

Conventional Counterforce Dilemmas

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South Korea's Deterrence Strategy and Stability on the Korean Peninsula

As a South Korean F-35 flies over North Korea undetected, it drops a guided bomb on a ballistic missile about to deliver its deadly payload. This scenario, which graphically demonstrates South Korean thinking about how to nullify North Korea's nuclear threat, was included in a short video the Republic of Korea (ROK) Air Force released in December 2019 amid heightened tensions on the Korean Peninsula.¹

As North Korea consolidates its nuclear capabilities, the debate surrounding the implications for strategic stability on the peninsula and beyond remains dominated by the dynamic between Washington and Pyongyang.² Meanwhile, military planners in Seoul are facing a dire challenge, as they seek to secure South Korea under the strain of both North Korea's nuclear threat and an intensified fear of abandonment by the United States.

This article sheds light on South Korea's military response to this challenge, a topic that has been long shrouded in ambiguity and largely ignored by the academic community.³ In doing so, we address the following questions: What

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1. "Urineun Daehanminguk Gonggunida! [Daehanminguk Gonggun Hongbo Yeongsang Bonpyeon]" [We are the Republic of Korea Air Force! (Republic of Korea Air Force promotional video)], YouTube video, 4:38, posted by Republic of Korea Air Force, December 9, 2019, https://www.youtube.com/watch?time_continue=121&v=4IHQqPv_8RE&feature=emb_logo.
 2. Van Jackson, *On the Brink: Trump, Kim, and the Threat of Nuclear War* (Cambridge: Cambridge University Press, 2018); Sung Chull Kim and Michael D. Cohen, eds., *North Korea and Nuclear Weapons: Entering the New Era of Deterrence* (Washington, D.C.: Georgetown University Press, 2017); and Victor D. Cha and David C. Kang, *Nuclear North Korea: A Debate on Engagement Strategies*, 2nd ed. (New York: Columbia University Press, 2018). For a review of recent literature, see Nicola Leveringhaus, "Beyond De-nuclearization: Debating Deterrence and North Korea in Asia's New Nuclear Age," *Asian Security*, Vol. 15, No. 3 (2019), pp. 365–369, doi.org/10.1080/14799855.2019.1594783.
 3. A notable recent exception is Joshua H. Pollack and Minji Kim, "South Korea's Missile Forces and the Emergence of Triangular Strategic (In)Stability," *Nonproliferation Review*, published online September 3, 2020, doi.org/10.1080/10736700.2020.1809156.
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is South Korea's strategy for managing the dual threats of a nuclear North Korea and potential U.S. abandonment? Is the strategy feasible and, if so, what operational and strategic complications does it present for South Korean decisionmakers? Finally, how will South Korea's strategy impact strategic stability on the peninsula?

To deter North Korea—and limit damage if a conflict breaks out—South Korea is operationalizing an independent conventional counterforce strategy, or offensive and defensive measures designed to destroy or deplete the nuclear forces of an adversary.⁴ To bolster deterrence, South Korea is also threatening countervalue strikes, seeking to hold the North Korean leadership at risk. South Korea is investing in advanced, integrated conventional capabilities, including missile defense systems; high-precision ballistic and cruise missiles; and complex command, control (C2), communications, computers (C4), intelligence, surveillance, and reconnaissance (ISR) capacities. This strategy is unique. Few, if any, nonnuclear states have sought to rely on advanced conventional capabilities to deter a nuclear-armed adversary.⁵ Although South Korea is developing this strategy within the framework of its alliance with the United States, the ultimate goal is a fully independent operational capability.

We argue that South Korea's approach should be understood as both a short- and long-term hedge against U.S. abandonment.⁶ As a short-term hedge, South Korea's capabilities can provide an independent deterrent against the threat of a North Korean nuclear attack. Consequently, they also limit the risk of North Korea attempting to drive a wedge between the United States and South Korea, because Seoul will have a deterrent of its own. Arguably, the strategy is also part of a longer-term hedge because it will bolster South Korea's nuclear latency. Many of the capabilities South Korea is acquiring or considering—particularly advanced ballistic and cruise missiles—will

4. Austin Long and Brendan Rittenhouse Green, "Stalking the Secure Second Strike: Intelligence, Counterforce, and Nuclear Strategy," *Journal of Strategic Studies*, Vol. 38, No. 1–2 (2015), pp. 41–42, doi.org/10.1080/01402390.2014.958150. Counterforce here excludes preventive counterproliferation strikes against states that are developing nuclear weapons. We also exclude so-called second-strike counterforce. On second-strike counterforce, see Scott D. Sagan, *Moving Targets: Nuclear Strategy and National Security* (Princeton, N.J.: Princeton University Press, 1989).

5. All other countries with a demonstrated or alleged past or present interest in counterforce options, such as the United States, India, and Russia, have had a nuclear deterrent. On India's alleged recent interest in counterforce, see Christopher Clary and Vipin Narang, "India's Counterforce Temptations: Strategic Dilemmas, Doctrine, and Capabilities," *International Security*, Vol. 43, No. 3 (Winter 2018/19), pp. 7–52, doi.org/10.1162/isec_a_00340.

6. We use Glenn Snyder's definitions of abandonment: the ally may "de-align, abrogating the alliance contract" or "fail to provide support in contingencies where support is expected." See Snyder, "The Security Dilemma in Alliance Politics," *World Politics*, Vol. 36, No. 4 (July 1984), p. 466, doi.org/10.2307/2010183.

shorten the time frame for development of a credible nuclear deterrent. Moreover, these conventional capabilities may function as a stopgap deterrent to protect South Korea during the dangerous window between abandonment and the attainment of deliverable nuclear weapons.

At the same time, we highlight that the pursuit of a conventional deterrence strategy leads to a series of problems and dilemmas for policymakers in Seoul. First, South Korea faces a significant credibility challenge. Developing the capability to threaten the North Korean nuclear arsenal based solely on conventional weapons is difficult and places major demands on the South Korean military. Second, North Korean leaders are unlikely to accept such a capability. North Korea already is designing around South Korea's counterforce capabilities by seeking to increase the survivability and penetrability of its nuclear arsenal. Consequently, the strategy requires constant and expensive adjustments in the face of North Korea's design around efforts. Third, the South Korean strategy may affect crisis stability adversely on the peninsula. Counterforce threats could provide North Korea with increased first-strike incentives in a crisis. The strategy also may result in North Korea taking steps, such as implementing more delegative C2 procedures, to overcome vulnerabilities and thereby increase the risk of accidental or unauthorized nuclear use. The threat of strikes against North Korean leaders only exacerbates these risks, because it leaves them few reasons to show restraint in a conflict.

While the South Korean case illustrates how deeply technological shifts are challenging common assumptions about nuclear strategy and, in particular, the role of conventional weapons, it also demonstrates that dilemmas associated with both counterforce and leadership targeting endure. Beyond these broader debates, our findings have important implications for discussions about the security landscape and peace on the peninsula. We argue that South Korea's conventional capabilities are further complicating disarmament efforts, but that given South Korea's challenging regional security environment, it will be a difficult choice for Seoul to give them up. Nevertheless, any future agreement will need to focus not only on the U.S.–North Korea relationship, but also on the growing gap in the conventional balance of forces on the peninsula.

The remainder of this article proceeds by first briefly describing South Korea's strategy. In the second section, we show how a conventional counterforce and countervalue approach may help South Korea address both short- and long-term challenges in the event of U.S. abandonment by providing a stopgap deterrent and by bolstering nuclear latency. Third, we outline the challenges South Korea faces, including the operational demands of its strat-

egy, the design around problem, and risks in terms of crisis stability. We conclude by pointing to implications that our findings may have for broader debates about nuclear strategy, counterforce, nuclear hedging and latency, and the future security environment on the Korean Peninsula.

South Korea's Conventional Counterforce and Countervalue Strategy

During the Cold War, counterforce strategies were discussed almost exclusively in the context of the nuclear relationship between the United States and the Soviet Union and were based on the destructive power of nuclear weapons.⁷ With contemporary technological advancements, it is now possible to operationalize nonnuclear, conventional, counterforce strategies. Because of a technological revolution in precision targeting and remote sensing, advanced conventional weapons may be used more effectively against hardened or mobile targets, such as missile launch sites and C2 nodes. There are still major debates about counterforce strategies, with critics pointing to both the substantial challenges of quickly finding, tracking, and destroying multiple targets, and their potentially negative impact on strategic stability.⁸ The extent to which conventional weapons may replace nuclear weapons in counterforce missions is also contested.⁹ Nevertheless, there is broad agreement that conventional weapons now pose a more potent threat to nuclear arsenals than they once did.

The South Korean strategy is based on a triad of military concepts that were initially labeled the Korean Air and Missile Defense (KAMD) system, the Kill

7. Some conventional capabilities—most notably, anti-submarine warfare capabilities—were key components of Cold War counterforce strategies. See Austin Long, “Deterrence: The State of the Field,” *New York University Journal of International Law and Politics*, Vol. 47, No. 2 (Winter 2014/15), pp. 367–368, <https://nyujilp.org/wp-content/uploads/2015/11/NYJ204.pdf>.

8. Keir A. Lieber and Daryl G. Press, “The New Era of Counterforce: Technological Change and the Future of Nuclear Deterrence,” *International Security*, Vol. 41, No. 4 (Spring 2017), pp. 9–49, doi.org/10.1162/ISEC_a_00273; Long and Green, “Stalking the Secure Second Strike”; and Keir A. Lieber and Daryl G. Press, “The End of MAD? The Nuclear Dimension of U.S. Primacy,” *International Security*, Vol. 30, No. 4 (Spring 2006), pp. 7–44, doi.org/10.1162/isec.2006.30.4.7. For a more skeptical take on counterforce and technological change, see Charles L. Glaser and Steve Fetter, “Counterforce Revisited: Assessing the Nuclear Posture Review’s New Missions,” *International Security*, Vol. 30, No. 2 (Fall 2005), pp. 84–126, doi.org/10.1162/016228805775124552; Jan Lodal et al., “Second Strike: Is the U.S. Nuclear Arsenal Outmoded?” *Foreign Affairs*, Vol. 89, No. 2 (March/April 2010), pp. 145–152, <https://www.jstor.org/stable/20699857>; and Ryan Snyder et al., “Correspondence: New Era or New Error? Technology and the Future of Deterrence,” *International Security*, Vol. 43, No. 3 (Winter 2018/19), pp. 190–193, doi.org/10.1162/isec_c_00338.

9. See Keir A. Lieber and Daryl G. Press, “The New Era of Nuclear Weapons, Deterrence, and Conflict,” *Strategic Studies Quarterly*, Vol. 7, No. 1 (Spring 2013), pp. 9–10, <https://www.jstor.org/stable/26270573>; and Glaser and Fetter, “Counterforce Revisited.”

