Using Delphi and Q-Methodology to Predict the Future of Nonproliferation and Multilateral Security Cooperation Around the North Korea Nuclear Problem

by

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This study explores the intricacies of policy-making decisions regarding denuclearization efforts in North Korea through the lens of expert analysis. Utilizing a novel research methodology blending Q-methodology and Delphi rounds, the study examines the convergence and divergence of expert opinions across various sectors and countries. Through rigorous data analysis, the study identifies key variables of influence and consensus among experts, shedding light on factors that could affect the success of denuclearization initiatives.

The findings highlight the importance of multilateral cooperation and targeted policy interventions in achieving denuclearization goals. While experts acknowledge the role of regional actors, particularly China, in influencing North Korea's behavior, there is also recognition of the need for tailored approaches to address specific challenges, such as cybersecurity threats and sanctions enforcement.

Moreover, the study underscores the significance of information sharing and scenario-based planning in mitigating uncertainties and enhancing policy effectiveness. By harnessing the collective wisdom of experts and promoting dialogue among stakeholders, policymakers can develop comprehensive strategies that consider a range of possibilities and foster regional stability.

Overall, this research contributes valuable insights to the field of policy-making by offering evidence-based recommendations for addressing one of the most pressing security challenges of our time: the denuclearization of North Korea.
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Preface

I would like to thank my family, friends, and colleagues for their mental, emotional, and technical support through the multiple challenges faced throughout my educational journey. I am also indebted to my committee for their continued advice and guidance, with special acknowledgement to the late Dr. William N. Dunn, Professor Emeritus at GSPIA, University of Pittsburgh. Thank you for your inspiration and friendship; to me, and to all PhD students you took under your wing. You encouraged and believed in us when we didn’t believe in ourselves. You will be missed.
1.0 Addressing the Limits of Expert Prediction in Foreign Policy

Ideally, intelligence drives policymaking. Intelligence is comprised of information, analysis, prediction, and planning. Harold D. Lasswell, a pivotal figure in 20th-century political and communication studies, includes as one of the seven categories of functional analysis his pivotal *decisional function*, answering the question, “How is information that comes to the attention of decision makers gathered and processed?” (1956). His contributions, including his work on functional analysis and decision functions, have provided lasting frameworks for understanding the intricacies of decision-making and the role of intelligence in shaping political outcomes. Intelligence is thus at the center of the circuitry of decision processes, preceding and continuously informing policy decisions at every stage (Dunn, 2019).

Intelligence plays a crucial role in the policymaking decision process. At its core, *intelligence* refers to processed information specifically selected for its relevance and utility to specific decision-making contexts. When integrated into policymaking, intelligence can shape decisions in several critical ways:

1. **Informed Decision Making:** Policymakers often face complex challenges, and raw data alone isn't sufficient to make informed choices. Intelligence, being processed and analyzed information, provides policymakers with synthesized insights about situations, enabling them to understand the nuances and make more informed decisions.

2. **Risk Assessment:** Intelligence can help policymakers understand potential or impending threats and vulnerabilities. For instance, in national security contexts, intelligence assessments can reveal potential threats to national interests or identify emerging global trends that may impact national objectives.
3. **Resource Allocation:** Intelligence helps policymakers prioritize areas that need attention or resources. By identifying the most pressing challenges or the most significant opportunities, intelligence ensures that resources (like funds, personnel, or materials) are used efficiently.

4. **Strategic Planning:** Long-term policy strategies benefit from forward-looking intelligence assessments. Predictive intelligence, such as forecasting economic trends or anticipating geopolitical shifts, can help policymakers draft proactive strategies rather than merely reactive ones. **Forecasting** refers to the process of making predictions or informed projections about future events, trends, or conditions based on analysis of available data, patterns, and potentially, sophisticated modeling techniques. Forecasting can be applied in numerous fields including economics, meteorology, technology, and more. The goal is to anticipate future developments so that individuals, businesses, or governments can prepare and strategize accordingly.

5. **Feedback Loop:** The policymaking process is cyclical. Once policies are implemented, intelligence agencies can monitor and evaluate the effects of these policies, providing feedback to policymakers about their efficacy and areas of improvement.

6. **Crisis Management:** In times of crises, rapid and accurate intelligence is vital. It enables policymakers to grasp the situation quickly and to adapt their strategies in real-time, making effective decisions under pressure.

7. **Bridging Knowledge Gaps:** Policymakers might not be experts in every domain. Intelligence agencies, with their specialized knowledge and analytical capabilities, fill these expertise gaps and provide policymakers with nuanced insights they might not have access to otherwise.
8. **Legitimacy and Accountability:** Reliable intelligence can lend credibility to policymakers' decisions, especially when these decisions might be unpopular or challenging to justify. Being able to base decisions on concrete intelligence findings can enhance the public’s trust.

9. **Diplomacy and Negotiations:** Especially in the realm of international relations, intelligence can provide policymakers with insights into the intentions, capabilities, and limitations of foreign entities, aiding diplomatic efforts and negotiations.

10. However, it's essential to understand that intelligence is only as good as the methods and sources from which it is derived. Biased, incomplete, or incorrect intelligence can mislead policymakers, potentially leading to undesired outcomes. Not to mention the consumers of this information are often themselves uninterested in or resistant to the intelligence.

    How are policymakers, then, deriving their *intelligence*—particularly as it relates to strategic planning? In addition to internal intelligence analysts, policymakers often rely on analyses and forecasts by external subject matter experts (SMEs), self-identified “experts” in the broader external environment. To make potentially faster “tailored” defense and security policy decisions, or explore potential outcomes of such decisions, in addition to consulting secret intelligence analysts employed by the federal government, decision-makers often also solicit the opinions of SMEs via an expanded network of friends, coworkers, the academic community and think tanks. Their written judgments and recommendations are then summarized, edited, and compiled into Department of Defense white papers or Chiefs of Staff reports that are subsequently passed to decision-makers.
The “experts” for these open-source reports are often self-selected via the expanded network of the official or contractor assigned to edit the report, are mostly from the U.S., and generally consist of academia or think tanks. After a brief vetting—most frequently consisting of nothing more than a Curriculum Vitae/resume review and paragraph introductions—SMEs are asked to submit written responses on key questions facing policymakers, with little to no feedback from peers or follow-up requests for clarification. The resulting lengthy reports are then summarized by the editor, circulated, and posted online, with no quantifiable data, replicable methodology, or system to cross-check and compare the expert opinions. Most often the data collection and writing of reports is outsourced to think tanks or private companies. NSI Team is one of these companies, contracted in 2018 by the Joint Staff J39 and USINDIOPACOM to provide a multi-layered futures analysis on the North Korean proliferation problem, for which expert predictions were one of the components.1 The author—despite still being a student and with limited academic credentials—was contacted for this NSI Team Virtual Think Tank (ViTTa) report series on “Korea Strategic Outcomes;” (Astorino-Courtois et al., July 2018; Popp, October 2018; Yager & Popp, October 2018).2

What criteria renders these open-source “experts” qualified? How do we account for their biases on the subject matter with such a small selection sample? And—perhaps most importantly—how reliable is their written prediction? Rather than relying solely on case studies or a handful of potentially biased SME queries, this paper creates quality probabilistic data from a tried and tested expert judgment forecasting method—the Delphi technique—to see if it can

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1 See https://nsiteam.com/services/#page-714 for a description of their expert solicitation process.
2 This NSI Team ViTTa document collection will be used as both a basis from which this study’s Delphi questions will be extracted, and for final comparison with the Delphi data to see if, in fact, there is any benefit in using Delphi as a prediction tool over the standard SME data collection process it demonstrates. It is also available online, at https://nsiteam.com/
provide additional information on the plausible futures surrounding the problem of North Korea’s nuclear proliferation than the ViTTa report, which in entirety consists of over 100 pages of written analyses, imprecise predictions and often conflicting information that would be cumbersome for any decision-maker to wade through. It also uses conditional statements derived from the Delphi to gauge not only which conditions would be most impactful (either positively or negatively) on the denuclearization of North Korea, but in which ways the experts who answered are similar to each other. In addition, instead of strictly using experts based in the United States, this study pulls and compares data provided by SMEs from all major Northeast Asian regional actors involved in the problem; making it the first study of its type.

There have been decades of research about cooperation around the proliferation of weapons of mass destruction (WMDs), notably the success and failures of curbing the DPRK (Democratic People’s Republic of Korea) proliferation efforts. Sanctions as well as the Six Party Talks between the DPRK, United States of America (USA), People’s Republic of China (PRC), Russian Federation (RF), Republic of Korea (ROK) and Japan have not resolved the nuclear proliferation problem. However, there has not been substantive research of quality done beyond a qualitative query to experts that examines their assessment of probabilities of success of cooperation and conditions that could potentially lead to the desired policy outcome, or potentially exacerbate the problem further. This is the research that policymakers are most interested in, and most often use, as all policy decisions are made to plan for and control the possible future.

This research design uses a variation of the Delphi technique to collect and analyze expert judgments on the prospects over the next decade for Northeast Asian security cooperation regarding the North Korea proliferation problem. These include areas of convergence and divergence among states as well as among experts across countries and sectors of employment.
The expert-produced conditional statements from the Delphi are then used in a mixed-methods analysis following Q-methodology. It asks experts to rank-order the statements on whether the conditions listed have a positive, neutral or negative effect on the denuclearization of North Korea using a Q-sort. Q-methodology goes beyond the Delphi, using qualitative output from the survey to quantitatively analyze the reasoning behind the judgements made, as well as comparing individuals to individuals to see more specifically where they converge and diverge on their conditional forecasting.

The Delphi technique, developed in 1967 by Olaf Helmer of the RAND Corporation, was created to “anticipate changes in our environment rather than deal with them belatedly and inadequately” (p. 2). Delphi is a unique method in that it proves a “systematic approach to the utilization of expert opinions” (p. 3), with Helmer realizing that “projections into the future, on which public policy decisions must rely, are largely based on the personal expectations of individuals rather than on predictions derived from well-established theory” (p. 4). Even decades later, with all the advances in computer simulation technology and forecasting models, Helmer’s realization still rings true in today’s policy world.

The Delphi method, while widely utilized, does face several scholarly critiques, most famously noted in Harold Sackman’s 1974 report for the US Air Force. One of Sackman’s concerns is the selection of experts, which may introduce bias into the process, as it can be challenging to ensure the panel represents a diverse and unbiased range of perspectives (1974). Additionally, there is a concern regarding group dynamics influencing outcomes, potentially leading to groupthink or conformity to dominant opinions within the panel. Critics also question the clarity of consensus criteria, which could lead to subjective interpretations and undermine the credibility of results. A 1974 study by R.J. Best demonstrated against that theory, showing that
when panelists were provided with feedback on the reasoning for judgements made by the other participants, forecasts were significantly more accurate – a method this study employs with intention to mitigate the problem (Rowe & White, 1999). Despite its advantages, some studies suggest limitations in predictive accuracy, particularly in rapidly changing environments. Furthermore, the Delphi method demands significant resources due to its iterative nature, prompting considerations regarding resource allocation. Rowe and White also offer a competing study and critically evaluate Sackman and others’ complaints, demonstrating that the number and diversity of experts increases validity and accuracy of the results (1999). Lastly, in complex problem domains, the method may struggle to adequately capture nuances, potentially oversimplifying or overlooking critical factors. This study hopes to mitigate this critique as well by employing the Q-sort in the third round. While these critiques highlight potential shortcomings, the Delphi method remains valuable when applied judiciously and supplemented with other forecasting or decision-making approaches.

Q-methodology was developed in the 1930’s by William Stephenson, a physicist-psychologist interested in exploring the subjectivity not typically captured in quantitative methods (Brown, 1996). Q-methodology is typically considered a quantitative research method as it uses the Q-sort technique as its primary instrument. Subjects will rank/order a set of statements from a positive (i.e. agree) to a negative (i.e. disagree), producing a quantitative output that is then analyzed in a correlation matrix to evaluate how similar or different each respondent is from the other. The purpose, according to leading Q method scholar Steven Brown from Kent State University, “is to reveal subjective structures, attitudes, and perspectives from the standpoint of the person or persons being observed” (p. 562).
Using a modified *three-round* Delphi technique combined with Q-methodology—the first study of its kind to combine these innately complementary methods—the research goals of this project are to:

- Create a detailed dataset and analysis of the probability of plausible scenarios and conditions that may facilitate/inhibit security cooperation among key actors in Northeast Asia by 2040.

Identify areas of convergence/divergence among experts on their forecasts in order to understand if and how experts from different countries/employment sectors differ in their forecasts of multilateral security cooperation and identification of key influential factors.

- Evaluate SME results produced via this study’s employment of the modified Delphi technique as compared with SME results produced in the original report by NSI Team’s Virtual Think Tank (ViTTa) to see, based on validity, cross-country/sector comparisons, and consensus on probabilistic predictions, if this method can supplement other forecasting methods.

1.1 Helping Bridge the Gap: Improving Forecasting Methods and Analysis to Better Inform Foreign Policy

The dynamic tension between academic research and policy decision-making is not a novel phenomenon, yet it remains a crucial subject of discourse in international relations and policy studies. At the heart of this divergence lies the very philosophical bedrock upon which each
institution is built. Academics embark on a relentless quest for knowledge, immersing themselves in the granularities of theory and reveling in the nuanced intricacies of methodological discipline. Contrastingly, policymakers navigate the tumultuous waters of realpolitik. They have their compass often guided not by in-depth analysis, but by the immediate exigencies of statecraft and governance.

Despite our in-depth understanding of the policymaking process, most policymakers do not apply the available frameworks, and thereby fail to achieve their desired impact. Most of the failures can be traced back to generalization, and the need for programs to reach a wide audience. Harold D. Lasswell attempted to rectify this problem with his context-mapping framework, but in the case of most federal programs, a deep understanding of the participants’ social context is extremely limited, either due to time or resource constraints. Lasswell contributed greatly to the policymaking field, helping researchers understand it as a process rather than a static framework. Unfortunately, Lasswell’s context-mapping framework, a key tool in public policy analysis, seems to have not been very well implemented in today’s policy world. Lasswell identified a gap between the policy’s intentions and the impact on the end-user, and emphasized the importance of bridging that gap by understanding the social and policy processes in terms of their cultural context (Torgersen, 2007).

Temporal perspectives further accentuate this chasm. The academic odyssey is a marathon – marked by exhaustive research phases, rigorous peer reviews, and the gradual evolution from hypothesis to publication, as exemplified in this paper. Meanwhile, policymakers are engaged in a sprint, reacting to the here-and-now, governed by the rapid cadence of current events and their immediate ramifications.
Divergences do not end here. Their foundational adherence to evidence and its interpretation varies considerably. In academia, every assertion undergoes meticulous scrutiny, subjected to rigorous, scrupulous peer review. In the corridors of power, however, decisions often emerge from a confluence of partial, sometimes discordant data streams. Policymakers, thus, are compelled to juggle potential outcomes, basing monumental decisions on these imperfect data mosaics.

Communication nuances stand as another demarcation. Academic discourse, rich in depth and astuteness, often meanders through elaborate terminologies and obscurely layered theoretical narratives—much like the ViTTa Korea Strategic Outcomes Report, for example. Policy communications, on the other hand, are laser-focused, crystallizing complex issues into precise briefs or memos, designed to impart actionable intelligence rather than encyclopedic detail.

John Dryzek is a leading post-positivist writer whom, in his article, “Policy Analysis as a Hermeneutic Activity,” presents six modes of policy analysis in attempt to make social science research more relevant in policy analysis: Policy evaluation, advocacy, single framework, social choice, moral philosophy, and the hermeneutic model. He, as the title suggests, advocates the hermeneutic model, which focuses on the transformation and utilization of information—primarily, how policy analysis is communicated. This mode of analysis is best when tackling ill-structured problems such as the North Korea proliferation problem. Dryzek defines hermeneutic policy analysis as “the evaluation of existing conditions and the exploration of alternatives to them, in terms of criteria derived from an understanding of possible better conditions, through an interchange between the frames of reference of analysts and actors” (322). Dryzek does note, however, that the other five models are appropriate in some circumstances, albeit a narrow range. He argues that hermeneutics is the only mode that works with ill-structured (or what he calls
“messy”) problems. He advocates for dialectic between policy analysts and actors that includes ethics and values. The analyst must try to understand the problem from the sociocultural perspective of the actors and policymakers while also being able to criticize their practices.

In essence, bridging this divide demands more than superficial attempts at collaboration; it calls for a holistic re-evaluation of how knowledge intended to inform policymakers is produced, disseminated, and then utilized in the realm of policy formulation and execution.

In an attempt to provide a more quantitative link in the bridges that attempt to remedy this gap between those with in-depth knowledge and those who make policy decisions, my paper uniquely applies a mixed-method, scenario-based study combining the rigorous judgmental forecasting technique called the Delphi, complimented by the nuances of Q-methodology. This will be used to more efficiently and precisely inform analyses on not only the desirability and likelihood of multilateral security cooperation between regional actors on nuclear nonproliferation efforts in Northeast Asia (and which actors are perceived as being most influential towards the denuclearization outcome), but also the reasoning behind those expert judgements, and whether the nationality or employment sector of the expert fielded matters.

Security cooperation literature addressing the North Korean nuclear proliferation problem is traditionally approached from either the norms or institutional perspectives. Formal quantitative models lack behavioral theory and are cumbersome to non-academics, and research reliant on case studies alone face problems of bias and construct validity. In addition, policy is most often informed by the judgments of secret intelligence analysts or open-source subject-matter experts (SMEs)—not formal models or case studies. There have been numerous studies on the importance of intelligence analysts or academic research in policy decision-making, but there have been few

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3 See end of Morgan, Lanham, Frankenstein, & Carley (2017), for information on governmental requests for a non-academic-friendly model
studies on how the characteristics of those consulted (e.g., gender, nationality or employment sector) factor into their predictions. This paper uses expert judgment forecasting by panels of academia, think tanks, policymakers, and military leaders from five different countries to create quality probabilistic data on the potential of achieving complete, verifiable denuclearization of North Korea by 2040, in addition to the desirability and likelihood of regional multilateral security cooperation around North Korean nonproliferation. It also produces an analysis on whether the demographic characteristics of the SME bias their judgement. This paper focuses on open-source SMEs rather than secret intelligence analysts due to access difficulties of federally-employed intelligence analysts.

The goal is for the data produced from this research to be useful in existing “easy-to-use” models of sociocultural analysis, such as those developed to aid the U.S. government in better assessing the impact of possible strategic choices surrounding the problem of North Korea’s nuclear proliferation.\textsuperscript{4} It could also be used to help decision-makers evaluate whether the type of expert they solicit matters – and whether or not the forecasts they are provided are influenced by the characteristics of the expert fielded.

\textbf{1.1.1 Summary of the ViTTa Korea Strategic Outcomes Report}

As mentioned in the introduction, the methods of and results from this study are being compared to the NSI’s Virtual Think Tank (ViTTa) reports on the same issue, published in 2018. These reports are purely qualitative, and can be quite lengthy – over forty pages; not a quick read for a busy decision-maker.

\textsuperscript{4} Again, see \textit{Morgan et al. (2017)} for an example of such model.
Each report on Korea Strategic Outcomes includes this description on the second page:

NSI's Virtual Think Tank (ViTTa) provides rapid response to critical information needs by pulsing a global network of subject matter experts (SMEs) to generate a wide range of expert insight. For this Strategic Multilayer Assessment (SMA) Strategic Outcomes on the Korean Peninsula project, ViTTa was used to address eight key questions provided by the Joint Staff project sponsors. The ViTTa team received written response submissions from 50 subject matter experts from academia, government, military, and industry. Each Korea Strategic Outcomes ViTTa report presents 1) a summary overview of the expert contributor response to the ViTTa question of focus, and 2) the full corpus of expert contributor responses received for the ViTTa question of focus. Biographies for all expert contributors are also included in each report.

The eight questions directed by the Joint Staff to be posed to the experts are included in Appendix C, but the ViTTa Korea Strategic Outcomes Report findings this study are most interested in are provided in summary format below:

**Strategic Outcomes**

1. *Is there a win-win scenario for all the key actors (DPRK, ROK, US, China, Russia)?*

   *If so, what might this look like?*
In this report, various perspectives emerge among the SMEs regarding the prospect of a win-win scenario.\(^5\)

A substantial majority of approximately 62% of SMEs hold the view that achieving a win-win scenario for all key actors is improbable. They argue that the fundamental interests of the United States, the DPRK, China, and Russia are fundamentally irreconcilable. The DPRK regards its nuclear capability as indispensable, while the United States insists on the concept of final, fully verified denuclearization (FFVD, also known as CVD). In addition, China and Russia seek to reduce U.S. influence in the region, a goal that conflicts with U.S. objectives and further complicates the possibility of a win-win outcome.

About 23% of SMEs suggest that while a short-term win-win scenario might be conceivable, doubts loom over its long-term feasibility. They highlight a misalignment of long-term interests among the key actors and an overall lack of trust in the DPRK's commitment to honor agreements as significant barriers to achieving a sustained win-win situation.

Lastly, approximately 15% of SMEs maintain that a win-win scenario involving all key actors is feasible. While acknowledging differing interests, they see room for negotiation and diplomacy to achieve mutually beneficial results. These SMEs emphasize the potential for dialogue and compromise in the pursuit of a win-win outcome.

Though Japan is not explicitly designated as a "key actor" in the question, it is interesting to note that many SMEs consider its role significant within the context of the Korean Peninsula and the broader Asia Pacific region. This dissertation takes this finding into consideration and includes Japan as a key actor.

\(^5\) See Kuznar, L., & Popp, G, eds. (2018). “Is There A Win-Win Scenario for the Key Actors Concerned with the DPRK?,” A Korea Strategic Outcomes Virtual Think Tank (ViTTa®) Report: NSI Team. Available at: https://nsiteam.com
2. *Is there is anything the US can do to empower the ROK to negotiate a solution that would remove both the nuclear and conventional instabilities on the peninsula. The current planning assumption is that the US will play a major, even lead role in these negotiations.*

In this *Korea Strategic Outcomes Report*, for which 15 SMEs contributed, opinions vary; however, several key perspectives emerge.6

Some SMEs believe that the United States can empower South Korea to implement measures for long-term stability. They emphasize concrete actions the U.S. can take to support South Korea's role. Others, like Dr. Patrick McEachern, argue that the U.S. must lead, given South Korea's limited leverage. Another perspective suggests that the U.S. can empower South Korea as a mediator between the U.S. and North Korea (DPRK). Some advocate a stronger role for Seoul, including leading efforts to negotiate a formal end to the war with Pyongyang. Others propose a combination, with the U.S. leading denuclearization negotiations and South Korea leading conventional détente efforts.

Regarding denuclearization, some SMEs believe holding the DPRK to agreements like the Panmunjom Declaration could reduce nuclear instabilities. Others suggest maintaining extended nuclear deterrence with South Korea, while some propose facilitating South Korea to lead efforts for a nuclear-free, neutral peninsula.

However, addressing conventional instabilities is more complex, requiring commitments from the U.S., South Korea, and the DPRK. SMEs suggest various approaches, including creating

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a DMZ Peace Zone, establishing hotlines, negotiating limits on forces, reducing artillery, and eliminating elements of the ROK missile program for DPRK arsenal reductions.

In broader terms, SMEs emphasize South Korea's leadership, Korean-centric policies, effective communication, economic incentives for North Korea, and reducing militaristic rhetoric. A potential win-win scenario may involve the U.S. supporting South Korean leadership in diplomacy, ensuring DPRK communication, providing economic incentives, and addressing conventional military concerns through negotiations and confidence-building measures.

**DPRK Denuclearization**

3. *Under what regional and domestic political, economic and social conditions would it be possible to achieve a complete and verifiable denuclearization of the DPRK without resorting to militarized conflict (i.e., what conditions would have had to occur to make that possible)?*

   - Which regional actors have interests consistent with a complete and verifiable denuclearization of the DPRK? Which actors have interests that are at odds with that outcome? Which are indifferent?

The “Necessary Conditions For Achieving FFVD Without Militarized Conflict” report is the main question posed by the ViTTa that is explored by this dissertation.7 Thus, this summary of ViTTa results will go into a bit more detail than those provided for other questions. This 43-page report also received the highest number of solicited SME responses: 30 (this dissertation’s author included). This is purely speculation based on where the SMEs list their affiliation, but it seems all but four SMEs are from the U.S.: one being from a university in South Korea, another

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two from Australian universities, and one from an Australian think tank. When distinguishing them by employment sector, it appears that 15 work at universities or colleges, 13 are from think tanks, one is from the military, and one in journalism.

The report results highlight the considerable challenges in achieving FFVD (more commonly referred to as “complete and verifiable denuclearization [CVD],” which is referenced in the question above and used throughout this dissertation), with most SMEs acknowledging the formidable odds and expressing skepticism about its feasibility. While some suggest potential long-term progress, they caution that success remains uncertain. In this context, SMEs emphasize that the order and approach to these conditions may be as critical as the conditions themselves.

To understand the prerequisites for CVD, SMEs begin by examining the motivations behind the DPRK's nuclear weapons program. They emphasize that nuclear prestige is crucial for the Kim regime and the nation, as it consolidates the regime's authority, aligns with its ideology, enhances security, and bolsters international standing. Several SMEs propose that some of the necessary conditions for CVD are less tangible shifts in perspective and ideology than concrete prerequisites. These shifts are deemed essential for meaningful progress.

SMEs advocating for perspective shifts as a necessary condition stress the importance of building mutual trust among key actors involved in DPRK denuclearization. They note that the pervasive lack of trust poses a significant obstacle to required shifts in perspective and on-the-ground conditions for CVD. Overcoming this distrust requires substantial risks and assurances from both sides. However, past U.S. actions, such as withdrawing from the JCPOA, have cast doubt on the reliability of U.S. commitments.

Furthermore, achieving CVD without military conflict may necessitate a shift in the DPRK's perception of security and sovereignty. This entails convincing the DPRK that there is no
external threat requiring nuclear arms and that economic strength outweighs nuclear power. Such a shift requires a fundamental change in the DPRK's worldview and motivations.

Additionally, SMEs in this ViTTa report suggest that the United States may need to reconsider its approach to the DPRK and denuclearization. This could involve revising previously established expectations and redlines to facilitate CVD. Such a shift could be effective if it includes recognition of the DPRK on the international stage, relaxation of economic restrictions, and substantial U.S. economic investment in the DPRK.

Regarding the specific economic, political and social conditions needed for CVD without militarized conflict, SMEs answers were similar—though much fewer and less expansive—to those conditions this dissertation extracts from Round 1 of the Delphi and uses in the Q-Sort. The ViTTa report provided a consolidated summary of their answers:

**Reassure Kim Jong-un’s safety and US credibility:**
- Significant reassurances are provided to Kim Jong-un that CVD will not threaten the security of his regime.
- Credible assurance is provided that the US will not renege on its agreements.
- The DPRK is acknowledged as a member of the international community.
- The US commits to not implementing any new sanctions during CVD negotiations.

**Support economic growth:**

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8. The following list was taken directly from the report, *Necessary Conditions For Achieving FFVD Without Militarized Conflict – A Korea Strategic Outcomes Virtual Think Tank Report* | NSI (nsiteam.com).
• Opportunities are created for the DPRK to access international markets and foreign economic aid.

• Economic development is promoted in the DPRK beyond Pyongyang and the Kim regime.

**Improve social conditions:**

• Social exchanges are facilitated between the DPRK and other countries (e.g., cultural, educational, and scientific exchanges are initiated in the region, particularly with the ROK; DPRK officials are allowed to travel and study abroad; Americans are allowed to live and work in the DPRK).

**Regime change:**

• Regime change occurs in the DPRK (e.g., peaceful coup occurs within the DPRK; Kim Jong-un suddenly dies and there is an ascension of figures dependent on China or the ROK; isolation from the outside world becomes so profound that the DPRK collapses, leaving its people and territory to fall under ROK or foreign tutelage).

**The US and China cooperate on the DPRK:**

• The US and China fully commit to and cooperate on offering the DPRK economic, political, and security assistance and guarantees.

• The US and China exert costly economic pressure on the DPRK to force it into initial CVD negotiations and keep it on track towards CVD.

**The US and China do not cooperate on the DPRK:**

• The US applies maximum economic pressure against both the DPRK and China (e.g., the US strengthens export/import embargoes against the
DPRK and China and toughens sanctions against Chinese financial institutions doing business with the DPRK) to isolate the DPRK from China and force the DPRK to comply with US CVD demands.

Multilateralism:

- The US commits to a multilateral approach that incorporates key regional actors (i.e., DPRK, US, ROK, China, Japan, and Russia) to work towards a broader Asian Pacific regional security architecture.

Reduced Tension on the Korean Peninsula:

- US-ROK military exercises are reduced or terminated.
- DPRK-ROK talks on the reunification or demilitarization of the peninsula are established.
- The Korean War is formally ended and a peace treaty is signed.
- Missile and weapon verification and limitation agreements are negotiated with the DPRK.
- DPRK-ROK joint military professional exchanges are established.
- DPRK and ROK observers are increasingly invited to regional military exercises.

This specific report ends with a foggy outlook: “Ultimately, it is unclear that any approach could truly achieve CVD on the Korean Peninsula. The best outcome for the US, therefore, may include living with a de facto nuclear DPRK, an improved relationship with the hostile state, and acceptance of the DPRK into the international community. What does
seem clear, however, is that in order for progress to be made toward achieving CVD in the DPRK, major shifts in perspectives and expectations are needed on all sides.”

This dissertation provides a much more specific answer to this question.

**Regional Non-Proliferation**

4. *Under what regional and domestic political, economic, and social conditions would it be possible to reinforce a non-proliferation regime in the region including extra-regional sales? What conditions would have had to occur to make that possible?*

In the ViTTa report answering this question, for which 18 SMEs contributed (This dissertation author included), two primary conditions emerge as particularly conducive to non-proliferation in the Asia Pacific region. First, the presence of a multilateral regional security dialogue and framework that includes key regional actors and international organizations is crucial. Such an architecture would address significant regional non-proliferation concerns, such as the DPRK's nuclear activities, illicit proliferation, and nuclear technology transfer. Establishing this multilateral security dialogue and framework is considered a fundamental prerequisite for progressing toward a regional non-proliferation regime.

Secondly, providing the DPRK with political, economic, and security assurances and guarantees is seen as another condition favoring non-proliferation in the Asia Pacific. However, there are varying perspectives on the best approach and types of assurances to offer. Some experts prioritize economic incentives, believing that proper compensation would dissuade the DPRK from proliferation activities. Others advocate for a combination of political, economic, and security assurances, emphasizing the importance of political stability, decreased security threats, and

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9 See Popp, G. (2018). “Conditions Conducive to Enforcing a Non-Proliferation Regime in the Asia Pacific Region,” A Korea Strategic Outcomes Virtual Think Tank (ViTTa®) Report: NSI Team. Available at: [https://nsiteam.com](https://nsiteam.com)
economic growth in promoting non-proliferation. Ultimately, a comprehensive approach may involve trade-related safeguards, regional disarmament, and targeted cooperation to shift the DPRK's capabilities from military to civilian use.

**Northeast Asia and Western Pacific Regional Stability**

5. *How does the US, working with its partners, best contest DPRK operations? Please explain your rationale.*

6. *What are the minimum regional and domestic political, economic and social conditions that are essential for achieving a stable regional order in alignment with US and ally interests? Are there any factors that are sufficient to generate such stability in the region? That is, what should not be negotiated away?*

The results from these questions were combined with the report summarized in question two above.

**1.1.2 Using a Modified Delphi Technique to Answer the Research Questions**

This study, through use of a modified three-round Delphi, analyzes the forecasts of SMEs on the probabilities of complete, verifiable denuclearization of North Korea, including any convergence or divergence among of the major regional actors regarding multilateral cooperation around the problem of North Korean nuclear/missile proliferation in Northeast Asia. A secondary objective uses Q-methodology to discover and analyze the similarities and differences of expert forecasts on this matter across countries (U.S., Japan, Russia, ROK and PRC) and sectors (government [military and policy], think tank and academia), and finally, compares forecast outcomes to forecast results produced from the qualitative ViTTa SME report. It is important to
note that it is not a goal of this dissertation to evaluate the quality or accuracy of these predictions; perhaps that is a project for 2041! An important additional deliverable as a result of this research, though, is the political, social and cultural probabilistic data set on the major actors involved in Northeast Asian security cooperation.

Specific research questions and aims are as follows:

Q1. Do SMEs assess a likely probability (>50%) for revival of regional cooperation regarding North Korea, either ad-hoc along the lines of the Six Party Talks, or more institutionalized, such as a nuclear weapon free zone or a Regional Nonproliferation Regime (RNR)? Specifically, what is their perception of role of the U.S. in this cooperation?

Q2. Do experts anticipate compatibility (>50% likelihood) on key multilateral security cooperation constructs despite sociocultural and political barriers such as historical, territorial, and other long-standing disputes between the actor states?

Q3. Do expert forecasts converge or diverge across countries or sectors of employment, either on the Q-sort or on Delphi answers?

Q4. Do expert forecasts from this research project differ significantly from those produced by the NSI Team ViTTa report?
1.2 Hypotheses

The hypotheses of the research question are as follows:

H1. SMEs assess a low likelihood (<50%) of a revival of regional security cooperation, be it ad-hoc or institutionalized.

   H1(1). Any type of cooperation would have to be spearheaded by the U.S. *Assumption:* The U.S. serves as the most powerful actor and possesses the greatest interest in a non-nuclear North Korea.

H2. Experts reach consensus that there is <50% likelihood of compatibility among Northeast Asian actors around the key multilateral security cooperation constructs provided. *Assumption:* Long-standing divergences in national interest cannot be overcome in the next decade and will prevent cooperation from going beyond the bilateral level.

H3. Expert forecasts will diverge across countries and across sectors of employment in both the Delphi and Q-sort techniques. *Assumption:* Major actors in Northeast Asia (not counting the U.S.) will view the prospect of multilateral security cooperation as less likely than their U.S. counterparts. This is due to the fact that they are geographically and emotionally closer to the issue at hand. Sectors of employment will also diverge in their answers: academics and military will in all probability be pessimistic about cooperation; Think tanks and policymakers will likely be optimistic.\(^{10}\)

H4. Expert forecasts from this research project will differ significantly from those produced by the ViTTa report:

\(^{10}\) Assumptions in H3 based on the author’s own informal interviews on the topic with individuals from each country and sector of employment discussed (with the exception of Chinese and Russian military members), conducted between the years of 2015 and 2019.
H4(1). Forecasts from this research project will be more precise. **Assumption:** A greater number of participants are solicited and probabilities are included in their estimates, leading to greater precision in forecasts.

H4(2). Forecasts from this research project will be more pessimistic about the possibilities of multilateral cooperation. **Assumption:** Non-U.S. experts in regional actor states have experience assessing and evaluating the presented issues on a day-to-day basis since they live in-region; they are acutely aware of the challenges of cooperation that U.S. experts may view with a more optimistic lens common to Americans.

H4(3). Forecasts from this research project will provide useful information to the U.S. government in future Northeast Asia security policymaking. **Assumption:** This study will contain evaluations of the role and perception of the U.S. from SMEs in actors involved in the region, rather than only American SMEs. This will allow policymakers to craft future policies that will yield better responses from regional actors.

### 1.3 Scope

*Figure 1.1 Snapshot of Dissertation Format*

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Following the introduction and literature review in chapters one and two, this dissertation provides a comprehensive introduction and background on both the North Korea proliferation problem and the history of multilateral security cooperation in Northeast Asia. Chapter three will first explore in brief the current state of nonproliferation cooperation in Northeast Asia, providing a brief background of regional historical attitudes on/involvement in nonproliferation, states’ roles in the changing Northeast Asian security environment, the specific threats faced, and points of historical time periods of convergence and divergence amongst regional neighbors, while quickly zeroing in on the continuing and serious problem of North Korean proliferation. Since the advent of this study, North Korea has purportedly succeeded in its quest to become a nuclear country. It has shifted its primary source of nefarious proliferation funding from black-market goods to crypto-theft due not only to the new opportunities that have arisen in cyberspace with advancing technologies but also to multilaterally-enforced sanctions imposed upon the country by the international community. The converging and diverging patterns of security cooperation in Northeast Asia are explored both at the state level and the system level. This provides a background that will aid in understanding the choice of scenarios provided to the experts in this study as well as the conditions affecting verified denuclearization of North Korea that the experts ranked in the Q-sort.

Chapter four introduces the research design and methodology. This includes the reasoning behind the diverse selection of panelists for the Delphi, the unique pairing with the Q-sort, and some definitions of key variables. Chapter five presents summary of findings and main analysis derived from this research. Since the study serendipitously administered its Delphi rounds both before and after the onset of COVID-19, chapter five will also present the view from experts on
whether or not they would change any of their forecasts based on the occurrence of the global pandemic, which occurred midway through the experiment.

Chapter six provides the meat of the paper; the analysis of the results obtained from each scenario presented to the panelists. It also looks at the data cross-sectionally by expert state of origin and sector of employment. An analysis of the data drawn from the state’s Delphi panel follows. This chapter draws separate conclusions on where the panel sees future areas of convergence and divergence on security cooperation with regional neighbors on the topic of North Korea, and where they have divergence/convergence with each other. The study then turns the lens on the experts themselves. Chapter seven explores the areas of convergence and divergence on forecasts with the aim of better informing policymakers on the impact their choice of expert consultants to seek advice from might (or might not) bring a bias into the type of predictions they will receive. This chapter demonstrates that while they may not converge or diverge based on traditional variables such as state or employment sector, they do fall into “factor groups” based on how they see the world. These two chapters are where the majority of supporting research questions of the study (outlined in Chapter 1) will be addressed:

Q1. What do SMEs identify as the prospects for revival of regional cooperation regarding North Korean nuclear/missile proliferation, either ad-hoc along the lines of the Six Party Talks, or more institutionalized, such as a nuclear weapon free zone or a Regional Nonproliferation Regime (RNR)?

Q2. Do experts anticipate any compatibility on key multilateral security cooperation constructs despite sociocultural and political barriers such as historical, territorial, and other long-standing disputes between the actor states?

