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A Behavioral Economic Approach to Nuclear Disarmament Advocacy

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A Behavioral Economic Approach to Nuclear Disarmament Advocacy

ABSTRACT

Nuclear disarmament advocates have provided a strong moral voice for the total disarmament of nuclear weapons, but if they are to remain credible participants in the disarmament process, they must redouble their efforts to assist in the difficult technical and political obstacles that stand in the way of a world without nuclear weapons. This Note first outlines impediments to disarmament towards which advocates could helpfully direct their attention, such as: conventional force imbalances; developing “proliferation-safe” civil nuclear technologies; enforcing nonproliferation obligations; and verifying nuclear disarmament. Second, it explains how tools from behavioral economics and negotiation theory could inform a more influential disarmament advocacy. Among other things, it suggests an iterative approach to disarmament to combat loss aversion and reference dependence. To fight time discounting, this Note urges support for ex ante agreement on UN Security Council action in response to violations of the nonproliferation regime. Finally, it recommends using a fairness norm based on process rather than distribution in formal disarmament negotiations.

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I. INTRODUCTION

Today there is increasing agreement, especially among leaders of the West, that nuclear disarmament must be a political priority, and nongovernmental disarmament advocates can claim some credit for this state of affairs. However, if these advocates are to remain relevant, they must move beyond their traditional moral arguments for the abolition of nuclear weapons toward an advocacy that helps states solve the real and difficult problems that stand in the way of a world free of these weapons of mass destruction. The will to pursue disarmament is stronger than ever, but the way remains challenging.

President Barack Obama declared in a 2009 Prague speech that the United States is committed “to seek the peace and security of a world without nuclear weapons.”¹ When the Nobel Committee awarded President Obama the Nobel Prize, it stated that special attention was given to the President’s commitment to a world without nuclear weapons.² Before the President gave his Prague speech, George Shultz, William Perry, Henry Kissinger, and Sam Nunn in 2007 wrote an opinion piece arguing for a nuclear-weapon-free world, and listed a series of steps that could be taken toward that end.³ In 2008, UK Defense Minister Des Browne told the Conference on Disarmament that his country was dedicated to a world free of nuclear weapons and introduced a new process to study the difficult challenge of disarmament verification.⁴ President Nicolas Sarkozy of France delivered a speech in 2008 that was more ambivalent on complete nuclear disarmament than the speeches by the leaders of the United Kingdom and the United States, but which nonetheless was remarkable in that a French President was willing to address the topic at all in such detail.⁵

1. Press Release, Office of the Press Sec’y, Remarks by President Barack Obama, Prague (Apr. 5, 2009), *available at* http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered/.

2. Press Release, Norwegian Nobel Comm., The Nobel Peace Prize 2009 (Oct. 9, 2009), *available at* http://www.nobelprize.org/nobel_prizes/peace/laureates/2009/press.html.

3. See George P. Shultz et al., Opinion, *A World Free of Nuclear Weapons*, WALL ST. J., Jan. 4, 2007, <http://online.wsj.com/article/SB116787515251566636.html>.

4. Des Browne, U.K. Sec’y of State for Defense, Speech at the Conference on Nuclear Disarmament (Feb. 5, 2008), *transcript available at* http://www.labour.org.uk/des_browne_conference_on_nuclear_disarmament.

5. See Nicolas Sarkozy, President of Fr., Presentation of Le Terrible in Cherbourg (Mar. 21, 2008), *transcript available at* <http://www.carnegieendowment.org/2008/03/24/presentation%2Dof%2Dle%2Dtterrible%2Din%2Dcherbourg/ynb> (urging all

A community of nongovernmental advocates (NGAs), composed of private individuals and nongovernmental organizations (NGOs) focused particularly on nuclear disarmament advocacy, deserves some credit for elevating the issue of nuclear disarmament to such heights. Ever since the end of World War II, there have been influential members of civil society giving a voice to common citizens and advocating for the abolition of nuclear weapons. With the entry into force of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) in 1970 and the accompanying periodic cycle of international meetings to review its operation, these advocates were presented a more formal venue within which to conduct their disarmament advocacy. In recent years, NGAs have increased their presence in the NPT review process and kept the fire to the feet of world leaders. They carried a simple message: the average citizen of the world does not want nuclear weapons to exist. The fact that world leaders such as President Obama have recently given prominent speeches on nuclear disarmament suggests that the message has been received.

Today, however, is a dangerous time for nongovernmental disarmament advocacy. The moral arguments for nuclear disarmament have been made and understood. There is diminishing doubt around the world that complete nuclear disarmament should be pursued. The question now is how. These advocates today risk their relevance if they do not evolve along with the changing nuclear disarmament landscape. They must turn their attention to helping states solve the most difficult challenges standing in the way of further nuclear reductions and eventual total disarmament. It is no longer enough to tell states what they should do in broad strokes to achieve nuclear disarmament; now is the time for diligence, to delve into the minute details that states are forced to confront when implementing their disarmament visions. The summit has been identified, now is the time to help states prepare an expedition.

This Note is organized into five parts. After this introduction, Part II provides a summary of the NPT, focusing on its disarmament provision, and recounts the development of NGA involvement in the NPT review process. Part III describes some of the difficult obstacles that states must overcome to make significant progress toward nuclear disarmament, and on which disarmament advocates might helpfully involve themselves. These obstacles include: the impact of disarmament on perceptions of security and political influence in nuclear-weapon states, nuclear-related security concerns in non-nuclear-weapon states, and the verification of nuclear disarmament. Part IV outlines an approach based on behavioral economics that advocates could employ to help states solve these problems and take

countries with nuclear weapons to dismantle their nuclear-testing sites, and announcing some nuclear reductions).

significant steps toward nuclear disarmament. This approach suggests reframing the issue and developing specific advocacy strategies for nuclear-weapon states and non-nuclear weapon states. Part V summarizes the results and offers a conclusion.

II. THE TREATY ON THE NON-PROLIFERATION OF NUCLEAR WEAPONS AND PRIVATE ADVOCACY

The NPT, which was opened for signature in 1968 and entered into force in 1970, has the titular purpose of curbing the proliferation of nuclear weapons.⁶ The NPT has been ratified by 190 states, making it the most adhered-to arms-control treaty in history.⁷ It recognizes five nuclear-weapon states, China, France, Russia, the United Kingdom, and the United States, and classifies all other states as non-nuclear-weapon states for the purposes of the treaty.⁸ Only four states are not party to the NPT: India, Israel, and Pakistan, which never adhered to it, and North Korea, which most states recognize as having withdrawn in 2003.⁹

The precise hierarchy of NPT obligations is often debated, but it is safe to say that three of the treaty's primary purposes are (1) to curb the proliferation of nuclear weapons, (2) to declare that the responsible use of nuclear energy is permitted, and (3) to commit to a goal of nuclear disarmament.¹⁰ The nonproliferation obligations of the NPT are specified in Articles I and II and require that weapon states shall not transfer or provide any assistance in the development of nuclear weapons to any non-nuclear-weapon state, and non-nuclear-weapon states shall not receive any such weapons or seek development assistance.¹¹ Next, Article III requires that all parties accept appropriate safeguards negotiated with the International Atomic Energy Agency (IAEA) to verify the fulfillment of obligations under the treaty.¹² Article IV affirms that all parties have an

6. Treaty on the Non-Proliferation of Nuclear Weapons, *opened for signature* July 1, 1968, 21 U.S.T. 483, 729 U.N.T.S. 161 [hereinafter NPT]; *Treaty on the Non-Proliferation of Nuclear Weapons (NPT)*, UNODA, <http://www.un.org/disarmament/WMD/Nuclear/NPTtext.shtml> (last visited Feb. 21, 2013).

7. *Id.*

8. See NPT, *supra* note 6, art. IX (defining a nuclear-weapon state to be a state "which has manufactured and exploded a nuclear weapon or other nuclear explosive device prior to January 1, 1967").

9. See, e.g., *NPT Membership*, JAMES MARTIN CENTER NONPROLIFERATION STUD. (last updated June 5, 2012), <http://cns.miis.edu/inventory/pdfs/apmnpt.pdf> (listing the states party to the NPT and explaining North Korea's withdrawal).

10. *Treaty on the Non-Proliferation of Nuclear Weapons (NPT)*, UNITED NATIONS OFF. DISARMAMENT AFF., <http://www.un.org/disarmament/WMD/Nuclear/NPT.shtml> (last visited Mar. 15, 2013).

11. NPT, *supra* note 6, arts. I, II.

12. *Id.* art. III.1.

“inalienable right” to peaceful nuclear energy, in conformity with the nonproliferation obligations of the treaty.¹³ Article VI is the disarmament provision, which reads: “Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control.”¹⁴

There has been a lot of debate about what Article VI actually requires of nuclear-weapon states and non-nuclear-weapon states. The plain language suggests that only good-faith negotiations are required, but some, including the International Court of Justice (ICJ), have argued that the NPT requires actual nuclear disarmament or at least tangible steps in that direction.¹⁵ Though some disarmament advocates promote the ICJ’s advisory opinion as the definitive word on what Article VI requires of parties, the ICJ’s opinion that the NPT requires actual nuclear disarmament is increasingly seen as conclusory and stretching the plain meaning of the treaty.¹⁶ The center of the debate today is focused on what “good faith” actually requires, recognizing that actual nuclear disarmament probably stretches the meaning of the NPT too far.