Chain, and the Korean Massive Punishment and Retaliation (KMPR) strategy. The Ministry of National Defense revealed the two first legs of this triad in 2012. The KAMD is a layered missile defense system designed to intercept multiple incoming North Korean missiles.¹⁰ Kill Chain, the offensive counterforce part of the strategy, is a set of surveillance, targeting, and kinetic capabilities, designed to detect imminent North Korean missile launches and then destroy the military's missile launch architecture to prevent an initial or follow-up attack.¹¹ Shortly after the fifth North Korean nuclear test in September 2016, the Ministry of National Defense released the KMPR strategy, the triad's final leg. This is a countervalue strategy that entails the use of multiple ground-, air-, and sea-launched land-attack munitions to target North Korean leadership and military headquarters facilities following any North Korean attack.¹²

The overall strategy rests on both a deterrence by denial and punishment logic. South Korea believes it will enhance deterrence by raising within the minds of the North Korean leadership the possibilities of attack failure and significant retaliation. Similar to other strategies that implement counterforce targeting, it arguably also contains a damage-limitation logic.¹³ If deterrence fails, South Korean counterforce capabilities, in principle, can contribute to limiting the damage of a North Korean nuclear attack or prevent damage altogether. Importantly, the strategy is meant to be employed preemptively: if a North Korean attack is deemed imminent, then the strategy calls for the rapid execution of strikes against nuclear targets.¹⁴

In 2018, the Moon Jae-in administration renamed the triad. Whereas the KAMD remains, the Kill Chain and KMPR were redesignated as the Strategic Strike System.¹⁵ The name change reflects President Moon's efforts to negotiate with North Korea and reduce tensions on the peninsula. South Korea's

10. *2014 Defense White Paper* (Seoul: Republic of Korea Ministry of National Defense [MND], 2014), pp. 62–63, https://www.mnd.go.kr/user/mnd/upload/pblicitn/PBLICTNEBOOK_201506120237036840.pdf.

11. *Ibid.*, pp. 61–62.

12. *2016 Defense White Paper* (Seoul: MND, 2016), pp. 71–72, https://www.mnd.go.kr/user/mnd/upload/pblicitn/PBLICTNEBOOK_201705180311469090.pdf.

13. On the logic of damage limitation, see Charles L. Glaser and Steve Fetter, "Should the United States Reject MAD? Damage Limitation and U.S. Nuclear Strategy toward China," *International Security*, Vol. 41, No. 1 (Summer 2016), pp. 49–98, doi.org/10.1162/ISEC_a_00248.

14. Secretariat of the National Assembly, *Gukhoebonhoeuihoeuirok, Je 346 Hoe-Je 06 Cha (2016 nyeon 09 wol 21 il)* [Minutes of a plenary session of the National Assembly, the 346th National Assembly, No. 06 (September 21, 2016)], p. 24, http://likms.assembly.go.kr/record/new/getFileDown.jsp?CONFER_NUM=046410.

15. *2018 Defense White Paper* (Seoul: MND, 2019), pp. 69–70, https://www.mnd.go.kr/user/mnd/upload/pblicitn/PBLICTNEBOOK_201907110548253080.pdf.

2018 defense white paper stated that counterforce capabilities under development now would focus on “omnidirectional security threats” instead of solely targeting North Korea.¹⁶ Some commentators have argued that the name change and reduced public profile, particularly of the KMPR, demonstrate a downgrading of these concepts within South Korean strategic planning.¹⁷

However, procurement plans and development budgets suggest otherwise. South Korea’s budget for counterforce-related capabilities has increased substantially during the Moon administration.¹⁸ Medium-term defense planning documents indicate that the government intends to spend \$27.86 billion from 2020 to 2024 on such capabilities, compared to the \$7.12 billion announced in the 2016–20 midterm defense plan.¹⁹ The newly released 2021–25 midterm defense plan includes commitments to develop more advanced capabilities in all three areas of the South Korean counterforce and countervalue strategy.²⁰ Moreover, since the mid-1990s, South Korean defense white papers have referred to “omnidirectional threats” or equivalent terms.²¹ That South Korea is

16. *Ibid.*

17. Takeshi Watanabe and Osamu Koike, “The Korean Peninsula: Prospects of the ‘Denuclearization’ Negotiations,” in *East Asian Strategic Review, 2019* (Tokyo: National Institute for Defense Studies, 2019), pp. 94–95, http://www.nids.mod.go.jp/english/publication/east-asian/pdf/2019/east-asian_e2019_03.pdf; and “North Isn’t the ‘Enemy’ in Military’s New Paper,” *Korea JoongAng Daily*, January 16, 2019, <http://koreajoongangdaily.joins.com/news/article/article.aspx?aid=3058220>.

18. During the previous right-wing Park government, the 2014 and 2016 counterforce budgets were \$958 billion (1.17 trillion Korean won [KRW]) and \$1.38 billion (KRW1.69 trillion), respectively. After Moon’s election in 2017, it was \$4.17 billion (KRW5.1 trillion) and, in 2020, the budget increased to \$5.04 billion (KRW6.156 trillion). See *2014 Defense White Paper*, p. 175; *2016 Defense White Paper*, p. 128; *2018 Defense White Paper*, p. 161; and MND, “‘Hawksilhan Byeonhwa, Daehanminguk 2020! Ganghan Anbo, Chaegim Bo Hun’ 2020 Nyeon Gukbangbu Eommubogo’ Bodo Jaryo” [Certain change, Republic of Korea 2020! Strong security, responsibility for veterans ‘2020 Ministry of National Defense task report’], *Bodojaryo* [press release], January 20, 2020, p. 4, <https://www.korea.kr/common/download.do?fileId=189512774&tblKey=GMN>. All exchange rates were calculated on a fixed rate of 1 KRW = 0.000818747 U.S. dollars as of May 1, 2020.

19. MND, “Gun Jeollyeokjeunggangui Cheongsajin, ‘16–’20 Gukbangjunggigyehoek Jakseong” [A blueprint for the buildup of military power, ‘16–’20 midterm defense plan], *Bodojaryo* [press release], April 17, 2015, p. 11, [https://www.mnd.go.kr/user/newsInFileDown.action?siteId=mnd&newsSeq=I_8494&num=](https://www.mnd.go.kr/user/newsInFileDown.action?siteId=mnd&newsSeq=I_8494&num=;); and MND, “Daehanminguk-Eul Jikineun Teunteunhan Gukbangseolgyedo [‘20–’24 Gukbangjunggigyehoek]” [A strong defence plan to protect the Republic of Korea (‘20–’24 midterm defence plan)], *Bodojaryo* [press release], August 14, 2019, p. 4, https://www.mnd.go.kr/user/newsInFileDown.action?siteId=mnd&newsSeq=I_11740&num=1.

20. MND, “Nugudo Neombol Su Eobsneun Yuneunghan Anbo Teunteunhan Gukbang [‘21–’25 Gukbangjunggigyehoek] Su Rip” [The establishment of a competent national security and strong national defense (‘21–’25 mid-term defense plan) that no one can surpass], *Bodojaryo* [press release], August 09, 2020, pp. 1–9, https://www.mnd.go.kr/user/newsInFileDown.action?siteId=mnd&newsSeq=I_12193&num=1.

21. *2006 Defense White Paper* (Seoul: Ministry of National Defense, 2006), pp. 38–47, <https://>

preparing for other contingencies—for which its counterforce capabilities will be relevant—by no means suggests that they supersede the threats North Korea poses. In any event, these name changes probably carry limited weight for leaders in Pyongyang. North Korean military planners likely perceive them as a threat and base their planning on these capabilities being directed against them.

Why Pursue a Conventional Counterforce and Countervalue Strategy?

At first glance, South Korea's pursuit of an independent conventional counterforce and countervalue strategy seems inefficient in terms of both its financial cost and uncertain deterrent effectiveness. That South Korea is already covered by the U.S. nuclear umbrella, which provides a superior nuclear capability in comparison to North Korea, thereby ensuring escalation dominance, only serves to highlight this inefficiency. Indeed, it can be argued that given the conventional strength that the United States can bring to bear on the peninsula, including missile defense, extensive strike capabilities, and comprehensive ISR, an independent South Korean conventional counterforce capability is wasteful.

This section asks how a conventional counterforce and countervalue strategy improves South Korean security. We demonstrate how South Korea's new capabilities may function as a hedge, namely by providing a stopgap deterrent if the U.S. alliance fails in the short term, while over the longer term providing South Korea with strengthened nuclear latency. This fits within a long-standing strategy of hedging against U.S. abandonment, and we argue that the United States has—somewhat counterintuitively—largely supported this approach.

SOUTH KOREA'S HEDGING LOGIC

South Korean hedging is not a new phenomenon. Since the 1970s, South Korea has (with varying degrees of enthusiasm) worked to ensure that if its interests are not met, it is not so dependent on the United States that it has no strategic or operational room for maneuver.²² That South Korea hedges does not mean

www.mnd.go.kr/user/mnd/upload/pblict/n/PBLICTNEBOOK_201505220946564640.pdf. See also 1994–1995 *Defense White Paper* (Seoul: Ministry of National Defense, 1995), p. 106.

22. Initially, such hedging took the form of defense industrial independence designed to reduce reliance on U.S. suppliers. In the contemporary era, South Korea's naval modernization demonstrates this independent operations logic. While the navy is designed to function within the U.S.

that is seeks or predicts an end to the alliance. Indeed, there are no initiatives aimed at terminating the relationship, and there is widespread South Korean political and public support for the U.S. alliance.²³ Rather, by bolstering its independent capabilities, South Korea is seeking to hedge against potential U.S. abandonment, thereby increasing its operational and strategic autonomy.

During the last decade, South Korea's incentives to hedge have increased. North Korea's 2010 sinking of the South Korean corvette *Cheonan* and shelling of Yeonpyeong Island were pivotal events: they provided some evidence to policymakers that the United States may not allow South Korea to risk conflict escalation and would constrain any response to such provocations.²⁴ Moreover, the sources of South Korea's abandonment fears now extend beyond the North Korean threat. The worsening U.S. relationship with China places U.S. allies in a difficult position, where they fear being entrapped or having their interests overlooked in a crisis or conflict.²⁵ The U.S. deployment of the Terminal High Altitude Area Defense (THAAD) system on the peninsula in 2016, and the subsequent Chinese backlash against the South Korean economy, reinforced such fears in Seoul, as South Korea was forced to choose between its security patron and its largest economic market. Although it chose the former, it received little or no support from Washington when Beijing applied pressure.²⁶

As North Korea is close to or has developed the ability to strike the continental United States with nuclear weapons, fears of alliance abandonment have increased in South Korea.²⁷ While clichéd, the question of whether Washington would sacrifice a West Coast city for Seoul remains pertinent in

alliance, the intention is for an independent warfighting capability if needed. See Ian Bowers, *The Modernisation of the Republic of Korea Navy: Seapower, Strategy, and Politics* (London: Palgrave Macmillan, 2018), pp. 117–124.

23. Karl Friedhoff, "While Positive toward U.S. Alliance, South Koreans Want to Counter Trump's Demands on Host-Nation Support," *Chicago Council on Global Affairs*, December 16, 2019, <https://www.thechicagocouncil.org/publication/lcc/while-positive-toward-us-alliance-south-koreans-want-counter-trumps-demands-host-nation>.

24. On U.S. efforts to restrain South Korea following the shelling of Yeonpyeong-do, see Van Jackson, *Rival Reputations: Coercion and Credibility in US–North Korea Relations* (Cambridge: Cambridge University Press, 2016), p. 185.

25. Victor Cha, "Collateral Damage: What U.S.–China Competition Means for Korea," Center for Strategic and International Studies (CSIS) Newsletter, October 10, 2019, <https://www.csis.org/analysis/collateral-damage-what-us-china-competition-means-korea>.