Q3. Do expert forecasts differ across countries or sectors of employment?
Chapter eight will conclude the dissertation, evaluating if the three-round Delphi and Q provided better-informed forecasts by SMEs than the traditional think tank report, thereby answering the following research question:

*Q4. Do expert forecasts from this research project differ significantly from those produced by the NSI Team ViTTa report?*

The Conclusion will also address the study’s research aims:

- Identify the most significant factors that influence or inhibit security cooperation in Northeast Asia and the possible creation of a Regional Nonproliferation Regime (RNR)
- Examine how experts evaluate the influence of perceived proliferation-unrelated tensions between actor states in Northeast Asia on security cooperation
- Identify the trends, warnings, and indicators experts use to form judgments about the future of security cooperation in the region
- Examine how personal characteristics of the experts – national identification and employment sector—cause them to diverge or converge on the Delphi and Q method questionnaires
- Create an unbiased, replicable, cross-cultural sociocultural data set that could be used to better inform U.S. nonproliferation strategy and analysis of regional threats to U.S. and allies

Chapter eight finishes with the author’s thoughts on what the next two decades of Northeast Asian security cooperation around nonproliferation will look like based on findings. Finally, the conclusion will suggest ways this data might be used in existing sociocultural forecasting models, and future areas of complementary research.
Chapter one laid out the foundation of the problem explored in this dissertation: the uses, limits, and qualifications of expert prediction in foreign policy, exemplified by the solicitation of SME opinions and forecasts solicited by the ViTTa Korea Strategic Outcomes Report on the future possibility of the denuclearization of North Korea. It summarized the key ViTTa report findings, provided a brief critique, and sneak-peak of the methodology this dissertation uses to provide SME forecasts and plausible futures on the North Korea nuclear proliferation problem that may tease out nuances or details that are likely to be helpful to policymakers. Finally, it discusses the research questions and hypotheses this dissertation will investigate. Chapter two will dive into recognized literature on the above, in a comprehensive literature review.
2.0 Literature Review & Scope

2.1 Literature Review

As mentioned earlier, there has not yet been a study such as this, which uses Delphi and Q to analyze expert forecasts across state actors and sectors regarding regional multilateral cooperation on the North Korea proliferation problem. This literature review thus looks at two separate bodies of work from which the author draws for her research, and how this study makes an informed contribution to each:

(1) Global, regional, and local literature assessing the success/failure of multilateral security cooperation efforts in Northeast Asia, and;

(2) Literature on using judgments in forecasting policy analyses.

2.1.1 Multilateral Security Cooperation

2.1.1.1 Global Nonproliferation Cooperation

International control regimes refer to internationally agreed-upon frameworks, often formalized through treaties or conventions, aimed at regulating specific goods, behaviors, or activities with transboundary implications. These regimes are often established to address issues that individual nations cannot tackle on their own due to the global or regional nature of the problem. The primary goals of such regimes include ensuring collective security, promoting cooperation, and preventing undesirable outcomes.
There are quality studies that focus on global efforts at multilateral cooperation around WMD proliferation or the success/failure of international control regimes in mitigating the problem. These works often include North Korea as a case study (Gormley, 2008; Hymans, 2010; Knopf, 2016; Mallik, 2004; Morgan et al., 2017; Muller & Wunderlich, 2013). One challenge for these papers is that, as a hermit kingdom with an unpredictable leader and a history of antagonizing its neighbors, North Korea’s case is an outlier in cooperative efforts and makes it hard to maintain construct validity when used as a gauge of multilateral cooperation at the global level. In fact, multilateral cooperation with the DPRK has faced limitations and will likely continue to as it lacks the four dimensions outlined by Williams that are necessary for multilateralism: (1) a shared commitment of states to common goals, values and norms; (2) a commitment to uphold those norms or to protect the regime; (3) that the collective norms and values are institutionalized to a degree, and; (4) agreed framework and procedures to facilitate those efforts (in Brenner, 2015, pp. 212). That is why this proposed research is specifying the North Korea proliferation problem as a dependent variable around which regional-level cooperation that incorporates norms and values of the region rather than the international community (and potentially led by a state other than the U.S.) could occur.

The independent variables for this study are adapted from a 2016 book edited by Jeffrey Knopf, in which authors examine multiple cases to determine which factors have the greatest influence on international cooperation around WMD proliferation. Case study authors were asked to follow a common analytical framework and consider seven specific factors pre-identified by Knopf in their analysis of what may have led to the emergence of nonproliferation agreements outside of the core WMD treaties, such as the Nuclear Non-Proliferation Treaty (NPT), among others. The results identified include a total of eleven impactful factors (in order of greatest
influence): Self-interest; U.S. Leadership; Norms and identity; Ideas and learning; Transnational networks; Outside inducements or persuasion; Domestic politics; Capabilities; Geopolitics; Regime design, and; Interactions of non-state actors. Knopf’s study constitutes the first comparative analysis of cooperative nonproliferation activities beyond the NPT.

Though informative, Knopf’s study suffers remarkably from confirmation bias. The fact that case study authors were provided a list of factors to consider may have led the authors to look for information in their analyses that confirmed Knopf’s pre-identified constructs. Contributing authors Hamel-Green and Giovannini brought this bias to Knopf’s attention in their chapters; though the project implicitly assumed U.S. leadership would play a significant role, quite often at the regional level it is a regional power that takes the lead. To control for confirmation bias the author of this study also, in addition to cross-checking constructs with multiple scholarly works (as did Knopf), solicited feedback on the constructs from SMEs throughout the process.

2.1.1.2 Regional Security Cooperation

A handful of scholarly papers have analyzed the prospect of multilateral cooperation on the regional level, with fewer focusing on Northeast Asia in particular. These papers often focus on bi- or trilateral cooperation, i.e. China-Russia (Kashin & Lukin, 2018), Japan-ROK (Park, 2009), China-Japan-ROK (Xintian, 2006; Zhang, 2018) or U.S.-Japan-ROK (Nam, 2010), rather than including a broader range of regional actors. Some allude to regional cooperation but do not give specifics either as to whom or about what (Frank & Swenson-Wright, 2013; D. M. Jones & Jenne, 2016; Pacheco Pardo, 2012; von Hippel, Hayes, Kang, & Katsuta, 2012). One recent paper does suggest the nations of the Six-Party Talks reconvene and discuss cooperation on nuclear issues but does not give specifics as to the content or likelihood of such multilateral regional meetings (Goodby & Hayes, 2016). In contrast, this dissertation not only includes all participants
in the Six-Party Talks, with the exception of the DPRK—the most salient example of multilateral security cooperation in Northeast Asia—but also produced data reflecting expert opinions on the likelihood and possible futures of such cooperation as related to a mutually-desirable outcome of denuclearizing North Korea.

2.1.1.3 North Korean Proliferation

There have been numerous studies on the North Korea WMD proliferation problem, covering topics such as the Six-Party Talks (Buszynski, 2013; Klingner, 2012; Kwak, August 2010; Moon, 2013), the effect (or ineffectiveness) of UN sanctions on North Korea for proliferating (Eckert, Winter 2009-10; Kim, 2014; Noland, 2009, 2019), and the AQ Khan network (Corera, 2006; Kelman, 2015; MacCalman, 2016). These works have focused on a state-level analysis of why the DPRK may choose to proliferate, or the ways in which they go about it. This dissertation takes the general findings of these former analyses—that North Korea tends to proliferate less and cooperate more as a result of multilateral efforts of legitimization, rather than 1:1 exchanges or punishments—into consideration in the formulation of security cooperation constructs. However, in addition to looking at the history of self-interest, regional leadership and norms surrounding the North Korea nuclear issue, this paper explores the future of the potential of such constructs to lead to successful multilateral cooperation around DPRK proliferation, and if some relationships might be more impactful than others in leading towards the goal of CVD of North Korea.
2.1.2 Expert Judgmental Forecasting

Human beings by nature are fascinated with predicting the future; thus, there exists extensive literature detailing the most accurate way to forecast. Forecasting, or making predictions about the future based on past and present data, is defined as a method of analysis that encompasses both qualitative and quantitative disciplines. As this research project focuses on policymakers’ primary source of open-source intelligence on plausible futures—the judgments of subject-matter experts (SMEs)—this literature review evaluates well-known studies on judgmental forecasting.11

In addition to Olaf Helmer’s aforementioned, pioneering work on the Delphi technique in 1969, Linstone & Turoff’s 1975 edited piece remains today one of the most respected references on the history, philosophy, and practice of Delphi. Their work has been made available by the authors as a free online reference since 2002, making it even more accessible. In this work, the authors outline the methods of conducting a Delphi inquiry as well as offer some examples of its use. This reference goes into great deal on one method of quantitative analysis of Delphi results—the Cross-impact analysis (CIA)—based on estimated probabilities of the impact of one future event on the occurrence of other events in the questionnaire. However, the reference does not explore in great detail how probabilities might be used in techniques outside of the CIA, such as those proposed in this prospectus. Overall, although Linstone & Turoff’s reference is over 40 years old, its overview of the Delphi philosophy, applications, evaluation, and pitfalls, is still useful in today’s practice.

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11 There have been a number of formal models developed regarding policy decision-making; see, for example: Bueno de Mesquita, Bruce (2011 & 2002); Montgomery et al (2012); Brant & Freeman (2006); Achen, Christopher (2006). There is also a growing literature addressing the need for attention to sociocultural issues in addition to formal forecasting models: Morgan et al (2017); Gleditsch & Ward (2013).
Philosopher Nicholas Rescher, who aided Helmer in the development of the Delphi, produced a book in 1998 on the theory of forecasting. In it he evaluates the robustness of multiple qualitative and quantitative predictive methods. Regarding quantitative methods, Rescher points out that simple models like time-series analysis have no behavioral theory built into them. While even complex models involve such a wide array of assumptions that it is best seen as an “exploration of futuristic possibilities” than a forecasting exercise. For qualitative methods Rescher concludes that Delphi is the preferred technique, though with the Delphi “consensus in error is no less common than consensus in truth” (1998). He laments, however, that judgmental prediction is what people resort to “in absence of theory-based alternatives” (e.g. process tracing). Rescher argues that, though (as David Hume once pointed out) there is no demonstrative proof that forecasting based on past events or behavior is successful, Delphi at least attempts to draw consensus from a collection of inductive forecasts (using an array of methods) rather than solely relying on the interpretations or analysis of one or two individuals. Rescher does not explore the prospect of formal models being informed by robust qualitative forecasting data based on probabilistic reasoning—a data set that this study intends to produce.

The present leaders in modern forecasting reside in The Good Judgment Project (GJP) at the University of Pennsylvania. This project was started in 2011 by Philip Tetlock, Barbara Mellers and Don Moore, in collaboration with the Intelligence Advanced Research Projects Activity (IARPA) and Aggregative Contingent Estimation (ACE). The GJP enlists and trains forecasters from a pool of non-expert civilians, of which the top 2% of performers, labeled “superforecasters,” are eventually able to forecast probabilities of certain events consistently better (up to 30% more accurate) than intelligence officers or other experts in the field. Forecasting guru Philip Tetlock details the main findings of the project in his book *Superforecasting*, coauthored by Dan Gardner.
(2015). One pitfall of this method, however, is the tedious process of the identification and training of superforecasters; the government occasionally solicits the GJP for policy forecasting, but it is unlikely that the training of superforecasters will ever move in-house. Thus, consultation of SMEs will most likely continue to be the forecasting “method” of choice for policymakers.

Most recently, GJP co-leaders Tetlock and Meller were contributing authors on two studies that demonstrated the value of probabilistic reasoning in forecasting foreign policy (Friedman, Baker, Mellers, Tetlock, & Zeckhauser, June 2018), as well as the value of teamwork in prediction accuracy vice individual assessments (Horowitz et al., 2019). Using data from the GJP scored against actual outcomes of the predictions made by forecasters, these studies come to two important conclusions, respectively: First, that foreign policy analysts provide reliable predictions when given the freedom to make precise probabilistic forecasts (i.e. rounded to the nearest 5% rather than grouped in general ‘buckets’) and that the number of questions asked, opportunities provided to revise answers, and brief probabilistic training lead to greater forecasting precision—all which happen to be qualities incorporated into the Delphi technique. Interestingly, this study on probabilistic reasoning also found that reliability did not change significantly based on gender, education level, or length of time horizon that analysts were asked to forecast. The author’s research cannot evaluate the reliability of estimates as the events may not take place until years in the future, but they will be able to expand on Friedman et al.’s work and make comparisons and test for continuity across forecasters of different native languages, countries of residence, and sector of employment. The second study, on the value of teamwork, found that forecasters were consistently more accurate when working in teams rather than individually. This challenges the groupthink hypothesis. The caveat was that the most successful teams feature individual analysis
and allow team members to react to and update their beliefs in response to arguments; again, traits 
present in the Delphi technique which will be used in this research proposal.

In conclusion, a brief review of literature on judgmental forecasting finds that the Delphi—
though not without its flaws—is still, after 50 years, the most steadfast, unwavering, and trusted 
method to produce reliable foreign policy forecasts.
3.0 Multilateral Security Cooperation Around the North Korea Problem

North Korea is a problem. North Korea is a communist dictatorship. North Korea is a humanitarian crisis. North Korea is an economic disaster. North Korea is a prolific proliferator. The most recent characteristic made known to the world stage, and perhaps the most distressing characteristic of the state: North Korea is now a nuclear power. Despite continued efforts by regime member countries to interdict, North Korea, also known as the Democratic People’s Republic of Korea (DPRK), continues to both acquire and proliferate nuclear materials and technology banned by global institutions promoting nonproliferation norms. Many participants of these multilateral institutions have enforced sanctions against North Korea in an effort to curb its nuclear development or transfer of nuclear technology and knowledge to other countries. Sanctions have not deterred the North from proliferating weapons, as demonstrated by their continuously intercepted transfers12 documented by the United Nation Security Council (UNSC) 1718 DPRK Sanctions Committee Panel of Experts (S/2018/171) Nor has it deterred their in-house nuclear endeavors, evidenced by the 2020 UNSC report indicating the DPRK continued development of their nuclear and ballistic missile program throughout 2019, violating a number of resolutions against such activity (S/2020/151). In fact, many experts believe that the sanctions may inadvertently strengthen anger and resentment by the DPRK government hardliners in their position that the U.S. is hostile to their regime (Wertz & Vaez, June 2012).

Global efforts to deter the North Korean government and companies from transferring nuclear and dual-use parts and technology have failed. Regional efforts have had more notable—

12 See SC/13272 as an example of numerous UNSC Press Releases and 1718 Sanctions Committee reports in which interdicted vessels were identified in ship-to-ship transfers. Available at: s_2018_171.pdf (securitycouncilreport.org)
though, admittedly, minor—success. After North Korea withdrew from the Nuclear Nonproliferation Treaty in 2003, major actors in Northeast Asia convened to form an ad-hoc diplomatic solution to the North Korea problem: The Six-Party Talks – though unsuccessful from an outcome perspective, notably the largest example of multilateral cooperation in Northeast Asia in recent history -- China, Japan, South Korea, the U.S., Russia and the DPRK all came together in a landmark effort solve the North Korea problem. The Talks originally produced a 2005 agreement for the DPRK to abandon its nuclear weapons and resign the NPT. It was all for naught, though, when the North refused IAEA nuclear verification protocol and, in 2009, conducted a nuclear test. It also unveiled its uranium enrichment facility to the world.

Failed efforts to contain or denuclearize North Korea have contributed to rising tensions in the Northeast Asian security environment. South Korea has had direct confrontations with its Northern neighbor, one of the deadliest being the 2010 sinking of the ROKS Cheonan. Japan has faced numerous verbal and material security threats from the DPRK, causing it to publicly reevaluate its traditionally pacifist constitution (Wadsworth, 2019). In an attempt to abate the nuclear crisis, the U.S. engaged in level one talks with the rogue state—though as with previous efforts, still has made little progress as North Korean testing continues.

China and Russia have occasionally stepped up to publicly “rein in” the DPRK to ease tensions in the area and appease complaining neighbors; however, due to their economic interest in the country, they habitually refuse to enforce sanctions they helped pass through the United Nations Security Council where they are voting members. They are also respectively in territorial disputes with Japan and South Korea - which are also embroiled in their own territorial and historical retribution disputes.

Needless to say, Northeast Asia suffers from a myriad of security challenges. Though
opinions differ on how to go about it, denuclearization of North Korea seems the salient issue all neighbors can agree upon.

3.1 Security Cooperation in Northeast Asia at Present: Convergence & Divergence

Before analyzing expert forecasts on the future of security cooperation in Northeast Asia, it is important to first understand the present state of cooperation, including the current state of sanctions. Bilateral security cooperation exists in Northeast Asia, but the region has yet to achieve any major multilateral cooperative security effort since the Six Party Talks officially ended in 2009. Each regional actor has a converging interest in ameliorating the North Korean nuclear threat. However, each major regional actor also has diverging bilateral disputes with its neighbors that have hindered cooperation in the past. For example, the Six Party Talks—though established ad-hoc and widely viewed as the prime example of multilateral security cooperation in the region—were unsuccessful not only because of North Korea’s resistance, but also largely because the actors could not put aside proliferation-unrelated grievances (Cossa, 2012; Hur, 2018). The following section summarizes those grievances, as well as current areas of convergence in security cooperation in Northeast Asia.

To exemplify the state of current “security cooperation” between states in Northeast Asia, this paper draws on the five types of security cooperation used in a recent RAND report on the issue as related to the Indo-Pacific (Harold et al., 2019):

1. High-level strategic dialogues (symbolized by “strategic partnerships” and by contacts among senior leaders, most notably in the form of “2+2 dialogues” that bring together foreign and defense secretaries from two partner states);
(2) Joint military training and exercises;

(3) Arms sales and transfers;

(4) Joint defense industrial development, and

(5) The signing of treaties or agreements, which could take the shape of formal alliances, acquisition and cross-servicing agreements (ACSA) or generalized security of military intelligence agreements (GSOMIA).

Security cooperation between each of the key actors in Northeast Asia can be visualized in Figure 2.1 below, demonstrating where each of the state actors converge on the five types of security cooperation listed in the aforementioned RAND report.

![Figure 2.1 Security Cooperation Convergences in Northeast Asia (c. Oct 2019)](image)

As represented in Figure 2.1, each country has had at least some form of security cooperation via (1) High-level strategic dialogues. Many of these meetings give optimists hope for future security cooperation, though none of the meetings has yet to bear fruit in other forms of security cooperation.

In fact, outside of the formal security alliances between China-Russia, U.S.-Japan and U.S.-ROK, very little security cooperation exists in Northeast Asia. Up until early 2019, Japan and ROK had arms sales and a GSOMIA agreement; however, due to wounds re-opened about
historical tensions, South Korea pulled out of GSOMIA and Japan retaliated by placing restrictions on its military trade to the ROK. Now the only security cooperation other than high-level strategic dialogues that the democratic neighbors share is the Pacific Vanguard joint military exercise with Australia and the U.S. in May 2019.

Russia and the U.S. were signatories to a bilateral arms treaty, the 1987 Intermediate-Range Nuclear Forces Treaty, but U.S. President Trump pulled out of the treaty in August 2019; Russia’s President Putin subsequently followed suit. Any further convergence between the two countries has been severely strained since the start of the 2022 Russian invasion of Ukraine. To add to that, in 2023 Russia “paused” the New START treaty that they and the U.S. agreed to adhere to, which limited the number of nuclear weapons each country would possess.

South Korean President Moon Jae-in’s “nine bridges” policy concept is strengthening economic ties with Russia, and though the correlation between trade and peace is still in hot debate, Russia alluded to a positive correlation by multiple mention of economic issues in its most recent national security strategy (Federation, 2021). Trade relations between the U.S. and Russia/China respectively do not seem to dissuade the U.S. from referring to Russia and China as “long-term strategic competitors,” that are “principle priorities for the Department,” due to the “magnitude of the threats they pose to U.S. security and prosperity,” according to the 2018 National Defense Strategy (Defense, 2018) (in 2017 the U.S. was Russia’s 5th largest importer and 4th largest exporter; the U.S. was China’s top export destination (20% in 2017) and China, the U.S.’s 3rd largest export receiver at 11% (Simoes & Hidalgo, 2011)).

Figure 2.2 below shows current areas of divergence in security cooperation between the major actors in Northeast Asia, based on the following five factors:

(1) Territorial disputes
(2) Historical grievances

(3) Hostile language in official defense papers (i.e., perceived as “threat”)

(4) Illegal arms transfers

(5) Hostile actions (sanctions, "grey zone" incidents, kidnapping, etc.)

**Figure 2.2 Security Cooperation Divergences in Northeast Asia (c. Oct 2019)**

<table>
<thead>
<tr>
<th></th>
<th>DPRK</th>
<th>JAPAN</th>
<th>CHINA</th>
<th>ROK</th>
<th>RUSSIA</th>
<th>US</th>
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</thead>
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<td>3,5</td>
<td>4,5</td>
<td>2,3,5</td>
</tr>
<tr>
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<td>2,3,5</td>
<td>1,2,3,5</td>
<td>1,2</td>
<td>1,3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHINA</td>
<td>4,5</td>
<td>1,2,3,5</td>
<td>1,5</td>
<td>3,5</td>
<td></td>
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</tr>
<tr>
<td>ROK</td>
<td>3,5</td>
<td>1,2</td>
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<td>3,5</td>
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<td>3,5</td>
</tr>
<tr>
<td>RUSSIA</td>
<td>4,5</td>
<td>1,3</td>
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<td></td>
</tr>
</tbody>
</table>

Based on Figure 2.2, Japan and China have the most contentious relationship, with an expected divide visible between the democratic and communist states. Surprisingly, the ROK displays a more divergent relationship with Japan than it does with neighboring Russia. This is due to the aforementioned long-standing historical and territorial disputes between Japan and South Korea that have hindered efforts to cooperate bilaterally.

**3.2 Nonproliferation Cooperation in Northeast Asia: Norms and Institutions**

Security cooperation around nonproliferation has had its challenges. Since the end of WWII, United States defense program funding and research on weapons proliferation have been concentrated on deterring or defending against the threat of nuclear weapons and ballistic missiles.
to our nation’s security. International policy organizations, such as the Missile Technology Control Regime, have formed in recent decades to focus on not only ballistic, but cruise missile nonproliferation and disarmament. However, studies have shown that missile proliferation is increasing at an alarming rate, and the current global policies in place are ineffective in deterring the worst perpetrators (Gormley, 2008).

States that disregard internationally established rules and norms of state sovereignty or human rights have in the 21st century come to be known by the terms “rogue state,” “pariah state,” or “outlaw state” (Preble, 2005). In his State of the Union Address on January 29, 2002, then-U.S. President George W. Bush declared three rogue states—Iran, Iraq and North Korea—in his “axis of evil,” pinpointed as common enemies of the U.S. War on Terror. Later that year, Undersecretary of State John R. Bolton gave a speech entitled, “Beyond the Axis of Evil,” in which he added the rogue states Cuba, Libya and Syria to the axis as “state sponsors of terrorism that are pursuing or who have the potential to pursue weapons of mass destruction or have the capability to do so in violation of their treaty obligations” (Bolton, 2002).

One of the primary assumptions guiding the behavior of states regarding proliferation is the perceived threat by opposing states to their security, and therefore the need for an adequate capability either to deter or to defend against these threats. Although, as discussed below, rogue states are not the only states guilty of weapons proliferation, rogue states--particularly those encompassed within the “Axis”—have been the primary interdiction targets of the enforcement regimes. Being termed the “Axis of Evil,” as well as the increased sanctions, has only increased the rogue states’ perceived hostility and distrust.

The Six Party Talks were an example of a multilateral diplomatic initiative aimed at denuclearizing the Korean Peninsula, encompassing six participating states: North Korea, South
Korea, China, the United States, Russia, and Japan. The initiative commenced in 2003, spurred by concerns over North Korea's nuclear ambitions, particularly after it withdrew from the Nuclear Non-Proliferation Treaty (NPT) earlier that year. This decision followed the collapse of the Agreed Framework and increasing tensions with the U.S. China played a central role as both host and mediator in the Six Party Talks, reflecting its unique position as North Korea's main ally and its interest in maintaining regional stability; a key point that is reinforced later in this study.

The talks were characterized by periods of negotiations interspersed with standstills. A significant breakthrough occurred in 2005 when North Korea pledged to abandon all nuclear weapons and existing nuclear programs (37th Republic of Korea-United States Security Consultative Meeting Joint Communique, October 2005). In return, the other parties agreed to provide energy assistance and security guarantees. However, the optimism was short-lived, with disagreements over specifics, verification measures, and sequence of steps leading to breakdowns in talks. Another notable development came in 2007 when the parties reached an agreement on a series of steps for North Korea's denuclearization, coupled with aid to the North. Despite this, progress remained halting, and by 2009, the Six Party Talks had effectively stalled. North Korea's satellite launch that year, along with subsequent nuclear tests, further strained the process.

The failure of the Six Party Talks can be attributed to several intertwined factors. One of the primary challenges was the differing objectives and lack of trust among the participating nations. Each country came to the table with its own strategic interests, leading to varied and often conflicting goals. For example, while the United States and Japan were firmly focused on North Korea's complete denuclearization, North Korea sought security guarantees and economic concessions. This disparity in objectives, coupled with a deep-seated mistrust, particularly between North Korea and the United States, created a significant impediment to progress. Complicating
matters further, North Korea continued to advance its nuclear capabilities, conducting tests and launching missiles during the negotiation period. These actions were perceived as provocative by the other parties, particularly the U.S. and Japan, and raised serious doubts about North Korea's commitment to the denuclearization process.

Bilateral tensions, especially between North Korea and the United States, and between North Korea and Japan, added another layer of complexity to the negotiations. Issues such as North Korea's abduction of Japanese citizens and the U.S. labeling North Korea as part of the "Axis of Evil" further strained relations and hindered the possibility of a consensus. Additionally, shifts in U.S. policy over the years affected the dynamics of the talks. The Bush administration's initial hardline stance softened somewhat in its second term, but the subsequent strategic patience approach of the Obama administration, which awaited North Korean concessions before serious negotiations could resume, also failed to achieve substantial progress.

Lastly, internal political dynamics within North Korea played a crucial role. The nuclear program is not only a key element of national defense strategy but also a symbol of regime legitimacy and national pride. This made it particularly challenging for the North Korean leadership to fully commit to denuclearization, as doing so could potentially undermine the regime's stability and domestic standing.

In essence, the Six Party Talks were hindered by a complex web of conflicting interests, mutual distrust, ongoing nuclear development by North Korea, and significant bilateral and regional tensions, all set against the backdrop of shifting policy approaches and the unique internal dynamics of the North Korean regime. Since then, despite occasional mentions and calls for resumption, the Six Party Talks have not reconvened, with North Korea's nuclear program advancing and international tensions persisting.
Despite the common (at least outward) global interest in establishing and upholding nuclear nonproliferation norms, nonproliferation cooperation on the multilateral level has been difficult, to say the least. Much of the literature on multilateral security cooperation focuses on a shared commitment to norms and institutions (see Williams, 1995; Knopf, 2016; Muller & Wunderlich, 2013). Nonproliferation institutions exist in the region, promoting global nonproliferation norms—namely the NPT and some multilateral export control regimes (MECRs)—but are plagued with mistrust about adherence to these norms amongst western and non-western members. Multilateralism also relies on a shared will and commitment to uphold the norms, as well as a degree of institutionalization—a collective effort to uphold the norms (Williams, 1995). Ultimately, nonproliferation cooperation in Northeast Asia still seems mostly driven by self-interest. According to Michael Brenner, who edited a book on multilateralism, cooperation can be problematic when the states involved make short-sighted decisions based on parochialism, which he defines as “using national filters to assess Alliance missions, structures, and strategic designs (diplomatic as well as military)” (1995, p. 12). In East Asia, as highlighted in chapter 3.1, national interests are quite diverse among regional actors. This likely means that multilateral cooperation around North Korea may need to be preceded by rebuilding bilateral trust relationships and minimalizing fear and threat perception between neighbors in order to reduce the perceived sacrifice to security that would be needed to cooperate.

3.2.1.1 The NPT & MECRs

The Nuclear Non-Proliferation Treaty (NPT) entered into force in 1970 with the purpose of preventing the spread of nuclear weapons and technology, promoting the peaceful use of nuclear energy, and achieving nuclear disarmament. Of the five states recognized by the NPT as nuclear weapons states, three are active in Northeast Asia: China, Russia, and the United States.
the NPT these states have agreed not to transfer or assist any non-nuclear weapons state with nuclear weapons directly or indirectly. They have also voluntarily offered safeguards agreements with the IAEA that verify that nuclear material is not being diverted from peaceful energy use except as agreed upon in the arrangement. Japan and South Korea as well are both signatories to the NPT, and the DPRK, as mentioned earlier, signed but withdrew in 2003. Non-nuclear signatories of the NPT agree not to receive such transfers or assistance. They also have arrangements with the IAEA to ensure any nuclear energy material is not getting redirected for non-peaceful use.

There are four Multilateral Export Control Regimes (MECRs) dedicated to producing consensus-based recommendations for export of dual-use technology in an effort to prevent the proliferation of WMDs: Nuclear Suppliers Group (NSG), Missile Technology Control Regime (MTCR), The Wassenaar Arrangement, and the Australia Group. These Western-dominated regimes serve as a forum for state leaders to communicate, foster relations, and develop mutually agreed-upon policies for regulating trade in weapons and other technology. This study focuses on nuclear nonproliferation, which is under the umbrellas of the NSG and MTCR.

The Nuclear Suppliers Group (NSG) was created following India’s detonation of a nuclear device in 1974 and currently contains 48 participating governments. All actors in this study, with the exception of the DPRK, are members. This is the only MECR of which China is a member, joining in 2004. Factors for participation include ("Nuclear Suppliers Group: Participants," 2019): (1) The ability to supply items (including items in transit) covered by the Annexes to Parts 1 and 2 of the NSG Guidelines; (2) Adherence to the Guidelines and action in accordance with them; (3) Enforcement of a legally-based, domestic export control system with commitment to act in

13 The author’s claim that these regimes are Western-dominated stems from the fact that their majority membership consists of American or European powers.
accordance with the Guidelines; (4) Adherence to one or more of the NPT, the Treaties of Pelindaba, Rarotonga, Tlatelolco, Bangkok, Semipalatinsk or an equivalent international nuclear non-proliferation agreement, and full compliance with the obligations of such agreement(s), and; (5) Support of international efforts towards non-proliferation of weapons of mass destruction and of their delivery vehicles.

The Missile Technology Control Regime (MTCR) was established by Canada in 1987 in response to increased proliferation of WMDs. There are currently 34 member countries that, via membership, have agreed to adhere to the MTCR’s common export policy guidelines designed to make the acquisition of WMDs more difficult. With few exceptions, most of the chairs of the MTCR have been states of North America or Europe. China and the DPRK remain the only Northeast Asian actors who are not partners in the MTCR.

Also of note is the Proliferation Security Initiative (PSI). In 2003, U.S. President George W. Bush established the PSI to inhibit the shipment of WMDs to terrorist groups and countries that support them. Membership requires endorsement of the “Statement of Interdiction Principles.” There are currently 107 signatories who commit to this statement ("Proliferation Security Initiative: Statement of Interdiction Principles," 2019) and (1) Interdict transfers to and from states and non-state actors of proliferation concern to the extent of their capabilities and legal authorities; (2) Develop procedures to facilitate exchange of information with other countries; (3) Strengthen national legal authorities to facilitate interdiction, and; (4) Take specific actions in support of interdiction efforts. Members participate in induction exercises such as mock ship boarding. There is also, within the PSI, the “Operational Experts Group,” composed of 21 members including the U.S., Russia, Japan, and South Korea, who agree to: (1) Leverage related counter proliferation efforts; (2) Contribute customs, law enforcement, military and other security experts and assets to
interdiction exercises; (3) Host PSI meetings, workshops, and exercises with other PSI-endorsing states; and (4) Work with specific partner states to improve their capacity to combat the proliferation of WMDs (PSI, 2019). In 2013 the six leading PSI regional partner states – the United States, Australia, Japan, New Zealand, and the Republic of Korea – established an annual event called the PSI Asia-Pacific Exercise Rotation. These events bring together PSI-endorsing and non-endorsing countries from North America, Europe, and Asia to practice their ability to engage in WMD interdiction activities and exchange valuable information on related capabilities and practices.

These regimes were formed in order to monitor production and exports of dual-use material, particularly to prohibit export to states that openly do not adhere to international nonproliferation norms. The members of these export control regimes assume –sometimes incorrectly—that fellow member states will adhere to the agreed-upon guidelines. States who decide to trade illegally assume that they will not suffer major consequences for doing so (PSI “Chairman’s Conclusions,” 2003). This leads one to very important question: are these nonproliferation institutions successful in their efforts?

3.2.1.2 Are global nonproliferation institutions successful in Northeast Asia?

The NPT, NSG, MTCR, and PSI are global institutions that were developed to promote cooperative security norms of nuclear nonproliferation in hopes that the norms could become “the defining standard for how a good international citizen should behave” (Muller & Wunderlich, 2013). However, global nonproliferation institutions have faced challenges in promoting these norms in Northeast Asia, and will likely require trust-building efforts on the sociocultural level before they prove successful.

How can a state trust another it diverges with? Global nonproliferation institutions and
MECRs are successful in providing forums for communication, but they cannot by themselves necessarily establish trust where it is lacking among its members. In the book *Trusting Enemies*, Nicholas Wheeler, a scholar known for his work on security dilemmas and international trust, examines how enemies in world politics can overcome mutual suspicion to build trust, a critical component for avoiding conflict and fostering peaceful relations (2018). He argues that trust can play a crucial role in breaking cycles of hostility and enabling cooperation among states, even those with a history of enmity. He discusses the mechanisms through which trust can be built, including signaling intentions, establishing communication channels, and taking risks for peace. He emphasizes the importance of signaling intentions, where states engage in actions that demonstrate their commitment to peaceful relations, often at some risk to their own security. This might involve restraint in military actions or public declarations of peaceful intent. Wheeler argues that when states build trust, they can escape the vicious cycle of mutual suspicion and hostility. Trust can lead to a reinterpretation of motives, where states start to see each other's actions as defensive rather than offensive. This shift in perception is crucial. It allows for de-escalation, disarmament, and cooperative security arrangements. Trust-building, therefore, can transform a relationship from one characterized by competition and threat perception to one of mutual security and partnership.

The MECRs have many member countries that are not formal allies, and many of which have animosity—for example, Russia and the United States. However, though they establish norms and guiderails for accepted behavior they do little to break the cycle of distrust – and at times, work instead to reinforce it. Russia, for example, is a minority in the enforcement regime, as the other major powers included in the decision making—such as the United States, United Kingdom, Germany, France and Canada—tilt the policies towards more Western-oriented values. China had
reservations about signing the NPT due to its perceived discrimination against developing countries, and had repeatedly been denied membership in MECRs thanks to its patterns of proliferation (Medeiros, 2001). Being a major actor and nuclear weapon state in Northeast Asia, in addition to an ally and influencer of the DPRK, adherence to nonproliferation norms by China is explored in this study as potentially pivotal to nonproliferation cooperation and system stability in the region.

3.2.1.3 The Challenge with China

Some states that legally possess peaceful nuclear or dual-use technology are both legally and illegally contributing to the problem of proliferation. This technology is acquired either through transactions between states or internal development. Unfortunately, some nuclear states have been long suspected of selling their knowledge or technology to rogue governments such as North Korea that are trying to develop WMD programs. This poses a significant security risk to proximate states and exacerbating the proliferation problem.

One nuclear state in particular—China—has been accused by states adhering to nonproliferation agreements of selling technology or blueprints to the DPRK. Perhaps spurred on by its distrust of the Western-led regimes, China has garnered allies outside the legitimate system and has been caught transferring WMD resources illegally, aligning with and trading with countries that share its distrust of the West. For example, a number of Chinese firms have been accused of helping North Koreans set up a front to smuggle weapons and missile launch vehicles into their country (Studies, 2012). As recent as March 2019 the U.S. imposed sanctions on two Chinese shipping companies that helped North Korea evade sanctions on its nuclear weapons program (U.S. Department of the Treasury, 21 Mar 2019).
China does have an interest in denuclearizing the Korean peninsula. One of the main reasons it has vested interest in avoiding a DPRK regime collapse is that the DPRK serves as a buffer state between the PRC and U.S. troops in the ROK. Recent meetings between Xi Jinping and Kim Jong Un have included denuclearization as a formal priority, though that does not align with their actual behavior. The hidden intent of China in going against the “global order” to proliferate technology seems to be both political and financial. States such as Iran, Pakistan and North Korea that are being denied by international agreements the resources to build a threatening military arsenal are willing to pay a hefty price to those who are willing to sell the materials and knowledge.

3.3 How Do You Solve a Problem Like North Korea?

North Korea has now been developing nuclear weapons for decades. The country's nuclear program has accelerated in recent years, and it is considered by most governments to be an ever-growing threat to international security and stability. Multiple attempts to curb their nuclear pursuits have failed – seemingly never-ending sanctions, the NPT, Six Party Talks, and even level-1 negotiations between Kim Jong Un and regional leaders have not proven fruitful – often credited to the “unpredictability” of the North Korean leader. But what drives this country’s relentless pursuit of nuclear weapons?

North Korea's pursuit of nuclear technology traces back to the 1950s with initial assistance from the Soviet Union, evolving into active research and development by the 1960s, primarily for peaceful purposes like energy production. However, concerns about North Korea's nuclear ambitions escalated in the late 1980s, despite signing the Nuclear Non-Proliferation Treaty (NPT)
in 1985. It wasn't until 1992 that North Korea allowed inspections by the International Atomic Energy Agency (IAEA) at its Yongbyon nuclear facility. The early 1990s saw tensions rise as North Korea refused IAEA inspections, leading to the signing of the Agreed Framework between North Korea and the United States in 1994. This agreement aimed to freeze North Korea's nuclear weapons program in exchange for aid and light-water reactor construction. However, the Agreed Framework faltered in the late 1990s and early 2000s due to various factors, prompting North Korea to restart its nuclear program, expel IAEA inspectors in 2002, and withdraw from the NPT in 2003. This escalation culminated in North Korea's first nuclear test in 2006, sparking international condemnation and increased sanctions by the United Nations Security Council. Despite diplomatic efforts, including the Six-Party Talks, aimed at denuclearization, progress remained slow, with North Korea conducting additional nuclear tests in 2009. During this period, North Korea's nuclear weapons program evolved from initial research and development to actual testing, triggering significant international concerns and diplomatic endeavors to address the issue.

