Smith, *How Much Is Enough?*, Harper and Row (1971), 207. The U.S. cities curve is derived from U.S. manufacturing value added data of the same era.

³⁹ An equivalent megaton consists of the number of weapons of any given explosive yield needed to do the same damage as a single 1-megaton weapon. Three 200 Kt weapons, seven 50 Kt weapons, or twenty-one 10 Kt weapons would constitute 1 EMT.

⁴⁰ In practice, the database used to make this assessment included only about 77 percent of Soviet industry. Thus the fact that the lines quickly peak at 77 percent does not mean that 23 percent of Soviet industry would necessarily

have survived, but rather that the information needed to determine the survivability of that 23 percent was not available.

⁴¹ This analysis was extremely simplistic and assumed, for example, that all nuclear weapons would be targeted on cities, and that weapons destroyed by counterforce attacks would be replaced by surviving weapons in attacking each target.

⁴² Department of Defense, *Nuclear Policy Review Report* (April 2010), viii.

⁴³ “U.S. General Concerned by Threat to Seoul Posed by N. Korea's 800-Missile Arsenal,” East-Asia-Intel.com (Oct. 17, 2008). General Sharp’s predecessor, General Bell, said, “I also know with some certainty that if for some reason deterrence fails and North Korea attacks South Korea in any way, that we would quickly and decisively defeat the aggression.” Anna Fifield, “U.S. General Warns of N Korean Nuclear Test,” *The Financial Times* (Oct. 30 2006).

⁴⁴ Department of Defense, *Nuclear Policy Review Report* (April 2010), viii-ix.

⁴⁵ See, for example, “Kim Jong Il Vanishes From Public Eye,” *Donga Ilbo*, (Aug. 7, 2006), and more recently, Ji-hyun Kim, “Kim Jong-il lying low,” *The Korea Herald* (June 2, 2010), <http://www.koreaherald.com/national/Detail.jsp?newsMLId=20100602000180>.

⁴⁶ This quote is from a report on the visit of Erich Honecker to North Korea in 1986, and is included in Balazs Szalontai and Sergey Radchenko, *op. cit.*, Document No. 52, 74.

⁴⁷ “Seoul Suspects About 100 Sites in N.K. Linked to Nuclear Program,” *The Korea Herald* (Oct. 5, 2009), http://www.koreaherald.co.kr/NEWKHSITE/data/html_dir/2009/10/05/200910050098.asp.

⁴⁸ The December 2009 North Korean currency revaluation took most of the wealth away from even the North Korean elites, leading to reports of North Korean social unrest that may open the door to defection for some.

⁴⁹ The author has been told stories of North Korean SOF coming into the ROK on commercial airlines, using forged passports. This kind of activity could be largely eliminated by tying the passport databases together for the regional countries, and dealing with anyone using a forged passport.

⁵⁰ See, for example, Yonhap News, “Kim's Failing Health Prompting N. Korean Power Transfer to Son: Seoul Minister,” *The Korea Herald* (June 4, 2009).

⁵¹ The North Korean leaders were likely surprised by the relative strength of the subsequent UN Security Council Resolution (UNSCR) 1874 and the sanctions it applied.

⁵² David E. Sanger, Mark Mazzetti and Choe Sang-Hun, “North Korean Leader Is Said To Pick A Son As Heir,” *New York Times* (June 3, 2009), 1.

⁵³ “N.Korean Missile Train on the Move,” *The Chosun Ilbo*, (June 17, 2009), http://english.chosun.com/site/data/html_dir/2009/06/17/2009061700282.html.

⁵⁴ Jennifer Loven, “Obama Vows Tougher N. Korea Stance,” *Arizona Daily Star* (June 7, 2009).

⁵⁵ So-hyun Kim, “N. Korean Agency Uses Clinton's Visit to Praise Kim Jong-un,” *The Korea Herald* (Aug. 10, 2009), at http://www.koreaherald.co.kr/NEWKHSITE/data/html_dir/2009/08/10/200908100042.asp.

⁵⁶ Jeong-ju Na, “President Plans Stern Steps After Cause of Ship Sinking Revealed,” *The Korea Times* (April 19, 2010), http://www.koreatimes.co.kr/www/news/nation/2010/04/116_64442.html.

⁵⁷ Sung-ki Jung, “Lee directs W3 tril. rise in arms buying: Seoul seeking to counter NK’s asymmetrical warfare,” *The Korea Times* (May 16, 2010), http://www.koreatimes.co.kr/www/news/nation/2010/05/205_65967.html.

⁵⁸ See, for example, Victor Cha, “We Have No Plan,” *The Chosun Ilbo* (June 9, 2008), <http://english.chosun.com/w21data/html/news/200806/200806090015.html>.

⁵⁹ The United States and the ROK could make such threats privately to the North Korean regime to have the best chance at deterrence.

⁶⁰ A laser weapon to shoot down artillery was developed years ago in the United States and could jump-start ROK efforts.

⁶¹ Malcolm Moore, “North Korea now ‘fully fledged nuclear power,’” *Telegraph.co.uk* (April 24, 2009), <http://www.telegraph.co.uk/news/worldnews/asia/northkorea/5212630/North-Korea-now-fully-fledged-nuclear-power.html>.