Every five years since 1975, parties to the NPT have convened to “review the operation of [the] Treaty with a view to assuring that the purposes of the Preamble and the provisions of the Treaty are being realized.”¹⁷ Since 1995, private disarmament advocates and NGOs have spoken with an increasingly forceful voice at these conferences. Review conferences typically last four weeks and involve debate on what can be done to promote the NPT’s purposes for nonproliferation, peaceful nuclear energy, disarmament, and other issues, such as how to respond to withdrawals. The outcomes of review conferences have ranged from acrimony and disagreement to consensus final

13. *Id.* art. IV.

14. *Id.* art. VI.

15. *Compare* Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, 267 (July 8) (concluding that the NPT requires states to “pursue in good faith and bring to a conclusion negotiations leading to nuclear disarmament”), *and* DANIEL H. JOYNER, INTERPRETING THE NUCLEAR NON-PROLIFERATION TREATY 103–04 (2011) (arguing that Article VI should be interpreted to mean there is an obligation on all parties to “proactively, diligently, sincerely, and consistently pursue meaningful negotiations on effective measures relating to the complete elimination of nuclear weapons”), *with* Christopher A. Ford, *Debating Disarmament*, 14 NONPROLIFERATION REV. 401, 405–07 (2007) (arguing that the negotiating history of the NPT reveals that Article VI does not require states to achieve anything, but only pursue negotiations in good faith).

16. JOYNER, *supra* note 15, at 96–97.

17. NPT, *supra* note 6, art. VIII.3. It is important to note that other than a meeting five years after entry into force and another at twenty-five years after entry into force, no other conferences are required by the Treaty. *Id.* arts. VIII.3, X.2.

documents recommending that various practical steps be taken to advance the goals of the NPT.¹⁸ Because the focus of this Note is NGA disarmament advocacy, it briefly summarizes the participation of such advocates in the disarmament debate of recent review conferences.

In 1995, states party convened as required by Article X of the NPT and agreed to extend the treaty indefinitely.¹⁹ Contrary to this decision, most NGAs seem to have favored a long-term, but bounded, extension of the NPT, such as by twenty-five years, so as to retain leverage over nuclear-weapon states.²⁰ The thinking was that if nuclear-weapon states wanted the NPT extended again, they might have to pay a price in terms of some significant new commitment on disarmament.²¹ Though these advocates did not see their preferences realized regarding extension of the treaty, the conference did mark the beginning of the NGA disarmament advocacy strategy that seems to have endured until today.²² NGA disarmament advocacy began to focus intently on what would come to be called a nuclear-weapons convention, namely a treaty that requires complete nuclear disarmament within a specified timeframe.²³

At the 2000 review conference, NGAs continued to argue a moral imperative for nuclear disarmament and bolstered their efforts to build support for a nuclear-weapons convention. For example, the mayor of Nagasaki passionately recounted the horrors suffered by Japanese victims of the World War II nuclear strikes, warned of the dangers of human annihilation, and argued for a nuclear-weapons convention.²⁴ Dr. Daniel Ellsberg, disarmament advocate and

18. See, e.g., Lewis A. Dunn, *The NPT: Assessing the Past, Building the Future*, 16 NONPROLIFERATION REV. 143, 160–61, 164–65, 167–69 (2009) (discussing a range of past review conference outcomes).

19. The Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, New York, U.S., Apr. 17–May 12, 1995, *Extension of the Treaty on the Non-Proliferation of Nuclear Weapons*, U.N. Doc. NPT/CONF.1995/32 (Part I), Annex (May 12, 1995), available at http://www.un.org/disarmament/WMD/Nuclear/1995-NPT/pdf/NPT_CONF199503.pdf.

20. See John Burroughs & Jacqueline Cabasso, *Confronting the Nuclear-Armed States in International Negotiating Forums: Lessons for NGOs*, 4 INT'L NEGOT. 457, 467 (1999) (explaining how the indefinite extension was the result of skillful diplomatic maneuvering of the conference president and likely did not represent the desires of some NGOs).

21. See *id.* at 468 (“[E]xtension of the regime for relatively long periods of time . . . could have . . . provided an ongoing stimulus for reduction and elimination of nuclear arsenals.”).

22. See *id.* (arguing that the 1995 conference marked a “significant development among the abolitionist NGOs with respect to future strategy”).

23. See *id.* (discussing how NGOs collaborated on a statement calling for “negotiations on a treaty to eliminate nuclear weapons within a time bound framework”).

24. Iccho Itoh, Mayor of Nagasaki, Japan, Opening Address at the Nuclear Non-Proliferation Treaty Review Conference 2000 (May 3, 2000), transcript available at

disseminator of the Pentagon Papers, also argued that a meaningful commitment to the NPT's disarmament provision would only be demonstrated if the nuclear-weapon states first and foremost immediately began multilateral negotiations leading to complete nuclear disarmament.²⁵ Notably, the 2000 review conference also produced the famous "13 Steps" toward nuclear disarmament, which included an agreement to achieve the entry into force of the Comprehensive Nuclear-Test-Ban Treaty, an agreement to begin negotiations on a Fissile Material Cutoff Treaty, and various other commitments on verification, transparency, and diminishment of the roles for nuclear weapons in states' defense strategies.²⁶

In contrast to the 2000 review conference, NGAs almost universally viewed the 2005 NPT review conference as a terrible failure. Most blamed the United States, arguing among other things that the United States would not accept any promotion of the Comprehensive Nuclear-Test-Ban Treaty, that it refused to build upon or even recognize the 13 Steps agreed to in 2000, and that it simply saw no value in multilateral diplomacy.²⁷ Many also recognized, however, that Iran, Egypt, and the Non-Aligned Movement frustrated negotiations by staking out extreme positions and failing to provide constructive leadership.²⁸ NGAs continued in 2005 to promote a nuclear-weapons convention within a specified time frame and urge the moral imperative for disarmament. The primary development in terms of disarmament advocacy was the view by some NGAs that the 13 Steps agreed to at the 2000 review conference were so tightly connected to the core meaning of Article VI that they constituted legal requirements for compliance under the NPT.²⁹

The most recent review conference in 2010 saw perhaps the most strident advocacy yet for a nuclear-weapons convention. Indeed, nearly every NGA presentation to the conference had as its principal focus the need to begin negotiations on a nuclear-weapons convention,

<http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2000/NGOpres2000/2.pdf>.

25. Daniel Ellsberg, Presentation at the Nuclear Non-Proliferation Treaty Review Conference 2000: Nuclear Disarmament (May 3, 2000), available at <http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2000/NGOpres2000/5.pdf>.

26. 2000 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, New York, U.S., Apr. 24–May 19, 2000, *Final Document*, at 14–15, U.N. Doc. NPT/CONF.2000/28 (Parts I, II) (2000).

27. *Eg.*, Rebecca Johnson, *Politics and Protection: Why the 2005 NPT Review Conference Failed*, 80 DISARMAMENT DIPL. (2005).

28. *See id.* (discussing "a dismal lack of leadership and the entrenched positions and proliferation-promoting policies of a small number of influential states").

29. John Burroughs et al., *NGO Presentations to the 2005 NPT Review Conference: Compliance Assessment*, REACHING CRITICAL WILL 8 (2005), <http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2005/NGOpres/compliance4.pdf>.

or otherwise advocated for such a convention.³⁰ For example, the headline presentation by Nobel Peace Prize winner Jody Williams was titled “A Nuclear Weapons Convention: The True Path to Nuclear Non-Proliferation,” though in her presentation she acknowledged that negotiations on such a convention could be long and the actual disarmament process lengthy.³¹

The preceding summary of NGA participation in the NPT review process is of course simplistic. NGAs do not focus exclusively on disarmament; they provide ideas on how to address nonproliferation challenges, safely provide for the peaceful use of nuclear energy, and handle other timely issues like withdrawal from the NPT.³² However, it is safe to say that the vast majority of NGA engagement at review conferences has been directed toward disarmament-related issues. Furthermore, the nature of this engagement on nuclear disarmament has been largely normative, suggesting what nuclear-weapon states should do. Even the 13 Steps agreed to at the 2000 review conference, which are called practical steps, largely are normative in nature. For example, it is urgent that the Comprehensive Nuclear-Test-Ban Treaty be brought into force; it is necessary to begin negotiations on a Fissile Material Cutoff Treaty; and steps toward greater transparency, diminishing reliance, and reduction of operation status must be taken.³³

There is nothing wrong with urging these disarmament measures or any others, but there has been very little discussion about how these “practical steps” should be accomplished in practice. There are difficult political and often technical challenges that must be overcome to take serious steps toward disarmament. Nuclear disarmament cannot be achieved by will alone. It is time for the NGO community to start helping NPT parties help themselves. In the next Part, this Note outlines some of the challenges toward which disarmament advocates may helpfully direct their attention. Subsequently, this Note discusses how behavioral economics could inform disarmament advocacy and bolster the influence of the NGA community.