26. Brad Glosserman, "Seoul Draws Wrong THAAD Lessons," *Japan Times*, January 27, 2020, <https://www.japantimes.co.jp/opinion/2020/01/27/commentary/japan-commentary/seoul-draws-wrong-thaad-lessons/>.

27. Terence Roehrig, *Japan, South Korea, and the United States Nuclear Umbrella: Deterrence after the Cold War* (New York: Columbia University Press, 2017), pp. 138–139; and Clint Work, "Alternative

the minds of South Korean decisionmakers. The actions of the Donald Trump administration, including unilateral threats to attack North Korea in 2017, efforts to reduce the U.S. presence on the peninsula, and exorbitant demands over cost-sharing have only served to underline these fears.²⁸ Under these conditions, South Korean military and political elites are unwilling to rely passively on extended deterrence by the United States. Instead, they are following a long-worn path of making incremental internal adjustments to their country's military capabilities to strengthen its relative position in the alliance.²⁹

The United States largely has supported South Korea's efforts to develop greater capabilities and is not necessarily opposed to its hedging behavior. Following the sinking of the *Cheonan* and the shelling of Yeonpyeong Island, South Korea and the United States sought to alter their traditional and largely passive deterrence policy. Through this process, the United States agreed—despite the Barack Obama administration's initial skepticism—to revise missile guidelines and allow South Korea to build more potent ballistic and cruise missiles.³⁰ At the 45th ROK-U.S. Security Consultative Meeting in 2013, South Korea and the United States agreed to operationalize a tailored deterrence-force posture specifically to counter unique elements of the North Korean threat.³¹ This agreement laid the bedrock for South Korean counterforce planning. The Trump administration further lifted limits on South Korean missile capabilities, removing all payload restrictions in 2017 and in 2020, allowing South Korea to produce solid-fueled rockets capable of putting satellites into orbit.³² Moreover, ongoing efforts to transform the alliance, centered on the

Futures for the US-ROK Alliance: Will Things Fall Apart?" *38 North*, May 7, 2020, pp. 4–6, <https://www.38north.org/2020/05/cwork050720/>.

28. Clint Work, "Beyond North Korea: Fractures in the US–South Korea Alliance," *Diplomat*, February 11, 2020, <https://thediplomat.com/2020/02/beyond-north-korea-fractures-in-the-us-south-korea-alliance/>.

29. Chung-in Moon, "China's Rise and Security Dynamics on the Korean Peninsula," in Robert S. Ross and Øystein Tunsjø, eds., *Strategic Adjustment and the Rise of China: Power and Politics in East Asia* (Ithaca, N.Y.: Cornell University Press, 2017), p. 225.

30. The United States feared that providing South Korea with a more potent missile capability would increase regional proliferation risks and leave Seoul with an uncontrollable escalatory potential. However, the threat from North Korea, combined with South Korean insistence, overrode those concerns. Daniel Pinkston, "The New South Korean Missile Guidelines and Future Prospects for Regional Stability," *International Crisis Group*, October 25, 2012, <https://www.crisisgroup.org/asia/north-east-asia/korean-peninsula/new-south-korean-missile-guidelines-and-future-prospects-regional-stability>.

31. U.S. Department of Defense, *Joint Communiqué: The 45th ROK-U.S. Security Consultative Meeting*, October 2, 2013, Seoul, p. 3, https://dod.defense.gov/Portals/1/Documents/pubs/Joint%20Communique_%2045th%20ROK-U.S.%20Security%20Consultative%20Meeting.pdf.

32. Ankit Panda, "Solid Ambitions: The U.S.–South Korea Missile Guidelines and Space

transfer of wartime operational control (OPCON), show that both South Korea and the United States are working toward increased South Korean responsibility. The United States has identified improved ballistic missile defense (BMD) and C4ISR capabilities as prerequisites for OPCON transfer.³³ Therefore, bolstering elements that are a critical part of South Korea's counterforce approach are also required for OPCON to occur.

Despite its support, the United States has sought to maintain leverage over South Korea and its deterrence strategy. One reason Washington initially accepted the South Korea counterforce plan in 2012 was its awareness that South Korea would remain dependent on U.S. capabilities for years to come. Most notably, South Korea's current lack of an independent ISR capability provides the United States with substantial leverage within the alliance and partially addresses entrapment concerns.³⁴ In addition, South Korea will continue to require U.S. support for several high-technology products it acquires, such as the Global Hawk unmanned aerial vehicle (UAV), the F-35, and the Aegis Combat System. Given South Korea's reliance on specific U.S. components, it would be difficult to indigenously develop advanced weapon systems without U.S. consent.³⁵

South Korea's leaders are likely keenly aware of this reliance, and somewhat paradoxically prefer to prepare its independent strategy within the alliance framework. For South Korea, the alliance acts as a blanket under which Seoul can develop the necessary capabilities with reduced risk of North Korea responding with force. It further secures access to advanced technology. In addition, South Korean leaders realize, while refusing to fully network their missile

Launchers," Carnegie Endowment for International Peace, August 25, 2020, <https://carnegieendowment.org/2020/08/25/solid-ambitions-u.s.-south-korea-missile-guidelines-and-space-launchers-pub-82557>.

33. Vincent K. Brooks, *Statement of General Vincent K. Brooks, Commander, United Nations Command; Republic of Korea and United States Combined Forces Command; and United States Forces Korea in Support of Commander, United States Pacific Command Testimony before the Senate Armed Services Committee*, March 14, 2018, pp. 14–15, https://www.armed-services.senate.gov/imo/media/doc/Brooks_03-15-18.pdf.

34. According to Brad Roberts, the U.S. deputy assistant secretary of defense for nuclear and missile defense policy from 2009 to 2013, the United States insisted on retaining control over ISR, which South Korea accepted. U.S. officials saw a need to bolster deterrence post-Cheonan but were concerned about entrapment. Author interview with Roberts, Oslo, June 21, 2019.

35. For example, news reports stated that the South Korean KTSSM system has been delayed because the United States is unwilling to transfer some vital components needed to operationalize it. "South Korea: New Artillery Brigade Equipped with KTSSM Ballistic Missile," *Army Recognition*, March 21, 2018, https://www.armyrecognition.com/march_2018_global_defense_security_army_news_industry/south_korea_new_artillery_brigade_equipped_with_ktssm_ballistic_missile.html.

defense systems with the U.S. forces, that combined forces provide a more credible deterrent.³⁶ For this reason, South Korea has bolstered coordination with the United States on missile defense and deterrence, and sought to improve interoperability.³⁷

Nevertheless, South Korea is progressively drawing closer to its goal of obtaining an independent conventional counterforce and countervalue capability. As South Korea strengthens these capabilities, it will no longer be dependent on the United States to initiate counterforce strikes. Similarly, as South Korea's defense industries mature further, and the country continues to develop indigenous capabilities, it will be less dependent on imports and support from the United States. Thus, even if the United States still maintains significant leverage over South Korea—and even if U.S. support is still strongly preferable—South Korea's reliance on the United States is declining. South Korea is thus approaching a point where it could employ its strategy without U.S. support.

SHORT-TERM HEDGING: A MINIMALLY CREDIBLE DETERRENT

In a scenario where the alliance has ended, U.S. forces have left the peninsula, or the United States is unwilling to commit to the use of force, South Korea's counterforce capabilities would provide a stopgap deterrent. The strategy may stay the hand of North Korean leaders—or at least raise the threshold for launching a nuclear strike. Moreover, by preparing for abandonment, South Korea may lower its likelihood in the first place. South Korea's independent capability would reduce North Korea's incentives to drive a wedge into the al-

36. South Korea's refusal to network its missile defense systems is likely the result of two, not mutually exclusive, reasons. First, China is very wary of networked missile defense systems on the Peninsula. Second, networked systems may discourage South Korea from acquiring the necessary systems to develop an independent missile defense capability.

37. At the SCM in 2014, both countries agreed to establish the "Concepts and Principles of ROK-U.S. Alliance Comprehensive Counter-Missile Operations." U.S. Department of Defense, *Joint Communiqué: The 46th ROK-U.S. Security Consultative Meeting*, October 23, 2014, p. 4, https://archive.defense.gov/pubs/46th_SCM_Joint_Communique.pdf. Moreover, U.S. and South Korean forces now hold quarterly joint missile defense exercises and there is some coordination on deterrence policy through committees, including the Deterrence Strategy Committee and the Extended Deterrence Strategy and Consultation Group. Oh Seok-min, "S. Korea-U.S. Missile Defense Exercise Crucial for OPCON Transfer: Ministry," Yonhap News Agency, June 11, 2020, <https://en.yna.co.kr/view/AEN20200611007300325>; Brad Roberts, "Deterrence and Détente on the Korean Peninsula," *Asia Unbound* blog, Council on Foreign Relations, April 22, 2019, <https://www.cfr.org/blog/deterrence-and-detente-korean-peninsula>; and David Santoro, "Deterring North Korea: The Next Nuclear-Tailoring Agenda," *War on the Rocks* blog, August 8, 2017, <https://warontherocks.com/2017/08/deterring-north-korea-the-next-nuclear-tailoring-agenda/>.

liance. That is, if the United States abandoned South Korea, North Korea still would not have free rein to engage in nuclear compellence threats (or nuclear blackmail) against South Korea.³⁸

South Korea's strategy faces significant credibility challenges. Resolve is not an issue, as South Korean leaders would have compelling incentives to employ their plan to defend the homeland.³⁹ Rather, the key problem for South Korea is the credibility of its capabilities.⁴⁰ As we outline in detail below, there are daunting challenges facing South Korea's operationalization of its deterrence strategy. Its ability to preemptively destroy the North Korean arsenal and retaliate in the event of an attack are far from assured.

Nevertheless, South Korea's counterforce capability can be at least "minimally credible," and thus have a deterrent effect. As Harrison Wagner argued in the context of U.S. counterforce targeting during the Cold War, a counterforce capability can deter "even if it is common knowledge that a counterforce attack would be a very risky option to choose—as long as it is not common knowledge that the probability that one would resort to it is zero."⁴¹ A similar (if not identical) logic applies to South Korea's counterforce capabilities. Even if leaders in North Korea believe that a preemptive strike against its nuclear arsenal is likely to fail, they need to consider the potential for a successful South Korean attack. Because the consequences would be grave, even a remote possibility of a disarming strike might deter North Korean leaders.

Similarly, South Korean threats to retaliate and kill North Korean leaders are minimally credible, as the mere possibility of such strikes may be enough to instill uncertainty. South Korea's retaliatory strategy resembles nuclear strategies premised on "first-strike uncertainty," which rests on a state's ability to make its opponent uncertain about whether it could prevent retaliation after a nuclear attack. Although less effective than a secure second-strike capability, such capabilities nevertheless may have a deterrent effect.⁴²

38. On nuclear blackmail, see Richard K. Betts, *Nuclear Blackmail and Nuclear Balance* (Washington, D.C.: Brookings Institution Press, 1987), pp. 3–7.

39. On primary versus extended deterrence and credibility, see Roehrig, *Japan, South Korea, and the United States Nuclear Umbrella*, p. 17.

40. Despite extensive debates about how to assess credibility, there is broad agreement that capabilities are a crucial ingredient. For a review, see Daryl G. Press, *Calculating Credibility: How Leaders Assess Military Threats* (Ithaca, N.Y.: Cornell University Press, 2005).