3.3.1 The Drive for Nuclear Weapons

Bruce Cumings is a renowned historian and his works on Korea, especially North Korea, are considered authoritative in the field. In his 2004 book, *North Korea: Another Country*, Cumings' examination of North Korea's pursuit of nuclear capabilities delves deeply into the nation's entrenched security concerns and historical context. Central to this perspective is the enduring legacy of the Korean War, which has profoundly impacted North Korea's national consciousness. The war, which concluded with an armistice rather than a peace treaty, has left the Korean Peninsula in a perpetual state of tension and war-readiness, particularly from North Korea's viewpoint.
This sense of ongoing threat is further magnified by the continuous presence of U.S. military forces in South Korea and regular joint military exercises between the U.S. and South Korea. Pyongyang perceives these as direct challenges to its sovereignty and security, considering the formidable military and nuclear capabilities of the United States. In this light, Cumings posits that North Korea's leadership regards nuclear weapons as a rational and indispensable tool for deterrence. The regime likely believes that a nuclear arsenal is essential not only for deterring foreign intervention but also for securing a more favorable position in international diplomacy.

Moreover, North Korea's nuclear ambitions are influenced by global events, particularly the fates of regimes in Iraq and Libya, which faced downfall after relinquishing their WMD ambitions. These instances seemingly reinforce Pyongyang's belief in the necessity of nuclear deterrence as a safeguard against similar foreign interventions. Furthermore, Cumings highlights the role of nuclear development in North Korea's domestic narrative. The regime utilizes its nuclear program as a tool for internal propaganda, framing it as a bastion against perceived U.S. imperialism and a symbol of national pride and sovereignty.

In essence, Cumings' analysis reveals that North Korea’s nuclear strategy is not just a matter of international posturing, but is deeply rooted in its historical experiences, security apprehensions, and the regime's need for legitimacy, both domestically and on the world stage. This nuanced understanding is critical for any meaningful diplomatic engagement with North Korea regarding its nuclear program.

Jacques Hymans has also contributed significantly to the study of nuclear proliferation with a focus on the types of leaders who might pursue nuclear weapons. In his 2006 work, *The Psychology of Nuclear Proliferation*, Hymans identifies different leader profiles that affect a country's likelihood to pursue nuclear armament. A key aspect of his analysis revolves around the
concept of national identity conceptions and how these influence leaders' decisions regarding nuclear weapons. Hymans argues that leaders with a certain type of national identity conception, which he terms "oppositional nationalist," are more likely to pursue nuclear weapons. These leaders are characterized by a strong belief in their country's uniqueness and a perception of international isolation or threat. They see nuclear weapons as a means to assert their nation's status and independence on the global stage; characteristics strikingly descriptive of North Korean leadership through the past half century.

On the other hand, leaders who do not adhere to such a nationalist outlook are less likely to see the need for nuclear weapons as a critical component of their national security or prestige. Hymans' work suggests that the personal beliefs and identities of leaders play a crucial role in the decision to pursue nuclear armament, alongside more traditional considerations of security and deterrence. His research provides a nuanced understanding of nuclear proliferation, emphasizing the psychological and identity-related factors of the state leader that influence a country's nuclear ambitions. This perspective adds depth to the analysis of nuclear proliferation, particularly when understanding the personality, actions, and impact of North Korea’s current supreme leader – Kim Jong Un.

Kim Jong Un, who succeeded his father as North Korea's Supreme Leader in 2011, is often perceived as an enigma on the international stage. His decision-making process from the onset seemed to diverge from established patterns, causing many to label him as “unpredictable.” For example, Kim's leadership was punctuated by abrupt purges and, in some extreme instances, executions of high-ranking officials. This included the execution of close family members such as Jang Song Thaek. Kim's regime also saw a marked increase in nuclear and missile tests—as demonstrated in the timeline from the Arms Control Association, summarized a few pages
following), even in the face of mounting international sanctions and condemnation. Yet, in a contrasting move, Kim displayed unexpected diplomatic inclinations when he agreed to a summit with U.S. President Donald Trump in 2018. This was a significant shift from the longstanding North Korean stance, perhaps because of the similarly “unpredictable” nature of the American President. Many hoped this summit would be the long-awaited answer to the North Korea problem.

Throughout Donald Trump's presidency (2017-2021), the dynamic between the U.S. and North Korea was marked by significant ebbs and flows. Initially, tensions escalated sharply in 2017 due to North Korea's aggressive missile testing, including the launch of intercontinental ballistic missiles and its claim of successfully testing a hydrogen bomb. This period witnessed an exchange of heated rhetoric between the leaders, with President Trump famously warning of "fire and fury" and derisively referring to Kim Jong-un as "Little Rocket Man." In contrast, though, 2018 brought about an unexpected shift towards diplomacy. This transformation was symbolized by the inter-Korean dialogue during the Winter Olympics, leading to a groundbreaking summit between Trump and Kim in Singapore in June 2018. This summit was historic as it was the first-ever meeting between sitting leaders of the U.S. and North Korea. While they produced a joint statement focusing on the denuclearization of the Korean Peninsula, tangible progress was elusive. Hopes of a breakthrough were dashed at a second summit in Hanoi, Vietnam, in February 2019, which concluded abruptly without a definitive agreement. Yet, Trump continued to engage with Kim and, in a symbolic gesture, became the first sitting U.S. president to set foot in North Korea during a brief meeting at the Demilitarized Zone (DMZ) in June 2019. Although these summits showcased a shift from hostility to diplomacy, tangible steps toward denuclearization remained out of reach during Trump's tenure. Indeed, just three months following the DMZ meeting, the U.S. Department of the Treasury’s Office of Foreign Assets Control (OFAC) imposed sanctions
on three North Korean state-sponsored cyber groups believed to be behind malicious cyber activities targeting critical infrastructures worldwide.

In contrast, the Biden Administration has taken a calibrated approach in dealing with North Korea (CRS Status Report, 2002). Their strategy aims for eventual complete denuclearization of the Korean Peninsula while maintaining a balance between firmness and diplomacy. Despite offering dialogue without preconditions, North Korea’s response has been limited. The administration has maintained sanctions against North Korea, emphasizing the importance of denuclearization and adherence to international norms. These measures include individual sanctions on entities involved in weapons programs, U.N. sanctions, and party central committee sanctions. While seeking engagement, the administration continues to address North Korea’s missile tests and cyberattacks.

### 3.3.2 A Timeline of Nuclear Activity and Sanctions

Sanctions are the most common “punishment” doled out to violators of global nonproliferation norms. Before the Russia-Ukraine war began, North Korea was the fourth most sanctioned country in the world; Iran was first with 3,616 sanctions placed on them, followed by Russia with 2,754, then Syria with 2,608, and then North Korea with 2,077. Following the Russia-Ukraine War, Russia became by far the most sanctioned country with 5,581 sanctions (Statista, 2022). All of these actors are either nuclear seeking or currently possess chemical weapons as these two types of weapons carry a higher taboo that often warrant sanctions on a global scale.

As a result of the DPRK’s nuclear developments and the failure of multilateral negotiations, North Korea has been sanctioned by a number of entities including: the United Nations, the U.S., South Korea, Japan, Australia, and the EU. The UN sanctions are most
prominent, serving as a backbone for each of the individual actors to add more sanctions if they choose. Since North Korea’s first nuclear test in 2006, the UN has sanctioned North Korea on the trading of arms, military equipment, dual-use technology, vehicles, industrial machinery, metals, luxury goods, and the import or export of a long list of raw materials that included textiles, coal, gas, and oil. In addition, the UN froze the assets of any individual involved in the country’s nuclear program, restricted scientific and technical cooperation with the DPRK, and prohibited UN members from opening back accounts in the country (Duan, 2022).

The UN has a history of sanctioning the DPRK in response to nuclear activities. These are in response to successive antagonistic actions; the first nuclear test in 2006, the second test in 2009, a satellite launch in 2013, the third test in 2013, two sets of sanctions from the fourth test in 2016, two ICBM tests in 2017, and their sixth and largest test later in 2017 (Duan, 2022). Every instance was followed by a UNSC resolution demanding sanctions be imposed on North Korea. Again, though, Chinese and Russian cooperation in the sanctioning process is pivotal to success; in May 2022 both China and Russia vetoed a U.S.-drafted resolution that would impose more sanctions on North Korea, including bans on oil.

The timeline below provides a snapshot of the last two decades of nuclear activity by the rogue state, as well as the international community’s reaction – United Nations-imposed sanctions – following almost immediately, in a very predictable and response-driven pattern. A full, detailed timeline is compiled and maintained by the Arms Control Association, available at: https://www.armscontrol.org/factsheets/dprkchron. The summarized timeline below was sourced from this website.
2006

North Korea conducted its first nuclear test on October 9, confirming its nuclear capabilities.

Less than a week later, the UNSC adopts Resolution 1718, demanding nuclear testing cease, calling on Pyongyang to return to the Six Party Talks, and imposes wider sanctions on commerce. The fifth round of Six Party Talks resume later that year.

2009

Six Party Talks break down and North Korea conducts its second nuclear test and multiple rocket launches.

A month later, the UN Security Council unanimously adopts Resolution 1874, which expanded sanctions against Pyongyang. The North Korean Foreign ministry issued a statement one day later outlining “countermeasures” Pyongyang would take in response to the Resolution.

2011

North Korean leader Kim Jong Il dies after 17 years in power. His son, Kim Jong Un, is declared the new Supreme Leader.

2013

Pyongyang conducts its third nuclear test.

The UNSC passes Resolution 2094, strengthening existing sanctions and expanding the scope of materials sanctioned, including bulk cash transfers and asset freezes.

2015

In 2015, North Korea conducted its fourth nuclear test. The test was a major escalation in the country’s nuclear program, and it drew widespread condemnation from the international community.
The 2015 UN Security Council Resolution 2270, adopted in March 2016, banned the export of coal, iron, and other minerals from the DPRK. The resolution also imposed travel bans and asset freezes on some North Korean individuals and entities. As a sting to the elite perhaps, it also banned the import of luxury goods into the state.

2017

In 2017, North Korea conducted its sixth nuclear test. The test was even more powerful than the previous test, further demonstrating the country’s nuclear capabilities.

The DPRK also conducted a number of missile tests in 2017, including the launch of an intercontinental ballistic missile (ICBM) that could potentially reach the United States. Most markedly perhaps, in September 2017, North Korea claimed to have successfully tested a hydrogen bomb; although experts are divided on whether or not the test was successful.

In August 2017, the United Nations Security Council (UNSC) adopted Resolution 2321. This resolution strengthened the sanctions imposed by Resolution 2270, banning the export of oil to and the import of seafood from North Korea. The resolution also imposed additional travel bans and asset freezes.

Resolution 2375, adopted in September of the same year, banned the export of textiles from North Korea. It also banned the import of industrial machinery and vehicles from North Korea. The resolution also imposed additional travel bans and asset freezes.

2018

In 2018, the DPRK engaged in a series of high-level talks with the United States aimed at denuclearizing the Korean Peninsula. In June 2018, North Korean leader Kim Jong-un met with U.S. President Donald Trump in Singapore. The two leaders signed a joint statement in which they committed to working towards the denuclearization of the Korean Peninsula. However, progress
on denuclearization has stalled since the Singapore summit. The DPRK has continued to develop its nuclear and missile programs since then, and – unsurprisingly – did not take any concrete steps to dismantle its nuclear weapons.

2019

In 2019, the DPRK continued tests of ICBMs that could potentially reach the continental United States. North Korea also conducted a number of cyberattacks in 2019 that targeted banks, cryptocurrency exchanges, and government agencies in the United States and South Korea, representing a foray into a form of criminal activity that would prove lucrative in the future.

In December 2019, the UNSC adopted Resolution 2452, banning the export of petroleum products from North Korea as well as banning the import of agricultural products from North Korea. The resolution also imposed additional travel bans and asset freezes.

2020

In 2020, North Korea continued to develop its nuclear and missile programs and conduct cyberattacks.

Likewise, the UN continued to sanction the country further. In addition to stricter travel bans and asset freezes, Resolution 2501 banned the export of all industrial goods from North Korea and the import of all mineral fuels. This was a desperate attempt by the UN to curb the ever-expanding nuclear program.

2021

In 2021, North Korea launched ballistic missiles into the Sea of Japan and tested its first and second-ever hypersonic missiles.

The UNSC calls a meeting to discuss the tests, resulting in additional sanctions.

2022
Undeterred by all the previous sanctions, in January 2022, North Korea fired a suspected hypersonic missile. The missile traveled at a speed of Mach 5, which is five times the speed of sound. In March of that same year, the DPRK fired two suspected ballistic missiles. The missiles flew about 1,000 kilometers and reached an altitude of about 60 kilometers.

With increasing alarm, in March 2022, the UNSC adopted Resolution 2616, banning the export of all commodities, goods, and technology to North Korea. The resolution also banned the import of all goods from North Korea.

In line with the author’s evaluation of nonproliferation regimes being founded on western norms, there exists a spectrum of stringency outside of UN-imposed sanctions apparent among states that impose their own sanctions on the DPRK. The U.S., Australia, and the EU all have additional sanctions on top of the already expansive sanctions put in place by the UN. They similarly include limits on imports and exports, travel bans, and the denial of seaport usage. In 2022 the U.S. added sanctions surrounding North Korean information technology workers, as they have become a growing area of concern for the U.S. government due to repeated cyber-attacks for monetary gains (U.S. Treasury, 2022). In response to North Korea's recent ballistic missile launches and violations of multiple United Nations Security Council resolutions (UNSCRs), in January 2022 the U.S. Department of the Treasury's Office of Foreign Assets Control (OFAC) imposed sanctions on five entities linked to North Korea's weapons of mass destruction (WMD) and missile programs. These sanctions specifically target a North Korean WMD research and development organization, and four revenue-generating subsidiaries associated with it. These measures are meant to curtail North Korea's access to both financial and material support overseas and to counteract their use of subterfuge tactics like front companies and joint ventures to bypass U.S. sanctions and UNSCRs.
In contrast, Japan and South Korea have tried, with varying levels of success, different approaches to reign in North Korea. These attempts include attempting to ease tension through a more open relationship with the Pyongyang in addition to sanctions. As with the UN, Japan added its first sanctions against the DPRK in 2006 in response to its nuclear test. It then lifted the sanctions in 2014 though, “in return for North Korea’s promise to reinvestigate the fate of Japanese citizens who were abducted by North Korean agents in the 1970s and 1980s” (Japan to lift some sanctions on North Korea, 2014). However, following the testing of more nuclear weapons, Japan imposed more sanctions in 2016 and 2017, and then renewed these sanctions in 2019. These sanctions, “ban bilateral trade with North Korea, restrict the entry of North Korean citizens and ships into Japanese territory, and prohibit remittances worth more than $880” (Duan, 2022).

South Korea has had an even softer—and some experts even say damaging—approach to relations with their northern neighbor. As of 2016, South Korean sanctions limit North Korean vessels from their territorial waters as well as bans on trade. The ROK has made good faith attempts to open relations with the North and alleviate the tension between them. For example, from 1991 to 2015 they provided the DPRK with $7 billion in humanitarian aid in the form of food and medical help. Moreover, as an attempt to negotiate concessions with the DPRK and encourage denuclearization, South Korea sought and received a UN sanctions exemption in 2018 to reconnect a railway to the North that had been severed during the Korean War (Lee, 2018). Despite a more humanitarian-focused effort by South Korea, the DPRK has continued to test increasingly technologically advanced weaponry and accelerated its nuclear program.

The cases above demonstrated that high-level negotiations, humanitarian aid, and both state and international sanctions, have all failed to deter North Korea’s nuclear ambitions. It begs the question: How do we solve a problem like North Korea?
3.3.3 Circumventing Sanctions

At first glance, the sanctions imposed on North Korea over the decades may not seem to have had a visible impact on the country’s nuclear weapons program; but it has definitely had a significant, negative impact on its economy and on the lives of ordinary North Koreans. According to multiple reports provided to the UNSC by the 1718 DPRK Sanctions Committee, the sanctions have led to shortages of food, medicine, and other essential goods. They have also led to a progressive decline in the standard of living in North Korea.\(^{14}\)

These crippling sanctions have made it difficult for North Korea to import the goods and technology it needs to develop its nuclear and missile programs. They have also made it difficult for North Korea to export its goods and earn foreign currency. As the nuclear timeline above alludes to, though, the scrappy country has turned to other dubious means to support its expensive endeavors.

According to sanctions expert Peter Andreas, “the most important criminalizing effect of sanctions is that the targeted regime may go into the business of organized crime to generate revenue, secure supplies, and strengthen its hold on power, fostering an alliance with clandestine transnational economic actors for mutual gain” (2005). Are the sanctions working to deter rogue behavior, or are they making the problem worse?

In 2019, the UNSC estimated that North Korea's economy was worth just $28 billion. This is a very small economy, even by developing country standards. The country's exports are worth only about $3 billion per year, and its tourism industry is very limited. Remittances from North Korean citizens living abroad are also a relatively small source of income. The DPRK, though, has

found a number of criminal ways to circumvent sanctions and generate revenue, and it is believed to have a significant amount of illicit money at its disposal (U.S. CISA, 2020). Below are some of the ways the rogue state is circumventing sanctions and purportedly funding its nuclear program.

**Traditional Sources of Income.** One of the most common ways the DPRK avoids sanctions is through illicit shipments of raw materials like oil and coal. There are numerous accounts, alleged and sanctioned, of ship-to-ship transfers that allow North Korea to exceed the 500,000 barrels of oil that the UN limits them to each year. In a 2019 United Nations Security Council Letter in regards to nefarious shipments supported by North Korea stated, “methods of evasion include physical disguise of tankers of the Democratic People’s Republic of Korea, the use of small, unregistered vessels, illegal name-changing and other forms of identity fraud, night transfers and the use of additional vessels for transshipment” (S/2019/171).

It is not unreasonable to infer that these shipments have been going on for a number of years, causing significant obstacles to the effectiveness of UNSC sanctions. These illicit shipments are one of the major ways that North Korea is able to continue to push its nuclear weapons program despite caps on shipments of oil. Another such instance came in 2020 when the Winson Group was accused of illicit oil shipments to North Korea from China using multiple tankers and deception methods to move through security systems. In 2021, the Cheng Chiun Shippy Agency Co Ltd was accused of moving tens of thousands of gallons of oil to Pyongyang. These resulted in the aforementioned U.S. sanctioning of Chinese firms associated with these acts (U.S. Treasury, 2021). However, these traditional sources of income alone do not prove robust enough to defray the cost of North Korea's nuclear program.

**Drug Smuggling.** North Korea is also believed to be involved in the production and trafficking of methamphetamine (meth), heroin, and other illicit drugs, as well as counterfeit
pharmaceutical products. North Korea's drug smuggling network is purported to have extended its reach all over the world (U.S. Department of State, “International Narcotics Control Strategy Report,” 2008). Historically, North Korea has been linked to the manufacture and distribution of meth as a means of generating revenue, particularly during times when the country faced significant economic sanctions and isolation. Journalist Isaac Stone Fish has been reporting on North Korean meth exports for decades in his Pulitzer Center project, “North Korea’s Addicting Export: Crystal Meth” (2011).

According to Fish, in the 1990s and early 2000s, North Korea was identified as a significant source of methamphetamine in East Asia. The production initially appeared to be state-sponsored, aimed at generating hard currency. North Korean meth was noted for its high purity and potency, making it a sought-after product in international drug markets. The methamphetamine produced in North Korea found its way to countries including China, Japan, and the Philippines, among others.

Over time, reports suggested that the North Korean government might have scaled back or ceased its official involvement in meth production due to international pressure and the desire to engage in diplomatic talks. However, illicit drug production and trafficking within the country have reportedly continued, with activities shifting to more decentralized operations. Defectors and intelligence reports have indicated that meth production and distribution networks within North Korea have become more fragmented, possibly with tacit approval or involvement from various levels of the government and military, who may see it as a source of revenue and a tool for survival.

Methamphetamine trafficking from North Korea poses significant challenges for regional security and law enforcement. The drug trade exacerbates the already complex dynamics of North
Korea's international relations, particularly with China and South Korea, and complicates efforts to address both human rights issues within North Korea and the country's nuclear program.

**Weapons Sales.** The DPRK is suspected of being involved in the sale of weapons, selling to other “rogue states” such as Syria and Iran, as well as Russia, Egypt and Qatar. As recently as 2020, the UNSC reported that North Korea was evading sanctions and continuing to export weapons, using the proceeds from arms sales to fund its nuclear and missile programs (Albright et al, 2020).

### 3.3.4 Crypto-theft to fund proliferation

Illegal ship transfers, weapons sales and drug trafficking together, though, would still not be enough to fund a growing nuclear program amid some of the strictest sanctions imposed over multiple decades. Advancements in cyber technology worldwide have led to advanced cyber-attacks by individuals, organized groups, and states. Over the past two decades North Korea has grown to become a leading state sponsor of cybercrime. The country’s government-backed hackers have been responsible for a number of high-profile cyberattacks, including the theft of millions of dollars from banks and cryptocurrency exchanges worldwide.

The country has been linked to a number of high-profile cyberattacks, including the theft of millions of dollars from banks and cryptocurrency exchanges, and the frequency and amount of cybercrime by the DPRK has been steadily increasing. One famous is the attack on the Bank of Bangladesh. In February 2016, hackers attempted to steal approximately $951 million from the bank's account at the Federal Reserve Bank of New York. According to a 2021 BBC article by Geoff White on the cyber-attack, the hackers successfully transferred $81 million to accounts in the Philippines; the remaining transactions were stopped due to a spelling error in one of the
requests. The heist was notable for its audacity and scale, and investigations pointed to the involvement of North Korean hackers, specifically those linked to a group known as Lazarus. This incident highlighted the vulnerabilities in the global financial system and the sophistication of state-sponsored cybercriminal activities.

The UNSC estimated that North Korea has earned up to $300 million from cybercrime in 2021. In 2022 the FBI released a statement claiming that the Lazarus Group conducted the largest cryptocurrency hack on record, stealing $650 million. Most recently, in June 2023, North Korea illicitly earned about $100 million in cryptocurrency from users of an online wallet. All of these were reported in the August 2023 issue of the TRM group’s “Insights” (18 Aug 2023). The following section dives into the DPRK’s cyber activities in an effort to shed light on the newest form of sanctions evasion, which has become the main source of funding for North Korea’s nuclear program.

The DPRK has exploited state-funded cryptocurrency attacks as a way to circumvent sanctions. According to a 2022 Belfer Center analysis, “The 2021 UN Security Council report suggests that North Korea accumulated $316.4 million dollars in virtual currency between January 2019 and November 2020 alone” (Kim et all, 2022). In addition, an FBI statement on 21 April 2022 reported that, “Through our investigation we were able to confirm Lazarus Group and APT38, cyber actors associated with the DPRK, are responsible for the theft of $620 million in Ethereum reported on March 29” (CNN, “FBI says North Korean hackers stole more than $600 million in cryptocurrency in single hack,” 14 Apr 2022).

The DPRK’s cybercrime program is highly sophisticated, dating back to the early 2000’s. The country employs a large number of skilled hackers, which allows it to be able to select targets
ranging from educational, corporate, financial and government entities. The rogue state has also been accused of developing malware that can steal cryptocurrency from these victims.

In 2009, North Korea was accused of being behind the cyberattack on Sony Pictures Entertainment. The attack was in retaliation for the release of the film *The Interview*, which depicted the assassination of North Korean leader Kim Jong-un. In 2014, North Korea was accused of originating the WannaCry ransomware attack, which infected over 200,000 computers in 150 countries, causing an estimated $4 billion in damage. In 2017, the DPRK was then alleged to have propagated the WannaCry 2.0 ransomware attack. This attack was more sophisticated than the original WannaCry attack, and it infected over 300,000 computers in 150 countries (CFR Cyber Operations Tracker). The DPRK more than likely realizes that it cannot win a conventional military battle with its adversaries. Perhaps it sees computer cyberattacks not only as a leveling the playing field, but also an area in which it can excel while enriching its funding for its nuclear program.

How is an isolated rogue state like North Korea conducting such effective cyber-attacks? In order to launch effective attacks, a state would require a team of educated computer scientists. North Korea is utilizing their universities to develop cryptojacking (cryptocurrency highjacking) software that allows students to become trained hacking experts. In addition, there have been reports of North Korean state hackers that show promise being given higher level training at the elite technical universities within the country (Kim et al, 2022). Moreover, the government will send students abroad to China where they learn more advanced techniques, demonstrating another way China is indirectly supporting North Korean nuclear proliferation. These tactics include:
• **Spear phishing:** This involves sending emails that are specifically targeted to a particular individual or organization. The emails often contain malicious attachments or links that, when opened, can self-install malware on the victim's computer.

• **Malware:** The DPRK has developed a number of sophisticated malware programs that can steal data from victims' computers. These malware programs can also be used to take control of victims' computers and launch other attacks.

• **Ransomware:** This involves encrypting a victim's computer files which may contain sensitive personal, financial or governmental information, and demanding a ransom payment in order to decrypt or unlock them.

• **Blockchain theft:** North Korea has been accused of stealing cryptocurrency from victims by hacking into cryptocurrency exchanges/banks and wallets (more personal financial storage).

The revenue from North Korea's cybercrime program has been used and will continue to be used to fund the country's nuclear and missile programs. In a June 2023 interview with North Korean experts, TRM Labs also reported that “In recent years, there has been a marked rise in the size and scale of cyber-attacks against cryptocurrency-related businesses by North Korea. This has coincided with an apparent acceleration in the country’s nuclear and ballistic missile programs” (TRM, 21 June 2023). The country is believed to be spending billions of dollars each year on these cyber weapons programs; however, that number is still small when compared to its rivals. Would the rogue state spend more if not sanctioned?

For comparison purposes, the U.S. military budget that is set aside for modernizing its nuclear arsenal was $44.2 billion in the fiscal year of 2021 alone, with a plan to spend $44 billion in 2022
– 5.68% of the $777.7 billion military budget. This nuclear spending is the most of any of the nine nuclear-armed states, with China in a distant second at $11.7 billion. According to the 2021 U.S. “World Military Expenditures and Arms Transfers” report, North Korea is believed to have spent around $4 billion on defense in 2019, which would have amounted to 26% of its estimated gross domestic product, the highest proportion among 170 countries it reviewed. The range of nuclear budgets paired with the fact that countries continue to spend more on these weapons indicate that if these sanctions on the DPRK did not exist, North Korea would gladly spend billions of dollars on its own nuclear arsenal. Moreover, the money spent on nuclear weapons is suspiciously close to the $620 million the FBI identified as stolen by the Lazarus Group and APT38 cyber actors. In other words, North Korea seems to be spending as much money as it can on nuclear weapons, which could signal to experts that its intentions are not benign and it has set one goal as the focal point of its military policy objective: expand the nuclear arsenal.

It may seem impossible that a country can continue to commit crimes like these despite severe sanctions and travel bans, and still not have their criminals apprehended. However, the DPRK does not extradite its citizens given an indictment by the U.S. government. This has allowed for global awareness of North Korean state-funded actors to be named, but not apprehended. The world recognizes the DPRK as a source of crypto theft but is left with no cooperative legal action to punish them. Essentially, actors around the globe decide at the state-level to either cut ties with North Korea or let them know they are open for illicit business. Sanctions do not appear to be working in a truly effective manner if their purpose is to stop North Korean nuclear proliferation.
3.4 Is Nonproliferation Cooperation Possible in Northeast Asia? What the Experts Say

Experts are divided on what they expect the future of North Korea’s nuclear program to be, and to what extent its regional neighbors and the U.S. will attempt to cooperate. Many experts believe that North Korea will continue to develop its nuclear weapons program, even if it means further isolation from the international community. They argue that North Korea’s leaders see nuclear weapons as a way to deter foreign intervention and to achieve their goal of becoming a “strong and prosperous nation.” These experts point to the fact that North Korea has continued to develop its nuclear and missile programs in recent years, even in the face of international sanctions. They argue that North Korea is determined to become a nuclear-armed power, and that it will not give up its nuclear weapons program without a significant change in its leadership or its strategic goals.

Alternatively, some experts believe that North Korea will eventually give up its nuclear weapons program in exchange for economic assistance and security guarantees from the international community. They argue that North Korea’s nuclear weapons program is a costly burden on the country’s economy, and that North Korea’s leaders will eventually realize that they cannot achieve their goals without the help of the international community – which would require multilateral cooperation in a region historically in strife. These experts point to the fact that North Korea has engaged in a number of high-level talks with the United States and South Korea in recent years. They argue that these talks show that North Korea is willing to negotiate on its nuclear program.

As detailed in section 1.1.1, bilateral security cooperation exists in Northeast Asia but the region has yet to achieve any multilateral cooperative security effort since the Six Party Talks officially ended in 2009. As a result of the distrust between major nuclear nonproliferation actors
in Northeast Asia and DPRK’s reliance on nuclear weapons for security and national identity, intuition follows that it is unlikely to see multilateral nonproliferation security cooperation towards resolving this issue possible by 2040. The promotion of nonproliferation norms via established institutions has not succeeded yet in the region due to states’ tendencies towards promotion of self-interest and the inherent bilateral distrust among Northeast Asian actors. The primary findings of the NSI Team’s *ViTTa Korea Strategic Outcomes Report* support this conclusion, as summarized below (*Part 1: Key Findings*, November 2018):

1. Although it is seen as a major security concern by the U.S., the interests driving regional states’ views towards North Korean nonproliferation involve their abilities to gain regional influence, either at the expense of the U.S. specifically (put forth by China, Russia) or to establish regional norms of multilateral, peaceful conflict resolution (espoused by South Korea, Japan);

2. Both China’s and North Korea’s interests are better served by moderate regional tension (as in the pre-summit status quo) than by a denuclearization plan, and;

3. The main actors in Northeast Asia cannot provide incentives nor threats (economic, security, or otherwise) sufficient to raise the value of denuclearization to North Korea.

It seems from this study that Northeast Asian multilateral cooperation on nuclear nonproliferation by 2040 will be impeded by national self-interest and distrust; security cooperation will remain a strictly bilateral effort. But will these and other *ViTTa Korea Strategic Outcomes Report* findings hold true when more rigorous judgmental forecasting methods are applied?
4.0 Research Design and Methodology

This research design used a three-round modified Delphi technique to collect and analyze expert judgments from five countries and four sectors of employment on the prospects over the next decade for Northeast Asian security cooperation on the North Korea proliferation problem. Conditional statements solicited from the first and second rounds of the Delphi questionnaire were then used to create a Q-sort asking the same SME Delphi participants to rank from “extremely positive effect” to “extremely negative effect” the impact of the conditional statements on the ultimate goal of verifiable denuclearization of North Korea.

4.1 Delphi Technique

Olaf Helmer of the RAND Corporation developed the Delphi technique in 1967. As described earlier, the Delphi is unique in that it is a “systematic approach to the utilization of expert opinions” (p. 3), with Helmer realizing that, “projections into the future, on which public policy decisions must rely, are largely based on the personal expectations of individuals rather than on predictions derived from well-established theory” (p. 4). The literature review on expert forecasting demonstrated that even with the development of additional SME forecasting methods (including the advances in quantitative modeling computer simulation technology and formal models), modifications of the Delphi are still the most tried and true methods of using SME judgments in plausible scenario forecasting.
A Delphi study is a forecasting method that relies on the judgment of a panel of experts to reach a consensus on a particular issue. The Delphi method is often used to forecast future events or trends, but it can also be used to make decisions about current problems. Over the last fifty years the Delphi method has solidified its place as a key tool for extracting collective insights from subject matter experts.

This technique is distinguished by its iterative and structured approach. The journey begins with the careful selection of a panel of experts, whose inclusion is predicated upon their depth of knowledge and expertise in the subject under examination. Anonymity forms the cornerstone of this method, ensuring participants can freely express their perspectives on the primary issue without external pressures.

Once initial insights are shared, the study’s facilitator compiles these views and funnels them back to the experts. Equipped with this consolidated perspective, the experts are then prompted to revisit and possibly amend their original positions. This cycle of feedback and refinement often unfolds over three rounds. The number of cycles of feedback may vary, especially if the topic is particularly intricate or the initial opinions are vastly divergent.

The merits of the Delphi method are manifold. At its core, it creates a confidential space, empowering participants to voice their understanding without the weight of potential biases or groupthink. The cyclical nature of the method ensures continuous honing of opinions, leading to a more refined and informed consensus. This not only makes it adept at addressing present challenges but also equips it to anticipate future developments. This makes it an invaluable method for both immediate problem-solving and long-term forecasting.

While the Delphi method has proven its efficacy in various contexts, relying on it exclusively to inform policymaking harbors inherent limitations. Central to the Delphi method’s
challenge is its dependence on the expertise and judgment of selected specialists. This invariably introduces the specter of bias emanating from personal convictions, professional affiliations, or entrenched political stances.

Furthermore, the operational aspects of the Delphi method occasionally exhibit deficiencies. For instance, procuring a representative sample becomes a challenge when faced with a notably low response rate. Such a scenario can inadvertently lend disproportionate weight to the opinions of the more vocal or responsive participants. Additionally, the methodology’s iterative nature makes it both time-intensive and financially demanding, potentially limiting its utility for urgent forecasting or constrained budgetary scenarios.

This study demonstrates that the Delphi method should not be perceived as a reliable alternative to traditional research modalities, be they surveys, interviews, or experimental setups. Rather, its strength lies in augmenting these methods, in the form of adding layers of depth and nuance. To address these inherent issues, the author suggests a modified Delphi technique—a structured two-round survey culminating in a third-round Q-sort. This modification not only aims to counteract the pitfalls of a conventional Delphi but also strives to render the gleaned insights more digestible and actionable for policymakers.

The modified Delphi in this study was modeled largely after two studies: the 1972 Michigan Sea Grant Delphi inquiry assessed by John Ludlow, and A Delphi Analysis of Agreement Between Organizations by Chester G. Jones, in Linstone and Turoff’s edited online reference (2002). The editors note in their introduction that Delphi technique has had its greatest application and acceptance as a means of compiling a list of future technical events or developments and collecting subjective judgments regarding them; Ludlow’s Delphi, though, also solicited judgments on social, economic, and political developments, so that panelists would be
encouraged to consider all environments in making their forecasts (Ludlow, 2002). The Michigan Sea Grant Delphi was comprised of three panels whose participants had varied backgrounds: technical panelists, behaviorists, and decisionmakers. Like the one conducted for this dissertation, both studies were carried out over three rounds and were interested in uncovering variations of judgment patterns across panels. A modification of Ludlow’s method for the author’s Delphi based on Ludlow’s assessment was to include informed citizens in addition to experts to solicit “informed judgment” in contrast to “expert opinion.” The inclusion of “informed citizens” is to serve as a control group for the SMEs in accordance to Tetlock’s findings summarized in the literature review.

The following sections provide a brief overview of the Delphi panels, a description of the three-round process conducted, and the questionnaire fielded to participants.

4.1.1 Organization and Composition of Panels

Delphi panels were organized by each state that is a major actor in nonproliferation in the Northeast Asian region—identified as the actors in the Six Party Talks—with the exception of the DPRK. The study’s original goal was to identify three participants per state, each from a total of five different sectors, for a total of 75 participants. Due to governmental limitations in Russia and China, no military participants could be secured from either state. No Chinese policymakers responded to requests and no Russian public could be reached, despite snowball sampling and cold-calls. In the end, participation agreement was secured from 62 panelists (see Appendix A). The author’s basis for organizing panels by state rather than sector was that policy decisions—though influenced and sometimes even proposed by individuals acting on behalf of a sector—are signed and implemented at the state level. In addition to being the first study to combine Delphi
and Q-methodology, this study constitutes the first known cross-culture and cross-sector Delphi analysis.

4.1.1.1 Panels and sectors were chosen and defined as follows:

Panels: Panels for the Delphi were organized by states chosen based on their historical role as an actor in nonproliferation security cooperation in Northeast Asia. States were selected based on their participation in the Six Party Talks, which was the exemplary effort of post-Cold War multilateral security cooperation in the region. The Six Party Talks were started in 2003 as an effort to discourage North Korea from further nuclear proliferation efforts.

The participants in the Six party Talks, excluding North Korea—and hence the five state panels for this Delphi—are (alphabetically): Japan, People’s Republic of China (PRC/China), Republic of Korea (ROK/South Korea), Russian Federation (Russia), and United States of America (U.S./United States). Note that North Korea was excluded from this study as it would have been understandably difficult to locate, contact, and obtain responses from citizens of North Korea, no matter their sector of employment.

Even though the Six Party Talks officially ended when North Korea pulled out of them in 2009, those six states are still the main regional actors whenever an issue or concern of nuclear proliferation arises in Northeast Asia. SMEs were assigned to a state based on their country of citizenship. When an expert held dual citizenship, the country of citizenship in which they currently (or most frequently) resided was used. Anonymity was guaranteed to all participants.

Sector: As has been demonstrated in the author’s previous research, the opinion or forecast of an expert can vary widely by sector, especially around the topic of nuclear weapons (Voss née Wadsworth, 2019). In this case study exploring the option for Japan to pursue offensive military capabilities and the option of nuclear weapons, the author interviewed members of U.S., Japanese
and South Korean academia, military, policy-makers, and think tank researchers. Findings revealed substantial differences in opinion based not on country, but rather on sector of employment, with military taking the most conservative stance and the policy-making officials being most hawkish. This current study expands on that qualitative finding to widen the net cast to more countries and sectors of employment that are typically called on to advise policymaking decisions.

Sectors from which panelists for this study were fielded were: Academic, Government, and Think Tank. These sectors are the most frequently consulted about and/or involved in international security cooperation policy or cooperative action. “Government” is divided into military officials and policymakers. Even though military officials by design do not make policy decisions, as enactors of policy their leaders are considered to have expert insights into potential outcomes of policy decisions. In the case that a panelist crossed multiple sectors, panelists were asked to self-select into one sector (e.g., one of the panelists was key negotiator for the U.S. in the Six Party Talks but then transferred to academia; they self-selected as a policymaker.). The public sector has been included as a “control” for experts, as some studies have noted public forecasts can be as accurate or even more accurate than experts (Tetlock & Gardner, 2015). Public sector participants were selected by the author’s network, cold-call requests and snowball sampling as well, with qualifications that they had at least a college degree and considered themselves “politically informed” (Fischhoff, Slovic, Lichtenstein, Read, & Combs, 1978). All panelists were also asked to self-rank their “expertise” on a Likert scale, as self-ranking has been found to be an accurate measure of expertise (Helmer, 1967).
4.1.2 “Three-Round” Delphi

The original intent of the author was to conduct a traditional three-round Delphi; consisting of only three rounds due to the large sample size and to limit attrition. In the first round, disseminated panel participants were asked open-ended questions regarding the plausibility of the three following plausible scenarios:

**SCENARIO A:** Complete, Verifiable Denuclearization (CVD) *WITHOUT MILITARIZED CONFLICT*

**SCENARIO B:** CVD *AS A RESULT OF MILITARIZED CONFLICT*

**SCENARIO C:** NORTH KOREA IS ALLOWED TO MAINTAIN A LIMITED NUCLEAR ARSENAL

These scenarios were selected by the author based on her extensive knowledge of the situation presented and plausible futures of the problem. Participants were also asked to provide their reasoning, were given the option to add their own plausible futures, and self-rank their own level of expertise by Likert scaling. The public was only surveyed in the first round, as the following rounds aim to move towards expert consensus, against which the control group would be measured. The first-round survey was sent using Qualtrics, a commonly used survey platform; questions can be found in Appendix A.1.