30. See generally *Statements to the 2010 NPT Review Conference: NGO Statements*, REACHING CRITICAL WILL 1 (May 3, 2010), <http://www.reachingcriticalwill.org/disarmament-fora/npt/2010/statements#NGO> [hereinafter *NGO Statements*] (documenting the statements of various NGO leaders).

31. Jody Williams, Chair, Nobel Women’s Initiative, Statement at the Review Conference of the Nuclear Non-Proliferation Treaty: A Nuclear Weapons Convention: The True Path to Nuclear Non-Proliferation (May 7, 2010), transcript available at <http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2010/ngostatements/JodyWilliams.pdf>.

32. See, e.g., REBECCA JOHNSON, IS THE NPT UP TO THE CHALLENGE OF PROLIFERATION?, available at <http://www.unidir.org/pdf/articles/pdf-art2186.pdf>.

33. *Final Document*, *supra* note 26.

III. BEYOND MORAL ARGUMENTS: PRACTICAL IMPEDIMENTS TO NUCLEAR DISARMAMENT

Since before the entry into force of the NPT, NGAs have made strong moral arguments for the abolition of nuclear weapons, but these advocates have given less serious thought to the role they can play in overcoming the difficult political and technological challenges inhibiting progress toward nuclear disarmament. There are many obstacles standing between the world as we know it and a world free of nuclear weapons, a good summary of which has been provided by George Perkovich and James Acton in their *Abolishing Nuclear Weapons Adelphi Paper*.³⁴ This Note divides what are perhaps the most difficult problems associated with nuclear disarmament into three broad categories.

First, the world must account for the near-term security concerns of those states that possess nuclear weapons. This includes China and Russia's concern about the conventional force superiority³⁵ of the United States, and the regional security problems that are at the heart of the non-NPT nuclear-weapon state problem. Fair or not, nuclear-weapon states are extraordinarily unlikely to relinquish nuclear weapons if they perceive their own security or the security of their allies will diminish. Second, the world must address the nuclear security concerns related to non-nuclear-weapon states. These include: the regulation of nuclear fuel and enrichment and reprocessing technologies in a world increasingly interested in civil uses of nuclear energy; the related development of effective safeguards and enforcement mechanisms; and the impact of disarmament on regional security alliances based on extended nuclear assurances. Finally, and perhaps most challenging, the world must start thinking about how to monitor and enforce nuclear disarmament as countries reduce nuclear arsenals to small numbers and eventually to zero. Even if the leader of a nuclear-weapon state wanted to disarm unilaterally, it would be politically infeasible to do so without the satisfactory resolution of these issues.

34. George Perkovich & James M. Acton, *Abolishing Nuclear Weapons*, Adelphi Paper 396, in *ABOLISHING NUCLEAR WEAPONS: A DEBATE* 30–46 (George Perkovich & James M. Acton eds., 2009).

35. I essentially use *conventional* to mean non-nuclear military capabilities. The conventional force imbalance that concerns China and Russia includes missile defense and space-based military capabilities. See Cristina Hansell & Nikita Perflyev, *Together Toward Nuclear Zero: Understanding Chinese and Russian Security Concerns*, 16 *NONPROLIFERATION REV.* 435, 436 (2009) (arguing that nuclear disarmament in China and Russia will depend on the perceived threat of a range of U.S. conventional capabilities, including missile defense and space militarization).

A. Security Concerns Related to Nuclear-Weapon States

There are many complicated factors that influence a state's decision to develop nuclear weapons, but broadly speaking, today there essentially are two kinds of nuclear-weapon states: world-political actors and issue-specific possessors, namely, the five NPT nuclear-weapon states and those states possessing nuclear weapons that are outside the treaty. This Note puts those five states in the category of world-political actors, but in reality, China, Russia, and the United States are the indispensable NPT states for nuclear disarmament.³⁶ In the context of the NPT review process, it is natural that most states party focus on the disarmament of NPT nuclear-weapon states.³⁷ The perceived effects of nuclear disarmament on these states' global political influence significantly influence their disarmament calculus. But advocates of nuclear disarmament must also appreciate the need to address the challenges posed by non-NPT nuclear-weapon states, recognizing that disarmament for these states largely is viewed through the lens of region-specific security issues. The obstacles to disarmament posed by these two kinds of states are somewhat different and are addressed in turn.

Table 1

Categories of Nuclear-Weapon States	
NPT Nuclear-Weapon States (World-Political Actors)	Non-NPT Nuclear-Weapon States (Issue-Specific Possessors)
China	India
France	Israel ³⁸
Russia	Pakistan
United Kingdom	North Korea (withdrew from the NPT)
United States	

Arguably the primary disarmament-related security concern for NPT nuclear-weapon states involves the conventional force imbalance between the United States on the one hand, and China and Russia, on the other. Indeed, if all states were to completely destroy their nuclear arsenals tomorrow, arguably no state would strategically

36. See *id.* at 435–36 (“[T]he United States, Russia, and China are in the best position to impact global nuclear weapons norms [T]he choices made in these three countries will determine if the world is able to start down the path toward complete nuclear disarmament.”).

37. A clear exception to this majority focus is the near exclusive attention paid to Israel by many states in the Middle East and North Africa. Interestingly, few states pay significant attention to the problems for disarmament posed by India, Pakistan, and North Korea.

38. Israel has not admitted to developing nuclear weapons but is widely assumed to possess them.

benefit more than the United States due to its dominant conventional capabilities.³⁹ Conversely, China and Russia would find their military deterrence and power-projection capabilities relatively diminished.⁴⁰

The United States, China, Russia, and arguably the NPT itself acknowledge that nuclear disarmament is inherently linked to conventional military capabilities. For example, the United States in its 2010 Nuclear Posture Review recognized that its security perceptions allowed further nuclear reductions in part because of its unrivaled conventional military capabilities.⁴¹ China, in multiple official working papers and statements at NPT meetings, has indicated that it does not intend to take any steps toward nuclear disarmament, nor even make any nuclear reductions, until reductions from the United States result in near parity with China's nuclear capabilities.⁴² Perkovich and Acton note that private discussions with the People's Liberation Army and China's nuclear-weapons establishment revealed that Beijing is doubtful Russian and U.S. nuclear disarmament is likely to happen in a way that would alleviate China's security concerns such that it would feel safe without a small nuclear deterrent.⁴³ Russia has indicated that there is a limit to how far it is willing to reduce its nuclear arsenal while the United States maintains conventional force superiority.⁴⁴

Finally, the fact that Article VI references the nuclear-arms race, nuclear disarmament, and general and complete disarmament indicates some connection between nuclear disarmament and general,

39. See Ford, *supra* note 15, at 405 (quoting U.S. officials as stating that the United States would benefit strategically from total disarmament).

40. See Hansell & Nikita, *supra* note 35, at 455 (discussing the interrelated power politics between the United States, Russia, and China based on their relative nuclear programs).

41. DEPT. OF DEFENSE, 2010 NUCLEAR POSTURE REVIEW REPORT 6 (2010), available at <http://www.defense.gov/npr/docs/2010%20nuclear%20posture%20review%20report.pdf>.

42. See, e.g., 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, New York, U.S., May 3–28, 2010, *Working Paper Submitted by China: Nuclear Disarmament and Reduction of the Danger of Nuclear War*, ¶ 7, U.N. Doc. NPT/CONF.2010/WP.63 (May 6, 2010) (stating that the United States and Russia must “take the lead in drastically reducing their nuclear arsenals . . . so as to create necessary conditions for . . . nuclear disarmament.”).

43. Perkovich & Acton, *supra* note 34, at 28.

44. See, e.g., Delegation of the Russian Fed'n, Statement at Main Committee I of the 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons 5 (May 7, 2010), available at http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2010/statements/7May_Russia.pdf (“[W]e are building on the assumption that the elimination of nuclear weapons can be discussed only as an ultimate goal of general and complete disarmament in the circumstances of strengthening strategic stability and strictly complying with the principle of equal security for all.”).

i.e. conventional, disarmament.⁴⁵ There has been some debate among NPT scholars as to what extent the three undertakings specified in Article VI were intended to be sequential or conditional upon each other.⁴⁶ Article VI alone suggests some connection between nuclear disarmament and conventional weapons, but the preamble is instructive as well:

Desiring to further the easing of international tension and the strengthening of trust between States in order to facilitate the cessation of the manufacture of nuclear weapons, the liquidation of all their existing stockpiles, and the elimination from national arsenals of nuclear weapons and the means of their delivery pursuant to a Treaty on general and complete disarmament under strict and effective international control⁴⁷

The references in this preambular language to “international tension” and nuclear disarmament “pursuant to a Treaty on general and complete disarmament” further suggest that the negotiators of the NPT understood there to be some connection between nuclear disarmament and conventional weapons.⁴⁸

The exact connection between nuclear and general and complete disarmament surely will continue to be debated, but whatever the legal relationship between nuclear disarmament and conventional weapons, the political reality is that China and Russia take the connection seriously.⁴⁹ Further advocacy for nuclear disarmament should take account of this political reality and help China, Russia, and the United States think about how to address the insecurities stemming from conventional force imbalance.