41. R. Harrison Wagner, "Nuclear Deterrence, Counterforce Strategies, and the Incentive to Strike First," *American Political Science Review*, Vol. 85, No. 3 (September 1991), p. 739, doi.org/10.2307/1963848.

42. Avery Goldstein, *Deterrence and Security in the 21st Century: China, Britain, France, and the Enduring Legacy of the Nuclear Revolution* (Stanford, Calif.: Stanford University Press, 2000); and Wu

In addition to a deterrent against North Korea, South Korea's advanced capabilities likely are intended to deter other regional actors, most notably China. Although Seoul could not hope to defeat China in a conventional conflict, the potential utility of its advanced conventional capabilities for high-impact precision strikes provides Seoul with a limited deterrence by punishment capability.⁴³ This is a high-risk strategy when facing a superior opponent that can maintain escalation dominance. However, South Korea's ability to hit high-value targets may deter Beijing from escalating a low-stakes conflict or crisis for fear of incurring costs disproportionate to possible gains.

LONG-TERM HEDGING: NUCLEAR LATENCY

South Korea's advanced conventional capabilities may also provide a longer-term hedge by bolstering its nuclear latency. If the U.S. alliance broke down, South Korea would arguably be likely to seek to develop nuclear weapons. Although it is difficult to prove that such considerations have informed decision-makers, the capabilities that South Korea is acquiring—particularly, its ballistic and cruise missiles—will significantly ease the path to a credible nuclear deterrent. It will also limit the acute vulnerability South Korea would face between abandonment and attainment of deliverable nuclear weapons. At the very least, the conventional deterrence strategy thus adds major value to a nuclear hedging strategy.

South Korea has for several decades pursued a nuclear hedging strategy. It had a nuclear weapons program during the 1970s (abandoned in large part because of U.S. pressure), and a majority of the South Korean public favors developing nuclear weapons to respond to the North Korean threat.⁴⁴ However, instead of developing nuclear weapons of its own, South Korea chose to develop many of the capabilities and technologies needed to cross the nuclear threshold and develop an arsenal in a relatively short time if it wants.⁴⁵ It has

Riqiang, "Certainty of Uncertainty: Nuclear Strategy with Chinese Characteristics," *Journal of Strategic Studies*, Vol. 36, No. 4 (2013), pp. 579–614, doi.org/10.1080/01402390.2013.772510.

43. Brad Glosserman and S. Paul Choi, "Don't Lose Sight of Under-the-Hood Changes to South Korea's Defense Posture," *Diplomat*, November 13, 2019, <https://thedi diplomat.com/2019/11/dont-lose-sight-of-under-the-hood-changes-to-south-koreas-defense-posture/>.

44. On the history of South Korea's nuclear weapons program, see Alexander Lanoszka, *Atomic Assurance: The Alliance Politics of Nuclear Proliferation* (Ithaca, N.Y.: Cornell University Press, 2018), pp. 110–131. On public opinion, see Dina Smeltz, Karl Friedhoff, and Lilly Wojtowicz, "South Koreans See Improved Security, Confident in US Security Guarantee," Chicago Council on Global Affairs, January 18, 2019, <https://www.thechicagocouncil.org/publication/lcc/south-koreans-see-improved-security-confident-us-security-guarantee>.

45. Scott D. Sagan, "Nuclear Latency and Nuclear Proliferation," in William C. Potter and

had a long-standing interest in acquiring such technologies, and its government's desire for sensitive nuclear technology crucial to a nuclear weapons program, including enrichment and reprocessing (which it currently does not possess), most likely is driven by a hedging logic.⁴⁶ Although most analysts agree that South Korea is unlikely to go nuclear any time soon, nuclear hedging provides South Korea with a future option to develop the bomb while avoiding major costs and risks.⁴⁷

A crucial, yet often overlooked, risk that South Korea would face if it decided to pursue a nuclear capability is the acute window of vulnerability before attaining deliverable nuclear weapons. To be sure, there are several other constraints keeping South Korea from developing the bomb, including the risk of a major U.S. backlash that could threaten the alliance and the prospects of broad international opprobrium and economic sanctions.⁴⁸ However, the window of vulnerability acts as a powerful constraint. As Mark Fitzpatrick highlighted, it would be almost impossible for an open society such as South Korea to hide its weapons program. Without a U.S. security guarantee, North Korea could in the worst case attempt a preventive strike against the program.⁴⁹ South Korea's security would therefore deteriorate, rather than improve, during the nuclear-weapons development process.

South Korea's deterrence strategy could help mitigate (albeit not eliminate) risks arising from this window of vulnerability and bolster its nuclear hedging strategy. First, with a stopgap deterrent at hand, South Korea would be safer in the period between abandonment and the attainment of deliverable nuclear weapons. Potentially, the advanced capabilities South Korea is acquiring could deter a North Korean preventive strike against the program. Even if North Korea only sought to engage in a limited preventive strike, its leaders would have to consider the risk of escalation into a full-blown conflict, where South Korea could attempt to hold its leaders at risk. Moreover, South Korea could attempt to take out North Korean strike assets and rely on missile defense to protect its nuclear program.

Gaukhar Mukhatzhanova, eds., *Forecasting Nuclear Proliferation in the 21st Century*, Vol. 1, *The Role of Theory* (Stanford, Calif.: Stanford University Press, 2010), p. 90.

46. Lami Kim, "South Korea's Nuclear Hedging?" *Washington Quarterly*, Vol. 41, No. 1 (2018), pp. 115–133, doi.org/10.1080/0163660x.2018.1445910.

47. Roehrig, *Japan, South Korea, and the United States Nuclear Umbrella*, pp. 149–151; and Alexander Lanoszka, "Alliances and Nuclear Proliferation in the Trump Era," *Washington Quarterly*, Vol. 41, No. 4 (2018), pp. 85–101, doi.org/10.1080/0163660x.2018.1557976.

48. For a discussion of constraints keeping South Korea from developing nuclear weapons, see Mark Fitzpatrick, *Asia's Latent Nuclear Powers: Japan, South Korea, and Taiwan* (Abingdon, U.K.: Routledge, 2016), pp. 50–55.

49. *Ibid.*, p. 52.

Second, the missiles South Korea is developing would greatly ease South Korea's path to deliverable and survivable nuclear weapons. South Korean ballistic missile capabilities now carry heavier payloads for greater distances, and several are potentially suited to carry nuclear warheads.⁵⁰ For a state seeking a secure second-strike capability, access to delivery vehicles—particularly ballistic missiles—is critical. Although often overlooked in the literature on nuclear latency, ensuring access to dual-use delivery vehicles is therefore an integral part of a nuclear hedging strategy.⁵¹ Even in the period when it would have only a few nuclear warheads available, an arsenal of missiles would significantly bolster South Korean deterrence, as it would be very challenging for North Korea to know which missiles carried nuclear warheads.⁵²

South Korea's nascent drive to acquire a nuclear-powered attack submarine to hold North Korean missile submarines at risk also may be driven partly by a nuclear hedging logic.⁵³ The most important hurdle South Korea would face were it to build the bomb is a lack of access to the technology necessary to produce weapons-grade fissile material.⁵⁴ To produce fuel for a submarine, South Korea would need the ability to enrich uranium. Some analysts therefore believe that the country's plans are at least partly informed by a desire for enrichment technology.⁵⁵ In the longer term, nuclear-powered submarines also could be a crucial nuclear-weapons platform for South Korea. Compared to land-based or air-launched missiles, submarines armed with ballistic or cruise missiles offer superior survivability, even against larger adversaries such as China, particularly for a state with limited strategic depth, such as South Korea.

Main Challenges to Conventional Counterforce

Conceptually, the ability to neutralize an opponent's nuclear weapons while avoiding the political and international ramifications of pursuing nuclear

50. Ibid., pp. 27–29.

51. Vipin Narang, "Strategies of Nuclear Proliferation: How States Pursue the Bomb," *International Security*, Vol. 41, No. 3 (Winter 2016/17), pp. 110–150, doi.org/10.1162/ISEC_a_00268. On nuclear latency (and how it overlooks delivery vehicles), see Sagan, "Nuclear Latency and Nuclear Proliferation"; and Rupal N. Mehta and Rachel E. Whitlark, "The Benefits and Burdens of Nuclear Latency," *International Studies Quarterly*, Vol. 61, No. 3 (September 2017), pp. 517–528, doi.org/10.1093/isq/sqx028.

52. On haystacking, see Ryan Boone, "Appendix A: Haystack Attacks," in Andrew F. Krepinevich and Jacob Cohn, eds., *Rethinking Armageddon: Scenario Planning in the Second Nuclear Age* (Washington, D.C.: Center for Strategic and Budgetary Assessments, 2016), pp. 125–129.

53. Kim, "South Korea's Nuclear Hedging?"

54. Fitzpatrick, *Asia's Latent Nuclear Powers*, pp. 29–34.

55. Kim, "South Korea's Nuclear Hedging?"

weapons is undeniably attractive. However, as we outline in the following section, South Korea's strategy creates a series of dilemmas and problems. First, operationalizing the plan is extremely demanding, which may place the South Korean military under strain and challenge the credibility of the strategy. Second, North Korea is highly unlikely to accept South Korea threatening both its arsenal and leaders, and will aim to design around South Korea's strategy and intensify its efforts to build a survivable nuclear arsenal. Third, although bolstering deterrence, South Korea's strategy may seriously undermine crisis stability, and thereby in the worst case increase the likelihood of nuclear use.

THE OPERATIONAL CHALLENGE

A credible South Korean conventional counterforce capability must overcome significant operational challenges. In short order, South Korea needs to detect imminent missile launches from anywhere in North Korea, process the data through the chain of command, and execute preemptive or responsive strikes. Simultaneously, it must defend against missiles that may survive any preemptive attack. Given the possibility of a surprise attack, the plan requires sustained readiness from South Korea's military. In addition, South Korea would need to retain some forces to implement the KMFR.

The following analysis demonstrates how demanding it will be to implement the operational plan's three key elements: detection and tracking, offensive strikes, and missile defense. The analysis is based on an abandonment scenario, where South Korea implements the plan without any support from the United States.

DETECTION AND TRACKING. Traditionally, ISR has been a source of weakness for South Korea, which has relied on the United States for such capabilities. Despite ongoing investment, South Korea's current airborne and satellite ISR platforms do not provide its military with real-time, 24-hour/365-day coverage of all North Korean territory. Gaps in ISR coverage create blind spots wherein North Korean launches could be prepared and executed without detection. Numerous semi-realized, defense-reform efforts have sought to remedy this situation.⁵⁶ Although progress has been slow, South Korean defense planning documents indicate an increasing focus on developing an independent, high-technology ISR capability. These developments would allow the

56. Michael Raska, *Military Innovation in Small States: Creating a Reverse Asymmetry* (Abingdon, U.K.: Routledge, 2016), pp. 95–129.