In the second round, as with traditional Delphi studies, panelists were provided anonymous aggregated answers from the first round (minus self-ranking). As the second round took place after the onset of Covid-19 and the subsequent global shutdown in March 2020, an additional question was posted asking respondents if they would modify their answers in light of the pandemic. They were also given the opportunity to change their Round 1 answers.
The author was initially going to ask participants to rank the importance of each construct identified in the previous round by Guttman scaling, but this was foregone due to the decision to transition Round 3 into a Q-sort. This method provided even richer data regarding participants’ judgments about the relative importance of each construct in nonproliferation cooperation in the Northeast Asian region. Panel participants were also asked to provide a probability estimate on the occurrence of the plausible cooperation futures (Scenarios D, E1, E2, and F), that were submitted by panelists in Round 1. They were asked to provide qualitative reasons for remaining at the extremes of the distribution curve, if deemed relevant. The second-round survey was e-mailed to participants individually as a Word document tailored to their responses. The template used for the second survey can be found in Appendix A.2.

The third and final round of the Delphi was intended to be similar to Round 2. However, at the suggestion of a faculty committee member, the author elected instead to conduct a Q-sort. The Q-sort was disseminated using QSortWare.net More on that will follow in the next section.

4.1.3 Questionnaire Constructs

*Main construct:* The prospect of multilateral security cooperation around the North Korean nuclear/missile proliferation situation between key state actors in the Northeast Asian region by 2040

According to Linstone & Turnoff, one of the most common failures of a Delphi is when the problem is over-specified by the monitor, thus imposing their biases and preconceptions (2002). To avoid this bias, and to maintain consistency in final comparison of expert forecasts across methods, the constructs in first-round questionnaires fielded to the participants mirrored as closely as possible the open-ended questions posed to SMEs in the NSI Team Korea Strategic
Outcomes ViTTa report. However, as this study is designed to go more in-depth than the ViTTa, questionnaires differed from the original ViTTa questionnaire (see Appendix C) in the following ways:

- It will be limited to the Northeast Asian region (i.e., not including Australia, Philippines or Malaysia);
- It poses a time constraint (i.e., “by 2040”), and;
- It maintains focus on nonproliferation security (i.e., excluding economics).

4.2 Q-Methodology

Q-methodology is quite different from any other method typically employed in forecasting research. When Q-methodology is combined with Delphi, it can produce some very useful information when decision-makers are trying to discern what effect certain conditions may have on a policy goal.

Q-methodology is a research method that uses a unique data collection and analysis process to study the subjective experiences and meaning-making of individuals or groups. It was developed by psychologist William Stephenson in the 1930s. It was seen as to overcome the limitations of traditional quantitative research methods, which Stephenson argued were unable to capture the complexity of human thought and behavior.

Stephenson's first book on Q-methodology, *The Study of Behavior: Q Technique and Its Methodology*, was published in 1953. In this book, he laid out the basic principles of the method and described its use in a variety of research applications. Stephenson argued that Q-methodology was a more powerful and flexible research method than traditional quantitative methods because
it allowed researchers to study the *subjective experiences* of individuals and groups *in their own words*.

Q-methodology gained popularity in the 1960s and 1970s, and was used in a variety of research areas, including psychology, sociology, political science, and education. However, it remained a relatively obscure research method until the 1980s, when a number of books and articles were published that helped to make it more widely known.

The “Q method” is now a well-established research method with a growing community of practitioners. Unlike traditional surveys that aim for generalizable results across a population, Q-methodology seeks to uncover the range of subjective viewpoints on a topic. It's particularly useful in exploring complex and multifaceted issues where diverse opinions are present and is used in a variety of research areas. These include psychology, sociology, political science, education, marketing, and management.

For example, a 2009 study by Frantzi, Carter and Lovett used the Q method to explore the effectiveness of international environmental agreements, specifically focusing on the Mediterranean Action Plan (MAP) and the Barcelona Convention, established under the United Nations Environment Programme (UNEP) in 1975. Recognizing that measuring the effectiveness of such agreements is challenging due to the diverse criteria used by different stakeholders, the research employs Q-methodology to uncover various discourses on this topic. Through extensive literature review, stakeholder identification, and 25 in-depth interviews with individuals from the Convention's Secretariat, academia, NGOs, and knowledgeable professionals, the study extracted 294 statements. From these, 44 were selected for a Q method study, where interviewees were asked to sort these statements. The findings reveal four distinct viewpoints on the effectiveness of
international environmental regimes, concluding that effectiveness cannot be universally defined and that any assessment can only partially evaluate a regime's overall effectiveness.

A more recent study used Q-methodology to examine Greek viewpoints on security issues in the Agean Sea (Karakasis, 2019). The study looks at how the Greek diplomats, military officers and political analysts interpreted Turkey’s behavior during the 2017 incidents and employed Q-methodology to uncover socially shared perspectives on that topic.

4.3 Delphi + Q Method

In a typical Delphi research study, one would start with a matrix with participants in the far-left column and variables or items from a questionnaire across the top. Instead, incorporating Q-methodology characterizes a set of philosophical, psychological, statistical, and psychometric ideas oriented to research on the individual, rather than the variables in the questionnaire. First one transposes the matrix so that the columns represent the experts and rows represent the items; then the research is no longer looking at the relationships among the items (e.g., correlation matrix), or the conventional “r analysis” done in the first round of the Delphi, with means, variance, standard deviation, sums, range, and so on. What this research is doing is actually looking at the differences between respondents instead. Q method analysis provides the ability to provide a deeper level of richness to the Delphi, which groups experts not by their formal designation/characteristics, but an empirical representation of the group structure based on values assessed in their responses to the Q-Sort exercise.

All participants who responded to the Round 1 Delphi were invited to participate in the Q-sort exercise, where they were prompted to “sort” the statements presented on a 9-point scale
described below. Respondents to the Round 3 Q-sort were sent a link to the exercise conducted in QSortWare online freeware. On the first screen participants were met with the set of 43 unique conditions placed in draggable “cards”. They were then asked to sort the statements into three categories via the following instructions (bold/italics in original text):

Below is a set of 43 conditions that have been identified by experts as having an influence on the denuclearization of North Korea. Please place each of the statements in a category you feel best indicates whether that condition would have a positive, neutral or negative effect on the denuclearization of North Korea. In the next (and final) step you will be asked to further refine your choices. (Note that method of denuclearization, e.g. via militarized or non-militarized means, does not matter in this survey: Only the ultimate goal of "denuclearization" should be considered). Some statements have only one-word differences so please read carefully. The rank-order of statements within each category does not matter.

The purpose of the initial card sort was for participants to gain familiarity with the conditional statements, the exercise format, and to make it easier to differentiate on a more minute level when they entered the next stage of the exercise. When the first round was completed, respondents were led to the next stage. Here they were asked to further parse out the values (positivity and negativity) of the 43 conditions’ influence on the said goal of denuclearization:

This part of the questionnaire asks you to further refine your initial sorting of statements. This time, we have 9 categories rather than 3. Accordingly, please place a specified number of statements in each of the 9 categories. The specified
number of statements that should be placed in each category is indicated in the instruction at the bottom of each category. For example, the instruction at the bottom of the first category (Extremely Positive Effect) states that you are to place exactly 3 statements in the category. The second category (Very Positive Effect) requires 4 statements; the third category (Positive Effect) requires 5 statements, and so on. When you have placed the required number of statements in each category you will see an “OK” preceded by a green check mark. By dragging each statement into one of the 9 positive or negative categories you will be indicating the degree and direction of the stated effect on the denuclearization of North Korea. Note that some statements have only one-word differences so, please read carefully. The rank-order of statements within each category does not matter.

On the administrative end, respondents were limited in the number of cards they could sort into each of the columned value statements. From there each statement was given a value and a score from 4 to -4 as indicated in Figure 4.1 below:

<table>
<thead>
<tr>
<th>Value Column</th>
<th>Number of Cards Allowed</th>
<th>Value Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely Positive Effect</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Very Positive Effect</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Positive Effect</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Somewhat Positive Effect</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Neutral or No Effect</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Somewhat Negative Effect</td>
<td>6</td>
<td>-1</td>
</tr>
<tr>
<td>Negative Effect</td>
<td>5</td>
<td>-2</td>
</tr>
<tr>
<td>Very Negative Effect</td>
<td>4</td>
<td>-3</td>
</tr>
<tr>
<td>Extremely Negative Effect</td>
<td>3</td>
<td>-4</td>
</tr>
</tbody>
</table>
Following Brown’s methodological reasoning, limiting the number of cards allowed in each value column forces respondents to make distinct decisions on the relation of each conditional statements to the other. For example, they were only allowed to place three cards in “Extremely Positive Effect”. This meant they had to decide which of the three cards they initially placed in the “Positive Effect” bin in the first stage of the exercise would have the most positive effect on the denuclearization of North Korea. An example of what a finished card sort looks like is found in section 5.1.4, Q-Sort Data.

4.4 Variable Definitions

Questions posed to SMEs included scenarios addressing the following dependent variables: stability, nonproliferation and multilateral security cooperation. Major theoretical concepts for these variable definitions were drawn from neorealism, liberalism, and constructivism, and include stability, norm dynamics, the security dilemma, and regime theory. Because this study also analyzes the experts themselves as a variable, the definition that qualified a person as a subject matter expert for this study is also provided.

4.4.1 Stability & Norms

4.4.1.1 System Stability

The concept of "system stability," as postulated by academic Ian Clark in his book *Legitimacy in International Society*, delves into the intricate nexus between legitimacy and the broader environment in which states operate. Clark challenges conventional thought by asserting
that legitimacy should not be seen merely as a catalyst for stability; instead, it should be recognized as a structural component of a stable system (2005). At its core, legitimacy encompasses the principles that delineate rightful state membership and dictate appropriate state conduct.

The dual nature of legitimacy—its capacity to simultaneously constrain and enable—shapes the contours of permissible actions and behaviors for states. This dynamic framework bestows certain liberties while simultaneously imposing restrictions. As such, the guiding philosophies and ideologies that mold state actions are intricately intertwined with the prevailing principles of legitimacy. Evaluating system stability, therefore, extends beyond a mere assessment of outcomes or the realization of a "legitimate order."

A more nuanced understanding of system stability emerges when one examines state behavior through the lens of their adherence to principles of legitimacy. The true measure of system stability lies not necessarily in the attainment of a "legitimate order" but rather in the concerted efforts of states to align their actions with recognized principles of legitimacy. In essence, the sincere attempts of states to act based on these principles underscore the vitality and resilience of the system's stability. Thus, the very essence of system stability is captured more in the journey—states' endeavors to embody legitimacy—than in the destination.

With this definition in mind, the system surrounding North Korean nuclear endeavors continues to produce instability as the rogue state deliberately goes against what its neighbors consider “appropriate state conduct” by disobeying international arms control efforts. However, the states actively diverging on other issues of international security – China, the U.S., Russia, South Korea, and Japan -- can be considered on a “journey” towards system stability in their cohesive effort to denuclearize the DPRK, as multilateral cooperation around arms control efforts in and of themselves are considered contributors to a stable system.
4.4.1.2 Arms Control and Stability

Authors Ken Booth and Nicholas Wheeler's exploration into the intricacies of the security dilemma underscores a persistent element of insecurity inherent within the international system. Their insights shed light on the perpetual nature of international insecurity, yet they posit a more hopeful outlook: that institutions and norms can act as mitigating forces against such pervasive unease (Booth & Wheeler, 2008). In fact, these scholars both argue that by adopting collective standards and leveraging global institutions, states can alleviate the pressing concerns that often precipitate spiraling security dilemmas.

Aiming to create a system governed by shared principles and mutual trust, various endeavors, including arms control, disarmament, and nonproliferation, emerge as pivotal. Such efforts, as highlighted by scholars Muller and Wunderlich (2013), are not merely reactive strategies but are crucial steps towards crafting consensual, norm-governed frameworks. These scholars further elucidate the nuances of these endeavors, categorizing stability in relation to arms control into three distinct models:

1. Arms control, which represents a holistic stability approach encapsulating all three models,
2. Disarmament, focused on the outright elimination of particular weapon categories, and
3. Nonproliferation, primarily concerned with curbing the diffusion of arms.

The intricacies of norm dynamics are not stagnant but evolve through various phases, as identified by Finnemore & Sikkink (1998). These phases—beginning with norm establishment, transitioning through further development post-recognition, and culminating in the eventual degeneration and decay of norms—map out the life cycle of these governing principles. Drawing
upon Clark's musings on legitimacy's integral role in system stability, one can extrapolate a potent insight: once cooperative security norms gain traction and are firmly established, they metamorphose into benchmarks of legitimacy. In such a scenario, adherence to these norms not only becomes a testament to a state's commitment to stability but will also serve as an indicator of its stature as a responsible (or irresponsible, as in the case of DPRK), international actor.

4.4.2 Multilateral Security Cooperation

One thing most experts agree on is that if the DPRK is going to ever denuclearize, multilateral cooperation will be the key piece to that puzzle. But which countries’ cooperation would have the most probability of successfully achieving CVD of North Korea? Some countries may be perceived by experts to have greater impact on or investment in this problem than others, based on a state’s self-interest, leadership in the region, pre-established norms, and capabilities.

Cooperation is a representation of a desire to participate in the international system, and will take on four distinct phases: Proposal making, establishment, enlargement, and implementation (S. A. Jones, 2016). In nonproliferation, formal and informal cooperative efforts have helped raise awareness and promote norms. Various high-level meetings and outreach and assistance efforts have created greater awareness of the dangers associated with WMD proliferation. These include poorly secured materials, illicit trafficking networks, and transnational terrorist organizations (Knopf, 2016). Cooperation around these norms follows Finnemore & Sikkink’s common pattern of norm dynamics: The new effort initially met with criticism or resistance but later became more widely accepted.
Nonproliferation institutions or other multilateral security efforts create an environment for conversation. This allows for the give-and-take quest for justice and reciprocity in support of mutually agreed-upon actions representing values.

Figure 4.2 Key Constructs Leading to Multilateral Cooperation on WMD Proliferation

Wadsworth’s factors, the finalized constructs leading to multilateral security cooperation as visualized above, were estimated by this author (née Wadsworth at the time) to be derived from first-round results. This list was derived from modifying Knopf’s findings of most important factors in cooperation around WMD proliferation (2016). Knopf, in his original factor identification, combined “norms” and “identity” into a single construct (in his conclusion, he only referred to “norms” and excluded “identity” entirely). This study instead includes “identity” as a sub-construct of “self-interest,” based on observations by Muller et. al that perceived identity
injustices based on self-interest fuel conflicts (Muller & Wunderlich, 2013). “Outside inducements or persuasion” is also grouped under “self-interest,” as such coercion is calculated based on states’ self-interest (Schelling, 1966). Other types of cross-state ties (such as trade and energy, identified in the literature review) are also included under “Self-interest,” as Jones identifies economic gains as intrinsically tied to self-interest in promoting or bypassing proliferation norms (S. A. Jones, 2016). “Ideas and learning” are sub-categorized under “Norms,” based on the author’s prior knowledge and findings from Jones’s case study on successful cooperation in multilateral export control regimes (2016). “Transnational networks,” “Regime design” and “interactions of non-state actors” are not separately listed constructs but taken into account as supporting constructs under “norms,” as these are ways in which norms are often spread, learned, and internalized (Finnemore & Sikkink, 1998). “Geopolitics” is grouped under “Regional leadership,” as is “U.S. Leadership,” which, as explained in the literature review, though an original pre-identified factor, is really a sub-factor when considering cooperation from the regional perspective. “Capabilities” remains unchanged.

These four final constructs—Self-interest, Regional Leadership, Norms, and Capabilities—are cross-checked by this author with knowledge based on her own expertise and prior conclusions from Muller et. al (2013). Construct definitions and what security cooperation might look like under each construct are detailed below.

1. Self-interest

In the realm of realism, self-interest forms the foundational principle guiding state behavior, particularly evident in the context of North Korea's perceived threat. Each country assesses this threat based on its unique perspective, weighing the likelihood of North Korea posing
a direct challenge, whether through nuclear, conventional military means, or acts like kidnapping. The ability to mitigate these perceived threats varies, with nations considering both individual and cooperative strategies. The possibility of a North Korean collapse is also a factor in this calculus. Moreover, the perception of interdependence among neighboring countries – encompassing economic, security, academic, and cultural dimensions – influences the perceived necessity of collaboration.

Self-interest driven security cooperation in response to North Korea's actions could manifest in various forms. It might involve agreements for collective responses to attacks on any neighboring nation, fostering multilateral intelligence sharing, conducting joint military exercises, and coordinating on sanctions. These cooperative measures reflect a pragmatic understanding of shared security concerns, acknowledging that a unified approach might effectively counterbalance North Korean threats while serving each nation's individual interests.

**Identity & Domestic Politics**

In East Asian geopolitics, the interplay of regional identity and domestic politics significantly shapes perceptions of threats and opportunities among neighboring countries. These perceptions often arise from a complex mix of economic competition, territorial disputes, and historical grievances. Particularly salient is the likelihood of escalating 'grey zone' crises, such as territorial disputes around oceanic boundaries in the region, which have the potential to intensify diplomatic tensions. The way governments respond to and perceive public attitudes towards their neighbors – be it at the governmental level or among the populace – also plays a crucial role in shaping foreign policy. A notable example is the ongoing debate in Japan over amending its constitution to potentially allow for a more offensive military stance, reflecting a significant shift in regional dynamics.
Envisioning identity-driven security cooperation in East Asia involves addressing deep-rooted historical and territorial issues. This could take the form of Japan making apologies or offering retributions for historical wrongs perceived by its neighbors. It might also involve reaching possession agreements or mutual understandings over disputed territories involving Japan, China, Russia, and South Korea. An essential aspect of this cooperation would be the public acknowledgment by each country's leadership of the respect and importance of their neighbors, fostering a sense of shared regional identity and mutual understanding. Such measures could pave the way for more inclusive multilateral dialogue, moving beyond trilateral talks to engage all regional countries in level 1 or level 2 discussions. This approach recognizes the intertwined destinies of East Asian nations and seeks to transform historical grievances and territorial disputes into opportunities for collaboration and mutual respect.

2. Regional Leadership

Regional leadership, as a concept in the context of nonproliferation efforts, is greatly emphasized in the literature, notably in Knopf's 2016 book, and aligns with the notion posited by S. A. Jones (2016) and Muller & Wunderlich (2013) that persuasion and assistance are often more effective strategies than condemnation and sanctions. In the complex geopolitical landscape of East Asia, identifying the most suitable regional leader for a cooperative nonproliferation initiative is a critical question. The effectiveness of sanctions, whether imposed by the UN or other entities, remains a subject of debate, and their impact varies based on numerous factors, including the commitment and coordination among the imposing nations.

Envisaging regional leadership-driven security cooperation, particularly in the sphere of nuclear nonproliferation, involves several potential actions and commitments. This could encompass the U.S. or Russia adopting a 'No First Use' policy regarding nuclear weapons, which
would signify a strong commitment to nonproliferation and could set a precedent for other nuclear-armed states. Additionally, the reduction of nuclear stockpiles by these major powers could serve as a tangible demonstration of their commitment to reducing the global nuclear threat. Fundamental to this approach is the public acknowledgment by regional leaders of the importance of nonproliferation and cooperation. Such statements would not only reinforce regional commitment to these goals but also set a tone of collective responsibility and collaboration. Perhaps most critically, Russia or China could take the lead in orchestrating a denuclearization agreement with the DPRK, leveraging their unique positions and relationships with North Korea to foster dialogue and negotiation. This role of regional leadership in security cooperation reflects a strategic shift towards collaborative efforts and mutual understanding in addressing one of the most pressing security challenges in the region.

**U.S. Leadership**

Muller's analysis, as presented in his discussion on Western-dominated "clubs", brings to light the efficiency-driven yet often resented nature of these groups (p. 386). He notes that while the leadership of great powers like the U.S. in establishing and promoting international norms is generally beneficial, it can also lead to perceptions of injustice, especially in cases where the U.S. is expected to take the lead in initiatives vis-à-vis other major powers like China and Russia. This dynamic is particularly evident in East Asia, where the perception of the reliability of U.S. security commitments, closely tied to the country's role in upholding international norms, varies significantly. Attitudes towards the U.S. presence in the region are mixed, with concerns about the likelihood of the U.S. either abandoning its commitments or escalating its military posture, for example, by deploying nuclear weapons in Japan or South Korea.
In this context, U.S. leadership-driven security cooperation could take several forms. The development of a "No first use" nuclear policy by the U.S. would be a significant step, signaling a commitment to reducing the risk of nuclear conflict. Additionally, negotiating new treaties to succeed the New START, aimed at reducing nuclear stockpiles, would underline the U.S.'s commitment to disarmament. Publicly stressing the importance of nonproliferation and cooperation by U.S. leaders would further emphasize the nation's dedication to these principles. Moreover, maintaining the U.S. hub-and-spoke system of joint exercises and protection treaties, as opposed to shifting to a multilateral approach, could continue to play a central role in the region. Also, a 1:1 denuclearization agreement with DPRK, led by the U.S., could be a pivotal move in addressing one of the most pressing security issues in the region. These steps, reflective of U.S. leadership in security affairs, would not only demonstrate a commitment to global security but also help build trust and foster collaborative relationships in a region where its presence and intentions are often under scrutiny.

3. Norms

Muller and Wunderlich emphasize the profound impact of cultural factors on shaping national interests, which are not static but evolve within the socio-normative environments of states. Many societal norms empower individuals and groups to pursue “interests” that are socially and politically deemed legitimate (Clark, 2005). Rationalism helps to explain these patterns, as the concept of "appropriateness" often legitimizes actions aligned with self-interest (Muller & Wunderlich, 2013). However, they also note that moral and justice concerns often stem from values that are not necessarily tied to national interests (2013: 362).

In this context, the perception of a country's values towards nuclear proliferation becomes crucial. The importance placed on the Non-Proliferation Treaty (NPT) by policymakers and the
public, for instance, is indicative of the nation's stance on nuclear issues. Policymakers' attitudes towards the NPT can reflect deeper values, just as public opinion on nuclear weapons and peaceful nuclear use reveals societal attitudes towards these critical issues.

Norms-driven security cooperation in this framework would likely involve leaders publicly committing to uphold (and sign, where applicable) the NPT. It would also see states collectively reinforcing sanctions against those who violate proliferation norms and agreeing to uphold other regime regulations such as the Missile Technology Control Regime (MTCR), Proliferation Security Initiative (PSI), and Nuclear Suppliers Group (NSG). Additionally, state leaders might collaborate to develop National Implementation Action Plans with guidance from bodies like the 1540 Committee, using tools like the 1540 Matrix (Committee, 2016).

The role of ideas and learning is also central in shaping security cooperation. The likelihood of collaborative efforts and information sharing among working-level groups or epistemic communities, including scientific, technical, and academic experts, is significant. This type of cooperation could involve dismantling former WMD production facilities, crafting laws to criminalize the financing of proliferation activities, and hosting conferences or courses where working-level groups provide industry perspectives on compliance and government-industry partnerships (Knopf, 2016; Gahlaut, 2016).

Finally, the design of a nonproliferation regime, particularly in Northeast Asia, is a key consideration. Factors influencing the most favorable characteristics for such a regime and the likelihood of establishing a Nuclear Weapons-Free Zone (NWFZ) in the region are critical. Security cooperation driven by regime design would likely be characterized by an informal, consensus-driven approach that is collaborative and inclusive (S. A. Jones, 2016). This approach
would prioritize the collective interests and shared goals of the region's states in maintaining a stable and secure environment.

4. Capabilities

A state's capabilities fundamentally influence its participation and effectiveness in global efforts to prevent the spread of weapons of mass destruction. Knopf underscores this, noting that a state's capacity not only shapes its ability to meet the requirements of nonproliferation initiatives but also determines its role in broader cooperative security frameworks (2016). The perception of a state's capability in this domain extends from its technological and scientific prowess to its bureaucratic and enforcement mechanisms. These capabilities are essential for effective implementation and compliance with nonproliferation norms and regulations, including those established under various international treaties and frameworks.

Expanding on this understanding, capabilities-driven security cooperation in nonproliferation can take various forms. Significantly, it may involve states recognizing their limitations and seeking assistance from more capable actors or international bodies. For instance, a state lacking in certain technical or enforcement capacities might request assistance from the 1540 Committee or neighboring states. The 1540 Committee, established by the United Nations Security Council Resolution 1540 in 2004, is tasked with overseeing the implementation of measures to prevent the proliferation of nuclear, chemical, and biological weapons, as well as their means of delivery, to non-state actors. It plays a critical role in providing expertise, facilitating assistance, and ensuring compliance with nonproliferation obligations.

In a scenario where capabilities are unevenly distributed, a resolution that encourages states capable of meeting the 1540 Committee's standards to assist those in need would be a pragmatic approach. Such cooperation could involve sharing best practices, providing technical assistance,
or helping to develop legal and regulatory frameworks. This not only ensures broader compliance with nonproliferation norms but also fosters a sense of collective responsibility and mutual aid.

Cooperation, in this study, will be assessed construct by construct through the conditional statements produced in the Delphi Round 1 combined with the analysis of said conditions vis-à-vis the Q-sort outcomes.

4.4.3 Subject-Matter Experts (SMEs)

Intelligence analysts and subject-matter experts (SMEs) both offer vital but distinctly different contributions to the policymaking process, each playing a role essential for informed decision-making. Intelligence analysts are primarily involved in gathering, interpreting, and presenting a wide array of information, often derived from covert sources or sensitive intelligence channels. They provide policymakers with a comprehensive and contextualized overview of various situations, including geopolitical, military, economic, and social dimensions. Their expertise is particularly crucial in risk assessment and forecasting, offering predictions about potential threats and future scenarios. This capability is essential for anticipating and preparing for potential crises, with analysts often providing real-time updates crucial for swift decision-making. Importantly, intelligence analysts are expected to maintain an objective stance, presenting unbiased analysis without advocating for specific policy outcomes.

In contrast, SMEs bring deep, specialized knowledge in specific fields like economics, science, or international studies. Their role is more focused on providing detailed insights and understanding of particular issues, which significantly enrich the policymaking process. They offer policymakers intricate insights into convoluted issues, suggest feasible solutions, assess policy impacts, and articulate the pros and cons of various policy directions. Unlike intelligence analysts,
SMEs often make policy recommendations as well, advocating for specific actions based on their expertise. They offer long-term strategic insights and in-depth trend analysis, invaluable for shaping sustainable policies. Additionally, SMEs play a crucial role in educating policymakers, ensuring that decisions are made with a comprehensive understanding of complex subject matters.

The differences between these two roles are marked. While intelligence analysts provide a broad overview and situational awareness, SMEs offer in-depth knowledge in their areas of expertise. In terms of policy involvement, intelligence analysts typically avoid direct advocacy and focus on presenting information as objectively as possible. In contrast, SMEs may influence policy more directly through their recommendations and advocacy. The source of information also differs, with intelligence analysts relying on a combination of public and covert sources, whereas SMEs primarily use open-source information, academic research, and industry data.

The benefits reaped from SME involvement include refined decision-making, amplified transparency, bolstered public engagement, and heightened accountability. However, while their insights can illuminate the policymaking process, a negative is that a discernible chasm persists between the depth of academic findings and their practical policy application. Several impediments underlie this gap: the financial burden of procuring “top-tier” SME services, limited access to these experts in certain regions, challenges in distilling intricate academic findings into accessible formats for time-constrained policymakers, and potential biases inherent in the SMEs' perspectives due to various factors such as regional affiliations or sectoral leanings. The latter two challenges are investigated in this study. Using a combined Delphi + Q method study of not just SMEs but also the informed public can improve decision-makers’ understanding of complex policy choices.

The limitations above beg the question: Do SMEs really matter? The Good Judgment Project (GJP), based in the University of Pennsylvania, intended to find out. As discussed in the
literature review, the GJP was a forecasting tournament that ran from 2011 to 2015 with a goal to identify and train people who were better than average at making predictions about the future – having a background or “expertise” in the area of forecasting was not a prerequisite.

The GJP was created by Philip Tetlock, a professor of psychology at the University of Pennsylvania. Tetlock was interested in the idea of "superforecasters," defined as people who were consistently better than average at making predictions. He believed that these people could be identified and trained to improve their forecasting skills which would provide more reliable information to decision-makers than SMEs. The GJP was a large-scale experiment to test Tetlock's hypothesis. Over 40,000 people from around the world participated in the tournament. Participants were asked to make predictions about a variety of events, including political elections, economic trends, and scientific discoveries.

The results of the GJP were surprising. A small group of participants, known as "superforecasters," consistently outperformed the rest of the field. These superforecasters were able to make more accurate predictions than the SMEs. Tetlock and his colleagues conducted a number of studies to try to understand why the superforecasters were so good at making predictions. They found that the superforecasters were better at identifying and understanding uncertainty. They were also better at taking into account multiple perspectives and considering alternative outcomes.

The GJP findings described in detail in a 2016 book by Bianco & Tetlock, The Good Judgment Project: Lessons from a decade of forecasting, have important implications for policymaking. They suggest that policymakers should not rely solely on the advice of experts. Instead, they should also consider the insights of the informed public. This is why this study includes the informed public as an addition to SME “employment sectors.”
5.0 Summary Of Findings

5.1 The Data

One could argue that one of the most useful deliverables of this research project is the rich and unique data set. This study gathered data showing the forecasts of 40 experts across five countries and five sectors and whether their forecasts changed (or did not) due to the onset of the 2020 global pandemic. This study produced over 40 unique conditional statements that experts believe could impact the complete and verifiable denuclearization (CVD) of North Korea, and also shows which conditions experts believe will be the most (or least) impactful on the CVD. The data set alone produced from this dissertation has already been requested to be purchased by a cyber-research organization that wants to input the data into a computer-based wargame simulation on the North Korean proliferation issue. The organization’s leadership also desires to be trained by the author on the research methods to collect this data so they can populate future wargame simulations on other national security topics.

5.1.1 The Panelists

As mentioned in Chapter 3, the original target of research participants was 75 SMEs. To test if bias would be a major factor influencing forecasts, five SMEs were approached from each of the four sectors of employment being studied (plus five public participants), from each of the five countries. However, due to difficulties arising from governmental limitations in Russia and China, no military participants could be secured from either state. In addition, no Chinese
policymakers responded to requests. Russia proved to be difficult as well in collecting data. As stated previously, no representative from the Russian public could be reached, even through snowball sampling. In the end, a participation agreement was secured from 62 panelists: 47 SMEs and 15 members of the “informed public,” to further test Tetlock’s hypothesis. As previously mentioned, informed public were qualified by being voting-age in their country, having at least a college-level education, and self-identifying as being interested in and up-to-date with world news.

Surveys were disseminated in February, June, and August of 2020. A total of 54 panelists responded to the first round of the Delphi, which amounts to an impressive 86% rate of response. Response rate for the second round was not nearly as high; just 35%, or 14 respondents out of the 40 SMEs surveyed—unlikely due to the onset of the coronavirus pandemic, since the survey was administered virtually; more likely due to normal attrition (note that the public was excluded from the second and third rounds). The response rate for the third round—the Q-sort—was notably higher. The response rate climbed to 48%, or 19 of 40 panelists. Perhaps this indicates an intrigue in Q-methodology. A few of the participants did comment to the author that the Q-sort and acquisition of information was a stimulating process. See Table 5.1 below for a complete breakdown of panelists by state and sector, as well as response rate:
5.1.2 Delphi Round 1: Scenario Predictions

Round 1 of the Delphi was the main data collection exercise of this research project. As detailed in Chapter 3.1, the Round 1 survey asked a total of 87 questions and was disseminated to 75 subject matter experts on the North Korea nuclear issue (identified through cold-calls, the
author’s network and snowball sampling) and 15 members of the informed public. The response rate for Round 1 was much higher than expected, and rather unprecedented, at 86%:

Table 5.2 Delphi Round 1 Response Rate

<table>
<thead>
<tr>
<th>Panelists who Completed Delphi Round 1 (Disseminated 12 Mar 2020)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STATE</strong></td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>China</td>
</tr>
<tr>
<td>Japan</td>
</tr>
<tr>
<td>Russia</td>
</tr>
<tr>
<td>South Korea</td>
</tr>
<tr>
<td>U.S.</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
</tr>
<tr>
<td><strong>Response Rate</strong></td>
</tr>
</tbody>
</table>

Analysis by state and sector are completed in following chapters, but data informing the analysis is included in detail below, organized by scenario. In brief:

Table 5.3 Summary of Probabilistic Forecasts for Scenarios

<table>
<thead>
<tr>
<th>SCENARIO (occurring by the year 2040)</th>
<th>N</th>
<th>Median Prob.</th>
<th>Mean Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: “Complete and verifiable denuclearization of North Korea without resorting to militarized conflict”</td>
<td>40</td>
<td>10%</td>
<td>18%</td>
</tr>
<tr>
<td>B: “Complete and verifiable denuclearization of North Korea as a result of militarized conflict”</td>
<td>38</td>
<td>15%</td>
<td>18%</td>
</tr>
<tr>
<td>C: “North Korea is allowed to maintain a limited nuclear arsenal”</td>
<td>39</td>
<td>50%</td>
<td>51%</td>
</tr>
</tbody>
</table>

Including three additional scenarios elicited through the survey:

<table>
<thead>
<tr>
<th>SCENARIO</th>
<th>N</th>
<th>Median Prob.</th>
<th>Mean Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>D: “The status quo continues”</td>
<td>17</td>
<td>61%</td>
<td>62%</td>
</tr>
<tr>
<td>E1: “North Korea collapses, leading to denuclearization”</td>
<td>5</td>
<td>15%</td>
<td>16%</td>
</tr>
<tr>
<td>E2: “North Korea collapses and the assuming power retains nuclear capability”</td>
<td>5</td>
<td>8%</td>
<td>14%</td>
</tr>
<tr>
<td>F: “An agreement is reached with North Korea”</td>
<td>6</td>
<td>30%</td>
<td>40%</td>
</tr>
</tbody>
</table>
Feedback from Round 2 suggests that there was confusion amongst the respondents as to the difference between Scenario C and D; many assumed C and D were the same, while some assumed C to mean the international community consented by formal agreement to North Korea maintaining nuclear weapons. More on this in chapter 6.3, an analysis of Scenario C.

Though there are noticeable differences in expert opinion by state when analyzing individual scenarios, there also are not any significant patterns across answers that would identify “state” as a descriptive variable that could be attributed to any bias in predictions based on nationality.

Figure 5.1 Breakdown of Scenario Forecast Results by State
At first glance, Figure 5.1 above might appear to show Chinese respondents to be far more liberal in their probability estimates than participants from other countries. However, in Scenario A, South Korean respondents actually averaged one percent higher than Chinese; in Scenario C, China and the U.S. were about equal in their mean probability predictions at 56.6% and 56.2%, respectively. Japan and Russia could be viewed to answer more conservatively on a whole, but in Scenario B both of their probability predictions were higher than their U.S. counterparts.

There are some interesting insights on each state’s optimism or pessimism regarding North Korean denuclearization. This insight can be derived from analysis of each individual scenario and separating the experts from public responses.

Just as with state, analysis of data does not show any significant bias that could be attributed to sector of employment. In Scenarios A and C, the military participants rated a higher median probability. Both of these scenarios would demonstrate a lower risk of military conflict. Academics and government tended to be more conservative in their probability estimates than other sectors, though academics stayed right about at the aggregate median for each scenario.
Analysis by scenario in the following sections of this paper shows more useful and interesting insights than aggregate results.