Issue-specific possessors, on the other hand, are less concerned with global force projection and instead view their nuclear weapons more as a deterrent against specific, regional, and existential threats. Regardless of moral consensus and formal multilateral processes for nuclear disarmament, these states are unlikely to take serious disarmament measures unless their perceived regional security threats are resolved.

45. See NPT, *supra* note 6, art. VI (“Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race . . . and to nuclear disarmament, and on a treaty on general and complete disarmament . . .”).

46. Compare JOYNER, *supra* note 15, at 102 (arguing that the three undertakings “are separate obligations with no conditionality or sequencing legally connecting them”), with Ford, *supra* note 15, at 404–05 (arguing that the Treaty does not require nuclear disarmament before general and complete disarmament).

47. NPT, *supra* note 6, pmb1.

48. Ford, *supra* note 15, at 404–05.

49. See Hansell & Nikita, *supra* note 35, at 455 (analyzing the interrelated future plans of China and Russia based on possible U.S. steps taken toward either nuclear or general disarmament).

India arguably is the issue-specific state most similar to the NPT nuclear-weapon states in that its program in part probably was developed for political reasons, though it is maintained as a deterrent against neighboring threats. The conventional wisdom is that India originally developed a nuclear program in response to China, and today also views its program as a deterrent against Pakistan.⁵⁰ Perkovich, however, argues that the security threat from China in the early 1960s was only vaguely defined, and the fact that it refused to deploy nuclear weapons for the following thirty years suggests that its nuclear program was not exclusively a result of security concerns.⁵¹ Instead, he argues that India developed nuclear capabilities at least as much out of a desire to be seen as a world-political actor, and for the technological prestige that accompanies this type of technology.⁵² Today, India is perhaps the most vocal advocate of nuclear disarmament among the nuclear-armed states, but it still conditions its own disarmament on the disarmament of China and Pakistan.⁵³ India, like China and Russia vis-à-vis the United States, would want to ensure that its conventional forces would be sufficient to deter China.⁵⁴

Pakistan is a more paradigmatic example of an issue-specific possessor, with its program intimately related to security concerns regarding India. Prime Minister Zulfikar Ali Bhutto initiated a nuclear program after the loss of East Pakistan to India in 1971.⁵⁵ To this day, Pakistan's nuclear program is directed almost entirely at deterring aggression from India and is considered necessary because of India's superior conventional military capability.⁵⁶ Indeed, though Pakistan has pledged not to use nuclear weapons first against any non-nuclear state, it has not ruled out a first strike against India.⁵⁷ Without a political reconciliation between India and Pakistan, it is difficult to see how South Asia could rid itself of nuclear weapons, even if the NPT nuclear-weapon states were to disarm.

Israel has never confirmed that it has nuclear weapons, but it is not difficult to understand why it would have developed them. Israel reportedly began considering a nuclear-weapon program as early as

50. GEORGE PERKOVICH, *INDIA'S NUCLEAR BOMB* 5–6 (1999).

51. *Id.* at 6.

52. *Id.*

53. *See generally*, Perkovich & Acton, *supra* note 34, at 28–29 (providing a discussion of India's long-term goals for disarmament).

54. *See id.* (discussing India's desire that its traditional forces be able to deter both China and Pakistan).

55. *Pakistan Nuclear Weapons*, FED'N AM. SCIENTISTS, <http://www.fas.org/nuke/guide/pakistan/nuke/> (last updated Dec. 11, 2002).

56. PAUL K. KERR & MARY BETH NIKITIN, CONG. RESEARCH SERV., *PAKISTAN'S NUCLEAR WEAPONS: PROLIFERATION AND SECURITY ISSUES* 3 (2012), available at <http://www.fas.org/sgp/crs/nuke/RL34248.pdf>.

57. *Id.* at 12.

1949.⁵⁸ In the wake of World War II, the early director of the Israeli Atomic Energy Commission, Ernst David Bergmann, advocated the development of nuclear weapons to ensure “that [Israel] shall never again be led as lambs to the slaughter.”⁵⁹ Since then, Israel has been surrounded by states often hostile to its existence. Given the almost constant state of tension between Israel and its Arab neighbors, the history of regional wars, including the Six-Day War and the Yom Kippur War, and Israel’s small size, it is easy to understand the appeal of nuclear weapons for Israeli decision makers. It also is understandable how the more recent threats from Iran could serve to bolster the conviction of Israel’s elites that nuclear weapons are a necessary deterrent against potentially existential threats. Without a comprehensive peace between Israel and at least its Arab neighbors, Israel’s decision makers are likely to continue to see advantages to a nuclear deterrent.

North Korea, as in many other things, is somewhat anomalous in its nuclear calculus. Like other weapon states, there are rational explanations for a nuclear deterrent that focus on a history of regional security threats, in particular post-World War II, Cold War dynamics and the Korean War, which still is not technically over and is the source of the roughly 35,000 U.S. military personnel that remain in South Korea.⁶⁰ However, North Korea more recently has used its nuclear program as a bargaining tool in negotiations for foreign aid to sustain its weak and isolated economy.⁶¹ This motivation creates complicated problems for working toward nuclear disarmament: on the one hand, it facilitates negotiations on nuclear disarmament, especially when North Korea’s economy is in particularly dire need and the United States and others are willing to talk; on the other hand, there are strong disincentives for actual disarmament, or even steps that cannot easily be undone.⁶² Perhaps one bit of encouraging news about North Korea is that today it is not locked in the same kind of intractable regional security dilemma like

58. See *Nuclear Weapons: Israel*, FED’N AM. SCIENTISTS, <http://www.fas.org/nuke/guide/israel/nuke/> (last updated Jan. 8, 2007) (recalling a 1949 geological survey conducted by the Israel Defense Forces’ Science Corps aimed at discovering uranium reserves).

59. *Id.*

60. See MARY BETH NIKITIN, CONG. RESEARCH SERV., RL34256, NORTH KOREA’S NUCLEAR WEAPONS 1 (2009) (tying North Korea’s initial nuclear origination to Soviet Union assistance and some of the country’s more recent nuclear-weapons decisions, particularly disarmament decisions, in response to South Korean actions); Victor Davis Hanson, *Why America Must Defend South Korea*, RICOCHET (Nov. 25, 2010, 2:14 PM), <http://ricochet.com/main-feed/Why-America-Must-Defend-South-Korea>.

61. Linbo Jin, *North Korea’s Nuclear Paradox*, BROOKINGS (May 27, 2009), http://www.brookings.edu/opinions/2009/0527_north_korea_jin.aspx.

62. See *id.* (“Since the [North Korean] economy needs a continuous flow of foreign aid, it would be extremely difficult if not impossible for [North Korea] to make a final deal . . . as such a deal may shut off this aid.”).

India, Pakistan, and Israel, which alleviates some of the collective action problems associated with nuclear disarmament in those cases. However, it is hard to see how actual disarmament will occur on the Korean Peninsula without significant political changes in Pyongyang that guide a very different kind of economy and relationship with the world.

It should be clear that serious advocates for nuclear disarmament must not only think about the traditional great power dynamics that originally produced nuclear weapons, but also about the ongoing, regional conflicts that sustain interest in weapons programs in non-NPT states. Even if the NPT process made serious progress on steps toward nuclear disarmament, the possession of nuclear weapons by some states outside the process would put a floor on what practically was achievable: the NPT nuclear-weapon states will not collectively disarm as long as other weapon states still exist.

B. Security Concerns Related to Non-Nuclear-Weapon States

The disarmament-related security concerns related to non-nuclear-weapon states fall into two main categories: (1) how to ensure access to civil nuclear technology without raising weapons proliferation concerns,⁶³ and (2) how to safely manage military alliances built on extended nuclear deterrence.⁶⁴ The first issue largely affects developing countries, while the second largely affects developed allies of the United States.

In the past decade, interest in nuclear energy has spiked among developing nations.⁶⁵ A 2010 report from the IAEA attempts to explain the reasons behind such sudden interest: "In the context of growing energy demands to fuel economic growth and development, climate change concerns, and volatile fossil fuel prices, as well as improved safety and performance records, some 65 countries are expressing interest in, considering, or actively planning for nuclear power."⁶⁶ As the IAEA report suggests, there are good economic and environmental reasons for why countries would wish to pursue nuclear energy.⁶⁷ There also, however, are proliferation concerns, and these proliferation concerns only will become starker as current nuclear-weapon states disarm.⁶⁸ In 2003, Mohamed ElBaradei, the

63. Perkovich & Acton, *supra* note 34, at 83–84.

64. See James M. Acton, *Extended Deterrence and Communicating Resolve*, 8 STRATEGIC INSIGHTS 5 (2009) (highlighting the effective communication of the United States' resolve as the "key to extended nuclear deterrence").

65. Int'l Atomic Energy Agency [IAEA], *International Status and Prospects of Nuclear Power*, at 10, IAEA Doc. GOV/INF/2010/12-GC(54)/INF/5 (Sept. 2, 2010).

66. *Id.*

67. *Id.*

68. Pierre Goldschmidt, *Multilateral Nuclear Fuel Supply Guarantees & Spent Fuel Management: What Are the Priorities?*, 139 DAEDALUS 7, 8 (2010).