South Korean military to leverage new sensor and data-processing technologies to independently perform Kill Chain and KMPCR operations.⁵⁷

South Korea is investing in UAVs and increased satellite coverage. It has procured four U.S.-made Global Hawk high altitude long endurance UAVs and is developing a family of indigenously designed UAVs.⁵⁸ The first Global Hawks entered service in December 2019. Once fully operational, the Global Hawks will greatly enhance South Korea's indigenous intelligence-collection capacity.⁵⁹ In addition, South Korea is procuring a constellation of satellites. Its KOMPSAT-6 and KOMPSAT-7 satellites, scheduled for launch in 2021, will significantly improve high-resolution coverage.⁶⁰ However, only when a new series of four satellites (Project 425) becomes operational will South Korea potentially have full, real-time coverage of the peninsula, which is crucial to successfully operationalizing its strategy. These satellites, planned for deployment from 2023 to 2025, will be equipped with advanced synthetic aperture radar.⁶¹ South Korea also intends to develop a constellation of cheaper nano ISR satellites equipped with synthetic aperture radar that can be indigenously launched into low orbit from solid-propellant rockets and will provide reliable, constant coverage of the peninsula.⁶²

Even with full coverage of the peninsula, the ISR challenge for South Korea is daunting. It is impossible to assess the exact number of missile launchers South Korea would need to detect and track, but according to U.S. government

57. MND press release, August 14, 2019, p. 4; MND, "18-22 Gukbangjunggigyehoeok, Hyanghu 5 Nyeongan 238 Jowon Tuip" [18-22 midterm defence plan, 238 trillion won will be invested for 5 years from now], *Bodojaryo* [press release], April 14, 2018, https://www.mnd.go.kr/user/newsInFileDown.action?siteId=mnd&newsSeq=1_10213&num=1; and Herbert C. Kemp, "Countering Mobile Missiles: Holding the Entire Launch Cycle at Risk," Mitchell Forum Paper Series No. 27 (September 2019), pp. 3-5, http://docs.wixstatic.com/ugd/a2dd91_fa949ddd645048bda9e7b0f50f77216c.pdf.

58. J.R. Ng, "Asia-Pacific Unmanned Aerial Vehicle Directory 2019," *Asian Military Review*, June/July 2019, pp. 12-25.

59. Greg Waldron, "Global Hawk Arrival to Bolster Seoul's ISR Capabilities," *Flight Global*, December 22, 2019, <https://www.flightglobal.com/defence/global-hawk-arrival-to-bolster-seouls-isr-capabilities/135914.article>; and Lieber and Press, *The New Era of Counterforce*, pp. 42-44.

60. The KOMPSAT-6 will have an enhanced X-band synthetic aperture array to provide imagery of up to .05m resolution, and the KOMPSAT-7 will be equipped with an electro-optical camera with 30cm resolution. Korea Aerospace Research Institute, "Korea Multi-Purpose Satellite (KOMPSAT, Arirang)" (Daejeon: Korea Aerospace Research Institute, 2016), https://www.kari.re.kr/eng/sub03_02_01.do.

61. "Thales Alenia Space Will Support Korean Aerospace Industry for the Development of a Constellation of Earth Observation Radar Satellites," *ThalesAlenia Space*, May 12, 2018, <https://www.thalesgroup.com/en/worldwide/space/press-release/thales-alenia-space-will-support-korean-aerospace-industry>.

62. MND, "Nugudo Neombol Su Eobsneun Yuneunghan Anbo Teunteunhan Gukbang," p. 4.

estimates, launchers likely would number in the hundreds and missiles in the high hundreds or more.⁶³ During hearings in the South Korean National Assembly, lawmakers suggested as many as 200 launchers and more than 1,000 missiles, most of which are nuclear capable.⁶⁴ As it would be highly challenging to ascertain which missiles carried nuclear warheads, South Korea would likely be forced to take out all of them.⁶⁵

Finally, the regime in Pyongyang has constructed thousands of hardened underground shelters around the country.⁶⁶ Open-source intelligence indicates that this type of underground construction is designed for leadership survival, protection of missiles, and general military capabilities.⁶⁷ This level of protection increases the complexity of both leadership and missile targeting, as well as the time Seoul would need to dedicate to ISR for both the Kill Chain and the KMPR strategies.

The time South Korea would have to detect the missiles is highly constrained. Original South Korean planning allowed thirty minutes from detection of an imminent North Korean launch to destruction of the launch vehicle.⁶⁸ However, as North Korean capabilities have developed, this reaction

63. U.S. government estimates suggest North Korea has around 100 launchers for its short-range, and approximately 50 launchers for its medium-range, ballistic missiles, with the number of missiles in the high hundreds. However, these figures have not changed in recent years. Plausibly, in line with its technological advances, North Korea also has pursued numerical advances. Office of the Secretary of Defense, *Military and Security Developments Involving the Democratic People's Republic of Korea* (Washington, D.C.: Department of Defense, 2017), <https://fas.org/irp/world/dprk/dod-2017.pdf>.

64. Secretariat of the National Assembly, *Gukhoebonhoeuihoeuirok, Je 343 hoe-je 07 cha (2016 nyeon 07 wol 05 il)* [Minutes of a plenary session of the national assembly, 343rd National Assembly, No. 07 (July 5, 2016)], p. 10, http://likms.assembly.go.kr/record/new/getFileDown.jsp?CONFER_NUM=046187.

65. Estimates of the number of North Korean nuclear warheads range from 30 to 100. See Gian Gentile et al., *Four Problems on the Korean Peninsula: North Korea's Expanding Nuclear Capabilities Drive a Complex Set of Problems* (Santa Monica, Calif.: RAND Corporation, 2019), p. 4.

66. Ashley Rowland and Yoo Kyong Chang, "Report: US Has Mapped North Korean Underground Escape Facilities," *Stars and Stripes*, August 05, 2015, <https://www.stripes.com/news/pacific/korea/report-us-has-mapped-north-korean-underground-escape-facilities-1.361678>.

67. Joseph Bermudez, Victor Cha, and Lisa Collins, "Undeclared North Korea: The Sino-ri Missile Operating Base and Strategic Force Facilities," *Beyond Parallel* (Washington, D.C.: Center for Strategic and International Studies, January 19, 2019), <https://beyondparallel.csis.org/undeclared-north-korea-the-sino-ri-missile-operating-base-and-strategic-force-facilities/>; Joseph S. Bermudez Jr., "North Korean Underground Facility: Probably Not a Ballistic Missile Silo," *38 North*, January 3, 2017, <https://www.38north.org/2017/01/jsbermudez010316/>; and C. Kenneth Quinones, "North Korea's Underground Construction," *NAPSNet Policy Forum*, October 5, 1998, <https://nautilus.org/napsnet/napsnet-policy-forum/north-koreas-underground-construction/>.

68. This number was revealed during National Assembly questioning of the South Korean prime minister in 2013. See Secretariat of the National Assembly, *Gukhoebonhoeuihoeuirok, Je 320 hoe-je 11cha (2013 nyeon 11 wol 20 il)* [Minutes of a plenary session of the national assembly, 320th Na-

time has most likely shortened. In 2018, the vice chairman of the U.S. Joint Chiefs of Staff, Gen. Paul Selva, stated that North Korea now could launch a ballistic missile in about twelve minutes.⁶⁹ This reduced time frame places increased emphasis on preemptive attacks in which South Korea could destroy missiles before they were ready to launch.⁷⁰

OFFENSIVE STRIKES. Even if South Korea managed to detect an imminent missile launch and track all necessary targets, the second operational challenge would be rapidly deploying strike platforms in sufficient numbers to destroy or disable them. To conduct a preemptive counterforce strike in a setting where warning time is limited, air-, sea-, and ground-launched cruise missiles and ballistic missiles are vital. Seoul is in the midst of a rapid buildup of such systems and now has the ability to target all regions of North Korea.⁷¹ Nevertheless, it will be difficult for South Korea to maintain sufficient strike platforms—and to sustain the necessary readiness—to conduct a preemptive strike against hundreds of North Korean targets within a highly constrained timeframe.

South Korea's cruise missile capabilities have developed rapidly in recent years. The Hyunmoo-3 and Haesong weapon families include ground and sea (surface and subsurface) variants that can hit targets with high precision from up to 1,500 kilometers. The development trajectory also shows that South Korea is pursuing incremental increases in range and lethality. South Korea also purchased 260 German air-launched KEPD-350 Taurus cruise missiles and has potent aircraft available to deliver them. It is in the process of integrating the first forty F-35A stealth aircraft into its fleet, which likely will enable the ROK Air Force to penetrate and loiter over North Korean airspace undetected.⁷² Moreover, its current, most advanced aircraft, fifty-nine F-15Ks, are more than a match for anything in the aging North Korean air force.

tional Assembly, No. 11 (November 20, 2013)], p. 12, http://likms.assembly.go.kr/record/new/getFileDown.jsp?CONFER_NUM=043297.

69. Colin Clark, "VCJCS Selva: North Korea Hasn't Demonstrated Key Tech to Nuke US Yet," *Breaking Defense*, January 30, 2018, <https://breakingdefense.com/2018/01/vcjc-selva-north-korea-hasnt-demonstrated-key-tech-nuke-us-yet/>.

70. The launch cycle of a ballistic missile consists of "moving to launch position, launching, re-loading or repositioning, and displacing to replenish missile loads." Kemp, *Countering Mobile Missiles*, p. 5.

71. In 2019, South Korean media reported that South Korea possessed more offensive (ballistic and cruise) missiles than North Korea. "S. Korea Has More Missiles Than N. Korea, Plans Further Beef-Up: Military Officials," Yonhap News Agency, August 1, 2019, <https://en.yna.co.kr/view/AEN20190801009100325>.

72. To exploit this loitering capability or launch from inside South Korean airspace, the South Ko-

Alongside South Korea's cruise missile capability sits a burgeoning force of Hyunmoo-2 series of ballistic missiles. These missiles are currently limited to a maximum range of 800 kilometers but carry a variety of payloads and give South Korea the ability to target most of North Korea from South Korea's southern tip. Some reports suggest the ROK Navy also plans to deploy a variant of the Hyunmoo-2 ballistic missile on its new Dosan ahn Chango-class submarine.⁷³ Further, in 2017, the army revealed the Hyunmoo-4 ballistic missile, which can carry a heavier payload and could target deeply buried military and leadership facilities.⁷⁴ Two of these missiles, each capable of carrying a 2,000-kilogram warhead, were tested in March 2020, with one failure.⁷⁵ In addition to these ballistic missiles, South Korea also is likely to rely on tactical missile systems to target both North Korea's leadership and missiles. South Korea possibly would seek to attack aboveground leadership facilities in Pyongyang with cluster munitions through the U.S.-designed ATACMS Block I-A. A Korean-made derivative of this system, the Korea Tactical Surface to Surface Missile (KTSSM-I) is in development with a proposed deployment date of 2021. With a range of 120 kilometers, a precise targeting capability, and a bunker-penetrating warhead, this missile is designed to counter North Korean artillery and multiple-launch rocket systems (MLRSs) in hardened tunnels proximate to the demilitarized zone (DMZ).⁷⁶ A derivative of this missile, the KTSSM-II, reportedly has a longer range and will be tasked with destroying unprotected North Korean short-range ballistic missiles (SRBMs) and long-range MLRS.⁷⁷

Despite this buildup, it remains to be seen if South Korea possesses adequate deliverable offensive capabilities to comprehensively target North Korean missile launchers and C2 facilities. The precise number of South Korean missiles is unknown. One South Korean news report suggested

rean military also developed the Korea global positioning system (GPS) guided bomb. Park Byong-su, "South Korea's Guided Bomb to be Equipped with US Military GPS," *Hankyoreh*, August 15, 2016, http://english.hani.co.kr/arti/english_edition/e_international/756752.html.