5.1.2.1 Conditional Statements

In addition to the scenario insights, the results from Round 1 of the Delphi also produced 43 unique conditions the SMEs indicated would impact the CVD of North Korea. This data set was solicited via Delphi and used to populate the cards in the Q-sort. Even on its own, it would be highly useful in policymaking and government strategizing:
Figure 5.3 Conditional Statements on the CVD of North Korea

1. The U.S. leads an initiative to normalize diplomatic relations with North Korea
2. The U.S. leads an initiative for meaningful 1:1 negotiations with North Korea
3. The U.S. increases economic sanctions against North Korea
4. The international community increases economic sanctions against North Korea
5. North Korea leads an initiative to normalize diplomatic relations with the international community
6. North Korea leads an initiative for meaningful 1:1 negotiations with the U.S.
7. Regional leaders in Northeast Asia collaborate to meaningfully negotiate with North Korea
8. North Korea is ensured by the international community of the security and survival of its regime
9. China leads an initiative to normalize diplomatic relations between North Korea and the international community
10. North Korea is ensured by the U.S. of the security and survival of its regime
11. North Korea is ensured by South Korea of the security and survival of its regime
12. South Korea leads an initiative for meaningful 1:1 negotiations with North Korea
13. U.S. President Trump gets re-elected for a second term
14. North Korea is ensured that negotiated agreements will withstand changes in U.S. administration
15. There is a coup in North Korea
16. Security miscalculations by regional leaders lead to militarized conflict in Northeast Asia
17. North Korea intentionally initiates conventional (non-nuclear) militarized conflict in the region
18. The U.S. takes conventional (non-nuclear) military action to denuclearize North Korea
19. The U.S. launches a nuclear strike targeting North Korean strategic locations
20. Regional leaders in Northeast Asia cooperate on military action to denuclearize North Korea
21. China encourages and then supports North Korea in initiating a militarized conflict
22. China militarily invades and then occupies North Korea
23. North Korea unintentionally deploys a nuclear weapon
24. North Korea launches a nuclear weapon targeting a U.S. ally
25. North Korea launches a nuclear weapon targeting the U.S. or a U.S. territory
26. North Korea suffers an internal nuclear crisis
27. North Korea suffers an extreme humanitarian crisis
28. North Korea suffers an extreme economic crisis
29. The U.S. reaches a 1:1 agreement with North Korea that allows the DPRK to maintain a limited nuclear arsenal
30. A multilateral negotiation amongst Northeast Asian regional leaders reaches an agreement that allows the DPRK to maintain a limited nuclear arsenal
31. China withdraws economic and political support from North Korea
32. There is a public uprising within North Korea
33. North Korea collapses and South Korea leads a reunification process
34. North Korea collapses and China takes control
35. North Korea collapses and the U.S. takes control
36. North Korea is provided an extended timeline to denuclearize (20+ years)
37. The international community concedes to less-than-verifiable denuclearization of North Korea
38. Regional leaders concede to less-than-verifiable denuclearization of North Korea
39. The U.S. concedes to less-than-verifiable denuclearization of North Korea
40. The U.S. closes its military bases in both South Korea and Japan
41. The U.S. closes its military bases in South Korea
42. Japan, South Korea and the U.S. cooperate on military action to denuclearize North Korea
43. South Korea leads an initiative to resume meaningful multilateral negotiations with North Korea and regional leaders

5.1.3 Delphi Round 2: A Move Towards Consensus?

Round 2 of the Delphi Technique is intended to move the surveyed group more towards consensus through the solicitation of Round 1 respondents for a modification of their answers
based on a summary of group responses. The Round 2 survey included the summary statistics detailed in section 4.1.2 and was e-mailed individually to respondents in hopes the personalized outreach would result in a higher response rate. However, despite these efforts, as noted in section 5.1.1, Round 2 of the Delphi received the lowest response rate of all three rounds, at just 35%:

Figure 5.4 Delphi Round 2 Response Rate

<table>
<thead>
<tr>
<th>Panelists who Completed Delphi Round 2 (Disseminated 6 Jun 2020)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STATE</strong></td>
<td><strong>Academia</strong></td>
<td><strong>Policymaker</strong></td>
<td><strong>Military</strong></td>
</tr>
<tr>
<td>China</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Japan</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Russia</td>
<td>0</td>
<td>1</td>
<td>N/A</td>
</tr>
<tr>
<td>South Korea</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>U.S.</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td><strong>Response Rate</strong></td>
<td>25%</td>
<td>40%</td>
<td>40%</td>
</tr>
</tbody>
</table>

As intended, respondents moved closer towards consensus with their Round 2 responses, but not significantly. A table of Round 1 and Round 2 descriptive statistics are included below; graphs of these comparisons are in Appendix D. Note that the statistics for Round 1 by scenario are slightly different in Table 5.4 below than in section 5.1.2 as only the respondents from Round 2 were included in the Round 1 statistics recalculated below in order to provide a more accurate depiction of the move towards consensus.
Table 5.4 Demonstrating a move toward consensus

<table>
<thead>
<tr>
<th></th>
<th>Scenario A</th>
<th></th>
<th>Scenario B</th>
<th></th>
<th>Scenario C</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Round 1</td>
<td>Round 2</td>
<td>Round 1</td>
<td>Round 2</td>
<td>Round 1</td>
<td>Round 2</td>
</tr>
<tr>
<td>Mean</td>
<td>16.3</td>
<td>12.7</td>
<td>19.2</td>
<td>15.1</td>
<td>59.4</td>
<td>48.1</td>
</tr>
<tr>
<td>Standard Error</td>
<td>4.5</td>
<td>3.9</td>
<td>5.3</td>
<td>3.4</td>
<td>7.2</td>
<td>7.2</td>
</tr>
<tr>
<td>Median</td>
<td>10</td>
<td>9</td>
<td>13.5</td>
<td>12</td>
<td>69</td>
<td>45.5</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>16.4</td>
<td>14.1</td>
<td>18.5</td>
<td>12.4</td>
<td>26.8</td>
<td>26.8</td>
</tr>
<tr>
<td>Sample Variance</td>
<td>268.7</td>
<td>198.4</td>
<td>342.3</td>
<td>153.7</td>
<td>718.9</td>
<td>719.8</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.4</td>
<td>7.5</td>
<td>5.3</td>
<td>1.7</td>
<td>-1.7</td>
<td>-1.4</td>
</tr>
<tr>
<td>Skewness</td>
<td>1.4</td>
<td>2.5</td>
<td>2.1</td>
<td>1.1</td>
<td>-0.3</td>
<td>0.1</td>
</tr>
<tr>
<td>Minimum</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Maximum</td>
<td>55</td>
<td>55</td>
<td>70</td>
<td>45</td>
<td>95</td>
<td>87</td>
</tr>
<tr>
<td>Count</td>
<td>13</td>
<td>13</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Confidence Level(95.0%)</td>
<td>9.9</td>
<td>8.5</td>
<td>11.8</td>
<td>7.5</td>
<td>15.5</td>
<td>15.5</td>
</tr>
</tbody>
</table>

5.1.4 Effects of COVID-19

This study also took the unique opportunity with the onset of a global pandemic happening between the first and second round of surveys to ask respondents the following:

*Since completing the first proliferation futures questionnaire the world has experienced the COVID-19 pandemic. To what extent has the occurrence of the global pandemic affected your responses to this questionnaire?*

Thirteen respondents answered that the pandemic had affected their responses either “Somewhat” (5 respondents) or “Very Little” (6 responses), with two responding that the pandemic had not affected their answers at all. Some of the reasoning given:

- **(Somewhat, Russia/Government)** Covid 19 gave North Korea a negative impact in the economic sense. Trade with China was severely affected. Covid 19 infections in China and the U.S. have made North Korea reconsider the timing of provocatopn [sic] against the
U.S. I think that's why Pyongyang had delayed the provocation against the U.S. since early this year until now. Of course, Pyongyang will go ahead with it sometime in the near future.

- **(Somewhat, South Korea/Think Tank)** Although the direct impact of COVID-19 towards North Korea is meager (to be sure, there are a lot of infected people within the country. I’m talking about the regime’s stance on nuclear matters), the global pandemic will negatively impact China. Once this COVID-19 affair is resolved somewhere in the future, China will not be able to support North Korea like before. North Korea will have to pursue its nuclear course in a more independent manner afterward.

- **(Somewhat, United States/Government)** I think that modern science will be able to prevent Covid producing the kind of pandemics the world experienced in the early Middle Ages. If I’m wrong the possible collapse (in the literal sense of all government function) of the NK regime becomes more of a risk. And a Covid driven collapse in NK would constitute an existential threat to Beijing.

- **(Very Little, China/Think Tank)** It does not fundamentally change the nuclear power dynamics and geopolitical trend in the region.

- **(Very Little, Russia/Think Tank)** While the pandemic has definitely impacted the overall strategic environment and the situation in North Korea (closed borders and economic crisis, unknown epidemic situation in the country), it has only exacerbated the existing threats and tensions rather than drastically changes the situation.

- **(Very Little, United States/Academia)** At most, I might raise the likelihood of my E2 scenario slightly, but I still believe regime collapse would need to be accompanied by several other factors to prevent the U.S. or other states from intervening more forcefully, but if South Korea is more concerned with containing the spread of COVID-19, there may
not be the political will to pursue unification and the possibility that large numbers of infected North Koreans coming into the South cause unmanageable outbreaks. The threat of the pandemic leading to the collapse of the Kim regime had already influenced my assessment of scenario A which was why I indicated a higher probability than the majority opinion.

- (Not at All, United States/Think Tank) I don’t think it has affected the key factors that determine the probabilities of different outcomes.

Ultimately respondents did not see the global pandemic as having a large effect on the future of the North Korea nuclear problem. Nonetheless, the timing of the survey rounds did offer a unique opportunity to ask, in light of the fact that a global pandemic was not even considered at the start of this research.

5.1.5 Q-Sort Data

As described extensively in Chapter 4, rather than complete a traditional third-round Delphi this study asked the original Round 1 respondents to participate in a Q-sort exercise. Round 3 received a higher response rate than Round 2; some experts said this was due to the intriguing nature of the exercise as opposed to a traditional survey, suggesting following a Round 1 Delphi with Q-sort directly (omitting Round 2) could have produced an even higher response rate.
Table 5.5 Round 3 Response Rate

| Panelists who completed "Round 3," Q-Sort (Disseminated 14 Aug 2020) |  |
|---|---|---|---|---|---|---|
| **STATE** | **SECTOR** |  |  |  |  |  |
|  | Academia | Policymaker | Military | Think Tank | Public | TOTAL |
| China | 0 | N/A | N/A | 0 | N/A | 0 | 0% |
| Japan | 0 | 0 | 0 | 0 | N/A | 0 | 0% |
| Russia | 0 | 0 | N/A | 2 | N/A | 2 | 33% |
| South Korea | 1 | 0 | 1 | 2 | N/A | 4 | 57% |
| U.S. | 4 | 4 | 1 | 4 | N/A | 13 | 81% |
| TOTAL | 5 | 4 | 2 | 8 | N/A | 19 | 48% |

The Q-sort produced two useful data sets: The actual sorts and the proximity matrix. The first is the most useful in a policy-making sense, showing the actual sorting of the respondents’ conditional statements into nine buckets ranging from “Extremely Negative Effect” (-4) to “Extremely Positive Effect” (4). It shows which conditions experts view as the most positively and negatively impactful on the policy goal of denuclearizing the DPRK. However, Q-methodology is designed to dig deeper and show the correlations among the responses of individuals as well. The correlation matrix is followed by a factor analysis, which for this research revealed via scree plot a 5-factor solution, shown below.15

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15 A scree plot is a graphical representation used in factor analysis or principal component analysis (PCA) to help determine the optimal number of factors or components to retain. It provides insight into the dimensionality of the data.
Each factor is a representation of the groups, and how much variation is explained by each group. The scree plot for this study had 65% variation on group one; in fact, the first five factor groups had 95% of the variation. It is interesting to see the correlation between formal groups and empirically generated groups. The groups did not match on formal or nominal characteristics, such as state or employment sector. Factor analysis brings a larger number of variables into a smaller number.

After the five factor groups were identified, the next step was to see which participants make up the groups, and if they have any characteristics in common; they are grouped, but what do the factors mean? To answer, we look at the original values the respondents have put in on the 9-point scale of the Q-sort and pull out the scores on particular items that are 4 or -4 on the scale. These different items become the basis for making a judgement on what to call the factor.
As assessed in chapter 7, all in factor group one of this study involve U.S. intervention or initiative, meaning a major influential factor is U.S./external power.

Through factor analysis in analytical software packages such as KenQ, visuals such as the one in Figure 5.6 below that depict where agreement was found within factor groups can help inform policy decisions in cases where the condition happens involuntarily or, alternatively, if a decision can be made to voluntarily affect the scenario at hand (Note: Factors, Legend, and Analysis further explained in Chapter 7):
Figure 5.6 Example of Composite Q-Sort Results for Factor 1

<table>
<thead>
<tr>
<th>-4</th>
<th>-3</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. The U.S. launches a nuclear strike targeting North Korea.</td>
<td>23. North Korea unintentionally deploys a nuclear weapon.</td>
<td>20. Regional leaders in Northeast Asia cooperate on military action.</td>
<td>42. Japan, South Korea and the U.S. cooperate on military action.</td>
<td>38. Regional leaders concede to than-verifiable nuclearization.</td>
<td>33. North Korea collapses and South Korea leads a reunification.</td>
<td>6. North Korea leads an initiative for meaningful 1:1 negotiations.</td>
<td>1. The U.S. leads an initiative to normalize diplomatic relations.</td>
<td>10. North Korea is ensured by the U.S. of the security and survival of its nuclear arsenal.</td>
</tr>
<tr>
<td>24. North Korea launches a nuclear weapon targeting a U.S. ally.</td>
<td>18. The U.S. takes conventional (non-nuclear) military action.</td>
<td>6. North Korea suffers an internal nuclear crisis.</td>
<td>3. The U.S. increases economic sanctions against North Korea.</td>
<td>4. The international community increases economic control.</td>
<td>35. North Korea collapses and the U.S. takes control.</td>
<td>43. South Korea leads an initiative to resume meaningful diplomatic relations.</td>
<td>8. North Korea is ensured by the international community of meaningful 1:1 negotiations.</td>
<td>2. The U.S. leads an initiative for meaningful 1:1 negotiations.</td>
</tr>
<tr>
<td>25. North Korea launches a nuclear weapon targeting the U.S. or a U.S. ally.</td>
<td>21. China encourages and then supports North Korea in initiating a nuclear strike.</td>
<td>15. There is a coup in North Korea.</td>
<td>32. There is a public uprising within North Korea.</td>
<td>37. The international community concedes to than-verifiable nuclearization.</td>
<td>12. South Korea leads an initiative for meaningful 1:1 negotiations.</td>
<td>30. A multilateral negotiation amongst Northeast Asian states is provided an extended timeline to denuclearize.</td>
<td>36. North Korea is ensured that negotiated agreements will withstand.</td>
<td>14. North Korea is ensured that negotiated agreements will withstand.</td>
</tr>
<tr>
<td>17. North Korea intentionally initiates conventional (non-nuclear) military action.</td>
<td>22. China militarily invades and then occupies North Korea.</td>
<td>13. U.S. President Trump gets re-elected for a second term.</td>
<td>31. China withdraws economic and political support from North Korea.</td>
<td>5. North Korea leads an initiative to normalize diplomatic relations.</td>
<td>29. The U.S. reaches a 1:1 agreement with North Korea that allows the U.S. to denuclearize.</td>
<td>7. Regional leaders in Northeast Asia collaborate to denuclearize.</td>
<td>11. North Korea is ensured by South Korea of the security and survival of its nuclear arsenal.</td>
<td></td>
</tr>
<tr>
<td>16. Security miscalculations by regional leaders lead to militarized conflict.</td>
<td>26. North Korea suffers an economic crisis.</td>
<td>40. The U.S. closes its military bases in both South Korea and Japan.</td>
<td>39. The U.S. concedes to than-verifiable nuclearization of North Korea.</td>
<td>11. North Korea is ensured by South Korea of the security and survival of its nuclear arsenal.</td>
<td>9. China leads an initiative to normalize diplomatic relations.</td>
<td>34. North Korea collapses and China takes control.</td>
<td>34. North Korea collapses and China takes control.</td>
<td></td>
</tr>
</tbody>
</table>

Legend

* Distinguishing statement at P < 0.05
** Distinguishing statement at P < 0.01
▲ z-Score for the statement is higher than in all the other factors
▼ z-Score for the statement is lower than in all the other factors
☐ Consensus statement

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A proximity matrix is useful in an academic sense as it was not only key in determining the factor groups to evaluate sort consensus, but shows how respondents were similar or different from each other.

This data would be useful when determining if respondents’ answers may have been affected by biases based on common variables such as state affiliation or employment sector. This particular study shows the respondents surveyed did have commonalities, but not based on variables typically considered when selecting subject-matter experts for consultation.

5.2 The Answers

A summary of findings produced from analysis of the data derived from this study as applied to each of the research hypotheses follows; more detailed analysis by state and sector is conducted in the proceeding chapters.

5.2.1 Likelihood of Regional Cooperation

Q1: Do SMEs assess a likely probability (>50%) for revival of regional cooperation regarding North Korea, either ad-hoc along the lines of the Six Party Talks, or more institutionalized, such as a nuclear weapon free zone or a Regional Nonproliferation Regime (RNR)? Specifically, what is the role of the U.S. in this cooperation?

H1. SMEs assess a low likelihood (<50%) of a revival of regional security cooperation, be it ad-hoc or institutionalized.
**Assessment:** True. Method indeterminate, but this research study shows that experts do agree regional security cooperation would be key in reaching the goal of complete, verifiable denuclearization of North Korea; percentage likelihood indirectly assessed at 10%.

To evaluate this hypothesis numerically, a specific question surrounding regional security cooperation producing a percentage likelihood would have had to be included as a scenario in the Round 1 Delphi. Upon careful study in Delphi Round 1 survey creation the author opted to exclude scenarios with varying policy goals and pre-stated conditions in favor of more open-ended scenarios focusing on the singular policy goal of complete, verifiable denuclearization of North Korea. This decision enabled the study to collect a rich array of conditions put forth by the SMEs rather than the author leading respondents towards pre-conceived conditions. It also allowed for a follow-up survey of these conditions.

Many of the conditions collected in Round 1 did indicate SMEs recognized that regional cooperation would be a condition leading to CVD, and the Q-sort showed further what effect such conditions would have on the goal of CVD, be it positive or negative. For example, the graphic in chapter 5.1.4 depicting the composite Q-sort for Factor 1 places conditions involving regional security cooperation in bins 2 and 3 (Positive Effect and Very Positive Effect, respectively). Statements 7, 8 and 36 implicitly or explicitly suggested regional cooperation and were all rated as having a “Very Positive Effect” on CVD:

7. Regional leaders in Northeast Asia collaborate to meaningfully negotiate with North Korea

8. North Korea is ensured by the international community of the security and survival of its regime
36. North Korea is provided an extended timeline to denuclearize (20+ years)

These statements do not detail whether such formal agreements would be through an institution such as the NPT or via ad-hoc negotiations.

Although a percentage likelihood was not directly determined through the results of this research, it could be indirectly assessed by matching the value judgements produced in Q-sort with the scenario from which those conditions were produced. In this case, the three statements above were derived from Scenario A, “Complete and verifiable denuclearization of North Korea without resorting to militarized conflict,” which received a median probability rating of 10% (<50%).

\[ H1(1). \text{Any type of cooperation would have to be led by the U.S. Assumption: The U.S. is the most powerful actor and has the greatest interest in a non-nuclear North Korea.} \]

Assessment: True.

The same composite Q-sort data places conditions involving U.S. leadership overwhelmingly in bins 3 and 4 (Very Positive Effect and Extremely Positive Effect, respectively). Statement 1 was rated as having a “Very Positive Effect,” and conditional statements 2, 10 and 14 as having an “Extremely Positive Effect” on CVD:

1. The U.S. leads an initiative to normalize diplomatic relations with North Korea
2. The U.S. leads an initiative for meaningful 1:1 negotiations with North Korea
10. North Korea is ensured by the U.S. of the security and survival of its regime
14. North Korea is ensured that negotiated agreements will withstand changes in U.S. administration
These statements were also produced under scenario A, with a 10% median probability of occurring by 2040. Statement 2 in particular was labeled as a “Distinguishing statement” in the Q-sort analysis, meaning it had a P<0.05 and a z-score higher than the other factors.

5.2.2 Compatibility on Key Multilateral Security Cooperation Constructs

Q2: Do experts anticipate compatibility (>50% likelihood) on key multilateral security cooperation constructs despite sociocultural barriers such as historical, territorial, and other long-standing disputes between the actor states?

H2. Experts reach consensus that there is <50% likelihood of compatibility among Northeast Asian actors around the key multilateral security cooperation constructs provided. Assumption: Long-standing sociocultural barriers cannot be overcome in the next decade and will prevent cooperation from going beyond the bilateral level.

Assessment: Indeterminant. Experts agree that cooperation would have an extremely positive effect on the denuclearization of North Korea but the research design did not allow for the assessment of the probability of such cooperation occurring to be differentiated from the outcome. Instead, this research suggests there is less than 15% likelihood of such cooperation resulting in CVD by 2040, with the exception of agreements or treaties allowing the DPRK to maintain a limited nuclear arsenal.

This question was developed in the proposal to consider the history of multilateral security cooperation in East Asia, with the research specifically focusing on the case study of the CVD of North Korea. This question assumed cooperation around the CVD of North Korea would need to
be preceded by rebuilding bilateral trust and minimalizing threat perception between neighbors. This research did not address such assumptions, but can give insight on what nonproliferation cooperation could look like in the multilateral security system based on the constructs in Chapter 3.2: Self-interest, Regional Leadership, Norms and Capabilities.

Although useful in assessing the likelihood of cooperation and the forecasted effect on the goal of denuclearizing the DPRK, the data derived from this study do not directly answer this research question regarding compatibility on the constructs above. The conditional statements produced from the Delphi Round 1 survey, combined with the probabilities of the scenarios from which they were drawn, can shed light on what cooperation could look like. But it can also show how experts predict the probability of success of such cooperation in achieving the stated scenario.

To classify the types of cooperation, the 43 conditional statements can be categorized into three types of security cooperation described above: Self-interest, Regional Leadership, and Norms. The fourth construct, “Capabilities,” did not appear represented in the 43 conditional statements, thus is not addressed here. Categorizations are found in Appendix B.

Probabilistic estimates of each type of cooperation both (a) occurring, and (b) resulting in the scenario described, can be derived in the same way as Question 1. Conditional statements from the first construct – self-interest – were from Scenario B, “Complete and verifiable denuclearization of North Korea as a result of militarized conflict,” which resulted in a median 15% probability among experts. The Identity and Domestic Politics construct is not as clear-cut. These statements regarding North Korean assurances as well as U.S. foreign military bases were derived from Scenario A, whereas the proceeding statements were conditions of Scenario E (an option afforded to respondents in the survey to provide their own scenarios): North Korea collapses. The median probability for Scenario E, though, was also low – at just 15%.
Conditions supporting the Regional Leadership construct were conditions that would lead to Scenario A, with a median probability of 10% likelihood of occurrence by 2040. The majority of statements suggested the U.S. would be expected to play a key role in such leadership, however the success of such efforts seems to not be assessed as very likely.

Cooperation involving the Norms construct – namely, signing of treaties or agreements – were listed as conditions that might bring about both Scenarios A (conditions 4, 7) and C (conditions 30, 36, 37, 38), “North Korea is allowed to maintain a limited nuclear arsenal.” Scenario C had a median probability of 50%, suggesting that the most likely factor of multilateral security cooperation experts consider might have a 50% or greater chance of occurring by 2040 is agreements or treaties that concede to either a less-than-verifiable denuclearization plan or the DPRK’s maintenance of a limited nuclear arsenal.

5.2.3 Convergence/Divergence of Expert Forecasts Along Traditional Variables

Q3: Do expert forecasts converge or diverge across countries or sectors of employment, either on the Q-sort or on Delphi answers?

H3. Expert forecasts will diverge across countries and across sectors of employment in both the Delphi and Q-sort techniques. Assumption: Major actors in Northeast Asia (minus the U.S.) will have shared pessimism on the prospect of multilateral security cooperation, but will run counter to judgements provided by their U.S. counterparts, since they are geographically and emotionally closer to the issue at hand. Sectors of employment will also diverge in their answers: Academics and military will be pessimistic; Think tanks and policymakers will be optimistic.
Assessment: False. There was no significant convergence or divergence of answers that could be tied to a respondent’s state or sector of employment.

Research Question 3 pivots from using the outcomes of the Delphi and Q-sort to determine the future of multilateral security cooperation around the DPRK issue. Instead, the questioning turns the lens on the experts themselves. Using Q-methodology, this study found no significance in traditional variables affecting the responses of the 19 participants in Round 3. Respondents did demonstrate consensus on shared values regarding level of impact, such as whether or not militarized involvement would have a positive or negative effect on the CVD of North Korea. However, factor groups could not be labeled significantly based on traditional variables such as state or sector of employment. A deeper analysis of this data can be found in Chapter 7.

5.2.4 Methodological Comparisons

Q4: Do expert forecasts from this research project differ significantly from those produced by the NSI Team ViTTa report?

H4. Expert forecasts from this research project will differ significantly from those produced by the ViTTa report:

H4(1). Forecasts from this research project will be more precise.
Assumption: A greater number of participants are solicited and probabilities are included in their estimates, leading to greater precision in forecasts.

Assessment: H4 False and H4(1) True. The forecasts from both the NSI Korea Strategic Outcomes ViTTa report and this study were in line with each other. However, this study produced a rich and well-populated set of quantitative and qualitative forecast data.
The ViTTa survey did not ask for quantitative data and had less than half of the number of respondents.

The key questions that were posed to SMEs in the ViTTa Korea Strategic Outcomes Report were, by design, also posed by this study. These questions are presented below, with answers derived from both research studies.

*Under what regional and domestic political, economic and social conditions would it be possible to achieve a complete and verifiable denuclearization of the DPRK without resorting to militarized conflict?*

The ViTTa survey had 30 experts respond to this question and summarized and compiled the responses in a 43-page report summarized in chapter 1.1.1. The most influential conditions towards this policy goal as derived from the ViTTa research, presented in order of number of SMEs (of at least three) who proposed such conditions, are:

1) Significant reassurances are provided to Kim Jong-un that final, fully verified denuclearization (FFVD) will not threaten the security of his regime (8 SMEs proposed);
2) The U.S. and China fully commit to and cooperate on offering the DPRK economic, political, and security assistance and guarantees, (6 SMEs proposed);
3) The U.S. commits to a multilateral approach that incorporates key regional actors (i.e., DPRK, U.S., ROK, China, Japan, and Russia) to work towards a broader Asian Pacific regional security architecture (6 SMEs proposed);
4) The DPRK is acknowledged as a member of the international community (5 SMEs proposed);
5) Regime change occurs in the DPRK (e.g., peaceful coup occurs within the DPRK; Kim Jong-un suddenly dies and there is an ascension of figures dependent on China or the ROK;
6) Economic development is promoted in the DPRK beyond Pyongyang and the Kim regime, (3 SMEs proposed), and;
7) U.S.-ROK military exercises are reduced or terminated (3 SMEs proposed).

For comparison, the results from this study demonstrate a median probability of 10% of this scenario of denuclearization without militarized conflict occurring by 2040, with conditions provided by the 40 SMEs who answered this study’s first-round Delphi survey narrowed down to just two key conditions:

1) Regime change in North Korea, brought about by death of Kim, a coup, major economic/humanitarian crisis (conditional statements 15, 27, 28 & 32; 20 SMEs proposed), and;
2) The U.S. leads an initiative to normalize diplomatic relations with North Korea via meaningful 1:1 negotiations, ensuring the DPRK of the survival of its regime (conditional statements 1, 2, 10 & 14; 16 SMEs proposed).

More useful, however, are the Q-sort survey results. These have identified the conditions with the most positive impact on the CVD of North Korea as condition #2 above (see Chapter 7). These results have great policy implications for having such precise direction in terms of number of SMEs who agree such condition would lead to the stated goal of denuclearizing North Korea without militarized conflict, as well as a probability indicator of the likelihood of such event.
What are the prospects for revival of regional cooperation regarding North Korean nuclear/missile proliferation, either ad-hoc along the lines of the Six Party Talks, or more institutionalized, such as a nuclear weapon free zone or a Regional Nonproliferation Regime (RNR)?

Do experts anticipate any compatibility on key multilateral security cooperation constructs despite sociocultural barriers such as historical, territorial, and other long-standing disputes between the actor states?

Similarly, the SME answers from the NSI Korea Strategic Outcomes ViTTA report to this question indicate regional cooperation would depend upon diplomatic relations with North Korea being normalized. It would also depend on North Korea being given security reassurances from the international community. The ViTTa responses were summarized in six pages of a 28-page document of compiled answers from 18 SMEs.

This dissertation did not specifically ask SMEs about the prospects of revival of regional cooperation, but instead left the conditions that could lead to the stated policy goal of complete verifiable denuclearization of North Korea up to the SMEs to produce. Multilateral and/or regional cooperation on this issue were produced as the following conditional statements:

4. The international community increases economic sanctions against North Korea
7. Regional leaders in Northeast Asia collaborate to meaningfully negotiate with North Korea
8. North Korea is ensured by the international community of the security and survival of its regime
20. Regional leaders in Northeast Asia cooperate on military action to denuclearize North Korea

Interestingly, nonproliferation regimes such as the NPT (addressed by experts at length in the ViTTa) were not mentioned at all by SMEs in the Delphi study as conditions that could lead
to CVD of North Korea. In regards to the above statements, they were also not highly scored in the Q-sort as impactful in a positive way, only having a “Somewhat Positive” effect on the policy goal, with the exception of condition #7, which received a “Very Positive” rating, on average. Overall, one could conclude the leading question posed by the ViTTa is not significantly relevant to any policy decision that could impact the CVD of the DPRK.

**H4(2).** Forecasts from this research project will be more pessimistic.

Assumption: *Non-U.S. experts in regional actor states have experience assessing and evaluating the presented issues on a day-to-day basis since they live in-region; they are acutely aware of the challenges of cooperation that U.S. experts may view with a more optimistic lens common to Americans.*

**Assessment:** False. This hypothesis was developed under the assumption that an expert’s state of identification would affect the validity of expert opinions. This research has demonstrated that some demographic variables of SMEs are more relevant than others when attempting to predict their biases – such as employment sector, rather than state.

**H4(3).** Forecasts from this research project will provide more nuanced information that could be helpful to the U.S. government in future Northeast Asia security policymaking. Assumption: *This study will contain evaluations of the role and perception of the U.S. from SMEs in actors involved in the region, rather than only American SMEs, which policymakers can use to craft policy that will yield better responses from regional actors.*

**Assessment:** True, but the assumption is inaccurate. Numerical probabilities and knowing how impactful certain conditions could be on a stated policy goal could be
considered more concise and helpful to busy policymakers than lengthy written summaries of expert opinions on the issue. However, as expressed by the H4(2) finding, this study shows that the traditional variables for identifying SMEs – state, in particular—do not necessarily indicate a prediction of bias. This means policy crafted based on a diversity of SME opinions based on national identification, while preferable, would not necessarily yield “better” responses than opinions solicited solely from one country’s experts. On the contrary, as described more below, the results from this thesis show that a SME’s sector of employment is more important to diversify when soliciting forecasts.
6.0 Scenario Analyses

As discussed, panelists in this study were presented in February 2020 the first round with three plausible futures of the North Korea nuclear problem (italics included):

**SCENARIO A:** Complete, Verifiable Denuclearization (CVD) 
*WITHOUT MILITARIZED CONFLICT*

**SCENARIO B:** CVD AS A RESULT OF MILITARIZED CONFLICT

**SCENARIO C:** NORTH KOREA IS ALLOWED TO MAINTAIN A LIMITED NUCLEAR ARSENAL

These scenarios were selected by the author based on her extensive knowledge of the situation presented and plausible futures of the problem. Understanding that rival scenarios might exist outside of the three she hypothesized, this study collected rival hypotheses from panelists as part of the survey. This left survey respondents with optional blank scenarios “D,” “E” and “F” for them to populate with their own hypotheses. This experiment resulted in 47 additional scenarios put forth by panelists, and four unique scenarios (E1 and E2 are slight variations of the same scenario, “North Korea Collapses”):

**SCENARIO D:** THE STATUS QUO CONTINUES (20)

**SCENARIO E1:** NORTH KOREA COLLAPSES, LEADING TO DENUCLEARIZATION (5)

**SCENARIO E2:** NORTH KOREA COLLAPSES AND THE ASSUMING POWER RETAINS NUCLEAR CAPABILITY (9)

**SCENARIO F:** AN AGREEMENT IS REACHED WITH NORTH KOREA TO EITHER PLACE LIMITS ON EXPANSION OF ITS NUCLEAR
Panelists were asked to enter into the survey the probability of each scenario happening before 2040, which would be 20 years from the start of the experiment. They were also asked to provide reasoning behind their forecast. For each scenario, panelists were asked to provide statements on the conditions that would lead to that particular scenario happening. This design was intended to answer H1 & H2 of the research experiment:

H1. SMEs assess a low likelihood (<50%) of a revival of regional security cooperation, be it ad-hoc or institutionalized.

H1(1). Any type of cooperation would have to be led by the U.S.

Assumption: The U.S. is the most powerful actor and has the greatest interest in a non-nuclear North Korea.

H2. Experts reach consensus that there is <50% likelihood of compatibility among Northeast Asian actors around the key multilateral security cooperation constructs provided.

Assumption: Long-standing sociocultural barriers cannot be overcome in the next decade and will prevent cooperation from going beyond the bilateral level.

Conditional statements were collected for the Q-sort experiment, listed in section 5.1.2.1 of this thesis; probabilities and reasoning are summarized in the following sections.

Panelists who provided additional scenarios D-F were also asked at the time of the survey to input probabilities and conditional statements for those scenarios as well. This is so the data could be included in the analysis of round 1 results as well as in the following rounds of the experiment.
Bottom line: There was a lot of data collected for this experiment! This is why the data set produced from this study is an incredible source of information on the North Korea problem, and is arguably one the most important deliverables of this research.

The following sections analyze the responses by scenario to demonstrate the likely way future research outcomes on policy forecasting could be communicated to policymakers in an easy-to-digest format. Following each analysis are breakdowns of the data by respondent country and sector of employment (including informed public) to answer H3: Expert forecasts will diverge across countries and across sectors of employment in both the Delphi and Q-sort techniques.

6.1 Scenario A: Cvd Without Militarized Conflict

SCENARIO A: Complete and verifiable denuclearization of North Korea without resorting to militarized conflict
The median expert forecast for Scenario A was a 10% probability before 2040 (40 respondents). Though this scenario was unsurprisingly rated the most desirable of all (31, or 78% rated “Very Desirable”) since it resulted in the policy goal of CVD without militarized conflict, SMEs saw this scenario the least likely of the three. Reasoning given from respondents near the median were that the North Korean leader is unlikely to give up nuclear weapons unless there was an internal change (e.g. due to a coup or death of Kim Jong Un). Those who rated the scenario probable (50% or over) attributed their forecast to either a probability of Kim’s death before 2040 or the probability a negotiated agreement could be reached that would ensure regime survival. Seven respondents responded that a multilateral initiative would be a necessary condition for CVD without military conflict.
6.1.1 Analysis by Country

Table 6.1.1 Expert Responses to Scenario A: Analysis by Country

<table>
<thead>
<tr>
<th></th>
<th>China</th>
<th>Japan</th>
<th>Russia</th>
<th>South Korea</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Median</strong></td>
<td>7.5% [0-20]</td>
<td>10.0% [0-70]</td>
<td>9.5% [0-41]</td>
<td>14.5% [0-80]</td>
<td>10.0% [2-60]</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>8.8%</td>
<td>18.1%</td>
<td>13.0%</td>
<td>27.5%</td>
<td>16.0%</td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>8.5</td>
<td>23.9</td>
<td>14.2</td>
<td>30.2</td>
<td>17.5</td>
</tr>
<tr>
<td><strong>n</strong></td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>8</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 6.1.2 Public Responses to Scenario A: Analysis by Country

<table>
<thead>
<tr>
<th></th>
<th>China</th>
<th>Japan</th>
<th>Russia</th>
<th>South Korea</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Median</strong></td>
<td>41.0% [20-40]</td>
<td>20.0%</td>
<td>N/A</td>
<td>15.0%</td>
<td>20.0% [2-60]</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>38.2%</td>
<td>20.0%</td>
<td>N/A</td>
<td>15.0%</td>
<td>23.4%</td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>17.9</td>
<td>N/A</td>
<td>N/A</td>
<td>23.4</td>
<td></td>
</tr>
<tr>
<td><strong>n</strong></td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

Experts did not differ noticeably in their opinions as separated by state, though a close look at the data shows South Koreans were slightly more likely to view the peaceful CVD of North Korea as more probable than their regional counterparts. South Korea also had the largest range and standard deviation in expert responses. China was the least optimistic and had the smallest range and standard deviation, of just 20 and 8.5 respectively, compared to South Korea’s range of 80 and SD of 30.2. One Chinese expert (think tank) that gave Scenario A a 5% probability stated, “As a paranoid state, North Korea is obsessed with an independent nuclear deterrent capability.” A South Korean expert (also think tank) who gave A just a 1% probability justified their response, questioning the likelihood any denuclearization would be verifiable: “It's not likely that NK will agree to denuclearize within 20 years absent major policy shifts from either or both sides. Also, even if NK agrees to denuclearize, it's extremely unlikely that it will be in a verifiable way. Also, sanctions will not pressure NK enough to change its behavior.” The South Korean respondent on
the other end of the spectrum though, assigning 80% probability, stated that North Korea values survival over nuclear weapons. But the respondent stressed that this scenario would depend on, “Secure patient dialogue and trust with neighboring powers, especially the United States.”

The Chinese and U.S. public varied quite a bit from the experts as compared to other scenarios, with the U.S. public assigning 10% more likelihood and Chinese public a 33.5% higher probability of a peaceful CVD of North Korea than the experts. One U.S. public respondent assigned a 60% probability to Scenario A, stating, “NK is softening its hardline position and as their leader ages he's going to want to be remembered fondly by his people and the world to stroke his ego.” A Chinese public respondent who also rated 60% probability for A provided this justification, suggesting the pressure will come from the People’s Republic of China (PRC): “As PRC rises on the global stage, North Korea will grow as an ugly younger brother and thorn in their side for global politics. PRC will need to rectify the issue. The question is how fast will PRC grow economically and how much stress PRC will put on global diplomacy.” The Japanese and South Korean public views are interesting but not significant due to the low number of respondents. The Chinese informed public seem a lot more optimistic regarding the possibility of CVD with a median 41% probability; Japanese and U.S. public only 10% higher than the SME predictions.

Chinese and Russian SMEs’ reasons for the probabilities were very similar and centered around the characterization of the Kim regime as untrustworthy, and conditions given for Scenario A were U.S. recognition of North Korea and guarantee of the regime. For these reasons, respondents assessed that was not very likely to happen by 2040. U.S., Japanese and South Korean experts’ reasoning focused more on the lack of willingness for North Korea to give up their nuclear weapons under any condition, with the exception of a regime change. U.S. and Chinese public
both suggested their own respective countries would need to take the lead on the issue, unless internal circumstances led to a DPRK regime change.

For Scenario A, among SMEs, country did not seem to be a source of major bias. The public was more optimistic about Scenario A occurring, with Chinese public especially assigning a much greater likelihood than their SME counterparts.

### 6.1.2 Analysis by Sector

<table>
<thead>
<tr>
<th>Scenario A</th>
<th>Academic</th>
<th>Think Tank</th>
<th>Government</th>
<th>Military</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>10.0% [0-26]</td>
<td>9.0% [1-60]</td>
<td>6.5% [0-80]</td>
<td>50.0% [0-70]</td>
<td>20.0% [2-70]</td>
</tr>
<tr>
<td>Mean</td>
<td>11.9%</td>
<td>17.2%</td>
<td>14.5%</td>
<td>37.0%</td>
<td>30.2%</td>
</tr>
<tr>
<td>SD</td>
<td>8.5</td>
<td>19.9</td>
<td>23.6</td>
<td>30.3</td>
<td>18.9</td>
</tr>
<tr>
<td>n</td>
<td>13</td>
<td>13</td>
<td>10</td>
<td>5</td>
<td>14</td>
</tr>
</tbody>
</table>

Responses for Scenario A analyzed by sector of employment showed more variation than when analyzed by country. The public and military were, on average, the most optimistic sectors regarding the probability of CVD without conflict; but the military also had the highest standard deviation. Some of the military respondents who rated a high probability either attributed their forecast to the possibility of a regime change or the guarantee from the international community to ensure Kim’s regime survival. A military respondent (Japanese) who assigned 70% probability to Scenario B stated, “Kim's hope is to ensure survival, and if it can be guaranteed and convincing, it will be possible.” Another military respondent that rated 55% stated, “If Kim Jung Un died and a new regime came in, this could be possible. I estimate that the likelihood of Kim's death before 2040 is about 50 percent.”
The public respondents who rated 50% or higher probability reasoned a more cooperative and multilateral global landscape would also arise in the next 20 years. Though their opinions varied on whether it would be China, South Korea or the United States that lead the cooperation efforts (note: those opinions were not visibly dependent on the respondents’ country of origin). One member of the public (Chinese) gave justification for their 50% probability, “That totally depends on whether or not a new and more cooperative and multilateral global landscape will be established in the future.” A public respondent (U.S.) who gave just 5% probability of A stated, “North Korea does not seem likely to denuclearize without outside intervention.”