Egyptian former Director General of the IAEA, argued that countries that traditionally had produced the world's fuel for nuclear reactors had strong accounting and protection measures in place, subjected their facilities to regular inspection by the IAEA, and implemented robust export controls, all in an attempt to control the spread of sensitive dual-use nuclear technology—specifically, technology that could be used for both civil and military purposes.⁶⁹ However, he noted that controlling access to this technology has become increasingly difficult as the technological and economic hurdles to developing it have eroded with time.⁷⁰ It is no longer the case that only highly skilled, industrial, wealthy countries can develop nuclear technology.⁷¹ The ever-lower barrier to nuclear technology raises nuclear-weapon proliferation concerns, because so much of the technology is dual use.⁷²

Surely some developing countries will have no ill intent, but some may, and the very fact that the nuclear genie could be unleashed in so many countries increases the chance that many countries could become virtual nuclear-weapon countries.⁷³ Virtual nuclear-weapon capability means having the capacity to produce nuclear weapons within a very short time frame, based on existing fissile material stocks and technological capability.⁷⁴ Though perhaps arguably better than many states actually possessing nuclear weapons, a world of many virtual nuclear-weapon states could be nearly as unstable.⁷⁵

As a means to prevent such a virtual nuclear world while still maintaining access to nuclear materials and technology for peaceful purposes, the idea of multilateral fuel supply and waste mechanisms has become increasingly popular in recent years.⁷⁶ Such proposals would place nuclear materials, as well as fuel production and waste services, under the control of multilateral corporations or other organizations.⁷⁷ The system would address the concern of developing countries that nuclear fuel could be cut off by a few supply countries for political reasons, while assuring those concerned about weapons

69. Mohamed ElBaradei, *Towards a Safer World*, ECONOMIST, Oct. 16, 2003, <http://www.economist.com/node/2137602>.

70. *Id.*

71. Iran is a perfect example of how the traditional characteristics of a country capable of developing nuclear technology no longer apply.

72. ElBaradei, *supra* note 69.

73. GEORGE PALOCZI-HORVATH, RESEARCH REPORT NO. 3: VIRTUAL NUCLEAR CAPABILITIES AND DETERRENCE IN A WORLD WITHOUT NUCLEAR WEAPONS 8 (1998).

74. *Id.* at 3.

75. *See id.* at 9 (asserting that if a country has virtual nuclear-weapon capability, "all it might take to build a nuclear device is one year's effort or efforts of two major industrial companies").

76. Goldschmidt, *supra* note 68, at 7.

77. *See id.* at 9 (providing an overview of "[m]ultilateral approaches to nuclear fuel supply").

proliferation that nuclear power in developing countries does not have to pose proliferation risks.⁷⁸

Not every country, however, will be willing to forego indigenous development of nuclear technology for peaceful purposes, nor could countries be required to do so under the NPT.⁷⁹ Furthermore, some developing countries like Iran already are pursuing advanced nuclear technologies with serious weapons potential.⁸⁰ For these reasons, in addition to providing alternatives to indigenous nuclear-technology development, the IAEA must have the tools to credibly monitor nuclear activities inside countries, and by its own admission, it has not kept up with the times.⁸¹

The IAEA has done a credible job of verifying states' declared nuclear materials and facilities, but as was made blatantly clear in the early 1990s in Iraq and more recently in Iran, it has done less well in discovering and monitoring undeclared nuclear materials and facilities.⁸² Many proposals have been made for exactly how the IAEA's verification authorities should be strengthened, but perhaps the most instructive view is that of the IAEA itself in what it believes is required to adequately do its job.

Yukia Amano, the Director General of the IAEA has consistently stated that in order for the IAEA to give credible assurances that there are no undeclared nuclear materials or activities in a state, Additional Protocols must be brought into force in every state.⁸³ Additional Protocols to a state's standard safeguard agreement, among other things, typically give the IAEA expanded authority: to conduct inspections of all parts of a state's nuclear-fuel cycle, to conduct short-notice inspections of all buildings at a nuclear site, and to collect environmental samples beyond declared nuclear locations in order to investigate the presence of any undeclared nuclear activity.⁸⁴ Such measures go well beyond the standard safeguard agreement,

78. *Id.* at 7.

79. NPT, *supra* note 6, art. IV.

80. IAEA, *Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions in the Islamic Republic of Iran*, at 10, IAEA Doc. GOV/2011/65 (Nov. 8, 2011).

81. See Herman Nackaerts, Deputy Dir. Gen., IAEA, Keynote Address at the INMM 52nd Annual Meeting: IAEA Safeguards Cooperation as the Key to Change 1–2 (July 18, 2011), *transcript available at* http://www.iaea.org/OurWork/SV/Safeguards/statements-repository/Key_to_Change.pdf (highlighting key ways in which the IAEA's safeguard system can be more effective).

82. *Id.* at 2–3.

83. Yukia Amano, Dir. Gen., IAEA, Statement at the 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (May 3, 2010), *transcript available at* http://www.un.org/en/conf/npt/2010/statements/pdf/head_iaea_en.pdf.

84. *Factsheets: IAEA Safeguards Overview*; INT'L ATOMIC ENERGY AGENCY, http://www.iaea.org/Publications/Factsheets/English/sg_overview.html (last visited Feb. 21, 2013).

which are focused on a state's declared nuclear materials and facilities.⁸⁵

Herman Nakaerts, the Deputy Director General of the IAEA for Safeguards, also has stressed the need to adopt what he calls a "state-level approach" to safeguards.⁸⁶ The IAEA traditionally has not differentiated between states that pose little proliferation threat and those of great proliferation concern when allocating safeguards resources.⁸⁷ Thus 60 percent of the IAEA's verification resources were directed toward only three states, due to the nature and size of their declared nuclear materials and facilities: the more a state declared, the more verification resources were allocated to it, regardless of the actual proliferation risk posed by the state.⁸⁸ While, understandably, desiring to implement safeguards in a nondiscriminatory manner to avoid the perception of political favoritism or criticism, the system was hugely inefficient.⁸⁹ Nakaerts has proposed making annual evaluations of a state's nuclear character, based not only on the nature and size of known nuclear activities, but also on other information available to the IAEA, such as satellite imagery, environmental sampling, and other open-source information.⁹⁰ Based on the assessment of a state's nuclear character, a tailored verification program could be implemented: "[O]ne that identifies a range of safeguards measures necessary to meet State-specific objectives."⁹¹

Without effective measures to verify the peaceful-uses nuclear technology, nuclear disarmament is likely to remain only a dream. No current nuclear-weapon state would feel secure disarming, nor would domestic politics permit disarming, if there were insufficient confidence that other countries were not secretly working to produce nuclear weapons or virtual nuclear deterrents.

While the discussion thus far focuses mainly on developing countries, there is a final concern that must be addressed related to developed countries that do not possess nuclear weapons. Stability has been achieved in parts of the world, and arguably several states have chosen to sacrifice development of nuclear weapons, based on alliance structures that provided extended nuclear deterrence. The most illustrative example of this situation is in East Asia.⁹²

85. *Id.*

86. Nakaerts, *supra* note 81, at 3–4.

87. *Id.* at 2.

88. *See id.* (explaining the historical policy of requiring "more verification scrutiny" for those states with more declared facilities "independent of the *real* proliferation risk posed by that State").

89. *Id.* at 8–9.

90. *Id.* at 4.

91. *Id.*

92. RICHARD C. BUSH, THE U.S. POLICY OF EXTENDED DETERRENCE IN EAST ASIA: HISTORY, CURRENT VIEWS, AND IMPLICATIONS 1 (2011), *available at*

Australia, Japan, South Korea, and Taiwan all arguably chose to forego nuclear weapons because the United States was willing to threaten their adversaries with nuclear weapons.⁹³ Disarmament that happens too quickly or without adequate consideration of existing alliance structures based on extended nuclear deterrence would expose huge imbalances of conventional forces, such as between China and Japan. The sudden sense of insecurity that would follow easily could result in a new regional nuclear-arms race, in addition to rapid augmentations of conventional forces. Clearly, it is not only developing countries that must be considered when thinking about the implications of nuclear disarmament on non-nuclear-weapon states; any advocacy for a world without nuclear weapons must account for these extended deterrence relationships and the stability they have provided.

C. Verification of Nuclear Disarmament

The difficulties regarding nuclear disarmament that this Note discusses thus far are the ones that most often are discussed by security analysts, and for good reason; these problems are likely to be the most imminent. Unfortunately, as challenging as these problems are, they may not be the most difficult.

At current levels of nuclear weapons, the verification of nuclear disarmament hardly seems to matter. Surely, the United States and Russia will want to ensure for political and confidence-building reasons that the other lives up to its agreements under the New Strategic Arms Reduction Treaty (START), which would bring the number of each country's deployed nuclear warheads to 1,550.⁹⁴ At these levels, however, strict verification of every single warhead matters relatively little from a security perspective. On the other hand, as countries diminish further the number of their nuclear weapons, verification becomes increasingly important. It is easy to see, for example, that if the United States and Russia agreed to possess only five nuclear weapons each, verification of those numbers would be extraordinarily important. A credible verification regime is a *sine qua non* for significant nuclear disarmament, but this point often is overlooked. Perhaps this is out of fear.