73. Gabriel Dominguez, "South Korea Developing SLBMs for KSS-III Attack Submarines," *Jane's Defence Weekly*, June 2, 2016.

74. Hyo Seol and Jang-Wook Lee, "Deterring North Korea with Non-Nuclear High-Tech Weapons: Building a '3K+' Strategy and Its Applications," *Korean Journal of Defense Analysis*, Vol. 30, No. 2 (June 2018), p. 202, <https://kida.re.kr/cmm/viewBoardImageFile.do?idx=24259>.

75. Dae Young Kim, "South Korea Conducts First Test Launch of Hyunmoo-4 Ballistic Missile," *Jane's Defence Weekly*, May 11, 2020.

76. "China and Northeast Asia—Republic of Korea Army," *Jane's Sentinel Security Assessment*, January 1, 2020.

77. *Ibid.*

that South Korea’s goal was to have 1,700 ballistic and cruise missiles by 2017 and more than 2,000 by the 2020s.⁷⁸ This, in theory, would allow South Korea to destroy 70 percent of North Korea’s long-range artillery and missiles within twenty-four hours of a conflict starting.⁷⁹ Even if this figure is correct, it remains uncertain whether South Korea has a sufficient number of missile launchers to use under combat conditions.⁸⁰ For air-launched capabilities, some calculations are possible. Using U.S. Air Force statistics and the number of ROK Air Force F-15K aircraft, it is possible to estimate that South Korea could deploy eighty-six Taurus missiles in a first strike against North Korean targets.⁸¹ In other words, while it may be possible in theory that South Korea could mobilize enough strike platforms, it is far from certain.

Even if South Korea had sufficient missiles, numbers alone are not a good indicator of capability. Instead, the key variable is readiness: ease and time of deployment and clarity of C2 procedures determine effectiveness. It will be highly challenging to maintain sufficient readiness, because the risk of a surprise attack can never be ignored. For example, if South Korea intends for the Kill Chain to activate on extremely short notice, then its aircraft must be maintained in a constant state of alert. This stresses aircraft, aircrews, and maintenance cycles and ultimately may undermine force readiness. Similarly, the ROK Navy faces the dilemma of maintaining enough vessels at sea proximate to North Korea to project sufficient power to make any counterforce plan realistic. Although the navy is rapidly building its strike capabilities, the realities of training and maintenance cycles and other operations mean perhaps only 30 percent of its fleet is deployable at any one time. In 2019, the ROK Navy admitted that insufficient numbers of Aegis-capable vessels made it unable to track a North Korean ballistic-missile launch.⁸²

78. Kim Tae-hoon, “24Sigan Nae Buk Haeksim 70% Pagoeg’ Jeollyeok Hwakbo” [Securing military power, to “destroy 70% of North Korea’s core within 24 Hours”], *SBS News*, January 25, 2016, https://news.sbs.co.kr/news/endPage.do?news_id=N1003381253.

79. *Ibid.*

80. South Korea possessed sixty ground-to-ground missile launchers. *2016 Defense White Paper*, p. 268; and *2018 Defense White Paper*, p. 332.

81. The ROK Air Force operates fifty-nine F-15Ks (USAF F-15Es). Assuming 73 percent readiness would mean forty-three available aircraft capable of carrying two Taurus missiles each. For readiness rates, see Stephen Losey, “Aircraft Mission-Capable Rates Hit New Low in Air Force, Despite Efforts to Improve,” *Air Force Times*, July 26, 2019, <https://www.airforcetimes.com/news/your-air-force/2019/07/26/aircraft-mission-capable-rates-hit-new-low-in-air-force-despite-efforts-to-improve/>.

82. Yu Yong-weon, “Aegis Ships Missed N. Korea’s Recent Missile Launches,” *Chosun Ilbo*, October 11, 2019, http://english.chosun.com/site/data/html_dir/2019/10/11/2019101100958.html.

A further problem is that a counterforce operation would unlikely happen in isolation. For example, in response to a South Korean preemptive attack, North Korea would probably retaliate by using its massed artillery against Seoul and other important areas proximate to the DMZ. The South Korean military therefore cannot plan for a preemptive assault on North Korean nuclear capabilities alone. Instead, it needs the capacity to simultaneously neutralize other North Korean capabilities while surviving the onslaught. Although some tactical missile systems and other capabilities are dedicated to this purpose, the ROK Air Force and the Navy would be hard pressed to enact a successful defense of South Korean areas from conventional assault while launching offensive counterforce attacks.⁸³ Moreover, the need to keep high-end South Korean military assets in a state of readiness for counterforce missions would divert these resources from other operations, including patrolling South Korean airspace and territorial waters to deter other regional actors, such as China or Russia.

Finally, given the large number of high-value structures capable of housing the North Korean leadership and elites, South Korea may need to task the KMPR with a substantial proportion of its strike capabilities. In any conflict, the North Korean leadership is likely to hide in deeply buried shelters that require multiple strikes with large warheads to either collapse the structures or entomb the occupants.⁸⁴ As the KMPR concept is retaliatory in nature, it requires survivable C2 and launch facilities, because South Korea would activate KMPR only following a North Korean attack.

MISSILE DEFENSE. Finally, unless South Korea preemptively can identify and destroy all necessary targets, it must rely on KAMD to intercept any initial or remaining missiles from a North Korean attack. Successful missile defense is a function of the number of targets to be defended; quality, readiness, and location of the missile defenses; quality and number of the attacking missiles; defender's level of information about the likelihood, origin, and targets of any attack; and attacker's level of information about the opposing missile defenses. Even if deployed against only a limited number of surviving North Korean missiles, successful missile defense will be difficult for South Korea.

83. Key capabilities include MLRS, the Korea GPS guided bomb, and the KTSSM. See Gabriel Dominguez, "ROKA Highlights Role Ballistic Missiles Could Play in Conflict with Pyongyang," *Jane's Defence Weekly*, October 20, 2017; and Park, "South Korea's Guided Bomb."

84. See Eric M. Sepp, *Deeply Buried Facilities: Implications for Military Operations*, Centre for Strategy and Technology Air University Occasional Paper No. 14 (Maxwell Air Force Base, Ala.: Air War College, May 2000), pp. 22–30.

The first challenge is detecting and tracking North Korean missiles. South Korea already operates two Israeli-made Green Pine Block-B missile defense radars and will procure the more advanced Block-C system in the early 2020s.⁸⁵ It is also developing indigenously designed medium- and long-range 3D radar systems.⁸⁶ Complementing its land-based capabilities, South Korea also possesses three Aegis destroyers capable of tracking ballistic missile launches and plans to acquire three more.

However, even if South Korea is investing significantly in its detection and tracking capabilities, the potential number of North Korean missiles—combined with the wealth of high-value military and civilian targets in South Korea—poses substantial challenges for South Korean missile-defense planners. If detected only upon launch, a North Korea SRBM attack would give South Korean defenses less than six minutes to react. This leaves South Korean missile defense systems only a short period to detect, track, and intercept and incoming missile.⁸⁷

In addition, it remains uncertain whether South Korea has enough interceptors—and adequate geographic coverage—to defend itself against surviving North Korean missiles. The goal of the KAMD is, through development of a layered missile-defense system, to provide defensive coverage over the entire country. However, the 2018 South Korean defense white paper asserted that South Korea currently has only the ability to protect strategic targets in Seoul and key airbases.⁸⁸ This suggests an initial focus on ensuring C2 survivability and maintaining the capacity to respond to North Korean attacks.

South Korea currently possesses eight Patriot batteries. The exact number of missiles these batteries can intercept depends on their configuration; theoretically, the combination amounts to several hundred missiles.⁸⁹ However, it is

85. John Grevatt, "South Korea to Procure Additional 'Green Pine' Radars," *Jane's Defence Weekly*, November 28, 2018.

86. "LRS-180," *Jane's C4ISR & Mission Systems: Land*, September 21, 2018; and "LRD-450," *Jane's C4ISR & Mission Systems: Land*, June 10, 2019.

87. A ballistic missile fired 500 kilometers from its target will impact in about six minutes. Rodney P. Rempt and Marvin J. Langston, "Theater Missile Defense: Technologies to Support a New Naval Mission," *Johns Hopkins APL Technical Digest*, Vol. 14, No. 2 (1993), p. 143, <https://www.jhuapl.edu/Content/techdigest/pdf/V14-N02/14-02-Rempt.pdf>.

88. *2018 Defense White Paper*, p. 80.

89. News reports indicated that South Korean batteries have a mix of PAC-3 and PAC-2 GEM-T. This increases the types, but reduces the number, of targets that can be intercepted. Kim Gamel and Yoo Kyong Chang, "South Korea Reportedly Moves Patriot Missiles Defense Battery to Seoul," *Stars and Stripes*, October 1, 2020, <https://www.stripes.com/south-korea-reportedly-moves-patriot-missile-defense-battery-to-seoul-1.613773#:~:text=1%2C%202019.&text=SEOUL>

unlikely that all Patriot batteries will be functional or deployed at the same time, given their training and maintenance requirements. It is also plausible that North Korea will utilize other conventional capabilities, including decoys, aircraft, drones, and rockets, to overwhelm or destroy South Korean missile defense systems before they can intercept any nuclear-armed warheads. In addition, the Patriot batteries have a relatively small defendable footprint. The need to defend many targets across the country means that North Korea could target one or two batteries with multiple warheads until the battery is exhausted. That would leave South Korean defense planners with a difficult choice—protect higher-value targets using multiple Patriot batteries or disperse the batteries across the country and risk them being overwhelmed. To alleviate this deficiency, South Korea is deploying the indigenously designed KM-Sam, also known as the Cheongung Block 1 and Cheongung Block 2.⁹⁰ The latter is tasked with intercepting ballistic missiles. South Korea reportedly intends to procure six to eight batteries of the Block-2 variant, with each battery capable of launching twenty-four missiles.⁹¹ For higher-altitude interception (50 to 60 kilometers), a further system named the L-SAM, with capabilities reportedly approximate to the U.S. THAAD system, is in development.⁹²

South Korea currently does not have a sea-based interception capability (only detection capabilities), as the combat system of its current Aegis destroyers is incapable of full BMD operations.⁹³ The three new Aegis destroyers the ROK Navy is procuring will have full BMD capability and could provide South Korea a high-altitude interceptor to complement its ground-based terminal systems. However, missile defense from the sea is complicated for South Korea given geographic constraints and the limited number of BMD-capable ships. It also requires ships to be deployed in specific and small areas, allowing

%2C%20South%20Korea%20%E2%80%94%20South%20Korea,local%20news%20agency%20reported%20Tuesday.

90. The Cheongung system was partially developed with Russia's Almaz-Antey design bureau, which also designed the S300 and S400 systems. See "Cheongung," *Jane's Land Warfare Platforms: Artillery & Air Defence*, November 14, 2019.

91. Lee Cheol Jae, "KAMD Haeksimin Cheongung Beullok2 Naeyeon Yangsan . . . Haeoseo Keun Gwansim" [Cheongung block 2, the core of KAMD in mass production next year . . . great attention from overseas], *Jungangilbo* [JoongAng daily], January 12, 2018, <https://news.joins.com/article/22235553>.