The government remained, perhaps ironically, most pessimistic about the possibility of CVD happening without militarized conflict – ironic because one might think that sector would be least likely to advocate for a militarized effort. Reasoning for the low probabilities provided by government respondents also indicated that multilateral cooperation would be necessary, but that such a community was unlikely to arise in the next 20 years. This is almost a direct contrast to the military and public opinion on the same issue. One government respondent (U.S.) gave the following reasoning: “absent some fundamental and profound change in NK’s national government, that government (with or without Kim) is not going to see the international situation that would guarantee the survival of that NK regime.”

6.2 SCENARIO B: CVD AS A RESULT OF MILITARIZED CONFLICT

SCENARIO B: Complete and verifiable denuclearization of North Korea as a result of militarized conflict
The median expert response to Scenario B was 15% probability, just 5% higher than CVD without militarized conflict. Respondents rated a lower probability because they assess that the region will avoid military conflict at all costs. One SME writes, “None of the nations involved desire an open military conflict on the Korean peninsula. North Korea's possession of nuclear weapons is for deterrence purposes, and they do not possess these with intention to launch a first-strike offensive. The United States and South Korea clearly have not deemed the current situation worth resorting to military conflict, or they would have likely done so by now.”

On the opposite (and less popular) spectrum, SMEs backed up their high probability estimates with the likelihood of a miscalculation and unpredictability of the regime leader. One who rated a 70% probability of a military conflict answered, “North Korea is on a timeline to complete miniaturization of nuclear warheads as well as the delivery vehicle (ICBMs and SLBMs in particular). If nothing changes North Korea will possess numerous ways to target the U.S. with nukes in the near future. In that case, the most likely option is to denuclearize North Korea with
military means,” which suggests a first strike (nuclear and/or conventional) attack to destroy the DPRK’s nuclear capability.

This was rated as the most undesirable scenario, with 24 respondents (63%) rating “Very Undesirable” and 11 (29%) rating this scenario “Undesirable.” One of the SMEs who gave this scenario a “Very Undesirable” rating attributed their reasoning to the following: “Military conflict with a paranoid, desperate, nuclear-armed North Korea is highly risky for all involved parties. Other than achieving complete and verifiable denuclearization, the human devastation that such a conflict could bring is considered entirely unacceptable by all parties in Northeast Asia. The United States, in particular, has shown a preference for status quo in the past, not military conflict on the Korean Peninsula.”

6.2.1 Analysis by Country

Table 6.2.4 Expert Responses to Scenario B: Analysis by Country

<table>
<thead>
<tr>
<th>Country</th>
<th>China</th>
<th>Japan</th>
<th>Russia</th>
<th>South Korea</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>14.0% [5-50]</td>
<td>15.0% [1-50]</td>
<td>17.5% [5-30]</td>
<td>10.0% [0-70]</td>
<td>12.5% [1-30]</td>
</tr>
<tr>
<td>Mean</td>
<td>20.8%</td>
<td>18.5%</td>
<td>18.7%</td>
<td>22.4%</td>
<td>14.9%</td>
</tr>
<tr>
<td>SD</td>
<td>20.5</td>
<td>17.0</td>
<td>10.0</td>
<td>27.1</td>
<td>9.5</td>
</tr>
<tr>
<td>n</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>16</td>
</tr>
</tbody>
</table>

Table 6.2.5 Public Responses to Scenario B: Analysis by Country

<table>
<thead>
<tr>
<th>Country</th>
<th>China</th>
<th>Japan</th>
<th>Russia</th>
<th>South Korea</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>20.0% [10-70]</td>
<td>10.0%</td>
<td>N/A</td>
<td>0.0%</td>
<td>20.0% [10-40]</td>
</tr>
<tr>
<td>Mean</td>
<td>29.0%</td>
<td>10.0%</td>
<td>0.0%</td>
<td>20.0%</td>
<td>12.3</td>
</tr>
<tr>
<td>SD</td>
<td>17.9</td>
<td>N/A</td>
<td>N/A</td>
<td>12.3</td>
<td>5</td>
</tr>
<tr>
<td>n</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>
When asked about the probability of militarized conflict leading to CVD of North Korea, expert responses were just slightly less probable than with Scenario A. The average being a median prediction of 15%. With the exception of three outliers that rated the probability 50% and one South Korean respondent who rated a 70% probability (due to the expectation North Korea will successfully build a nuclear weapon and prompt a war in the region), SMEs rated this question similarly when compared across state, within a few percent difference. Chinese and American informed public seemed to think the prospect of CVD more likely to happen under militarized force than the experts did, although they still rated it less likely than Scenario A, which proposed CVD by non-militarized means. An American public respondent who rated Scenario B at 40% probability answered, “Based on history, I feel like the world is currently in a game of chicken with North Korea. All are waiting for North Korea to make the first move.” The Japanese public surveyed saw the likelihood of militarized conflict 5% less likely than their SME counterparts, with the explanation that, “It's risky (sic) for both countries than continuing status quo.”

Russian experts answered the highest probability amongst the states, at 17.5%, but had the lowest range, of just 25. Reasoning provided stated that war would be likely avoided by regional actors at all costs. However, the Russian experts stated that provocation by North Korea could not be ruled out. In contrast South Korean SMEs forecasted a median 10% probability with a range of 70 and the highest standard deviation (27.1). Many South Korean respondents largely rated this scenario as the least likely. The reason being that no one wants a militarized conflict in the region, and the neighboring countries will avoid it at all costs. That fact was backed up by the question on desirability; only two respondents rated Scenario B as “Desirable” (one South Korean and one Russian, both from think tanks), with just one providing reasoning, as follows: “Through military
options, the U.S. can ensure a transparent denuclearization and eliminate other WMD as well. The option has a high chance of a forceful regime change that can liberate the North Koreans.”

Overall, as with Scenario A, country did not seem to have a significant bias on forecasts for Scenario B.

### 6.2.2 Analysis by Sector

#### Table 6.2.6 Scenario B Analysis by Sector of Employment

<table>
<thead>
<tr>
<th>Scenario B</th>
<th>Academic</th>
<th>Think Tank</th>
<th>Government</th>
<th>Military</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>12.5%</td>
<td>25.0%</td>
<td>11.0%</td>
<td>15.0%</td>
<td>12.5%</td>
</tr>
<tr>
<td></td>
<td>[2-50]</td>
<td>[1-70]</td>
<td>[1-30]</td>
<td>[10-50]</td>
<td>[0-70]</td>
</tr>
<tr>
<td>Mean</td>
<td>15.2%</td>
<td>24.9%</td>
<td>13.0%</td>
<td>22.5%</td>
<td>19.3%</td>
</tr>
<tr>
<td>SD</td>
<td>12.6</td>
<td>19.9</td>
<td>9.3</td>
<td>18.9</td>
<td>17.9</td>
</tr>
<tr>
<td>n</td>
<td>12</td>
<td>12</td>
<td>10</td>
<td>4</td>
<td>14</td>
</tr>
</tbody>
</table>

Again, analysis by sector shows a much more noticeable difference in opinion on the future of the North Korea problem. Where the government was again the most skeptical this scenario would take place (just 11% probability), with the public and academic sectors not far off (12.5% respectively), respondents working in think tanks forecasted a significantly higher probability: 25%. Respondents from think tanks estimated a higher probability for Scenario B than those of other sectors, but also had the highest standard deviation.

Overall, there was a general sense that the unpredictability of both the U.S. President at the time of the survey, Trump, and DPRK’s Kim Jung Un. In addition, unpredictability also shrouds North Korea’s continued nuclear pursuits. This reasoning led many respondents to the conclusion that there is a high likelihood of either (a) miscalculation leading to an escalatory spiral, or (b) a direct threat to the U.S., leading to a militarily-forced denuclearization of the DPRK, most often by the United States. For example, one academic (U.S.) who gave Scenario B a 15% probability
stated, “This is still highly unlikely due to the preference for status quo stability, but the likelihood is higher due to the potential for miscalculation and unintended escalation from a lower-level North Korean provocation.” However, there was great variability in the forecasts made based on that unpredictability: Those in think tanks who provided such reasoning averaged responses upwards of 30-50%, whereas all other respondents provided similar reasoning, but with a lower probability still: just 10-20%, on average. Those in the government sector are traditionally considered more hawkish when it comes to military action, but they were the most conservative in their probability forecasts on this question. The most likely reasoning being that none of the major powers in the region, nor the DPRK, want war and will take all costs to avoid it. A government respondent (Japanese) similarly reasoned, “The cost of a militarized conflict is so high that the both North Korea and the international community want to avoid it.”

As with Scenario A, sector of employment again seems to have an influence on the overall weight of the forecast. This trend could have important implications regarding the selection of panelists from which policymakers draw their forecasts.

**6.3 Scenario C: North Korea is Allowed to Maintain a Limited Nuclear Arsenal**

Scenario C was interpreted very differently by SMEs and resulted in a median probability of 50% by the 39 respondents to this question. The ambiguity in this question was somewhat intentional, as the author wanted to elicit answers pertaining to multilateral cooperation without leading the respondents. However, this ambiguity – especially around the term “allowed” – resulted in some SMEs responding with a probability a multilateral agreement would be formed to “allow” the DPRK to formally become a nuclear weapon state (those who responded with 50%
likelihood or below). Other SMEs interpreted the word “allow” to mean the international community would let the status quo to continue, informally accepting DPRK’s continued nuclear weapons production without formal restraint (those who responded above 50% likelihood). The results below, therefore, include those calculated solely from Scenario C but also an optional Scenario D, “The Status Quo Continues,” which 17 respondents added as an extra scenario when given the option in the first-round Delphi survey.

**Figure 6.3.3 What is the probability of D occurring by the year 2040?**

![Histogram for "What is the probability of C occurring by the year 2040? - Probability (%)"

The median expert response to Scenario C was a 50% probability of occurrence by 2040. As stated above, answers were split between those who interpreted “allowed” in terms of a formal or informal agreement in the international community for North Korea to maintain nuclear weapons. A SME who responded with a 10% probability gave the reasoning, “It is unlikely the international community ‘allows’ North Korea to maintain its nuclear arsenal, however a failure to negotiate a denuclearization agreement by 2040 may lead to the acceptance of this scenario.” An opposite
example is of a respondent who forecasted a 90% probability, saying, “North Korea will likely maintain its nuclear arsenal by 2040 because the international community (mainly the U.S.) is not willing to take any risks that would bring about military conflict nor is it willing to provide the concessions required for North Korea to be satisfied. So, NK will be ‘allowed’ to maintain its arsenal, though it's not ideal.” However, some respondents did see the possibility of negotiations taking place in order to limit the already-expanding arsenal. For example, one SME who gave a probability of 80% stated, “North Korea is still likely to be under the Kim regime in 20 years. Kim clearly sees nuclear weapons as safeguarding his rule. He is not going to give them up absent a significant transformation in his relationship with Washington, which seems unlikely. But North Korea has declared the strategic objectives of its nuclear weapons program have been met, so negotiations the (sic) limit further expansion of the program are likely.”

Most experts rated this scenario as either “Undesirable” (18, or 46%) or “Very Undesirable” (21%), largely because any scenario where North Korea maintains nuclear weapons is not viewed as a positive for the international community. One SME states, “This situation is undesirable since NK maintains its nuclear weapons and continues its human rights abuses, though less undesirable than a nuclear war. The U.S. and international community cannot politically allow NK to maintain its nuclear weapons, in a de facto and de jure way, because this may cause other states like South Korea, Japan, and Taiwan to seek nuclear weapons.” Those who rated this scenario as “Desirable” reasoned that this was the most likely scenario and better than the alternative of unrestrained expansion – or worse – war. “This really depends on what you compare it to. Compared to a war with North Korea, or an unchecked nuclear program, this is desirable.” Also, “Certainly better than an unconstrained growth of DPRK arsenal that would be a direct threat to U.S. Better than war.”
Overall Scenario C was the second-least desirable next to Scenario A, but most likely of all three scenarios.

6.3.1 Analysis by Country

<table>
<thead>
<tr>
<th>Country</th>
<th>Median (Range)</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>55.0% (30-87)</td>
<td>56.8%</td>
<td>23.7</td>
<td>4</td>
</tr>
<tr>
<td>Japan</td>
<td>45.0% (10-60)</td>
<td>38.3%</td>
<td>19.4</td>
<td>6</td>
</tr>
<tr>
<td>Russia</td>
<td>40.0% (15-80)</td>
<td>41.2%</td>
<td>26.2</td>
<td>5</td>
</tr>
<tr>
<td>South Korea</td>
<td>50.0% (5-95)</td>
<td>53.6%</td>
<td>53.6</td>
<td>7</td>
</tr>
<tr>
<td>U.S.</td>
<td>55.0% (10-95)</td>
<td>56.2%</td>
<td>26.4</td>
<td>16</td>
</tr>
</tbody>
</table>

Table 6.3.8 Public Responses to Scenario C: Analysis by Country

<table>
<thead>
<tr>
<th>Country</th>
<th>Median (Range)</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>55.0% (30-86)</td>
<td>56.5%</td>
<td>25.9</td>
<td>5</td>
</tr>
<tr>
<td>Japan</td>
<td>70.0%</td>
<td>70.0%</td>
<td>N/A</td>
<td>1</td>
</tr>
<tr>
<td>Russia</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>South Korea</td>
<td>30.0% (5-95)</td>
<td>30.0%</td>
<td>35.4</td>
<td>1</td>
</tr>
<tr>
<td>U.S.</td>
<td>60.0% (5-95)</td>
<td>56.2%</td>
<td>35.4</td>
<td>5</td>
</tr>
</tbody>
</table>

Scenario C scored the highest probability on average, with a 50% median. Medians by state did not stray far from the aggregate. The one exception to that was Japan, with a median 70% forecast that North Korea would be allowed to maintain a limited nuclear arsenal. South Korea had the largest range and standard deviation again, of 90 and 28.8, respectively. The wide ranges for all states can be attributed to the dual interpretations of the question; as described in Chapter 4.1.2. Many of the respondents interpreted Scenario C as “the status quo maintains,” rather than the author’s intent, which was a multilateral agreement which might be put in place that allows North Korea to legally maintain its arsenal. Those who interpreted the question as the former
scenario rated probabilities much higher than those who interpreted it as the latter. In future questionnaires, the two scenarios might be separated. In any case, the public was not significantly different than the SMEs in their predictions and gave similar reasoning. This contributed to the higher probabilities that the likelihood a militarized CVD of the DPRK will not happen, nor would the country be persuaded to give up nuclear weapons by other means—namely, the continuation of the status quo is the most likely scenario of the three. Respondents from each country—including the public—echoed that though the international community would hesitate to openly accept the DPRK’s nuclear status, the most likely scenario is that the state will continue with its nuclear pursuits without “official” approval nor backlash. One public respondent (Japanese) stated, “It's not ‘officially’ going to happen but the current situation is practically this scenario and o (sic) believe it'll last for some time.” Russian SMEs rated this scenario the lowest probability compared to the estimates of other countries, although many said in the comments that it was the most likely of the three scenarios. Those who rated this scenario more unlikely did so for all three scenarios. For example, one Russian think tank panelist rated Scenario C at 15%, saying “Generally the international community would not tolerate such a scenario but if attempts to denuclearize North Korea via negotiation still fail by 2040 there may come a U.S. administration that will be willing to accept such a scenario.” This panelist rated A at 10% and B at 15%.

### 6.3.2 Analysis by Sector

<table>
<thead>
<tr>
<th>Scenario C</th>
<th>Academic</th>
<th>Think Tank</th>
<th>Government</th>
<th>Military</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>50.0% [10-80]</td>
<td>51.0% [10-95]</td>
<td>32.5% [5-60]</td>
<td>80.5% [50-95]</td>
<td>40.0% [1-95]</td>
</tr>
<tr>
<td>Mean</td>
<td>50.7%</td>
<td>56.8%</td>
<td>33.5%</td>
<td>76.5%</td>
<td>48.3%</td>
</tr>
<tr>
<td>SD</td>
<td>22.2</td>
<td>26.8</td>
<td>16.8</td>
<td>18.9</td>
<td>30.9</td>
</tr>
</tbody>
</table>
n | 12 | 13 | 10 | 4 | 13

Sector again shows the most variance, with respondents from military estimating a significantly higher median probability for Scenario C of a DPRK maintaining a limited nuclear arsenal than those of other sectors (80.5%), with a comparatively lower range (45) and standard deviation (18.9). A South Korean military respondent who assessed an 80% probability to Scenario C stated, “Practically, no option is preferred to North Korea's maintenance of limited nuclear capability.” Their reasoning followed: “1. U.S. is disinclined to using the military attacks to resolve North Korea's nuclear weapons problem; 2. South Korea does not prefer a preemptive war against North Korea due to the North's nuclear buildup; 3. China thinks the current equilibrium is preferable.” A U.S. military respondent who forecasted Scenario C at 95% answered similarly: “I assess that the DPRK will not willingly give up its nuclear arsenal and that sane decision makers in the U.S. will not chose to use military force to accomplish this due to the high cost. There is a possibility of miscalculation which leads to a war no one wants which then may result in denuclearization of the North. I put the odds at 95% rather than 90% because while there may be a 10% chance of a full-blown military conflict, it is not clear to me that U.S. forces will succeed in overrunning North Korea and eliminating their arsenal.”

In contrast, a government respondent (Japanese) who rated a 20% possibility that North Korea would be allowed to maintain its nuclear arsenal stated, “The international (sic) community will hesitate to admit North Korean nuclear arsenal openly.” A South Korean government respondent justified their 5% probability assessment with doubt in the trustworthiness of North Korea, as follows: “It is not very likely the U.S. and the western leaders agree that certain conditions given to the NK would be observed by NK.”
As in the preceding scenarios, the differences between respondents when divided by sector was more significant than when analyzed by country.
As described previously, all panelists were provided the opportunity to write up to three additional likely scenarios involving the CVD of North Korea they forecast as probable before the year 2040. Out of the 55 SME and public respondents, there were 21 (18 SME + 3 Public) who described various scenarios that could be summarized as “the status quo continues.” For example, a Japanese Think Tank panelist wrote, “The international community will continue pressuring North Korea to give up its nuclear weapons, but North Korea will maintain the weapons.” A Russian Government respondent stated as an additional scenario, “Continued murky situation, in which protracted negotiation with virtual nuclear North Korean is going on.” Some respondents described the scenario frankly: “Remain the same situation, no one knows how many nuclear weapons North Korea has and no way to check,” wrote a respondent from Chinese Academia.
These types of responses were categorized by the author as “The status quo continues,” and labeled as Scenario D regardless of what letter the respondents listed in their survey answer.

Analyses of the data for the additional scenarios D, E and F were approached differently from the first three scenarios since respondents self-selected into the scenarios as an additional option they found likely. Therefore, it was to be expected that the probabilities assigned would be much higher than the three scenarios provided initially. That being said, some interesting insights can still be obtained from the data.

The median expert response to Scenario D was a forecasted 61% probability of the status quo continuing. This scored the highest probability of all scenarios, even though many respondents considered Scenario C, “North Korea is allowed to maintain a limited nuclear arsenal,” and Scenario D, “The status quo continues,” the same scenario. Some of the reasoning provided included, “No breakthrough can be expected. No future U.S. presidents would repeat Trump's approach, and DPRK understands U.S. has not (sic) interest in military options,” from a think tank respondent (Japan) who gave this scenario an 80% probability. Another respondent (U.S., Military) who assigned a 91% probability said, “It's impossible to ‘de-nuclearize’ North Korea at any acceptable price. But Japan, South Korea, China and the U.S. will not be able to tell their populations that they ‘just have to live under the North Korean threat’, especially when we have experiments and tests underway that have proven the efficacy of boost-phase intercept. Destroying any potentially nuclear-tipped missile over North Korea is a wonderful deterrent by denial of any attempts by Kim to strike any country.” Even the respondent who rated this scenario with the lowest probability given by SMEs – 29% (Russia, Think Tank), stated “Endurance is a key characteristic of the North Korean regime.”
Most respondents rated this scenario as “Undesirable” (12) or “Very Undesirable” (3), though one curiously rated it as “Very Desirable.” Their reasoning was as follows: “The objective of ‘de-nuclearizing’ North Korea is to ensure the security of South Korea, Japan, the U.S., others. If denuclearization is impossible, the next step is to ensure they can never strike another nation. Hence, boost-phase intercept.” This respondent seems to imply that the status quo continuing would prompt technological advances by other countries, which could actually be seen as a positive. The majority of respondents supplied more intuitive reasoning for their “Undesirable” rating, such as: “NK’s continued development of nuclear capabilities is a serious potential threat to both regional and international stability. Stagnation is undesirable, but quite realistic. Progress requires leadership beyond what we have seen in key nations.”

### 6.4.1 Analysis by Country

#### Table 6.3.10 Expert Responses to Scenario D: Analysis by Country

<table>
<thead>
<tr>
<th></th>
<th>China</th>
<th>Japan</th>
<th>Russia</th>
<th>South Korea</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>80.0%</td>
<td>70.0%</td>
<td>60.0%</td>
<td>N/A</td>
<td>60.0%</td>
</tr>
<tr>
<td></td>
<td>[30-80]</td>
<td>[29-61]</td>
<td></td>
<td></td>
<td>[40-91]</td>
</tr>
<tr>
<td>Mean</td>
<td>80.0%</td>
<td>62.0%</td>
<td>50.0%</td>
<td>N/A</td>
<td>64.3%</td>
</tr>
<tr>
<td>SD</td>
<td>N/A</td>
<td>21.7</td>
<td>18.2</td>
<td>N/A</td>
<td>21.0</td>
</tr>
<tr>
<td>n</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>0</td>
<td>8</td>
</tr>
</tbody>
</table>

#### Table 6.3.11 Public Responses to Scenario D: Analysis by Country

<table>
<thead>
<tr>
<th></th>
<th>China</th>
<th>Japan</th>
<th>Russia</th>
<th>South Korea</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>64.0%</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>[1-70]</td>
</tr>
<tr>
<td>Mean</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>64.0%</td>
</tr>
<tr>
<td>SD</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>22.7</td>
</tr>
<tr>
<td>n</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>
Rather than look at the differences in probabilistic estimates between countries, since Scenario D was self-selected into, it is more interesting to see how many respondents from each country devised this scenario without prompt to be a possible outcome of the North Korea proliferation problem. “The Status Quo Continues” was proposed by U.S. panelists more than any other country, both public and SME. Even though U.S. probabilities of this scenario taking place before 2040 were not higher than any other countries’ respondents (except for South Korea, where no respondents proposed this scenario – perhaps because they assumed it was already encompassed as a possibility in Scenario C, perhaps because they saw it as unlikely), the topic seems to be more on the forefront of the U.S. panelists’ minds than other countries. It is important to take into consideration the fact that U.S. panelists may have picked up more on the nuances in the wording of Scenario C, “North Korea is allowed to maintain a limited nuclear arsenal,” prompting them to propose a continuance of the status quo as a different scenario.

6.4.2 Analysis by Sector

Table 6.3.12 Scenario D Analysis by Sector of Employment

<table>
<thead>
<tr>
<th>Scenario D</th>
<th>Academic</th>
<th>Think Tank</th>
<th>Government</th>
<th>Military</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>70.0%</td>
<td>55.5%</td>
<td>55.0%</td>
<td>90.5%</td>
<td>64.0%</td>
</tr>
<tr>
<td></td>
<td>[45-80]</td>
<td>[29-80]</td>
<td>[30-80]</td>
<td>[90-91]</td>
<td>[1-70]</td>
</tr>
<tr>
<td>Mean</td>
<td>65.0%</td>
<td>58.0%</td>
<td>55.0%</td>
<td>90.5%</td>
<td>64.0%</td>
</tr>
<tr>
<td>SD</td>
<td>18.0</td>
<td>19.9</td>
<td>18.7</td>
<td>0.7</td>
<td>22.7</td>
</tr>
<tr>
<td>n</td>
<td>3</td>
<td>6</td>
<td>7</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Breaking this scenario down by sector again yields much more interesting results. There were more respondents from think tank and government than other sectors. These respondents were also the most conservative in their forecasts. Even still, at 55.5% and 55.0% medians, respectively, this is the scenario both sectors found most likely among the four presented thus far,
with the second-most-likely again being Scenario C. The two military respondents were both U.S.
and both very similar in their estimates, at 90% and 91%. At least 2 panelists from each sector
proposed this scenario, indicating both that the author-intended meaning of Scenario C was not
ambiguous to all, and also that the North Korea situation staying at status quo is on everyone’s
mind.
7.0 North Korea Collapses

Another scenario both the public and SMEs inputted as an additional possibility is the scenario where various conditions lead to the collapse of North Korea. In analyzing the responses, though conditions leading to the collapse varied, the outcome of the collapse followed two trends with the author dividing scenario E into two sub-scenarios: E1 (leads to complete, verifiable denuclearization, n = 5) and E2 (assuming power retains nuclear capability, n=5). Due to the small n for each scenario the author did not break down analysis into country and sector as she did with previous scenarios, but the insights gleaned from analyzing the respondents’ self-selection into these additional scenarios and their reasoning provided are still worth exploring.

7.1 Leads to CVD

SCENARIO E1: North Korea collapses, leading to denuclearization.
Figure 6.5.1 What is the probability of E1 occurring by the year 2040?

The median expert response for the five who proposed the scenario of North Korea collapsing and leading to CVD was a 15% probability. It is notable that even though this scenario was thought of and proposed by these five panelists, all considered it equally as unlikely as Scenario B, “Complete and verifiable denuclearization of North Korea as a result of militarized conflict,” which also received a medial 15% probability from SMEs. Public was not included in the graphical statistical analysis for consistency with previous scenarios but it is worth noting that there was also one public respondent (China) who rated this scenario at a 15% probability, reasoning, “Government collapse from various factors (people's uprising, government in-fighting, internal coup-de-etat) (sic).” This falls in line with the reasoning from the SMEs, attributing the collapse to primarily reunification (and then denuclearization) or internal coup/economic collapse of the DPRK.

I have included all five SME scenario descriptions and reasoning provided below.
Scenario descriptions and reasoning (probabilities in parentheses):

- **(8%)** North Korea collapse leads to reunification; Unified Korea gives up its nuclear arsenal. Included in the probability of the peaceful denuclearization scenario. Most likely scenario for peaceful denuclearization is collapse of the Kim regime. But that is unlikely to occur by 2040. United Korea is more likely than not to abandon its nuclear weapons.

- **(10%)** North Korea regime collapse. Possible but not likely. China stops supporting North Korea regime; China and U.S. have built enough strategic trust to deal with the outcome.

- **(15%)** North Korea collapses and is denuclearized as part of unification with South Korea. Any type of maximum pressure campaign is unlikely to force Kim to change course. The regime is practiced in sanctions evasion and willing to allow the North Korea people to suffer a great deal of pain. At the same time, information about the outside world continues to reach North Koreans and an event like a pandemic or nuclear accident could cause the regime to fall.

- **(15%)** Widespread economic/social collapse or dislocation causes DPRK to lose control of its arsenal and proliferate to other regimes. Prior to the coronavirus, I did not consider this possibility as highly likely, but unlike a famine, it is more difficult to mitigate the threat to leaders or sensitive/secure locations with a contagion. The coronavirus infecting a large number of soldiers or leaders in the regime, and the lack of medical equipment would probably mean a higher number of deaths. Large numbers of dead or desertions would make it more difficult to secure facilities or ensure loyalty to the regime. However, militating against the
scenario would be the need to physically remove the weapons, which might be more difficult with the desire not to enter a quarantined zone.

- **(30%)** Internal collapse of the North Korean state and subsequent rapid reunification of the Korean Peninsula under the Republic of Korea, with ROK completely relinquishing all of the former DPRK's nuclear capability. The key to this is the probability of North Korean collapse. A North Korea should still be viewed as unlikely, but this scenario's probably is slightly higher because it's more likely that South Korea wouldn't keep North Korea's nuclear capability.

The desirability of this scenario varied a lot by respondent, ranging quite evenly from Very Undesirable to Very Desirable. The respondent who rated scenario E1 as “very desirable” provided reasoning for their scenario that the country was reunified, encouraging the justification, “No longer a DPRK nuclear threat. Reunified Korea. Unified Korea giving up nuclear weapons reduces the chance that Japan decides to acquire nuclear weapons.” The panelist that marked this scenario as “Very Undesirable” provided the reasoning that, “Chaos is always the enemy of progress. The proliferation of weapons would be very difficult to trace in this scenario.” The other respondent who marked “Undesirable” echoed that sentiment, adding the humanistic element: “Collapse due to accident or disaster would likely have a significant negative impact on the lives of North Koreans and, in the event of collapse, the risk of nuclear material being lost or stolen increases.”

This scenario was proposed by four U.S. respondents and one Chinese; likewise, by sector respondents were two think tank and three academia. It is worth noting that one think tank (South Korea) respondent provided the scenario description but did not make a probabilistic forecast. It seems the U.S. respondents considered the implosion of North Korea more than any other country
respondents. The particular respondents still found this scenario rather unlikely. One respondent noted that with the onset of the coronavirus, the implosion of the country seems more likely than previously estimated (though still just at 15%).

7.2 Assuming Power Retains Nuclear Capability

SCENARIO E2: North Korea collapses and the assuming power retains nuclear capability.

Figure 6.5.2 What is the probability of E2 occurring by the year 2040?

The median response for the five SME panelists who proposed this scenario was 8% probability. This scenario was forecasted even lower than Scenario A: CVD of North Korea without militarized conflict, which received the lowest rating of the originally proposed three
scenarios, at 10% probability by 2040. What is most intriguing that three of the five SME panelists who proposed this scenario were South Korean military with the other two being U.S. academia. There were two public respondents who proposed this as well, one from China who forecasted 6% and a U.S. respondent who forecasted 20%. Both public respondents proposed occupation by China as the scenario, but both reasoned the prospect of Chinese occupation would not be peaceful, practical, nor allowed by the international community.

**SME scenario descriptions and reasoning (probabilities in parentheses) follow below:**

- **(3%) North Korea becomes a protectorate of China.** When considering China's foreign policy and modern international politics, this scenario is very unlikely.

- **(5%) North Korea and South Korea become one state.** U.S., China, and Japan may not like the unification. 1. North Korea's regime is in an unstable situation; 2. Surrounding powers prefer to the regime change than the unification.

- **(8%) The Kim regime collapses, but the subsequent leaders of DPRK negotiate a more open federation without full unification, maintaining its nuclear ambitions for later bargaining power.** I could foresee the Kim regime collapsing, but the subsequent power struggle would be unlikely to encourage conciliatory leaders. The Kim regime collapse would need to be accompanied by some other event that exposed the weakness of the DPRK's position within North Korea without alerting the rest of the world to such failures. The subsequent regime would be desirous to secure something approaching unification without giving up too much. Some crisis in South Korea would also be necessary to make federation more palatable to the massive expense associated with unification.
• **(25%)** Internal collapse of the North Korean state and subsequent rapid reunification of the Korean Peninsula under the Republic of Korea, with ROK maintaining some of the former DPRK's nuclear capability. The Kim dynasty will be challenged to maintain its power in the face of internal and external pressures, and the ROK would face very strong pressure to not absorb the former DPRK's nuclear capability. Economic catastrophe, an empowered merchant/moneyed class, sudden death of Kim Jong Un, or unsuccessful transfer of power to Kim Jong Un's successor are all pressures that could lead to DPRK state collapse and rapid reunification led by the ROK. The ROK would then have to resist U.S. pressure to not absorb the former DPRK's nuclear capability, or change of preferences in the U.S.-ROK alliance could let the ROK absorb that nuclear capability. Even then, China and Japan would react strongly to such a move by the ROK.

• **(30%)** North Korean regime collapses and a third party controls nuclear weapons. The likelihood of North Korea's regime collapse is low. 1. Kim Jong Un's health condition is worsened; 2. Someone from Kim's family succeeds in the leadership; 3. U.S. or China controls North Korea's nuclear weapons with the consent of the new leadership.

Requesting respondents to rate the desirability of this scenario occurring and to provide their reasoning for their choice once again proved useful, as it resulted in descriptions of how panelists viewed different countries having different costs and benefits associated with the outcome. However, all of the answers provided should still be taken in context with the rest of the survey, emphasizing that understanding the qualitative along with the quantitative for this experiment is crucial. For example, a panelist who rated this scenario as desirable stated, “Maybe
the scenario is desirable for U.S. but not desirable for China if unified Korea is with U.S. side.” This was stated by a South Korean military respondent. On the flip side, one who marked “undesirable” reasoned similarly: “Surely this scenario is not desirable for U.S. and South Korea, but maybe desirable for China.” This was another South Korean military panelist. At face value, they both seem to be in direct contrast. However, when we look deeper into their answers, we find they both saw this scenario’s outcome slightly differently: The first respondent, who rated “desirable, stated the scenario as such: “North Korea and South Korea become one state.” The respondent was envisioning reunification. This is an ideal desired publicly by many South Koreans. The second, who rated “undesirable,” stated the scenario as “North Korea becomes a protectorate of China.” This would put China on the border with ROK, an undesirable neighbor for many South Koreans.

7.3 An Agreement is Reached

SCENARIO F: An agreement is reached with North Korea.
Though only six experts out of the 40 postulated the scenario of a multilateral agreement being reached between North Korea and one or more members of the international system as an additional possibility, their median forecast of 30% probability ranks it as the second-most likely scenario following scenarios C and D, which were interpreted by many as the same thing: “North Korea is allowed to maintain a limited nuclear arsenal” and “The status quo continues.” Respondents, though, varied significantly in how they interpreted Scenario F, so further analysis would not prove insightful.

**Scenario descriptions and reasoning (probabilities in parentheses):**

- **(None given)** *North Korea is allowed to maintain a limited nuclear arsenal. Yet the delivery systems (ICBM, SLBM, and TELs, etc) are either dismantled or under heavy supervision by an international regime.*

- **(20%)** *"Complete" denuclearization of North Korea without resorting to militarized conflict, but not 100% verifiable. There is a slight possibility that a U.S. administration"*
decides to reach a deal with NK, with all the necessary concessions made by both sides, but that denuclearization can't be verified, and the U.S. is okay with it. All the conditions outlined in scenario A: Complete U.S. and international sanctions relief, withdrawal of most U.S. forces from the Korean Peninsula and its vicinity, security guarantees, economic assistance, humanitarian assistance, normalization of relations with U.S., and a 20 year timeline for denuclearization.

- **(20%) Agreement to give up weapons but retain reconstitution capability (unlikely but possible).** This is not the most far fetched idea; it has been floated periodically since the dawn of the atomic era. DPRK decides it doesn’t need the actual weapons to ensure security; Much would then depends on the level of transparency required to verify compliance.

- **(30%) Presumed but ultimately unverifiable de-nuclearization of North Korea after either agreement or military conflict.** Either conflict or pressure for agreement may sway North Korea to play along to a degree, but without ultimately verifiable protocols. Either conflict or agreement is feasible if pressure builds, yet ultimate reliability in North Korea's commitments stretches credibility.

- **(30%) There is a sustained international agreement of some sort which does not "allow" North Korea to maintain a nuclear arsenal, but does place limits on its expansion in exchange for partial sanctions relief, normalization of diplomatic relations, etc. North Korea's limited nuclear arsenal continues to be illegitimate under international law and a source of global tension, but complete denuclearization is tacitly regarded as an unrealistic objective.** This is a more realistic deal that might emerge, although it is unclear if
Washington and Pyongyang would be willing to sustain such an agreement if reached. Nobody wants a military conflict on a peninsula with close to 100 million people.

- **(60%)** Sanctions pressure forces NK to agree to denuclearize but full verification is not possible; i.e., they are not "allowed" to keep them but we suspect some remain since verification is not complete. NK has to give in eventually unless China provides unlimited support but they will find a way to cheat; NK flexibility and U.S. desire to declare victory with less than CVID.

- **(80%)** North Korea takes steps to limit the expansion of its nuclear weapons and roll back the program decreasing the risk and continues on the path to denuclearize (but is never recognized as being 'allowed' to maintain a limited arsenal). (This may be what you were thinking with Scenario C???). I could just see Kim deciding to negotiate and taking steps to dismantle and roll back parts of the program, but never actually making the decision to give up nuclear weapons and continuing to string on negotiations. U.S., North Korea, & South Korean leadership committed to step by step negotiations that exchange meaningful progress on denuclearization for reciprocal steps that address North Korea's security and economic demands. Political will and leadership on both sides to see through a long, technical negotiation. Empowerment of negotiating teams and a sound process that can withstand changes in administrations.

### 7.4 Analysis of Experts (Q-Sort)

As preceding analyses demonstrate, there is not much correlation between expert answers that can be meaningfully attributed to their state or sector of employment. As the Round 3 survey
will show, though, similarity does exist in terms of how experts view the major influencers of world events: namely, the United States and China. This type of data can be easily derived from a Q-sort.

As detailed in Chapter 5, the data produced from the Round 1 Delphi survey included a set of 43 unique conditional statements that experts indicated would lead to the described scenario. Using Q-methodology, the same group of experts solicited for Round 1 were asked to complete a Q-sort, where they participated in an exercise sorting the 43 conditional statements from -4 “Extremely Negative Effect,” to 4 “Extremely Positive Effect,” on the denuclearization of North Korea, with 0 being “Neutral or No Effect.” A total of 19 experts across three countries and four sectors completed the Q-sort (48% response rate), many of them commenting that they enjoyed the mental exercise.