The challenge of verifying nuclear disarmament is incredibly difficult. Legal, technical, national security, and political issues stand

http://www.brookings.edu/~media/Files/rc/papers/2011/02_arms_control_bush/02_arms_control_bush.pdf.

93. *Id.*

94. See *Comparison of the START Treaty, Moscow Treaty, and New START Treaty*, U.S. DEPT ST. (Apr. 8, 2010), <http://www.state.gov/t/avc/rls/139901.htm> [hereinafter *Treaty Comparison*] (graphically comparing the START treaty, Moscow Treaty, and New START treaty).

in the way of credible disarmament verification. First, the NPT legally binds nuclear-weapon states to “not in any way . . . assist, encourage, or induce any non-nuclear-weapon State to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices, or control over such weapons or explosive devices.”⁹⁵ Presumably, any disarmament verification regime would require experts to access sensitive national nuclear sites and inspect sensitive nuclear materials and technologies. If inspection teams included experts from non-nuclear-weapon states, would nuclear-weapon states be at risk of violating the NPT’s provision that they not assist non-nuclear-weapon states in the acquisition of nuclear weapons?⁹⁶ Or does the NPT only prohibit intentional or sought after assistance?⁹⁷

Assuming this interpretive challenge could be overcome, there are significant technical and national security challenges that would have to be resolved. For example, how does one account for weapons-grade nuclear material from disassembled weapons while protecting government secrets, such as the precise isotopic ratios and masses of the material that once comprised the weapon’s pit?⁹⁸ Different states may even have different ideas about what kinds of information are too secret and sensitive to allow international monitors to inspect directly.⁹⁹ Even if workable definitions of “sensitive materials” could be agreed to among nuclear-weapon states and international monitors, presumably the same line would not be appropriate for the public. Thus a further problem is finding a level of transparency that would allow the public to have faith in the reported findings of international inspectors.¹⁰⁰

The fundamental challenge of disarmament verification will be finding agreement on the level of intrusiveness required to provide credible assurances of compliance with disarmament obligations. No verification regime, not even the most intrusive, will be perfect. There will always be some uncertainty. The question is, how much uncertainty would states be willing to live with, and would states be willing to live with the intrusiveness that such a level would require?¹⁰¹ To complicate matters further, different states may have

95. NPT, *supra* note 6, art. I.

96. Andreas Persbo & Marius Bjørningstad, *Verifying Nuclear Disarmament: The Inspector’s Agenda*, ARMS CONTROL ASS’N (May 2008), http://www.armscontrol.org/act/2008_05/PersboShea.

97. *Id.*

98. Christopher A. Ford, *Why Not Nuclear Disarmament?*, 27 *NEW ATLANTIS* 3, 7 (2010).

99. *Id.* at 7.

100. *Id.*

101. *See id.* at 4, 19 (providing an overview of potential questions surrounding disarmament verification).

different tolerances for uncertainty.¹⁰² Generally, however, states are likely to demand more and more certainty as the number of nuclear weapons shrinks to zero.¹⁰³ The presence of even a single nuclear weapon under a regime of complete nuclear disarmament would have extraordinary military significance.¹⁰⁴

Given these challenges, it is hard to imagine that acceptable levels of both intrusiveness and uncertainty could be agreed to among the nuclear-weapon states, let alone the public. This does not mean that nuclear disarmament should be abandoned as a goal, but it might mean that different end games should be considered, such as a disarmament agreement that allows each nuclear-weapon state to retain one weapon or only a few weapons, or an agreement that gives some measure of control over a remaining few nuclear weapons to an international organization.¹⁰⁵ These non-zero alternatives to complete disarmament may be easier, but they too would face many of the challenges described above. In any event, the behavioral economic and negotiating tools subsequently described will help the disarmament advocate make the best case for a world without nuclear weapons.

Table 2

Summary of Significant Impediments to Complete Nuclear Disarmament		
Concerns Related to Nuclear-Weapon States	Concerns Related to Non-Nuclear-Weapon States	Disarmament Verification
<ul style="list-style-type: none"> • Conventional force imbalances between China, Russia and the United States • Nuclear capabilities of states outside the NPT and associated regional conflicts 	<ul style="list-style-type: none"> • Developing “proliferation-safe” civil nuclear technology • Enforcing NPT nonproliferation provisions • Effects on extended deterrence, especially for allies of the United States 	<ul style="list-style-type: none"> • Inspections that prevent proliferation and protect state secrets • Living with uncertainty

IV. HOW BEHAVIORAL ECONOMICS COULD INFORM A NEW DISARMAMENT ADVOCACY

Advocates for nuclear disarmament have been quite successful during the past decades in making the moral argument for the

102. *Id.* at 4.

103. *Id.* at 4–5.

104. *Id.* at 5.

105. See Avis Bohlen, *Arms Control in the Cold War*, 14 FOOTNOTES (2009), available at <http://www.fpri.org/footnotes/1407.200905.bohlen.armscontrolcoldwar.html>.

abolition of nuclear weapons.¹⁰⁶ But moral pressure alone is unlikely to be sufficient to convince states to disarm. Under a classic economic model, states would have to be convinced that the utility of disarmament, perhaps taking account of the “warm glow” from acting in the public good, is greater than the utility of retaining nuclear weapons.¹⁰⁷ The proper way to calculate these utilities, of course, would be a subject of much debate, and may vary by country, but calculating utility is not the purpose of this Note. Here, every benefit of the doubt is given to the disarmament advocate, so that it is assumed that disarmament is not only the morally correct thing to do, but also the classically, economically rational thing to do. If this is not the case, disarmament advocates have more serious challenges than those discussed above. The questions then are (1) assuming disarmament is the economically rational decision, why have states not yet disarmed, and (2) what could be done to help them disarm?

Classical economics teaches that people have stable and coherent preferences, and given a set of options and probabilistic beliefs, they will make decisions that maximize the expected value of utility.¹⁰⁸ Generally stated, human behavior is determined by utility maximization based on stable preferences and ideal information.¹⁰⁹ Psychology and other social sciences, however, have shown that real-world behavior deviates significantly and consistently from how this ideal rational person makes decisions.¹¹⁰ Daniel Kahneman and Amos Tversky have written extensively about how people are loss averse and heavily influenced by arbitrary reference points; risk averse in losses and risk seeking in gains; and subject to diminishing sensitivity to possibilities farther away from a reference point.¹¹¹ Christine Jolls, Cass Sunstein, and Richard Thaler argue that people have bounded rationality, bounded willpower, and bounded self-interest.¹¹² A few of these deviations from classical economic decision

106. See, e.g., Press Release, Norwegian Nobel Comm., *supra* note 2 (explaining that “[d]emocracy and human rights are to be strengthened” as the world progresses toward nuclear disarmament).

107. See Stefano DellaVigna, *Psychology and Economics: Evidence from the Field*, 47 J. ECON. LITERATURE 315, 338 (2009) (describing how a “warm glow” effect can influence economic decision making).

108. Matthew Rabin, *Psychology and Economics*, 36 J. ECON. LITERATURE 11, 11 (1998).

109. See Christine Jolls, Cass R. Sunstein & Richard Thaler, *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1476 (1998) (recalling Gary Becker’s basic definition of “standard economic principles”).

110. See *id.* at 1476–77 (explaining the concept of bounded rationality).

111. See generally Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 ECONOMETRICA 263 (1979) (providing an alternative to the utility theory in recognition of the fact that there are “several classes of choice problems in which preferences systematically violate the axioms of expected utility theory”).

112. Jolls, Sunstein & Thaler, *supra* note 109, at 1477–79.

making will be explored before describing what they might teach us about how to better advocate for nuclear disarmament.

A. *Tools from Behavioral Economics*

Kahneman and Tversky's Prospect Theory has become quite influential in the field of behavioral economics.¹¹³ One of the most distinctive characteristics of Prospect Theory is that, in evaluating risks, reference points heavily influence people's outcomes.¹¹⁴ People are more sensitive to deviations from a reference point than they are to absolute values. For example, the same cup of water can feel either cold or hot, depending on whether one has just come inside from the frigid cold or a sweltering summer day.¹¹⁵ Moreover, even arbitrary anchor points have a significant impact on decision making.¹¹⁶ For example, in one experiment, two sets of federal judges were asked to estimate damages in a tragic tort case: one set of judges simply was given the facts of the case, while the other set was also told that the defendant had filed a motion to dismiss for failure to meet the \$75,000 amount-in-controversy requirement.¹¹⁷ The set of judges that was told of the amount-in-controversy issue denied the motion to dismiss, but awarded on average \$882,000 in damages. On the other hand, the set of judges who only heard the facts of the case awarded, on average, \$1,249,000.¹¹⁸ The difference between the two awards was roughly 30 percent.¹¹⁹ Though the amount-in-controversy requirement should have nothing to do with a rational calculation of a damages award—indeed it was an arbitrary reference point—it clearly played a significant role in the average award.¹²⁰

A corollary to this reference dependence is that people routinely are more averse to losses than they are attracted to the same-size gain, in a ratio of about two-to-one.¹²¹ Colloquially speaking, a modest loss feels twice as bad as the same-sized gain feels good. Prospect Theory also predicts that people are risk seeking in losses and risk averse in gains.¹²² For example, when faced with a certain loss, one

113. See, e.g., *id.* at 1477–78 (highlighting and building upon Daniel Kahneman and Amos Tversky's model).

114. Kahneman & Tversky, *supra* note 111, at 274.

115. Rabin, *supra* note 108, at 13.

116. See Chris Guthrie, Jeffrey J. Rachlinski & Andrew J. Wistrich, *Inside the Judicial Mind*, 86 CORNELL L. REV. 777, 790–93 (2001) (revealing the results of a judicially based anchoring study).