92. "S. Korea Decides to Push in Earnest for Development for Indigenous Long-Range Surface-to-Air-Missile," *Yonhap News Agency*, December 4, 2019, <https://en.yna.co.kr/view/AEN20191204009700325>.

93. South Korea's three current Aegis destroyers are equipped with the Baseline 7 version of the Aegis Combat System and armed with SM-2 Block IIIA and IIIB missiles.

their interceptors optimal trajectory to defend against weapons threatening the shore.⁹⁴ Further, interceptors optimized for shipborne theater missile defense may not be suitable to intercept North Korean SRBM that can operate at low altitudes.⁹⁵

In the future, the deployment of new and upgraded systems will increase both the number of incoming targets capable of being intercepted and the size of the defended footprint. This may provide South Korea with defensive coverage over a greater portion of the country. Nevertheless, missile defense remains an incredibly complex task with a high possibility of leakage.

THE DESIGN AROUND CHALLENGE

As the preceding analysis showed, for South Korea to establish a credible counterforce capability is technically and operationally challenging. The arms race instability it almost certainly will create on the Korean Peninsula compounds these challenges. Arms race instability refers to a situation in which states race for new arms because they fear the other side is developing capabilities that might enable a preemptive or preventive attack.⁹⁶ South Korea's strategy gives North Korea strong incentives to race for new weapons to ensure the survivability and penetrability of the North Korean nuclear arsenal.

For South Korea, the problem with arms race instability is not the costs or political fallout and mistrust that arms races may generate: if South Korea could be certain that its new capabilities would deny North Korea the ability to threaten a nuclear attack, then both costs might be worth the price.⁹⁷ Instead, South Korea's key problem is that offensive nuclear capabilities are eas-

94. David B. Larter, "The US Navy Is Fed Up with Ballistic Missile Defense Patrols," *Defense News*, June 16, 2018, <https://www.defensenews.com/naval/2018/06/16/the-us-navy-is-fed-up-with-ballistic-missile-defense-patrols/>.

95. There is a debate within South Korea about purchasing the SM-3 Block IIB midcourse ballistic missile interceptor or the SM-6 multipurpose air defense missile capable of terminal ballistic missile defense. Likely, vessels will carry a mix of SM-3 Block IIB and either SM-2 or SM-6 missiles. Jeff Jeong, "South Korea to Buy Ship-Based Interceptors to Counter Ballistic Missile Threats," *Defense News*, October 12, 2018, <https://www.defensenews.com/naval/2018/10/12/south-korea-to-buy-ship-based-interceptors-to-counter-ballistic-missile-threats/#:~:text=SEOUL%20%E2%80%94%20The%20South%20Korean%20military,last%20year%2C%E2%80%9D%20said%20Maj>.

96. Thomas C. Schelling and Morton H. Halperin, *Strategy and Arms Control* (New York: Twentieth Century Fund, 1961), p. 37. See also Heather Williams, "Asymmetric Arms Control and Strategic Stability: Scenarios for Limiting Hypersonic Glide Vehicles," *Journal of Strategic Studies*, Vol. 42, No. 6 (2019), pp. 789–813, doi.org/10.1080/01402390.2019.1627521.

97. See Charles L. Glaser, "When Are Arms Races Dangerous? Rational versus Suboptimal Arming," *International Security*, Vol. 28, No. 4 (Spring 2004), pp. 44–84, doi.org/10.1162/0162288041588313.

ier and less expensive to develop than the conventional capabilities designed to stop them.⁹⁸ Moreover, because effective deterrence requires clear communication of capabilities, the aggressor has substantial opportunities to find solutions to the capabilities it faces.⁹⁹

North Korean missile and weapon tests since 2016 strongly indicate that the country seeks to counter missile defenses and disrupt counterforce capabilities. It has demonstrated the ability to launch multiple missiles simultaneously, a variety of missile types capable of flying different ballistic trajectories, and a fully mobile launch capability.¹⁰⁰ Moreover, North Korea is building up its arsenal and developing new advanced ballistic missiles. That many of these systems have short ranges implies they are directed against South Korea and its counterforce strategy. In January 2020, the U.S. vice chairman of the Joints Chiefs of Staff, Gen. John Hayten, stated that North Korea is “building new missiles, new capabilities, new weapons as fast as anybody on the planet.”¹⁰¹ Indeed, if North Korea is capable of efficiently producing these capabilities on a large scale, then it will have developed a potent ability to counter extant defensive and counterforce capabilities.

Even if South Korea is investing in a series of advanced ISR, strike, and missile defense capabilities, the long lead times and the technology development costs make it challenging for Seoul to obtain an advantage in the action-reaction dynamic. An example of this dilemma is South Korea’s proposed development of a nuclear-powered attack submarine (SSN). The main SSN program rationale is to counter future North Korean ballistic missile submarines (SSBs). Although South Korea already operates a potent fleet of advanced, conventionally powered submarines, a nuclear-powered class would allow its navy to loiter submerged outside North Korean submarine bases for sustained periods.¹⁰² However, the costs and technological hurdles of inde-

98. In the conventional realm, designing around counterforce capabilities is generally easier because conventional threats and costs are contestable. Edward Rhodes, “Conventional Deterrence,” *Comparative Strategy*, Vol. 19, No. 3 (2000), p. 226, doi.org/10.1080/01495930008403210.

99. Ibid.

100. Michael Elleman, “North Korea’s New Short-Range Missiles: A Technical Evaluation,” *38 North*, October 9, 2019, <https://www.38north.org/2019/10/melleman100919/>.

101. Zachary Cohen, “No. 2 U.S. General Says North Korea Building New Missiles ‘As Fast as Anybody on the Planet’,” *CNN*, January 17, 2020, <https://www.cnn.com/2020/01/17/politics/hyten-north-korea-new-missiles/index.html>.

102. Although South Korea has not decided to procure nuclear submarines, it has established a task force to assess the feasibility of such a program. Yoo Kang-moon, “S. Korean Navy Pursuing Acquisition of Nuclear-Powered Submarine,” *Hankyoreh*, October 11, 2019, http://www.hani.co.kr/arti/english_edition/e_national/912881.html.

pendently developing and operating such a capability may prove impossible for South Korea to meet.

THE STABILITY CHALLENGE

A further broad challenge springing from South Korea's strategy is its potential negative impact on crisis stability. Crisis stability refers to situations in which one or both parties have limited reason to fear a preemptive or a premediated attack, and thus limited incentives to strike first in a conflict.¹⁰³ Certainly, there is a potential trade-off between deterrence and crisis stability.¹⁰⁴ For South Korea, this leads to a difficult dilemma. While its strategy may reduce the likelihood of North Korea engaging in nuclear brinkmanship and threats, it may increase the likelihood that nuclear weapons are employed in a crisis.

South Korea's strategy may negatively affect crisis stability in several ways. First, although South Korea has signaled that it intends to employ its counterforce option only preemptively, North Korean leaders nevertheless may fear that South Korea misunderstands their intentions in a crisis, launching a strike even if no attack is imminent. In a situation of increasing tension, they may even fear a preventive strike. This could present North Korea with a "use them or lose them" dilemma, believing it must strike first to avoid being disarmed.¹⁰⁵ Of course, one may argue that North Korea has few incentives to strike first because that would invite devastating retaliation from the United States, particularly given the substantial U.S. civilian and military presence in South Korea.¹⁰⁶ However, if North Korean leaders were convinced that a disarming and regime-ending strike was imminent, in an act of desperation they still could strike first to neutralize the South Korean threat while holding back its longer-range missiles, hoping to deter U.S. retaliation.

Second, South Korea's strategy may stress both countries' civilian and military leadership in a crisis. The South Korean plan is premised on rapid execution, leaving leaders with a small window to decide a course of action.

103. Schelling and Halperin, *Strategy and Arms Control*, pp. 10–14.

104. For a discussion of this trade-off and the dilemmas facing the United States during the Cold War, see Glenn A. Kent and David E. Thaler, *First-Strike Stability: A Methodology for Evaluating Strategic Forces* (Santa Monica, Calif.: RAND Corporation, 1989), p. 5.

105. Thomas C. Schelling, *The Strategy of Conflict* (Cambridge, Mass.: Harvard University Press, 1960), pp. 207–229.

106. On conventional forces and their role as "tripwires," see, for example, Glenn H. Snyder, "Deterrence and Power," *Journal of Conflict Resolution*, Vol. 4, No. 2 (June 1960), p. 173, doi.org/10.1177/002200276000400201.

Given the short flight times of missiles on the peninsula, leaders on both sides potentially will need to make gut-wrenching decisions in a brief time frame after they receive warning of a possible strike. This raises the risk of errors and misunderstandings.¹⁰⁷

Third, the South Korean strategy may increase risks that a conflict would turn into an all-out war. It would be difficult for South Korean leaders to credibly signal to North Korea that a strike would be limited to its nuclear arsenal, as a counterforce attack would involve strikes on hundreds of military targets, severely degrading the North's military capabilities in the process. For a regime that for decades relied on a "military first" policy, this likely would be seen as a mortal threat.¹⁰⁸

Fourth, several steps that North Korea may take to enhance survivability and address its vulnerabilities to counterforce could be destabilizing. Threats against its arsenal may provide Pyongyang an incentive to bolster positive controls over its nuclear forces—that is, adopting a doctrine and C2 arrangements to ensure that weapons work when directed. For example, North Korea may predelegate launch authority to military commanders under certain circumstances, such as if communications are disrupted.¹⁰⁹ Even though North Korea—judging from the scarce information available about its doctrine—appears to favor assertive control in peacetime, we do not know what its doctrine and C2 arrangement would look like in a time of crisis.¹¹⁰ If North Korea were to bolster positive control, then it could raise the risk of accidental nuclear use and inadvertent escalation or enable launch by rogue commanders.¹¹¹

To enhance survivability, North Korea also could hasten efforts to develop

107. James J. Wirtz, "Counter Proliferation, Conventional Counterforce, and Nuclear War," *Journal of Strategic Studies*, Vol. 23, No. 1 (2000), p. 12, doi.org/10.1080/01402390008437776.

108. On the challenges of communicating limited objectives, see Wirtz, "Counter Proliferation." On North Korea's military-first policy, see Victor Cha, *The Impossible State: North Korea, Past and Future* (New York: Ecco, 2012), pp. 91–92.

109. Peter D. Feaver, "Command and Control in Emerging Nuclear Nations," *International Security*, Vol. 17, No. 3 (Winter 1992/93), pp. 160–187, doi.org/10.2307/2539133.

110. For two opposing views, see Vipin Narang and Ankit Panda, "Command and Control in North Korea: What a Nuclear Launch Might Look Like," *War on the Rocks* blog, September 15, 2017, <https://warontherocks.com/2017/09/command-and-control-in-north-korea-what-a-nuclear-launch-might-look-like/>; and Austin Long, "The Rorschach Test of New Nuclear Powers: Analogies for North Korean Command and Control," *War on the Rocks* blog, October 6, 2017, <https://warontherocks.com/2017/10/the-rorschach-test-of-new-nuclear-powers-analogies-for-north-korean-command-and-control/>.