Table 7.1 Delphi Round 3 Response Rate

<table>
<thead>
<tr>
<th>STATE</th>
<th>Academia</th>
<th>Policymaker</th>
<th>Military</th>
<th>Think Tank</th>
<th>Public</th>
<th>TOTAL</th>
<th>Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Japan</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Russia</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
<td>2</td>
<td>N/A</td>
<td>2</td>
<td>33%</td>
</tr>
<tr>
<td>South Korea</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>N/A</td>
<td>4</td>
<td>57%</td>
</tr>
<tr>
<td>U.S.</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>N/A</td>
<td>13</td>
<td>81%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>8</td>
<td>N/A</td>
<td>19</td>
<td>48%</td>
</tr>
</tbody>
</table>

| Response Rate | 42% | 40% | 40% | 62% | N/A |

The results were analyzed using Q-sort software called KenQ. A scree plot identified that 95% of the variance in answers could be explained by five unique factors, or groups of respondents that had shared ways of thinking as compared with other respondents.
Again, as described in Chapter 4.2, the purpose of a Q-sort is analyzing differences between respondents based on their value judgements in card placement. The first two rounds of Delphi demonstrated that expert judgements cannot be easily grouped according to formal designations or characteristics, such as state or sector of employment. Q analysis gives us the ability to group experts by correlation of their value judgements via an empirical representation of the group structure. Each “dimension” in the scree plot is a representation of the groups, and how much variation is explained by each group. The factor groups do not match on formal/nominal characteristics, but instead how they placed cards in each of the value columns. Factor analysis brings larger number of variables into a smaller number based on the following statistics:
Table 7.3 Q-Sort Factor Analysis Statistics

<table>
<thead>
<tr>
<th></th>
<th>FACTOR 1</th>
<th>FACTOR 2</th>
<th>FACTOR 3</th>
<th>FACTOR 4</th>
<th>FACTOR 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. OF DEFINING VARIABLES</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>AVG. REL. COEF.</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>COMPOSITE RELIABILITY</td>
<td>0.941</td>
<td>0.889</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>S.E. OF FACTOR Z-SCORES</td>
<td>0.243</td>
<td>0.333</td>
<td>0.447</td>
<td>0.447</td>
<td>0.447</td>
</tr>
</tbody>
</table>

Respondents grouped by factor are listed below, again showing little correlation between an expert’s state/sector and the variance in responses:

Factor 1: U.S. Academia; U.S. Think Tank; U.S. Government; South Korea Think Tank

Factor 2: U.S. Government; South Korea Academia

Factor 3: U.S. Government

Factor 4: South Korea Think Tank

Factor 5: Russia Think Tank

As shown in the tables, Factors 3, 4 and 5 had only one defining variable, or respondent. However, those singular factors also had the most closely correlating z-score variance with the other factors in terms of which conditional statements would have the most positive or negative effect on the denuclearization of North Korea; but not as highly correlated as those four grouped in Factor 1, for example. In the author’s opinion the areas of consensus and disagreement on the conditional statements are the most interesting and useful part of this research project. They are discussed in more detailed below.
7.5 Areas of Convergence

Traditional Delphi rounds are good for extracting mean probabilities of specific scenarios as well as extracting the conditions that could bring about said scenarios. Q-methodology is interesting from the research perspective to identify what key variables of influence certain groups of respondents find consensus on, but also from an actionable policymaking perspective, what these factor groups identify as the most influential conditions surrounding a stated policy goal: In this case, the denuclearization of North Korea.

7.5.1 Convergence to Identify Variables of Influence

One deliverable of the Q-sort data when analyzed through Q-sort software such as KenQ is a Composite Q-Sort of each factor, as originally shown as an example in Chapter 5.1.4. As we now revisit this graphic with an analytical lens, we can identify certain variables of influence the four respondents in this factor (U.S. Academia; U.S. Think Tank; U.S. Government; South Korea Think Tank) reached consensus on as to the effect on the stated policy goal:
Based on Figure 7.1 above, experts grouped in Factor 1 all felt United States and South Korean leadership can play a positive role in the denuclearization of North Korea (consensus items
are indicated in red, which are discussed further in the next section). They also agreed that China could have a very or extremely negative effect on that goal if the state encourages and supports North Korea in initiating a militarized conflict.

In contrast, respondents in Factor 2 (U.S. Government; South Korea Academia) felt Chinese leadership or initiative could have the most positive effect on the desired goal. This is followed by efforts of the international community (again, consensus statements in red are of policymaking importance, discussed further in the next section):
This difference between factor groups is interesting from the research perspective. This further verifies that an expert’s state or employment sector is not necessarily what influences who
they perceive as having the most influence over any particular policy outcome; rather, experts’ belief systems seem to be what influences their answers the most. Therefore, surveying a number of experts and analyzing consensus across their varying values can help researchers produce results that can more actively inform policymaking.

### 7.5.2 Convergence to Inform Policymaking

Analyzing consensus among factors can provide valuable information to policymakers seeking the effects of events or actions on a stated goal. In this research study looking at the conditions that could affect the goal of denuclearizing North Korea, across factor groups there were four conditional statements that received consensus, or a z-score variance less than 0.2:

<table>
<thead>
<tr>
<th>Statement</th>
<th>factor 1</th>
<th>factor 2</th>
<th>factor 3</th>
<th>factor 4</th>
<th>factor 5</th>
<th>Z-Score variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security miscalculations by regional leaders lead to militarized conflict in Northeast Asia.</td>
<td>-2</td>
<td>-2</td>
<td>-1</td>
<td>-2</td>
<td>-2</td>
<td>0.056</td>
</tr>
<tr>
<td>China encourages and then supports North Korea in initiating a militarized conflict.</td>
<td>-3</td>
<td>-4</td>
<td>-4</td>
<td>-3</td>
<td>-3</td>
<td>0.072</td>
</tr>
<tr>
<td>South Korea leads an initiative for meaningful 1:1 negotiations with North Korea.</td>
<td>1</td>
<td>-1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.106</td>
</tr>
<tr>
<td>North Korea collapses and South Korea leads a reunification process.</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>0.178</td>
</tr>
</tbody>
</table>

This information would be useful to decision-makers trying to determine what effect the occurrence of a particular event would have on their desired goal, and whether or not they had the power to or control over initiating such an event. For example, the statement that received the most consensus, “Security miscalculations by regional leaders lead to militarized conflict in Northeast
Asia,” four out of the five factors indicated that condition would have a “Negative Effect” (-2) on the denuclearization of North Korea. This finding could shift a policy focus towards avoiding miscalculations in the region, given its potential consequences. If a miscalculation were to occur, though, having this information would be useful to policymakers when determining the impact of the occurrence on their ultimate goal of denuclearizing North Korea. In this case, though the miscalculation would have a negative effect, it would not be as detrimental to their goal as, “China encourages and then supports North Korea in initiating a militarized conflict,” which factor groups indicated would have either a “Very Negative Effect” (-3) or “Extremely Negative Effect” (-4) on the denuclearization of North Korea.

7.6 Areas of Divergence

Similarly, Q-methodology can show policymakers which conditions experts do not agree on; important when, for example, U.S. leadership is considering whether to take conventional military action to denuclearize the DPRK:
Table 7.5 Variance Statistics for Q-sort Factors Demonstrating Divergence on Conditional Statements

<table>
<thead>
<tr>
<th>Statement</th>
<th>factor 1</th>
<th>factor 2</th>
<th>factor 3</th>
<th>factor 4</th>
<th>factor 5</th>
<th>Z-Score variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Korea collapses and China takes control.</td>
<td>0</td>
<td>4</td>
<td>-4</td>
<td>-2</td>
<td>-4</td>
<td>1.885</td>
</tr>
<tr>
<td>China militarily invades and then occupies North Korea.</td>
<td>-2</td>
<td>4</td>
<td>-4</td>
<td>-3</td>
<td>-4</td>
<td>1.708</td>
</tr>
<tr>
<td>North Korea unintentionally deploys a nuclear weapon.</td>
<td>-3</td>
<td>-1</td>
<td>2</td>
<td>-4</td>
<td>2</td>
<td>1.182</td>
</tr>
<tr>
<td>The U.S. takes conventional (non-nuclear) military action to denuclearize North Korea.</td>
<td>-3</td>
<td>-2</td>
<td>-3</td>
<td>3</td>
<td>-3</td>
<td>1.034</td>
</tr>
</tbody>
</table>

Knowing that experts cannot agree on the effect of this particular action could persuade decision-makers to instead follow an action where a positive consensus was reached, as the outcome would be considered more predictable, therefore more justifiable.

Chapter 7 chapter provided valuable insights into the use of Q-methodology for understanding scenarios and identifying influential factors related to experts fielded, and how those insights might inform policy goals. From a research perspective, the Q-method helps identify key variables that certain groups of respondents find consensus on. It also has implications for actionable policymaking, as it reveals the most influential conditions surrounding a stated policy goal. Analysis highlighted two distinct factor groups:

Factor 1: Experts who believe that U.S. and South Korean leadership can positively impact North Korea’s denuclearization.

Factor 2: Respondents from the U.S. Government and South Korea Academia, who emphasize the positive role of Chinese leadership and international efforts.

The difference between factor groups underscores that an expert’s belief system influences their perception of influential actors; state or employment sector does not necessarily dictate influence; rather, it’s their underlying beliefs. Therefore, surveying experts and analyzing
consensus across *varying values* can actively inform policymaking. This research sheds light on
the interplay between expert perspectives, belief systems, and actionable policy recommendations.
By considering these factors, policymakers can better assess the effects of events or actions on
their stated goals.
8.0 Conclusion

In the pursuit of addressing the complex challenges of denuclearization in North Korea, this study embarked on a multifaceted journey encompassing extensive research, innovative methodology, and insightful analysis. As we approach the conclusion of this study, it is important to reflect on the wealth of knowledge garnered from incorporating both traditional Delphi rounds and the cutting-edge Q-methodology. This process allowed us to delve into the minds of a diverse panel of experts who hold a unique understanding and perspective of the intricate geopolitical landscape surrounding the North Korea nuclear problem. The results of this study offer a supplemental approach to “bridging the gap” between the experts and the meaningful translation of their forecasts to policy application.

To provide background to the complex policy problem selected for my case study, this paper began by delving into the backdrop of North Korea's nuclear ambitions. This situated the reader in a world grappling with a regional system struggling with convergent and divergent interests surrounding the implications of a nuclear-armed Pyongyang. Understanding the historical context, regional dynamics, and the enigmatic leadership of North Korea provided the essential foundation upon which the case study for this unique methodology was built.

The analysis of expert opinions and the convergence and divergence of perspectives have been the crux of this study. We explored how different sectors of employment and national backgrounds may not influence expert forecasts as much as hypothesized, revealing both areas of consensus and divergence in SME views on the denuclearization of the DPRK. These insights carry profound implications for policymakers striving to navigate the complex terrain of North Korea's denuclearization.
As we embark on the concluding chapter, it is paramount to first highlight not only the key takeaways from this research but also their potential significance for the future of policymaking.

The first goal of this study was to identify areas of convergence/divergence among experts on the probability of plausible scenarios and conditions that may facilitate/inhibit security cooperation and CVD. This mixed-methods study discovered not only the probability of the plausible scenarios posited to the panel—a continuation of status quo being the most likely—but also additional plausible scenarios and probabilities put forth by the panelists themselves, providing a more comprehensive understanding of possibilities and percentage likelihood of each. The first round also produced the conditions that may facilitate or inhibit security cooperation towards achieving CVD of North Korea, which is a valuable dataset in and of itself.

The Q-sort I identified areas of convergence and divergence among experts. Most experts agreed that mainly U.S., but also South Korean leadership could play a positive role in the denuclearization of North Korea. They also agreed that Chinese leadership could either have a very positive or very negative effect on the goal, depending on whether it was leading the rogue state towards a normalization of diplomatic relations, or encouraging and then supporting North Korea in initiating a militarized conflict. This could be an important indication to policymakers to include China in any diplomatic conversations to increase the likelihood of a positive—rather than negative—outcome. Opinions diverged, however, when it came to question about China taking control of North Korea, either militarily or post-collapse of the regime due to other reasons. Some saw that as being extremely positive towards the CVD goal; others saw it as having a negative effect—another reason to include China in the conversation.

The second goal was to understand if and how experts from different countries and employment sectors differ in their forecasts and identification of key influential factors.
Interestingly enough, and quite unintuitively to the author, both the Delphi and Q-method showed no significant difference based on identified nationalities and only a slight difference with sectors of employment of the participants. This could be important for policymakers when considering SME opinion; that perhaps the quantity of experts fielded matters more than the diversity. In the future, with another policy problem, more panelists and thus more data, there might be other key influential factors that become apparent.

The third research aim was to evaluate SME results produced via this study as compared with the ViTTa report to see if one method produces more nuanced findings. The project showed forecasts from both the NSI Korea Strategic Outcomes ViTTa report and this study were in line with each other. However, this study produced an additionally rich and well-populated set of quantitative and qualitative forecast data. The ViTTa survey did not ask for quantitative data and had less than half of the number of respondents. Presumably, being able to present the findings in charts and percentages in addition to long essay-based reports would be an informative aid to busy policymakers tackling complex problems.

The following sections will delve more deeply into the overarching themes and findings, offering a comprehensive understanding of how this study can inform effective policies to encourage North Korea's denuclearization before 2040. It will also show a more effective way to collect and synthesize the forecasts of subject-matter experts than the traditionally long academic papers.
8.1 Multilateral Cooperation Towards Denuclearization

The findings of this multi-method study underscore the importance experts place on multilateral cooperation and regional leadership in resolving the North Korea nuclear issue. Policymakers should therefore prioritize diplomatic efforts to build consensus among key stakeholders, including the United States, China, and South Korea, when it comes to strategies to approach denuclearizing the DPRK. Collaboration can lead to a more unified approach and increased leverage over North Korea. Analysis shows these efforts should encompass diplomatic negotiations, confidence-building measures, and dialogues to promote trust and transparency not only with Pyongyang but also with regional neighbors.

Multilateral cooperation is seen by the SME participants as offering several distinct advantages in this context. It fosters a sense of shared responsibility, where all stakeholders actively engage in diplomatic efforts to address the issue. This unity amplifies the international community's voice and provides a more coherent and forceful message to North Korea, rather than policy that shifts with every change in administration. It underscores the seriousness of the global community's intent to see denuclearization through peaceful means, despite their divergences on other policy issues.

Moreover, collaboration enhances leverage over North Korea. This research study findings indicate that SMEs view North Korea's actions as being influenced by various external factors. These external factors include economic incentives, security assurances, and diplomatic engagement. A unified front, as facilitated by multilateral cooperation by the U.S., South Korea and China, can provide a comprehensive package of incentives and disincentives that makes denuclearization a more attractive option for Pyongyang.
These cooperative efforts should encompass a multifaceted approach. The Q-sort indicated that policymakers should prioritize diplomatic negotiations aimed at building consensus on the principles and timelines of denuclearization. These should be paired with confidence-building measures that should be actively pursued to alleviate tensions and foster an environment conducive to productive negotiations. Engaging in dialogues, both formal and informal, can further promote trust and transparency. This will enable stakeholders to understand each other's perspectives and concerns.

Multilateral cooperation is not merely a diplomatic option but a strategic imperative in the pursuit of denuclearization. Policymakers should recognize that concerted efforts involving key state actors such as China and South Korea, underpinned by diplomacy with the DPRK, trust-building, and continued dialogues, will provide the best pathway towards achieving the shared goal of a denuclearized Korean Peninsula. As they navigate the complex geopolitical landscape, they should prioritize this cooperative approach to maximize their chances of success and lay the foundation for a more stable and secure Northeast Asia.

8.1.1 The Role of Regional Actors

Secondly, the Q-sort findings emphasize the role of regional actors, particularly China and the United States, in influencing North Korea's behavior. Policymakers in both countries should engage in diplomatic initiatives with the DPRK and each other to use their leverage effectively. A better understanding of China's perspectives, as revealed in this study, can aid in shaping diplomatic strategies. This may involve incentives for China to play a more constructive role, such as economic cooperation or assurances related to regional stability.
China's position as North Korea's most significant neighbor and trading partner grants it substantial leverage over the regime. Experts highlighted the complexities of China's relationship with North Korea, including its balancing act between maintaining stability on the Korean Peninsula and managing its broader regional interests. To harness China's influence effectively, U.S. policymakers and the broader international community should engage in sustained diplomatic initiatives. These initiatives should be aimed at encouraging China to use its leverage in ways that align with the shared goal of denuclearization. This might involve providing incentives to China for playing a more constructive role in the denuclearization process.

Incentives could encompass economic cooperation, trade agreements, and investment opportunities that enhance China's interests in the region while promoting denuclearization. Additionally, assurances related to regional stability, security, and economic prosperity should be explored. These assurances could help assuage China's concerns about the potential consequences of a destabilized North Korea.

Moreover, U.S. policymakers should consider the broader regional context and engage with other key stakeholders in East Asia, such as South Korea and Japan. Collaboration with these actors can bolster the diplomatic efforts directed at North Korea. This would create a more comprehensive and unified approach. Regional actors, with China at the forefront, hold significant sway over North Korea’s actions – for better, or worse. Policymakers should leverage this insight to craft diplomatic strategies that would encourage China to use its influence effectively. By understanding China's perspectives and motivations and providing the right incentives and assurances, policymakers can foster a conducive environment for progress toward denuclearization on the Korean Peninsula. This approach recognizes the intricate web of relationships in the region.
and aims to align the interests of all relevant parties with the overarching goal of peace and stability.

### 8.1.2 Targeted Sanctions

Another facet of multilateral cooperation vital to the CVD of North Korea is the need for targeted sanctions that affect specific sectors, such as the financial industry and cryptocurrency exchanges, which the DPRK exploits to evade sanctions. Policymakers should tailor sanctions to address these areas effectively. This could involve enhancing financial security mechanisms, strengthening international cooperation on sanctions enforcement, and imposing penalties on entities facilitating illicit financial activities.

One critical aspect involves the enhancement of financial tracking mechanisms. Recent events highlight North Korea's adeptness at concealing its financial transactions and bypassing monitoring efforts. Policymakers should collaboratively invest in advanced financial intelligence and tracking technologies which would better identify and trace the flow of illicit funds.

Furthermore, strengthening international cooperation on sanctions enforcement is paramount. Research showcases the global nature of North Korea's financial networks, indicating that unilateral actions are insufficient. Policymakers should engage in collaborative efforts with key stakeholders. This would include international financial institutions and countries with significant financial ties to North Korea. To deter entities from facilitating illicit financial activities, policymakers should be prepared to impose penalties on those involved. Sanctions should not solely target North Korea but also extend to individuals, organizations, or nations complicit in enabling these activities. By imposing punitive measures on facilitators, policymakers can create a strong deterrent against aiding North Korea's sanctions evasion.
By employing these measures, policymakers can create a sanctions framework that effectively disrupts North Korea's access to critical resources and further encourages denuclearization efforts. This approach aligns with the evolving landscape of financial networks and emphasizes the importance of adaptability in addressing complex challenges to international security and stability.

8.1.3 Embrace Unpredictability

Finally, this comprehensive study provides valuable insights into the inherent unpredictability of North Korea's leadership, particularly under Kim Jong Un's regime, and the necessity of a multilateral approach to craft effective policies and contingency plans. These findings underscore the importance of acknowledging and factoring in this uncertainty when formulating diplomatic, security, and crisis management strategies. Policymakers should adopt a posture of preparedness that accounts for the potential for sudden shifts in North Korean behavior. This would ensure they remain agile and adaptable in the face of evolving circumstances.

One crucial aspect of multilateral cooperation in policy development is the incorporation of diplomatic off-ramps. North Korea's leadership can be unpredictable but not necessarily intractable. Policymakers should explore diplomatic avenues and be open to engagement, even during periods of heightened tensions. Establishing channels for dialogue and negotiation can serve as essential mechanisms to de-escalate conflicts and avoid unintended consequences.

Furthermore, the establishment of effective crisis communication channels is paramount. Experts frequently cited miscommunications and misunderstandings as one of the most likely reasons tensions would exacerbate and increase the risk of accidental escalations. Policymakers should prioritize the development of clear and reliable communication channels with North Korean
counterparts and other relevant stakeholders to swiftly address emerging crises. To mitigate the potential for miscalculation, policymakers should also consider confidence-building measures that promote transparency and trust-building between nations. These measures can help reduce the risk of misinterpretations and unintended confrontations.

If regional leaders expect North Korea's leadership unpredictability and integrate this understanding into policy formulation, they will be able to adopt a multifaceted approach that includes diplomatic off-ramps, crisis communication channels, and confidence-building measures. By doing so, they can enhance their ability to manage uncertainties, reduce the risk of miscalculations, and contribute to the prospects of a peaceful resolution of the North Korean nuclear issue. This approach reflects the importance of flexibility and adaptability in addressing complex global challenges.

8.2 A Better Use of Experts

In the intricate world of foreign policy, expert-driven predictions significantly influence the decisions taken by policymakers. As highlighted in the case of North Korea's nuclear proliferation, the existing forecasting methodologies focused purely on qualitative methods as exemplified in the ViTTa report have notable limitations. For reliable and easily-digested forecasts, improvements in this sphere are paramount.

This research uniquely combined the Delphi Technique with Q-Methodology, offering a multi-pronged approach to collecting and analyzing expert judgments while mitigating potential bias. While each method has its individual strengths, their integration may represent a novel avenue for advancing the quality of predictions in foreign policy. The ability to understand the
subjective underpinnings of expert predictions and the comparative consistency or divergence among them offers nuanced insights that could be instrumental in shaping effective policies.

8.2.1 Employment Sector Matters More Than Country

These research findings provide a critical understanding of the divergent views held by experts across different sectors regarding the likelihood of denuclearization scenarios. It highlights that the experts working in different fields, whether academia, government, think tanks, or the military, bring unique insights and considerations to the table. Policymakers should acknowledge this diversity as a source of strength rather than a challenge. This concept was highlighted by the work of political scientist Alexander George and his concept of "multiple advocacy" in presidential decision-making (1972). George, known for his contributions to the study of international relations and foreign policy analysis, discussed this concept in the context of how presidents and other decision-makers can best manage their advisory systems to make effective foreign policy decisions. In his view, multiple advocacy is a decision-making style where a president encourages and facilitates the expression of diverse viewpoints among advisors.

Incorporating these varied expert perspectives into policy development can lead to more holistic and effective strategies. Policymakers should leverage the expertise of individuals from different sectors to gain a comprehensive understanding of the North Korean situation. This approach can help identify blind spots and ensure that policies are well-informed and adaptable.

Furthermore, collaboration and engagement with experts from different sectors can foster a sense of shared ownership and commitment among international partners. Policymakers should harness this collective wisdom to build consensus and facilitate cooperation on the North Korean nuclear issue. By embracing this diversity, policymakers can enhance their ability to address the
North Korean nuclear challenge effectively and promote peace and stability in the region. This approach recognizes that expertise is not confined to a single sector but emerges from the collective insights of experts across disciplines and borders, making it a valuable resource in the pursuit of international security and cooperation.

8.2.2 Mixed-Methods, Scenario-based SME Solicitation

When policymakers are soliciting forecasts, it is important they use a mixed-methods approach rather than just a purely quantitative (traditional Delphi) or purely qualitative (e.g. ViTTa report) to get both a more diverse panel of engagement as well as deeper insights into SME reasoning. Rather than relying on a one-size-fits-all approach, policymakers should embrace mixed-methods scenario-based planning. This approach entails developing strategies that account for a range of potential outcomes, both optimistic and pessimistic, cooperative and confrontational.

The results from mixed-methods studies such as the one conducted here that incorporate scenario-based planning can serve as a valuable tool for policymakers to prepare for different contingencies, as well as providing information on what conditions might lead to those contingencies. This approach can be used to tease out nuances that SMEs believe could make a big difference in making certain outcomes more or less likely. By acknowledging and incorporating the varying views and forecasts from experts, policymakers can create robust, adaptive strategies that are not overly reliant on a single, predetermined path to denuclearization.

Furthermore, this research emphasizes the importance of scenario-based planning that extends beyond the immediate future. Policymakers should consider long-term scenarios, such as those approaching the year 2040, to ensure their strategies remain relevant and effective in the face of evolving geopolitical dynamics.
It is crucial to engage experts, stakeholders, and representatives from different sectors of employment in the scenario-based planning process. By doing so, decision-makers can enhance their preparedness, resilience, and adaptability in addressing complex problems like the North Korean nuclear issue and contribute to the prospects of a peaceful resolution. This approach aligns with the evolving nature of international relations, where flexibility and foresight are essential in addressing complex global challenges.

8.3 What Can a Delphi+Q Study Tell Us About the Future of Foreign Policy?

The Delphi+Q method can be particularly useful for foreign policy decisions that are complex and involve a high degree of uncertainty. This is because the Delphi method allows experts to share their knowledge and expertise in a confidential setting, which can help to reduce bias and ensure that the best possible decision is made.

Delphi on its own is a tried-and-true method of deriving near-consensus on expert forecasts. It can also, if surveyed, be a useful method of collecting conditional statements that might lead to the scenarios included in the Delphi. The Q-sort on its own is a very useful methodology to gain insights into value judgements of participants; for example, favorite ice cream flavors. When these methodologies are combined, the Q-sort is populated with conditional statements derived from the Delphi. It will then become a powerful tool not only from an academic perspective in assessing how experts relate to each other, but also from the policymaking perspective as it can be used to discern exactly which events or conditions could have a positive or negative impact on the scenarios fielded in Delphi.
A great example of what a Delphi+Q can do to inform policy was shown through the pre/post pandemic survey of Round 1 and Round 2 Delphi. Responses to the question asking SMEs to what extent the occurrence of the global pandemic affected their responses to Round 1 demonstrated that any extra insight gained through re-surveying the participants after a major global event could have instead been answered through further analysis of the Q data. Although the global pandemic impacted government policies related to healthcare and immigration and changed the lives of almost everyone in the world, the experts surveyed overwhelmingly thought it affected the probability of complete, verifiable denuclearization of the DPRK very little. The exception is when experts linked the pandemic to the probability of economic crisis or regime collapse, factors already indicated in experts’ conditional statements that could lead to the CVD of North Korea. The fact that expert responses for the pandemic question tie back to the conditional statements produced in Delphi Round 1 demonstrate how useful and applicable the data set can be to help decision-makers assess the array of global events and conditions that may affect policy goals. For example, experts fielded in this study commented the pandemic was only impactful as it related to the possibility of economic hardship or regime collapse (see Chapter 5.1 data). If decision-makers were interested in the pandemic’s influence on the CVD of the DPRK, they could identify which of the conditional statements provided in the Round 1 survey that the pandemic would likely impact (see conditional statements #27-28 and #33-35). Then they could revisit the Q-methodology data, which shows how experts tended to rate these specific conditional statements related to the hardship or collapse of the regime; data for these conditions were overwhelmingly sorted by factor groups into having either a “Somewhat Positive Effect” (1) or “Neutral or No Effect” (0) on the CVD of the DPRK (see 5.1.4). Ultimately, using this study’s methodology after the onset of a major globally-impacting event like COVID-19, policymakers would not need to re-
survey the SMEs to update their forecasts; they could instead revisit the Q-sort data and assess how impactful such an event (if related to the conditions derived from Round 1) would or would not affect the policy goal.

The Delphi+Q method be used in a variety of foreign policy situations to identify potential risks and opportunities that policymakers should be aware of. For example, a multi-sector Delphi panel could be asked to forecast the probability of scenarios involving the rise of China. Conditions posited by SMEs in the Delphi could then be fed into a Q-sort fielded to the same experts to identify the potential risks and opportunities associated with the rise of China. The panel would be asked to consider a variety of factors, such as China's economic growth, its military capabilities, and its political ambitions. The Delphi+Q method could help policymakers to better understand the challenges and opportunities that China presents to the United States and its allies in a more robust way than the sole use of one or the other method could.

The Delphi+Q method can also be used to develop and evaluate different policy options. For example, the Delphi panel could be asked in a survey to develop different options for dealing with the Syrian Civil War, then evaluate their effectiveness via a Q-sort. The panel would be asked to consider a variety of factors, such as the humanitarian crisis in Syria, the threat of terrorism, and the risk of regional instability. The Delphi+Q method could help policymakers to identify the best possible policy option for dealing with the Syrian Civil War.

Finally, the Delphi+Q method can be used to assess the impact of different policy options on a variety of stakeholders. For example, the Delphi panel could be asked to assess the impact of different sanctions regimes on North Korea. The panel would be asked to consider a variety of factors, such as the impact of sanctions on the North Korean economy, the impact of sanctions on the North Korean people, and the impact of sanctions on the international community. They could
then be presented a Q-sort exercise to rate each factor’s effect – positively or negatively – on the overarching goal of deterring North Korea from the targeted illicit activity, which is where traditional sanctions have failed. The Delphi+Q method could help policymakers to make more informed decisions about the use of sanctions against North Korea.

8.4 Charting the Way Forward

In conclusion, this research has provided valuable insights into the intricate and multifaceted issue of North Korean denuclearization by examining the perspectives of experts from diverse states and sectors of employment. The findings from my study illuminate the low likelihood of DPRK nuclear reversal at this point, the importance of engagement with North Korean leadership, and regime assurances if there is to be any hope of still finding a deal. To increase likelihood of a denuclearization agreement being reached, the U.S. should consider a possible agreement that lets the DPRK keep small numbers of nuclear weapons. In terms of information gathering, this study showcases where differences lie in experts' assessments of the likelihood of various denuclearization scenarios, underscoring the imperative for a comprehensive and well-informed approach to policymaking in this critical domain. Notably, Scenario A, which envisions complete and verifiable denuclearization without militarized conflict, was assigned a low probability. This highlights the formidable obstacles faced in diplomatic efforts and underscores the paramount importance of nurturing trust and confidence among nations, particularly in light of the widely held perception that the North Korean regime lacks trustworthiness. In contrast, Scenario B, which posits denuclearization as a result of militarized conflict, received a higher probability, raising substantial concerns about the potential risks and
catastrophic consequences associated with military actions. Consequently, the need for diplomatic initiatives to prevent the escalation of military hostilities remains paramount. Most significantly, Scenario C emerged as the most probable outcome, wherein North Korea maintains a limited nuclear arsenal. This underscores the necessity of diplomatic endeavors aimed at curbing the expansion of the North Korean nuclear program. At the same time, it signifies the importance of collaborative, targeted, long-term strategies focused on minimizing the security threats posed by the DPRK's nuclear capabilities.

The application of Q-methodology in this research has furnished a distinctive and invaluable perspective by unveiling areas of consensus and divergence among experts. This methodology not only facilitated the categorization of experts into distinct groups but also spotlighted the pivotal variables and conditional statements that hold the potential to shape the trajectory of North Korea's denuclearization efforts. Policymakers can draw upon these valuable insights to make well-informed decisions regarding the most effective strategies and actions for advancing the cause of denuclearization. Furthermore, this study emphasizes the critical significance of incorporating discipline diverse expert viewpoints when formulating policies, as the intricacies of North Korea's denuclearization are influenced by a multitude of factors that are perceived differently by different employment sectors. By integrating these findings and harnessing the power of Q-methodology in identifying plausible solutions for a shared problem, policymakers can adeptly navigate the complexities associated with North Korean denuclearization, enabling them to pursue regional and global security objectives with enhanced precision and efficacy.

To further fortify complex foreign policy decisions, there is a pressing need for continuous methodological refinement and the inclusion of disciplinary diversity in expert panels. Future
research might explore more ways to include forecasts from professionals outside academia and delve deeper into understanding the cultural and psychological aspects that shape expert opinions. Additionally, a comparative study with other geopolitical challenges could expand the generalizability of this study’s findings.
Appendix A : Organization of Delphi Panels

<table>
<thead>
<tr>
<th>PANELS (6) by STATE</th>
<th>SECTOR (30)</th>
<th>PANELISTS (90)</th>
<th>#</th>
<th>Contact</th>
</tr>
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<tbody>
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<td>Military</td>
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<td></td>
<td>official</td>
<td>Official</td>
<td>34</td>
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<td>Policymaker</td>
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<td>Think Tank</td>
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<td>Public</td>
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<tr>
<td>People's Republic of China (PRC/China)</td>
<td>Academic</td>
<td>Academic</td>
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Republic of Korea (ROK/South Korea)
Appendix A.1 Delphi Questionnaire Round 1

Introduction

Thank you for your interest! You have been asked to participate in research being conducted to support Kelly Wadsworth’s PhD dissertation, which aims to analyze expert and public opinions from multiple countries on future scenarios regarding the North Korea problem.

This survey is the first of three rounds; it takes just 15 minutes on average to complete. The following two rounds (distributed over the next two months) should take no more than 10 minutes. If you would prefer to reply to these questions via e-mail rather than over the internet survey, I will be happy to provide you the questionnaire in Word document format.

Thank you again for participating in my dissertation research!

Please let me know if you have any questions or concerns, or need to withdraw for any reason: kcw@pitt.edu

Kindly,

Kelly
Below are descriptions of 3 future scenarios: A, B and C.

<table>
<thead>
<tr>
<th>A</th>
<th>Complete and verifiable denuclearization of North Korea without resorting to militarized conflict</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Creation of a formalized multilateral nonproliferation cooperation mechanism in Northeast Asia, such as a Nuclear Weapon Free Zone (NWFZ)* or a Regional Non-proliferation Regime (RNR)**</td>
</tr>
<tr>
<td>C</td>
<td>Establishment of an informal multilateral security cooperation mechanism in Northeast Asia, such as the Six Party Talks†.</td>
</tr>
</tbody>
</table>

Can you think of any more future scenarios regarding the North Korea problem? If so, please list them below (up to 3).

*A NWFZ is defined by the UN as a zone in which any group of states has agreed via a treaty or convention to (a) keep free of nuclear weapons, and (b) establish compliance verification for peaceful use of nuclear power.

**An RNR is defined as a consensus-driven multilateral institution in which participating regional governments combat multilaterally problems related to export control and WMD proliferation.

†The Six Party Talks, which began ad-hoc in 2003 and ended in 2009 when North Korea pulled out of the process, were a series of multilateral negotiations with the aim of dismantling North Korea’s nuclear program. The talks were hosted in Beijing and included negotiators from China, Japan, Russia, United States, South Korea and North Korea.
**Scenario A:** Complete and verifiable denuclearization of North Korea without resorting to militarized conflict

What is the probability of A occurring? (Click and drag the slider to select the probability)

0 10 20 30 40 50 60 70 80 90 100

Probability (%)

Why did you choose this probability? Please help me understand your reasoning.

If A were to occur, by what year would this be accomplished?

2020 2023 2025 2028 2030 2033 2035 2038 2040 2043 2045 2048 2050

Year

How desirable is A?

<table>
<thead>
<tr>
<th>Very Desirable</th>
<th>Desirable</th>
<th>Undesirable</th>
<th>Very Undesirable</th>
<th>No Judgment</th>
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Scenario A

Why?


Who would most likely be the leader in initiating Scenario A? If you think there would be multiple leaders, please select all that apply.

<table>
<thead>
<tr>
<th>Option</th>
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<td>North Korea</td>
</tr>
<tr>
<td>United States</td>
</tr>
<tr>
<td>Russia</td>
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<tr>
<td>Japan</td>
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<tr>
<td>South Korea</td>
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<tr>
<td>China</td>
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<tr>
<td>Other</td>
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</tbody>
</table>
**Scenario B**: Creation of a formalized multilateral nonproliferation cooperation mechanism in Northeast Asia, such as a Nuclear Weapon Free Zone (NWFZ)* or a Regional Non-proliferation Regime (RNR)**

*A NWFZ is defined by the UN as a zone in which any group of states has agreed via a treaty or convention to (a) keep free of nuclear weapons, and (b) establish compliance verification for peaceful use of nuclear power.

**An RNR is defined as a consensus-driven multilateral institution in which participating regional governments combat multilaterally problems related to export control and WMD proliferation.

What is the probability of B occurring?

| 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

Probability (%)

Why did you choose this probability? Please help me understand your reasoning.
If B were to occur, by what year would this happen?

2020  2023  2025  2028  2030  2033  2035  2038  2040  2043  2045  2048  2050

Year

Why did you choose the above year? Please help me understand your reasoning.

Why?

How desirable is B?

Very Desirable  Desirable  Undesirable  Very Undesirable  No Judgment

Scenario B

Why?

Who would most likely be the leader in initiating Scenario B? If you think there would be multiple leaders, please select all that apply.

Japan
China
Russia
South Korea
North Korea
United States
Other

>>
Scenario C: Establishment of an informal multilateral security cooperation mechanism in Northeast Asia, such as the Six Party Talks†.

†The Six Party Talks, which began ad-hoc in 2003 and ended in 2009 when North Korea pulled out of the process, were a series of multilateral negotiations with the aim of dismantling North Korea’s nuclear program. The talks were hosted in Beijing and included negotiators from China, Japan, Russia, United States, South Korea and North Korea.

What is the probability of C occurring?

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<th>20</th>
<th>30</th>
<th>40</th>
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<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
</table>

Probability (%)

Why did you choose this probability? Please help me understand your reasoning.
If C were to occur, by what year would this happen?

2020 2023 2025 2028 2030 2033 2035 2038 2040 2043 2045 2048 2050

Year

Why did you choose the above year? Please help me understand your reasoning.

How desirable is C?

<table>
<thead>
<tr>
<th>Scenario C</th>
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<th>Desirable</th>
<th>Undesirable</th>
<th>Very Undesirable</th>
<th>No Judgment</th>
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</tbody>
</table>

Why?

Who would most likely be the leader in initiating Scenario C? If you think there would be multiple leaders, please select all that apply.

- China
- Russia
- Japan
- South Korea
- United States
- North Korea
- Other
Please self-rank your own expertise on this subject area.

<table>
<thead>
<tr>
<th>Extremely knowledgeable</th>
<th>Very knowledgeable</th>
<th>Moderately knowledgeable</th>
<th>Slightly knowledgeable</th>
<th>Not knowledgeable at all</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

You are: O    O    O    O    O

Thank you so much for completing Round 1 of my dissertation research project! I will be contacting you in about one month with my follow-up questionnaire.
Appendix A.2 Delphi Round 2 Questionnaire (Example)

Wadsworth Delphi Questionnaire Round 2

------------- <e-mail> -------------

Dear [Participant First Name],

Thank you again for taking the time to provide your expertise on the future of the North Korea Nuclear Issue. As promised, I have attached the summarized results of my survey for your reference. A total of 40 experts responded.

If you don’t mind, I have a few follow-up questions regarding your answers and those of the other experts polled. In some cases your responses varied significantly from others. The attached summary includes an average of the responses of experts and the comments offered to support your responses.

If, after reviewing the summary, you feel you would like to revise your original responses (which I have provided below for your convenience), please include your revisions in the attached Word document or, if you wish, in the body of the email. If you would like to keep your original responses it would be helpful if you provide any additional reasons for keeping your original judgment.

I also included an additional question at the end asking if any of your answers have changed in light of COVID-19. Many respondents answered before the onset of this pandemic.

Thank you again for your time and participation in this valuable project.