117. *Id.*

118. *Id.*

119. *Id.*

120. *Id.* at 791–92 (discussing how the amount-in-controversy requirement affected the damage awards).

121. Rabin, *supra* note 108, at 13–14.

122. Kahneman & Tversky, *supra* note 111, at 286–87.

may be willing to take a large risk of an even greater loss for the chance of breaking even, but when faced with a certain gain, even good odds on a significantly larger gain will be rebuffed.¹²³ If the odds or the wager differential is significantly changed, these tendencies, of course, can be overcome.

As Jolls, Sunstein, and Thaler note, rationality is not the only human faculty that is bounded; willpower is bounded as well.¹²⁴ Most people will be sympathetic to the scenario of deferring a trip to the gym and promising one's self to go instead "tomorrow," only to find one's self repeating the promise when "tomorrow" rolls around.¹²⁵ Economists refer to this as time discounting: people tend to discount the utility of future gains and losses.¹²⁶ Some people know they do this, can correctly predict it, and can account for such discounting under classical economic models, but others do not correctly predict how they discount the future.¹²⁷ For these people, commitment devices, such as paying a large amount for a monthly gym membership, with rebates for each visit, are particularly helpful in keeping promises.¹²⁸

Finally, whether economically rational or not, people care about the fairness of behavior, especially in negotiations.¹²⁹ In this fairness context, assuming that a bargaining zone actually exists, there is only one "fair" point or perhaps a small range within that zone at which a deal can be reached.¹³⁰ This ignores the fact that, by definition, any deal within the bargaining zone will be economically rational to both parties; there is no rational justification for parties to seek such a particular "fair" deal point.¹³¹ Nonetheless, parties almost always agree that a particular deal point within the bargaining zone is somehow "fair."¹³² Fairness, however, is an elusive concept.¹³³

123. See *id.* (discussing Prospect Theory and risk preferences for losses).

124. Jolls, Sunstein & Thaler, *supra* note 109, at 1479.

125. See *id.* ("[Bounded willpower] refers to the fact that human beings often take actions that they know will conflict with their long-term interests.")

126. See *id.* at 1539 (asserting that "impatience is very strong for near rewards (and aversion very strong for near punishments) but that each of these declines over time—a pattern referred to as 'hyperbolic discounting'").

127. *Id.* at 1479, 1539 (discussing smokers who recognize that they cannot stop smoking because of time-discounting problems and thus "pay money to join a program or obtain a drug that will help them quit," while criminals fail to recognize their time-discounting problems and thus often commit crimes).

128. See *id.* at 1479 (discussing other commitment devices such as pension plans to prevent undersaving).

129. RUSSELL KOROBKIN, *NEGOTIATION THEORY AND STRATEGY* 184 (2d ed. 2009).

130. *Id.* at 184, 211–20.

131. *Id.* at 183–84.

132. *Id.*

133. *Id.* at 184.

Sometimes fairness is thought of merely as similar to what has been done before; for example, if all previous contracts between two parties have included a “hold harmless” provision, it might seem unfair if a party unilaterally demanded the removal of such a clause during a contract negotiation, even if that provision were worth very little to both sides.¹³⁴ Oftentimes in the negotiation context, fairness is thought of as a procedural norm: if the procedure to reach a deal was considered fair, the deal itself must be fair.¹³⁵ Other times, if resources must be divided, the division often will be judged fair if the division was based on the principle of equity, equality, or need.¹³⁶

The disarmament advocate can harness these few insights from behavioral economics to better make a case for nuclear zero.

B. Applying Theory to Nuclear Disarmament Advocacy

One of the main findings of behavioral economics is that, in the real world, peoples’ decisions are strongly influenced by the reference point from which decisions are measured.¹³⁷ Furthermore, people are loss averse; once one possesses something, it is more difficult than traditional economics suggests it rationally should be to give that thing up.¹³⁸ The application of this finding to nuclear disarmament advocacy should be clear: nuclear-weapon states possess nuclear weapons, and it will be more difficult to give them up than traditional economics suggests it rationally should be.¹³⁹ This may seem to be anything but helpful to disarmament advocates, but beyond merely describing the resistance many advocates sometimes encounter from nuclear-weapon states, it suggests ways that advocacy might be reshaped to better account for this reference dependence and loss aversion.

First, disarmament advocates should reconsider how they frame their goals.¹⁴⁰ A treaty on complete nuclear disarmament within narrow timetables may be the desired goal,¹⁴¹ but if it is presented as the next step and the only way forward, the effort seems doomed to fail. Such a proposition is a bit like telling a drinker of five venti Starbucks coffees per day that he must discontinue all caffeine consumption tomorrow: a position that is perhaps physically possible,

134. See *id.* at 183–84 (indicating that participants of a negotiation may reject offers they view as unfair, “even when doing so is costly to them”).

135. See *id.* (“[C]oncluding an agreement often requires negotiators . . . to believe that . . . the division of the cooperative surplus is a fair one.”).

136. *Id.* at 211–23.

137. Kahneman & Tversky, *supra* note 111, at 274.

138. Rabin, *supra* note 108, at 13–14.

139. See *id.* (discussing theories regarding loss aversion).

140. Kahneman & Tversky, *supra* note 111, at 274 (asserting that reference points and expectations “can be affected by the formulation of the offered prospects”).

141. See *NGO Statements*, *supra* note 30.

but one that is highly unlikely to be adopted. Instead, disarmament advocates should consider endorsing a specific, serial approach to complete disarmament in order to minimize the effects of loss aversion.

The advocate conscious of reference dependence, framing effects, and loss aversion¹⁴² would become expert in analyzing just how much "loss" nuclear-weapon states could tolerate at each step toward disarmament, taking account of current threat perceptions, military planning, and alliance structures. Advocates could argue that progress should be reframed, not in terms of progress toward total disarmament, or even in terms of further reductions from the most recent arms-control treaty,¹⁴³ but rather with respect to then-existing perceptions of need based on the security environment and military infrastructures. The advocate would challenge those perceptions and urge realistic steps toward the end of the spectrum of the possible, informed by an understanding of loss tolerance. Initially, such an approach could be to argue for just how many weapons Russia and China would actually need to feel secure against the United States' superior conventional capabilities, and how many weapons the United States would need to assure its allies that its threat of extended deterrence remained credible.

After each iterative reduction, a period of transformation would have to take place: either tensions would have to be further reduced, or alternative deterrence capabilities would have to be developed to make possible another step in the iterative reduction process. Doubtless, disarmament advocates would promote an easing of tensions, but if their ultimate goal is *nuclear* disarmament, they also should be open to the possibility of some less objectionable deterrence structure to take the place of nuclear weapons. Without such periods of transformation, Russia and China presumably would not feel secure enough to disarm further, and U.S. allies presumably would not feel secure enough to condone further reductions from the United States.

This new framing of the disarmament process would seem to put advocates in the strange position of legitimizing nuclear weapons, at least in the short term, but there is no reason that advocates could not continue to make their moral arguments for a world without nuclear weapons. An iterative reframing approach, however, could minimize loss aversion and bring about significant, though not total, disarmament in the near term. It also would build the credibility of

142. Rabin, *supra* note 108, at 13–14 (discussing reference dependence, framing effects, and loss aversion).

143. *Treaty Comparison*, *supra* note 94 (showing reductions in warheads and delivery vehicles).

the NGA community, making suggestions for further iterative steps more forceful.

The approach to a disarmament process for issue-specific possessors has always been more complicated, given that these states are involved in ongoing and severe regional disputes, and that NPT states do not want to be seen as legitimizing weapons outside of international norms.¹⁴⁴ As a result, NPT states have been reluctant to address head-on the disarmament of non-NPT states within the formal treaty review process.¹⁴⁵ Though this is a difficult problem for NPT states, it presents an opportunity for the NGA community. As nonpolitical, independent actors, disarmament advocates could provide the primary source of motivation for disarmament outside of the NPT process.

Just because issue-specific possessors are outside the NPT does not mean they are any less susceptible to loss aversion.¹⁴⁶ Like with regular NPT nuclear-weapon states, disarmament advocates could promote an iterative approach to disarmament with intervening transformation periods for issue-specific possessors. This, of course, would require advocates to understand the regional conflicts that spurred the development of nuclear weapons in the first place. Some surely would reject any perceived link between regional conflicts and nuclear disarmament, probably out of concern of the intractability of the conflict, and thus the unlikelihood of any progress toward disarmament.¹⁴⁷ However, the iterative approach this Note suggests does not necessarily require easing of tensions between disarmament steps; the development of an alternative deterrence structure also may allow for further steps toward *nuclear* disarmament. Thus an iterative approach to disarmament for issue-specific possessors engaged in ongoing conflicts does not necessarily require the resolution of the conflicts as a prerequisite for nuclear disarmament.