111. Moreover, use-control features designed to prevent such launches most likely are quite rudimentary in North Korea. Narang and Panda, "Command and Control in North Korea."

potentially destabilizing weapons systems. For example, it may accelerate efforts to develop an SSB. Although submarines generally are regarded as highly survivable platforms, North Korean submarines are likely to be vulnerable. In a crisis, South Korean anti-submarine warfare operations could lead to escalation if, for example, South Korea inadvertently targets an SSB. South Korea's counterforce strategy increases the risk that North Korea would perceive this as an attack on its nuclear forces.¹¹² In addition, establishing C2 and communication procedures for its submarines might severely challenge the North, which could increase pressure to predelegate some degree of launch authority.¹¹³

South Korea's leadership-targeting threats further exacerbate many of these risks. Threats against leaders severely impede possibilities to signal limited intentions. As James Wirtz highlighted, even talk about targeting leaders makes it extremely challenging to signal that counterforce attacks are limited and directed against an adversary's nuclear weapons (and not regime).¹¹⁴ Moreover, threats against leaders may complicate greatly intrawar deterrence and efforts to negotiate an end to a war.¹¹⁵ In a crisis, such threats could leave North Korean leaders highly cautious about establishing lines of communication because they would have legitimate reasons to fear that any communication could reveal their location. Being skeptical about their prospects for survival also would dampen incentives to negotiate or surrender. In addition, threats against leaders provide further incentives to bolster positive controls and develop procedures to ensure retaliation if the leadership were killed or left incommunicado. Such threats may stress decisionmaking further if leaders expect to be among the first targeted in a conflict.

Many of these sources of reduced crisis stability are not new. North Korea long has had to worry about the United States' ability to target both its leaders

112. Barry R. Posen, *Inadvertent Escalation: Conventional War and Nuclear Risks* (Ithaca, N.Y.: Cornell University Press, 1991), p. 3. On ballistic missile submarines and the risk of inadvertent escalation, see also Diana Wueger, "India's Nuclear-Armed Submarines: Deterrence or Danger?" *Washington Quarterly*, Vol. 39, No. 3 (2016), pp. 77–90, doi.org/10.1080/0163660X.2016.1232636; and Caitlin Talmadge, "Would China Go Nuclear? Assessing the Risk of Chinese Nuclear Escalation in a Conventional War with the United States," *International Security*, Vol. 41, No. 4 (Spring 2017), pp. 50–92, doi.org/10.1162/ISEC_a_00274.

113. Christopher Clary and Ankit Panda, "Safer at Sea? Pakistan's Sea Based Deterrent and Nuclear Weapons Safety," *Washington Quarterly*, Vol. 40, No. 3 (2017), pp. 154–155, doi.org/10.1080/0163660X.2017.1370344. As Clary and Panda highlight, states historically have employed fewer restrictions against unauthorized used on their submarines.

114. Wirtz, "Counter Proliferation," p. 17.

115. Robert J. Art, "Between Assured Destruction and Nuclear Victory: The Case for the 'Mad-Plus' Posture," *Ethics*, Vol. 95, No. 3 (1985), p. 510, www.jstor.org/stable/2381034.

and its nuclear weapons infrastructure. Nevertheless, South Korea's strategy exacerbates these risks. As South Korea develops an independent capability, North Korean leaders will have to worry about strikes not only from the United States, but also from its neighbor.

Conclusion

In the shadow of North Korea's nuclear weapons program, South Korea is pursuing comprehensive, independent, conventional counterforce, and countervalue capabilities. Although this strategy has received far less attention than the mercurial diplomacy of Kim Jong-un and Donald Trump, this article demonstrates that the strategy may have a determining effect on the prospects for peace and stability on the Korean Peninsula. Although providing South Korea with a stopgap deterrent and potentially bolstering its long-term nuclear hedging strategy, the strategy may negatively affect both arms race and crisis stability. Moreover, it will be costly and challenging to operationalize.

This study's findings have several important implications for contemporary discussions about the theory of the "nuclear revolution," which maintains that the dominance of nuclear second-strike strategies have altered the nature of warfare and international relations more broadly.¹¹⁶ Other scholars recently argued that we have entered a "new era of counterforce" where nuclear arsenals are less survivable, and that even regional nuclear powers may pursue counterforce strategies.¹¹⁷ However, the South Korean case demonstrates the depth to which technological shifts challenge common assumptions about nuclear strategy. That a nonnuclear power is attempting to deter a nuclear-armed rival and incorporate both counterforce and countervalue targeting vividly illustrates how advanced remote sensing and precision guidance have sparked a revolution in military affairs. It further illustrates that even if the so-called new era of counterforce favors great powers, it also can have a major effect on non-great power conflict dyads, such as the inter-Korean conflict.¹¹⁸ In

116. Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Ithaca, N.Y.: Cornell University Press, 1989).

117. Lieber and Press, "The New Era of Counterforce"; and Clary and Narang, "India's Counterforce Temptations."

118. For differing perspectives on whether the "new era of counterforce" favors great powers, see Lieber and Press, "The New Era of Counterforce"; and Andrew Futter and Benjamin Zala, "Emerging Non-Nuclear Technology and the Future of the Global Nuclear Order," in Bård Nikolas Vik Steen and Olav Njølstad, eds., *Nuclear Disarmament: A Critical Assessment* (Abingdon, U.K.: Routledge, 2019), pp. 207–223.

the future, other nonnuclear powers may incorporate conventional counterforce targeting into their military postures. Notably, Japan is already showing nascent interest in developing capabilities to strike adversaries' missiles.¹¹⁹ If more states in the Middle East develop nuclear weapons after Israel, other actors might include some elements of conventional counterforce into their military postures.¹²⁰

At the same time, the South Korean case illustrates that the dilemmas of counterforce strategies endure. Counterforce strategies are often highly challenging to enact, are likely to set off arms races, and may lead to crisis instability—all risks and dilemmas that were discussed extensively during the Cold War. With technological change and the advent of conventional counterforce strategies, some of these dilemmas are even becoming more serious. For example, as James Acton recently argued, the increasing entanglement between nuclear and conventional weapons is likely to lead to increasing risks of inadvertent escalation in the future.¹²¹ South Korea's strategy illustrates this. In any future confrontation, there is a significant risk that North Korean leaders may interpret conventional military operations as precursors to a disarming or decapitating strike against the regime. This type of entanglement would extend beyond the strategic level and into the diplomatic realm. In future disarmament negotiations, conventional weapons will be closely tied to nuclear capabilities.

Our analysis further indicates that the literature on nuclear latency and hedging, which is focused on whether a state has the capability to produce a nuclear device, has often overlooked the crucial importance of delivery vehicles. More broadly, studies frequently ignore that nuclear latency is fluidic, and that what constitutes a "virtual deterrent" may vary over time as both technology and the capabilities of adversaries evolve.¹²² For present-day nuclear

119. Jeffrey W. Hornung, "Is Japan's Interest in Strike Capabilities a Good Idea?" *War on the Rocks* blog, July 17, 2020, <https://warontherocks.com/2020/07/is-japans-interest-in-strike-capabilities-a-good-idea/>.

120. For example, Saudi Arabia has a limited number of ballistic missiles and could possibly seek to expand its missile forces.

121. James M. Acton, "Escalation through Entanglement: How the Vulnerability of Command-and-Control Systems Raises the Risks of an Inadvertent Nuclear War," *International Security*, Vol. 43, No. 1 (Summer 2018), pp. 56–99, doi.org/10.1162/isec_a_00320. For a more skeptical take on technological change as an independent driver of inadvertent escalation, see Caitlin Talmadge, "Emerging Technology and Intra-war Escalation Risks: Evidence from the Cold War, Implications for Today," *Journal of Strategic Studies*, Vol. 42, No. 6 (2019), pp. 864–887, doi.org/10.1080/01402390.2019.1631811.

122. Two notable exceptions are Narang, "Strategies of Nuclear Proliferation"; and Tristan A.

hedgers, developing dual-use ballistic missiles is likely to take on great urgency. Without access to missiles, it is highly challenging (if not impossible) to develop a secure second-strike capability, leaving the risk of preventive strikes significantly higher.

Beyond these broader debates, our findings also hold important implications for the future strategic environment on the Korean Peninsula, including prospects for disarmament or arms control agreements. Crucially, although fear of the United States initially may have driven North Korea's pursuit of nuclear weapons, South Korea now plays an increasingly central role in determining how Pyongyang will develop its arsenal. North Korea's nuclear deterrent slowly will be undermined unless it continues to design around South Korean capabilities. Hence, if South Korea continues to develop its counterforce and countervalue strategy, as the planning documents suggest, then North Korea will likely only accelerate its efforts to improve its missile and nuclear capabilities.

This dynamic raises a major new obstacle to disarmament. As long as South Korea maintains capabilities to target not only North Korea's nuclear arsenal, but potentially also its leadership, it will be more challenging to reach an agreement that is acceptable to Pyongyang. Even if North Korea could be persuaded that the United States does not constitute a mortal threat, its leaders increasingly will factor in the independent threat emanating from South Korea. The conventional superiority that South Korea is developing further aggravates this dynamic. Traditionally, North Korea has relied on its arsenal of thousands of artillery and rocket batteries aimed at metropolitan areas proximate to the DMZ as a deterrent. With its new advanced conventional capabilities, South Korea is gaining the ability to independently neutralize these batteries, which provides North Korea further incentive to maintain its nuclear deterrent.

In addition, South Korea's conventional military edge complicates bilateral peace initiatives and conventional arms control. Recent inter-Korean military agreements have focused on reducing the escalation risks in hot spots such as the contested western maritime border and the symbolic, but important, removal of key military installations along the DMZ.¹²³ Further agreements will

Volpe, "Atomic Leverage: Compellence with Nuclear Latency," *Security Studies*, Vol. 26, No. 3 (2017), pp. 517–544, doi.org/10.1080/09636412.2017.1306398.

123. Kim Do Kyun, "Agreement on the Implementation of the Historic Panmunjom Declaration in the Military Domain: Implementation Status and Way Ahead," *ROK Angle: Korea's Defense Policy*, May 10, 2019, p. 199, <https://www.kida.re.kr/cmm/viewBoardImageFile.do?idx=27033>.

be difficult to reach if the conventional capabilities gap keeps expanding. Although, in theory, it would be possible to include South Korean advanced conventional capabilities in a future agreement on the peninsula, that inclusion will be difficult to achieve for several reasons. Even if they are primarily a hedge against a nuclear-armed North Korea and U.S. abandonment, South Korea's increasingly challenging security environment puts a premium on these capabilities in other contexts as well. They provide South Korea with additional conventional options against a rising China, and their development indicates that Seoul will not automatically bandwagon with Beijing in an abandonment scenario, but rather seek to preserve its autonomy. Persuading South Korean leaders to give up such capabilities at a time when regional arms spending is on a consistent upward trajectory would require either a substantial U.S. bolstering of the alliance or a significant change in the region's geostrategic circumstances. In essence, the article demonstrates that peace on the Korean Peninsula must now be linked to wider Northeast Asian strategic stability.

In sum, it is therefore unlikely that bilateral peace initiatives between the United States and North Korea will end in success. Rather, any peace agreement must simultaneously address the conventional balance of forces on the Korean Peninsula and both Koreas' places within Northeast Asia's regional security architecture. In a world of increasing great power rivalry and distrust, where non-major powers such as South Korea feel increasingly squeezed, the prospects for such an agreement are slim.