Kindly,

K.C. Wadsworth

------------- <attachment> -------------

Proliferation Futures Questionnaire: Your Responses Compared With An Average of Other Expert Responses

SCENARIO A: Complete and verifiable denuclearization of North Korea without resorting to militarized conflict
Median expert response: 10%

Reasoning (with answer given for % probability):

- (0%) The North Korean leader believes his survival depends on nuclear weapons so is unlikely to give it up. In addition, change in U.S. administration makes it difficult for him to see credibility in any security guarantee as it could be reneged by succeeding administrations.

- (1%) It’s not likely that NK will agree to denuclearize within 20 years absent major policy shifts from either or both sides. Also, even if NK agrees to denuclearize, it’s extremely unlikely that it will be in a verifiable way. Also, sanctions will not pressure NK enough to change its behavior. (Taken from Scenario E answer) More likely (5%) is complete and verifiable denuclearization of North Korea without resorting to militarized conflict, but over a very long-term period (e.g., 50 to 100 years) and before which, North Korea maintains its nuclear arsenal but slowly gives it up.

- (9%) While Kim’s regime is in force, it is doubtful that they will give up their nuclear and missile capability. The international community (including the US but not only) has to offer some guarantees to DPRK for it to quit their tests.

- (9%) Irrespective of internal and external (non-military) pressures for denuclearization, nuclear weapons will be the last thing the North Korean regime will abandon. Kim Jong-un perceives nuclear arsenal as a guarantor of regime survival. The track record of his two predecessors reinforces the argument: nuclear weapons development is what Kim Il-sung and Kim Jong-il strenuously strived for, in a consistent manner, under a dynamic environment during the 1990s and 2000s. Despite some fitful events that attempted to dissuade the DPRK having nukes (framework agreement of 1994, the six-party talks, etc), the incentive for nuclear development was strong enough for the Kim dynasty. Under such a context, a non-military approach will be ineffective in achieving the objective. The negative historical track record and the high threshold for the North Korean regime to genuinely give in their nukes motivated me to give a 10 percent chance of scenario A being materialized.

- (10%) North Korea has already spent so much resources on nuclear arsenal to abandon it.
• (15%) Low incentive for North Korea to agree to stop its own programs without significant and uniform pressure from the international community (including China), which pressure is difficult to unify.
• (20%) I think basically Kim Jong Un never give up Nuclear weapon in any case. Because they believe the conferences between NK and US have conducted after they get the Nuclear capability. But Kim can not control everything. Mil coup will change the regime. And also people can't endure the starvation if people receive no food. Then NK people stand on rebellion
• (50%) Verifiable denuclearization is technically possible within 20 years, but it would be an intensive negotiation process and require significant political will. Despite the challenges, Kim has indicated a willingness to negotiate and continues to couch denuclearization as possible if the US-NK relationship transforms, so I think it could happen.
• (55%) If Kim Jong Un died and a new regime came in, this could be possible. I estimate that the likelihood of Kim’s death before 2040 is about 50 percent.
• (70%) Kim’s hope is to ensure survival, and if it can be guaranteed and convincing, it will be possible.

Your original response:

Your reasoning:

Your updated response (if applicable):

Your updated reasoning (if applicable):

**How desirable is this scenario?**

Expert response:

<table>
<thead>
<tr>
<th>Very Desirable</th>
<th>Desirable</th>
<th>Undesirable</th>
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<tr>
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</table>

Reasoning for “Very Desirable”:

• NK is not a trustworthy country. Just as felons, murderers, crazy people are blocked from buying firearms in most US states, some states just should not have a nuclear deterrent. NK is such a state given its violent history and nasty pattern of rule.
• Nuclear weapons are inherently destabilizing. Elimination of nuclear weapons is the best way to prevent use. No war no nucs has to be the preferred outcome
• The denuclearization contributes to regional security.
• Greater stability and predictability
• Because it would (peacefully) eliminate nuclear weapons from a country.
• This is because it minimizes damages between the two Koreas and is the premise of unification.
• **(Very Undesirable)** Even if the North Korean regime gives up nuclear weapons development in exchange for any of the items I have mentioned above (ranging from US’ promise for a non-intervention/invasion, economic aid, normalization or a mixture of these, etc), DPRK will remain as a threat factor in the Far East region. Its conventional weapons largely intact (including WMDs
like chemical and biological weapons), DPRK can provoke South Korea and Japan with its non-nuclear arsenals. Besides, nuclear weapons development can be reinitiated somewhere in the future, once the regime considers it as a necessity. Moreover, in terms of human rights and democracy for the North Koreans, this scenario will be recorded as a negative precedent. To be sure, the immediate threat of nuclear blackmail will be substantially reduced for a while and countries that have a geographical distance with North Korea will enjoy relief (most likely the US). Earlier answer: No matter what US guarantees and promises, the North Korean regime will have a strong tendency to rely on nuclear weapons as a deterrent against a regime change. Reliance (or to some degree, obsession) on nuclear weapons has been increased throughout the years. In particular, Qaddafi’s death after Libya’s decision to abandon their nuclear ambition left a strong impression, both to Kim Jong-il and Kim Jong-un.

Your original response:

Your reasoning:

Your updated response (if applicable):

Your updated reasoning (if applicable):

SCENARIO B: Complete and verifiable denuclearization of North Korea as a result of militarized conflict

What is the probability of B occurring by the year 2040?

Median expert response: 15%
Reasoning (with answer given for % probability):

- **(2%)** I believe armed conflict is even less likely than a peaceful settlement. None of the nations involved desire an open military conflict on the Korean peninsula. I believe North Korea’s possession of nuclear weapons is for deterrence purposes, and that they do not possess these with intention to launch a first-strike offensive. The United States and South Korea clearly have not deemed the current situation worth resorting to military conflict, or they would have likely done so by now. North’s Korea’s possession of nuclear weapons seems to achieve at least one desired result, in that such weaponry likely reduces the willingness of its adversaries, especially South Korea, to engage in open warfare with North Korea.

- **(5%)** We came fairly close to a conflict in 2017, and miscalculations of some sort could make the conditions for a conflict ripe again. A war on the Korean Peninsula wouldn’t necessarily lead to verifiable denuclearization, though, given the possibility of loose nukes, fissile materials, etc...

- **(8%)** US and its allies are unlikely to take the risk of a military (potentially nuclear) conflict in Northeast Asia.

- **(15%)** Generally all sides involved in security on the Korean peninsula take steps to avoid a second Korean war. Largely the opinion exists that military measures that may cause quick escalation are avoided and thus generally unlikely

- **(20%)** NK’s acquisition of usable, deployed nuclear capability, and or other actions could lead to militarized confrontation with the US and SK. This would likely lead to the end of the regime.

- **(30%)** A number of developments could spark a military conflict. For example, if we believed the DPRK was close to achieving the ability to deliver a nuclear weapon to U.S. territory.

- **(50%)** We can’t predict what will be happened in NK. But also we can’t estimate what will be happened under the Mr. Trump.

- **(70%)** By the timeline, North Korea would very likely to progress on its miniaturization of the nuclear warheads as well as the delivery vehicle (ICBMs and SLBMs in particular). In comparison to the current juncture (2020), North Korea will possess numerous ways to target the US with nukes in the coming days ahead. If the incentives are high enough for the DPRK to stick on the nuclear option, the most viable, if not preferable, option is to denuclearize North Korea with a military operation. Projecting the current level of the DPRK’s technological advancement (both in terms of nuclear warheads and its delivery systems) and the US’ increasing threat perception vis-à-vis North Korea lead me to give a 70% chance of scenario B being materialize.

Your original response:

Your reasoning:

Your updated response (if applicable):

Your updated reasoning (if applicable):

**How desirable is this scenario?**

Expert response:
Reasoning:

- **(Very Undesirable)** That would involve all major players in Northeast Asia, and the hostililty would last long.
- **(Very Undesirable)** It means the failure to build a peace system on the Korean Peninsula.
- **(Very Undesirable)** Military conflict with a paranoid, desperate, nuclear-armed North Korea is highly risky for all involved parties. Other than achieving CVID, the human devastation that such a conflict could bring is considered entirely unacceptable. The United States, in particular, has shown a preference for status quo in the past, not military conflict on the Korean Peninsula.
- **(Undesirable)** War with NK would likely bring devastation to SK, Seoul in particular. It could bring economic devastation to NE Asia. It could bring war between the US and China, depending on how it played out.
- **(Undesirable)** In fact it might be any of desirable, undesirable or very undesirable, depending on the scale and casualties of the military options
- **(Desirable)** Through military options, the US can ensure a transparent denuclearization and eliminate other WMD as well. The option has a high chance of a forceful regime change that can liberate the North Koreans. The downside would be North Korea’s possible retaliation, most likely towards US’ key allies (South Korea and Japan) during the US’ military operation. Even with a meticulously planned operation, North Korea could respond by firing several missiles to Japan, artillery shells to the South Korean capital Seoul, resulting in some casualties. Furthermore, if the military operation is not consulted with the allies beforehand, it might seriously damage alliance management (most likely in the case of ROK-US alliance).

SCENARIO C: North Korea is allowed to maintain a limited nuclear arsenal

What is the probability of C occurring by the year 2040?
Median expert response: 50%

Reasoning (with answer given for % probability):

- **(10%)** There is no way to eliminate North Korea's nuclear weapons without resorting to a militarized conflict.
- **(30%)** This implies some external constraint on NK's acquisition of further nuclear weapons -- to me that indicates Chinese pressure that is effective, which Chinese pressure (political & economic) has not been since NK's creation after WWII (remember how the Korean War started, when Kim Il Sung sought to force unification of Korea contrary to Chinese & Soviet desires.
- **(40%)** India and Pakistan are allowed already
- **(40%)** The 40% probability in scenario C was the calculation of three possible sub scenarios: Scenario C-1 is the current North Korean regime having some nuclear weapons. Scenario C-2 is the current North Korean regime having some nuclear weapons with a caveat (that their delivery systems (ICBM, SLBM, and TELs, etc) are either dismantled or under heavy supervision by international regimes). Scenario C-3 assumes the new North Korean government (a new government established after the implosion of the current regime) having some nuclear weapons. Chances for each sub scenarios to materialize is 60%, 30%, 30%, respectively. In sum (adding 60%, 30%, 30%, and dividing it to three), I gave the overall chances for scenario C, the probability of 40%.
  - The rationale behind scenario C-1’s 60%. Although I have mentioned the high chance of DPRK’s tendency to develop nuclear weapons and its delivery vehicles (in scenario B), North Korean regime might suggest the US to either freeze or reduce some of their nuclear arsenals for the sake of regime survival. North Korea would destroy most of its nuclear weapons, except for the minimum deterrence capability (say 10 to 15 nuclear warheads with some ICBMs). Yet the tolerance of the US in this particular scenario may be shallow. 60% chance is the combination of these two elements.
  - The rationale behind scenario C-2’s 30%. Destroying the key delivery systems (ICBM, SLBM, and TELs, etc) yet retaining some nuclear weapons can be attempted by the North Korean regime to reduce the threat perception of the US while maintaining its nuclear threat towards South Korea and Japan (since these two countries can be targeted by nuclear-tipped short and mid-range
missiles). But I think the chances are not so high (30%) since it contains negative elements that could hamper US’ alliance management.

- The rationale behind scenario C-3’s 30%. A North Korean implosion due to a coup or the natural death of Kim Jong-un is a possible scenario: there is intelligence (gained mostly through the recent defector from the DPRK) that corroborates the existence of assassination and coup attempt during the Kim Jong-un era. If regime change does occur, the signatories of the Korea War (US, China, and North Korea) will decide the way and manner of denuclearization. Due to the differing views between the US and China, the denuclearization process might not be “complete and verifiable,” meaning some nuclear weapons are allowed to be kept beyond the timeline of 2040. Overall, the chances are not so high, so I gave a 30% probability for scenario C-3.

- (50%) By accepting summit meetings with KJU, Trump virtually accepted DPRK as a nuclear weapon state. US might accept the situation as it is.

- (50%) The probability of scenario C is about 50% in the case North Korea will be given the right concessions. And we don’t know how this new post-coronavirus world will look like, what the main geopolitical actors will be and how the world order will emerge. Internal order in many countries, maybe also North Korea with a strict regimented system, will be more acceptable now to the rest of the world after the virus because the same system is now been introduced in many so-called democratic countries. So now maybe there would be some probability that North Korea would limit its nuclear arsenal to the limits of rational defense capacity.

- (80%) North Korea is still likely to be under the Kim regime in 20 years. Kim clearly sees nuclear weapons as safeguarding his rule. He is not going to give them up absent a significant transformation in his relationship with Washington, which seems unlikely. But North Korea has declared the strategic objectives of its nuclear weapons program have been met, so negotiations the limit further expansion of the program are likely.

- (87%) The international community lacks the will to impose sufficient coercive pressure on North Korea to disarm.

- (95%) I assess that the DPRK will not willingly give up its nuclear arsenal and that sane decision makers in the US will not chose to use military force to accomplish this due to the high cost. There is a possibility of miscalculation which leads to a war no one wants which then may result in denuclearization of the North. I put the odds at 95% rather than 90% because while there may be a 10% chance of a full-blown military conflict, it is not clear to me that US forces will succeed in overrunning North Korea and eliminating their arsenal.

Your original response:

Your reasoning:

Your updated response (if applicable):

Your updated reasoning (if applicable):

How desirable is this scenario?

Expert response:

<table>
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<tr>
<th>Very Desirable</th>
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<td>8</td>
<td>5</td>
</tr>
</tbody>
</table>

212
Reasoning:

1. **(Undesirable)** NK has shown it is a proliferation threat (Syria, Libya, Iraq, Iran). NK has shown it is reckless and murderous if one looks at its foreign policy from 1950 to present, whether starting the Korean War or killing Kim Jong-nam in the KL airport with chemical weapons.

   **(Undesirable)** This situation is undesirable since NK maintains its nuclear weapons and continues its human rights abuses, though less undesirable than a nuclear war. The US and international community cannot politically allow NK to maintain its nuclear weapons, in a de facto and de jure way, because this may cause other states like South Korea, Japan, and Taiwan to seek nuclear weapons.

   **(Undesirable)** Its undesirable for scenario C-1 since nuclear North Korea will remain a threat factor in the Far East region and there will be a very limited way to handle North Korean provocation vis-à-vis ROK and Japan (with conventional weapons). Seoul and Tokyo will remain hostage under North Korean nuclear blackmail and this precedent will resonate to the potential nuclear powers. Especially for the latter case, it might give false signals. Adding to that, if North Korea proliferates its nuclear technologies to the highest bidder around the world, the NPT regime itself might be negatively impacted.

   - **(Undesirable)** Its undesirable for scenario C-2 since South Korea and Japan might question the US’ nuclear umbrella. As a result, the perception of nuclear decoupling might permeate among these two countries, further damaging US’ alliance management. If the US does not offer a reasonable solution, ROK and Japan might resort to their way of countering North Korean nuclear blackmail. In a nutshell, such development will likely make Far East region vulnerable, in terms of security.

   - **(Undesirable)** It is undesirable for scenario C-3 since the existence of the weapon itself (even if these items are managed by a democratized North Korean government, South Korean government, or a unified Korean government) will exorbitantly alert the neighboring countries (most likely China and Japan) having less strategic advantage (with some nuclear warheads, its deterrence capability against China will be insignificant at best). Furthermore, the political, economical and environmental costs in maintaining nuclear arsenal in the Korean peninsula will be high.

   **(Undesirable)** The situation retards economic growth in the region especially in North Korea itself and China’s northeast, the populations of the countries of Northeast Asia would probably benefit in the long run from a change in the status quo, but the uncertainty and destruction of war is a shadow whose shape defies prediction.

   **(Undesirable)** North Korea maintains its nuclear weapons, so the risk of nuclear use, either intentional or accidental, persists. But at least the situation is stabilized and North Korea’s arsenal is not growing.

   **(Very Undesirable)** No country including Korea should be allowed to possess nuclear weapons due the importance of maintaining the NPT regime.

   **(Very Undesirable)** North Korea’s nuclear is the largest asymmetric strategic weapon for South Korea.

   **(Very Undesirable)** The problem on the peninsula should be settled unless it develops into a full-scale conflict.

   **(Desirable)** This would be progress, if achievable. North Korea relies on certain protectors, which would presumably "see the light" of cohesive pressure on Pyongyang; that would suggest a more stable international approach than has been the norm.

   **(Desirable)** This really depends on what you compare it to. Compared to a war with North Korea, or an unchecked nuclear program, this is desirable.

   **(Desirable)** Certainly better than an unconstrained growth of DPRK arsenal that would be a direct threat to U.S. Better than war.

   **(No Judgment)** North Korea will continue to be ruled by a dictatorship. No real reform and opening up. North Korea’s nuclear weapons will destabilize the region. But a serious military conflict to forcibly disarm North Korea would be avoided.
• **(No Judgment)** This option is better than war but worse than North Korea's full-scale nuclear capability. Neither desirable nor undesirable.

Your original response:

Your reasoning:

Your updated response (if applicable):

Your updated reasoning (if applicable):

--<if participant included additional scenarios below in their response, questionnaire will mimic above scenarios. If they did not include these scenarios, they will be asked the survey questions following this section>--

**SCENARIO D: The status quo continues.**

*What is the probability of D occurring by the year 2040?*

![Histogram for "What is the probability of D occurring by the year 2040? - Probability (%)"

Median expert response (n = 15): 61%

Reasoning (with answer given for % probability):

• **(29%)** Endurance is a key characteristic of the North Korean regime

• **(30%)** The negotiation with North Korea has produced little results. North Korea wants to acquire capability to attack continental US.
• (48%) Because this is the story of the last several decades, and it is more likely than other individual outcomes.

• (50%) Status quo has held for many years and through many changes of government in other nations. This is an enduring problem that may continue.

• (50%) President Trump has been lost the emotion to persuade Mr. Kim to disarmament of Nuclear weapons after the Election this Nov.

• (61%) There are for now no indicators of the change of situation

• (70%) Chinese efforts to control or reduce NK's nuclear weapons program have failed for decades (Kim Jung Il showed signs of foregoing nuclear weapons at the time of the Agreed Framework, but NK secretly cheated on that agreement by pursuing uranium enrichment, while the U.S. simply failed (refused) to meet some of its commitments under that agreement. both sided defaulted.) So NK has pursued nuclear weapons since the 1950s, with first the USSR and then China trying repeatedly to dissuade (and often impede) that effort. Nothing worked. I see nothing in the future likely to alter that trajectory.

• (80%) No breakthrough can be expected. No future US presidents would repeat Trump's approach, and DPRK understands US has not interest in military options.

• (91%) It's impossible to "de-nuclearize" North Korea at any acceptable price. But Japan, South Korea, China and the U.S. will not be able to tell their populations that they "just have to live under the North Korean threat", especially when we have experiments and tests underway that have proven the efficacy of boost-phase intercept. Destroying any potentially nuclear-tipped missile over North Korea is a wonderful deterrent by denial of any attempts by Kim to strike any country.

Your original response:

Your reasoning:

Your updated response (if applicable):

Your updated reasoning (if applicable):

How desirable is this scenario?

Expert response (n = 14):

<table>
<thead>
<tr>
<th>Very Desirable</th>
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<td>1</td>
<td>0</td>
<td>11</td>
<td>2</td>
<td>0</td>
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</table>

Reasoning:

• (Undesirable) Undesirable, but not as undesirable as a war with North Korea.

• (Undesirable) Low predictability

• (Undesirable) NK's continued development of nuclear capabilities is a serious potential threat to both regional and international stability. but until/unless NK changes its basic security posture to become more assertive/aggressive, it remains less likely to lead to major and/or nuclear war than does South Asia. the one big variable there is if the credibility of U.S. defense of South Korea and Japan weakens, either actually or in NK's perception, then risks can escalate rapidly.
• **(Undesirable)** Stagnation is undesirable, but quite realistic. Progress requires leadership beyond what we have seen in key nations.

• **(Very Undesirable)** Failure of nonproliferation regime; North Korea remains as a factor of uncertainty in Northeast Asia; Improvement of nuclear and missile technologies by North Korea

• **(Very Desirable)** The objective of "de-nuclearizing" North Korea is to ensure the security of South Korea, Japan, the U.S., others. If "de-nuclearization" is impossible, the next step is to ensure they can never strike another nation. Hence, boost-phase intercept.

Your original response:

Your reasoning:

Your updated response (if applicable):

Your updated reasoning (if applicable):

**SCENARIO E: North Korea Collapses (n = 10) has been divided into E1 (leads to denuclearization) and E2 (assuming power retains nuclear capability)**

SCENARIO E1: North Korea collapses, leading to denuclearization.

*What is the probability of E1 occurring by the year 2040?*

![Histogram for "What is the probability of E1 occurring by the year 2040? - Probability (%)"

Median expert response (n = 5): 15%

*Scenario descriptions and reasoning (with answer given for % probability)*:

• **(8%)** North Korea collapse leads to reunification; Unified Korea gives up its nuclear arsenal. Included in the probability of the peaceful denuclearization scenario. Most likely scenario for peaceful denuclearization is
collapse of the Kim regime. But that is unlikely to occur by 2040. United Korea is more likely than not to abandon its nuclear weapons.

- **(10%) North Korea regime collapse.** Possible but not likely. China stops supporting North Korea regime; China and US have built enough strategic trust to deal with the outcome.

- **(15%) North Korea collapses and is denuclearized as part of unification with South Korea.** Any type of maximum pressure campaign is unlikely to force Kim to change course. The regime is practiced in sanctions evasion and willing to allow the North Korea people to suffer a great deal of pain. At the same time, information about the outside world continues to reach North Koreans and an event like a pandemic or nuclear accident could cause the regime to fall.

- **(15%) Widespread economic/social collapse or dislocation causes DPRK to lose control of its arsenal and proliferate to other regimes.** Prior to the coronavirus, I did not consider this possibility as highly likely, but unlike a famine, it is more difficult to mitigate the threat to leaders or sensitive/secure locations with a contagion. The coronavirus infecting a large number of soldiers or leaders in the regime, and the lack of medical equipment would probably mean a higher number of deaths. Large numbers of dead or desertions would make it more difficult to secure facilities or ensure loyalty to the regime. However, militating against the scenario would be the need to physically remove the weapons, which might be more difficult with the desire not to enter a quarantined zone.

- **(30%) Internal collapse of the North Korean state and subsequent rapid reunification of the Korean Peninsula under the Republic of Korea, with ROK completely relinquishing all of the former DPRK's nuclear capability.** The key to this is the probability of North Korean collapse, which should still be viewed as unlikely, but this scenario's probably is slightly higher because it's more likely that South Korea wouldn't keep North Korea's nuclear capability.

2.  
3.  
4. Your original response:

Your reasoning:

Your updated response (if applicable):

Your updated reasoning (if applicable):

*How desirable is this scenario?*

Expert response (n = 5):

<table>
<thead>
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Reasoning:

- **(Very desirable)** No longer a DPRK nuclear threat. Reunified Korea. Unified Korea giving up nuclear weapons reduces the chance that Japan decides to acquire nuclear weapons.

- **(Desirable)** North Korea has been a trouble-maker for years; collapse might post short term challenges, but it might have long term positive outcome for the region and the world.
• **(Desirable)** Reunification under the ROK and elimination of a nuclear weapons-capability is the most desirable future scenario for the Korean Peninsula, but DPRK state collapse likely will be very messy and costly.

• **(Undesirable)** Collapse due to accident or disaster would likely have a significant negative impact on the lives of North Koreans and, in the event of collapse, the risk of nuclear material being lost or stolen increases.

• **(Very Undesirable)** Chaos is always the enemy of progress. The proliferation of weapons would be very difficult to trace in this scenario.

Your original response:

Your reasoning:

Your updated response (if applicable):

Your updated reasoning (if applicable):

**SCENARIO E2: North Korea collapses and the assuming power retains nuclear capability.**

*What is the probability of E2 occurring by the year 2040?*

Median expert response (n = 5): 8%

*Scenario descriptions and reasoning (with answer given for % probability):*

• **(3%)** North Korea becomes a protectorate of China. When considering China's foreign policy and modern international politics, this scenario is very unlikely.
• **(5%)** *North Korea and South Korea become one state.* US, China, and Japan may not like the unification. 1. North Korea's regime is in an unstable situation; 2. Surrounding powers prefer to the regime change than the unification.

• **(8%)** *The Kim regime collapses, but the subsequent leaders of DPRK negotiate a more open federation without full unification, maintaining its nuclear ambitions for later bargaining power.* I could foresee the Kim regime collapsing, but the subsequent power struggle would be unlikely to encourage conciliatory leaders. The Kim regime collapse would need to be accompanied by some other event that exposed the weakness of the DPRK's position within North Korea without alerting the rest of the world to such failures. The subsequent regime would be desirous to secure something approaching unification without giving up too much. Some crisis in South Korea would also be necessary to make federation more palatable to the massive expense associated with unification.

• **(25%)** *Internal collapse of the North Korean state and subsequent rapid reunification of the Korean Peninsula under the Republic of Korea, with ROK maintaining some of the former DPRK's nuclear capability.* The Kim dynasty will be challenged to maintain its power in the face of internal and external pressures, and the ROK would face very strong pressure to not absorb the former DPRK's nuclear capability. Economic catastrophe, an empowered merchant/moneyed class, sudden death of Kim Jong Un, or unsuccessful transfer of power to Kim Jong Un's successor are all pressures that could lead to DPRK state collapse and rapid reunification led by the ROK. The ROK would then have to resist US pressure to not absorb the former DPRK's nuclear capability, or change of preferences in the US-ROK alliance could let the ROK absorb that nuclear capability. Even then, China and Japan would react strongly to such a move by the ROK.

• **(30%)** *North Korean regime collapses and a third party controls nuclear weapons.* The likelihood of North Korea’s regime collapse is low. 1. Kim Jong Un's health condition is worsened; 2. Someone from Kim’s family succeeds in the leadership; 3. US or China controls North Korea’s nuclear weapons with the consent of the new leadership.

**Your original response:**

**Your reasoning:**

**Your updated response (if applicable):**

**Your updated reasoning (if applicable):**

*How desirable is this scenario?*

Expert response (n = 5):

<table>
<thead>
<tr>
<th>Very Desirable</th>
<th>Desirable</th>
<th>Undesirable</th>
<th>Very Undesirable</th>
<th>No Judgment</th>
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<tbody>
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<td>0</td>
<td>3</td>
<td>2</td>
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**Reasoning:**

• **(Desirable)** Maybe the scenario is desirable for US but not desirable for China if unified Korea is with US side.
• **(Desirable)** It would draw North and South together and open up the possibility of deeper negotiations. More frequent contact between the citizens on both sides would also probably encourage steps toward unification.

• **(Desirable)** North Korea regime is still stable so that it does not break the status quo equilibrium. And nuclear weapons are under the control of a third party.

• **(Undesirable)** Surely this scenario is not desirable for US and South Korea, but maybe desirable for China.

• **(Undesirable)** The latter part of the scenario (ROK absorption of the former DPRK’s nuclear capability) is undesirable, but the elimination of the DPRK would be desirable.

Your original response:

Your reasoning:

Your updated response (if applicable):

Your updated reasoning (if applicable):

**SCENARIO F: An agreement is reached with North Korea.**

*What is the probability of F occurring by the year 2040?*

---

Median expert response (n = 6): 30%

*Scenario descriptions* and reasoning (with answer given for % probability):
• **(None given)** North Korea is allowed to maintain a limited nuclear arsenal. Yet the delivery systems (ICBM, SLBM, and TELs, etc) are either dismantled or under heavy supervision by an international regime.

• **(20%)** "Complete" denuclearization of North Korea without resorting to militarized conflict, but not 100% verifiable. There is a slight possibility that a US administration decides to reach a deal with NK, with all the necessary concessions made by both sides, but that denuclearization can’t be verified, and the US is okay with it. All the conditions outlined in scenario A: Complete US and international sanctions relief, withdrawal of most US forces from the Korean Peninsula and its vicinity, security guarantees, economic assistance, humanitarian assistance, normalization of relations with US, and a 20 year timeline for denuclearization.

• **(20%)** Agreement to give up weapons but retain reconstitution capability (unlikely but possible). This is not the most far fetched idea; it has been floated periodically since the dawn of the atomic era. DPRK decides it doesn’t need the actual weapons to ensure security; Much would then depends on the level of transparency required to verify compliance.

• **(30%)** Presumed but ultimately unverifiable de-nuclearization of North Korea after either agreement or military conflict. Either conflict or pressure for agreement may sway North Korea to play along to a degree, but without ultimately verifiable protocols. Either conflict or agreement is feasible if pressure builds, yet ultimate reliability in North Korea’s commitments stretches credibility.

• **(30%)** There is a sustained international agreement of some sort which does not "allow" North Korea to maintain a nuclear arsenal, but does place limits on its expansion in exchange for partial sanctions relief, normalization of diplomatic relations, etc. North Korea’s limited nuclear arsenal continues to be illegitimate under international law and a source of global tension, but complete denuclearization is tacitly regarded as an unrealistic objective. This is a more realistic deal that might emerge, although it is unclear if Washington and Pyongyang would be willing to sustain such an agreement if reached. Nobody wants a military conflict on a peninsula with close to 100 million people.

• **(60%)** Sanctions pressure forces NK to agree to denuclearize but full verification is not possible; i.e., they are not "allowed" to keep them but we suspect some remain since verification is not complete. NK has to give in eventually unless China provides unlimited support but they will find a way to cheat; NK flexibility and US desire to declare victory with less than CVID.

• **(80%)** North Korea takes steps to limit the expansion of its nuclear weapons and roll back the program decreasing the risk and continues on the path to denuclearize (but is never recognized as being 'allowed' to maintain a limited arsenal). This may be what you were thinking with Scenario C. I could just see Kim deciding to negotiate and taking steps to dismantle and roll back parts of the program, but never actually making the decision to give up nuclear weapons and continuing to string on negotiations. U.S., North Korea, & South Korean leadership committed to step by step negotiations that exchange meaningful progress on denuclearization for reciprocal steps that address North Korea’s security and economic demands. Political will and leadership on both sides to see through a long, technical negotiation. Empowerment of negotiating teams and a sound process that can withstand changes in administrations.

Your original response:

Your reasoning:

Your updated response (if applicable):

Your updated reasoning (if applicable):

**How desirable is this scenario?**
Expert response (n = 6):

<table>
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Reasoning:

- **(Desirable)** This might be the best case it provides all the benefits outlined in Scenario A, with greater probability, but the downsides of not achieving 100% verification.
- **(Desirable)** The continued expansion of North Korea’s nuclear program is destabilizing, and capping it would reduce the prospects of conflict or horizontal proliferation.
- **(Desirable)** Denuclearization without full certainty better than no dec or status quo.
- **(Desirable)** It keeps denuclearization as a goal, so North Korea’s nuclear weapons are not recognized and accepted. It prevents the program from going and keeps negotiations open, which can be stabilizing and provide a venue to prevent escalation.
- **(Undesirable)** Great risk of miscalculation and misperception in a crisis about whether DPRK reconstituted with actual weapons again; preemptive and preventive war pressures on both sides.
- **(Undesirable)** This would essentially mean continuation of the status quo with a twist -- either conflict or agreement gives the impression of change within (and commitment by) North Korea, in the absence of full confidence in North Korea’s actual posture.

Your original response:

Your reasoning:

Your updated response (if applicable):

Your updated reasoning (if applicable):

---if participant included scenarios below in their response, questionnaire will mimic above scenarios. If they did not include these scenarios, they will be asked the following>---

There were also three additional scenarios that a number of expert participants indicated should be included in my analysis. If you would kindly provide your estimates/updates to the answers below, I can include better estimates of an extended range of possible scenarios.

**SCENARIO D: The status quo continues.**

What is the probability of D occurring by the year 2040?
Why did you choose this probability? Please help me understand your reasoning.

What conditions would bring about Scenario D with the probability you assigned to it?

How desirable is this scenario? (circle one)

- Very Desirable
- Desirable
- Undesirable
- Very Undesirable
- No Judgment

Why do you think so?

**"SCENARIO E: North Korea Collapses" has been divided into E1 (leads to denuclearization) and E2 (assuming power retains nuclear capability)**

**SCENARIO E1: North Korea collapses, leading to denuclearization.**

What is the probability of E1 occurring by the year 2040?

Why did you choose this probability? Please help me understand your reasoning.

What conditions would bring about Scenario E1 with the probability you assigned to it?

How desirable is this scenario? (circle one)

- Very Desirable
- Desirable
- Undesirable
- Very Undesirable
- No Judgment

Why do you think so?

**SCENARIO E2: North Korea collapses and the assuming power retains nuclear capability.**
What is the probability of E2 occurring by the year 2040?

Why did you choose this probability? Please help me understand your reasoning.

What conditions would bring about Scenario E2 with the probability you assigned to it?

How desirable is this scenario? (circle one)

Very Desirable | Desirable | Undesirable | Very Undesirable | No Judgment

Why do you think so?

SCENARIO F: An agreement is reached with North Korea.

What is the probability of F occurring by the year 2040?

Why did you choose this probability? Please help me understand your reasoning.

What conditions would bring about Scenario F with the probability you assigned to it?

How desirable is this scenario? (circle one)

Very Desirable | Desirable | Undesirable | Very Undesirable | No Judgment

Why do you think so?

Since completing the first proliferation futures questionnaire the world has experienced the COVID-19 pandemic. To what extent has the occurrence of the global pandemic affected your responses to this questionnaire? (circle one)

To a Great Extent | Somewhat | Very Little | Not at All | Not Sure
Why do you think so?
Appendix B: Conditional Statements Assigned to The Constructs of Multilateral Security Cooperation

(1) Self-interest

16. Security miscalculations by regional leaders lead to militarized conflict in Northeast Asia
17. North Korea intentionally initiates conventional (non-nuclear) militarized conflict in the region
18. The U.S. takes conventional (non-nuclear) military action to denuclearize North Korea
19. The U.S. launches a nuclear strike targeting North Korean strategic locations
20. Regional leaders in Northeast Asia cooperate on military action to denuclearize North Korea
21. China encourages and then supports North Korea in initiating a militarized conflict
22. China militarily invades and then occupies North Korea
23. North Korea unintentionally deploys a nuclear weapon
24. North Korea launches a nuclear weapon targeting a U.S. ally
25. North Korea launches a nuclear weapon targeting the U.S. or a U.S. territory
42. Japan, South Korea and the U.S. cooperate on military action to denuclearize North Korea

Identity & Domestic Politics

8. North Korea is ensured by the international community of the security and survival of its regime
10. North Korea is ensured by the U.S. of the security and survival of its regime
11. North Korea is ensured by South Korea of the security and survival of its regime
13. U.S. President Trump gets re-elected for a second term
14. North Korea is ensured that negotiated agreements will withstand changes in U.S. administration
15. There is a coup in North Korea

26. North Korea suffers an internal nuclear crisis

27. North Korea suffers an extreme humanitarian crisis

28. North Korea suffers an extreme economic crisis

39. The U.S. concedes to less-than-verifiable denuclearization of North Korea

40. The U.S. closes its military bases in both South Korea and Japan

41. The U.S. closes its military bases in South Korea

(2) Regional Leadership

5. North Korea leads an initiative to normalize diplomatic relations with the international community

6. North Korea leads an initiative for meaningful 1:1 negotiations with the U.S.

9. China leads an initiative to normalize diplomatic relations between North Korea and the international community

12. South Korea leads an initiative for meaningful 1:1 negotiations with North Korea

14. North Korea is ensured that negotiated agreements will withstand changes in U.S. administration

43. South Korea leads an initiative to resume meaningful multilateral negotiations with North Korea and regional leaders

U.S. Leadership

1. The U.S. leads an initiative to normalize diplomatic relations with North Korea

2. The U.S. leads an initiative for meaningful 1:1 negotiations with North Korea

3. The U.S. increases economic sanctions against North Korea

10. North Korea is ensured by the U.S. of the security and survival of its regime
29. The U.S. reaches a 1:1 agreement with North Korea that allows the DPRK to maintain a limited nuclear arsenal

(3) Norms

4. The international community increases economic sanctions against North Korea
7. Regional leaders in Northeast Asia collaborate to meaningfully negotiate with North Korea
30. A multilateral negotiation amongst Northeast Asian regional leaders reaches an agreement that allows the DPRK to maintain a limited nuclear arsenal
36. North Korea is provided an extended timeline to denuclearize (20+ years)
37. The international community concedes to less-than-verifiable denuclearization of North Korea
38. Regional leaders concede to less-than-verifiable denuclearization of North Korea
Appendix C : Expert Outreach Questions Used for The NSI Team Vitta Korea Strategic Outcomes Report (Spring 2018)

**Strategic Outcomes**

1. Is there a win-win scenario for all the key actors (DPRK, ROK, U.S., China, Russia)? If so, what might this look like?

2. Is there anything the U.S. can do to empower the ROK to negotiate a solution that would remove both the nuclear and conventional instabilities on the peninsula. The current planning assumption is that the U.S. will play a major, even lead role in these negotiations.

**DPRK Denuclearization**

3. Under what regional and domestic political, economic and social conditions would it be possible to achieve a complete and verifiable denuclearization of the DPRK without resorting to militarized conflict (i.e., what conditions would have had to occur to make that possible)?

   • Which regional actors have interests consistent with a complete and verifiable denuclearization of the DPRK? Which actors have interests that are at odds with that outcome? Which are indifferent?

**Regional Non-Proliferation**

4. Under what regional and domestic political, economic, and social conditions would it be possible to reinforce a non-proliferation regime in the region including extra-regional sales? What conditions would have had to occur to make that possible?
Northeast Asia and Western Pacific Regional Stability

5. How does the U.S., working with its partners, best contest DPRK operations? Please explain your rationale.

6. What are the minimum regional and domestic political, economic and social conditions that are essential for achieving a stable regional order in alignment with U.S. and ally interests? Are there any factors that are sufficient to generate such stability in the region? That is, what should not be negotiated away?

Economics

7. Many analysts indicate that due to the partial marketization of the North Korean economy, the economy has stabilized somewhat. What were the key reasons the regime made the decision to marketize? What factors inhibit a broader marketization of the economy?

Regional Actor Interests

8. How does each of the actors below define its key national interests / regional objectives in Northeast Asia and the Western Pacific? What are seen by each actor to be the major threats to each interest? Are there any redlines associated with these interests?

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Appendix D: Round 1 & Round 2 Statistical Comparisons

### Round 1: Scen. A Probability

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### Scenario A

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### Scenario B

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Bibliography


Lygass, S. CNN. “FBI says North Korean hackers stole more than $600 million in cryptocurrency in single hack.” Retrieved 30 Oct 2023 from