Behavioral economics also can inform advocates about how to handle security concerns related to non-nuclear-weapon states in a way that would not threaten total nuclear disarmament and would ensure continued access to nuclear technology for civil purposes. Supporting a robust IAEA safeguards system to verify declared nuclear activities and monitor potential undeclared activities should not be controversial,¹⁴⁸ but what happens when a state violates those

144. Jenny Nielsen, *Engaging India, Israel and Pakistan in the Nuclear Non-Proliferation Regime*, ACRONYM INST. DISARMAMENT DIPL. (Dec. 15, 2007), <http://www.acronym.org.uk/dd/dd86/86jn.htm>.

145. *Id.*

146. Rabin, *supra* note 108, at 13–14 (discussing people's general sensitivity to loss and loss aversion).

147. Greenpeace, *Conditions for a Nuclear Free Middle East*, MIDDLE POWERS INST. (February 2007), http://www.middlepowers.org/docs/A6F_Vienna_Datan.pdf.

148. See ElBaradei, *supra* note 69 (pointing out considerable advantages of nonproliferation measures).

safeguard agreements often is very controversial.¹⁴⁹ If there ever is to be sufficient confidence to support developing country access to civil nuclear technology, or a credible system of nuclear disarmament verification, the world must expect that violations of verification regimes will be punished.¹⁵⁰

Unfortunately, too often states mispredict how they will respond to future violations of safeguards agreements.¹⁵¹ This is what Jolls, Sunstein, and Thaler refer to as bounded willpower, or time discounting.¹⁵² For example, a state may be reluctant to support UN Security Council resolutions against a potential violator of the NPT before the IAEA raises questions of weapons development, but then once such a finding is made, the state nonetheless allows other political considerations to trump a policy in support of sanctions.¹⁵³ Disarmament advocates could help reframe this issue to be one necessary for disarmament: it would only be damaging to the civil use of nuclear technology and to a future disarmament verification regime to set the precedent of safeguards violations that go unpunished.

To help states cope with the problem of bounded willpower, disarmament advocates could propose commitment devices; for example, that the Security Council adopt *ex ante* mandatory, minimum consequences for safeguards violations as determined by the IAEA. First-time offenders could face relatively minimal mandatory consequences, but successive or continuing violators could be subjected to an increasingly onerous scale of minimum punishments.

Such mandatory international condemnation of illicit behavior would serve two purposes. First, it would build trust among nations to facilitate the continued use of nuclear technology for civil purpose around the world, especially in developing countries. Without confidence in the international system to respond to NPT violations, sophisticated nuclear countries almost certainly would become wary of facilitating the development of nuclear technologies around the

149. See, e.g., Steve Gutterman, *Russia Opposes New Iran Sanctions over IAEA Report*, REUTERS (Nov. 9, 2011, 1:29 PM), <http://www.reuters.com/article/2011/11/09/us-nuclear-iran-russia-idUSTRE7A857620111109> (explaining Russia's reluctance to support a new UN Security Council resolution against Iran despite a damning new IAEA report).

150. Amano, *supra* note 83, at 2 (noting that the IAEA has a role to play in verifying nuclear disarmament).

151. Gutterman, *supra* note 149 (recounting Russia's assertion that a step-by-step process should be employed for responding to Iran's misconduct "under which existing sanctions would be eased in return for actions by Tehran to dispel international concerns").

152. Jolls, Sunstein & Thaler, *supra* note 109, at 1479.

153. See, e.g., Gutterman, *supra* note 149 (recounting Russian comments that any new sanctions "will be seen in the international community as an instrument for regime change in Tehran").

world.¹⁵⁴ Second, a mandatory punishment system could serve as a test model for an eventual nuclear disarmament regime, which non-nuclear-weapon states surely would have a strong interest in making credible.¹⁵⁵ In the world of complete nuclear disarmament, states must have the confidence that any hint of a violation of a nuclear-weapons convention would be quickly and appropriately addressed, and if need be, punished.¹⁵⁶

Disarmament advocates also could help promote the use of multilateral nuclear supply-and-waste mechanisms to limit the potential of a future virtual weapons race, and increase the chance that a world without nuclear weapons would be sufficiently stable.¹⁵⁷ Here, however, one must be mindful of the fact that people tend to be risk seeking in losses and risk averse in gains.¹⁵⁸ Advocates should be careful of zero-sum analysis in which non-nuclear-weapon states feel like current momentum for nuclear disarmament is a gain for them, and a loss for the nuclear-weapon states. Such thinking could make non-nuclear-weapon states risk averse to novel kinds of nuclear supply-and-waste mechanisms.

Part of the work of the expert advocate would be to frame the issue as a win-win scenario rather than a zero-sum calculation; indeed, some advocates already have made this point.¹⁵⁹ An additional approach, however, would be to increase the odds of a perceived "risky" bet or decrease the expectation of a sure gain.¹⁶⁰ The perceived risk of relying on multilateral fuel supply-and-waste mechanisms could be reduced in many ways, including: creating regional fuel banks, with regional officials serving as directors; encouraging developed states to provide subsidies for power grids or nuclear facilities in countries that agree to rely on multilateral fuel banks; or developing international agreements against anticompetitive or politically motivated nuclear trade involving fuel

154. See HAROLD FEIVESON ET AL., CTR. FOR INT'L & SEC. STUDIES AT MD., CAN NUCLEAR POWER BE MADE PROLIFERATION RESISTANT? 15 (2008), available at http://www.cissm.umd.edu/papers/files/future_nuclear_power.pdf (noting that in a world of significant nuclear disarmament, any attempt by a country to acquire nuclear weapons would have to be confronted by strong measures to ensure compliance with international obligations).

155. See generally Persbo, *supra* note 96 (noting the importance of credibility in a disarmament verification regime).

156. See *id.*

157. Goldschmidt, *supra* note 68, at 7.

158. Kahneman & Tversky, *supra* note 111, at 286–87 (discussing Prospect Theory).

159. Jasjit Singh, Manpreet Sethi & Garry Jacobs, *Abolishing Nuclear Weapons*, INT'L CENTER PEACE & DEV. (2007), http://www.icpd.org/defense_studies/Elimination%20of%20nuclear%20weapons.htm.

160. See Kahneman & Tversky, *supra* note 111, at 286–87 (discussing Prospect Theory).

banks.¹⁶¹ Alternatively, the perceived expectation of a sure gain could be diminished by stating that the advocate's credibility regarding disarmament depends on being a strong voice for safeguards enforcement and promoting proliferation-safe and disarmament-encouraging civil uses of nuclear energy. Without a demonstrated commitment to nonproliferation, the sure gain of momentum toward disarmament will diminish.

Finally, the work of the disarmament advocate, indeed of the entire enterprise of nuclear disarmament, must be viewed as fair if it is to succeed. But as was noted above, "fair" can be an elusive concept.¹⁶² For many years, non-nuclear-weapon states have argued that the review and enforcement of the NPT has been skewed against them, requiring ever more stringent and intrusive nonproliferation measures, while failing to require significant steps toward disarmament.¹⁶³ Also, for many years, nuclear-weapon states, especially France, the United Kingdom, and the United States, have argued that the world seems unwilling to do what is necessary to actually curb the proliferation of nuclear weapons.¹⁶⁴ Criticisms here include both failure to enforce nonproliferation obligations and punish violators of the NPT, and a perception that non-nuclear-weapon states view their right to nuclear technology as unfettered, regardless of proliferation risk. Last but not least, many states view it as unfair that non-NPT states are able to escape significant inspection and pressure to adhere to international nonproliferation and disarmament norms.¹⁶⁵ Clearly, the perception of unfairness is prevalent today. Changing this perception may be the most important work of the new disarmament advocate.

First, the disarmament advocate must establish his or her own credibility. Moral credibility is not the issue; rather, the disarmament advocate must focus on becoming evermore technically and politically credible. To be technically credible, an advocate must demonstrate a sufficient understanding of both the international laws and norms that govern nonproliferation and disarmament, and the technological intricacies of nuclear materials and processes. Of course not every advocate must be a nuclear engineer, but he or she should know

161. See Perkovich, *supra* note 34, at 90–95 (discussing the possibility of multinational or international fuel-cycle facilities and the implications of such ownership).

162. KOROBKIN, *supra* note 129, at 184.

163. Harold Müller, Exec. Dir. & Head of the Research Dep't, Peace Research Inst. Frankfurt, & George Perkovich, Vice President for Studies & Dir. of the Nuclear Policy Program, Carnegie Endowment for Int'l Peace, Carnegie Endowment for International Peace Speech: Debating Disarmament: Bridging the Gap in the Nuclear Order (Feb. 14, 2012), *transcript available at* http://carnegieendowment.org/files/021412_transscript_disarmament.pdf.

164. *Id.*

165. Nielsen, *supra* note 144.

enough about nuclear materials to know what are and are not technically credible possibilities for nuclear disarmament and power.¹⁶⁶ The advocate also must be politically credible, and in two ways: he or she should not overtly take sides between the parties, and he or she should sufficiently demonstrate an understanding of the political and security dynamics countries consider when evaluating nuclear disarmament and nonproliferation issues. If the disarmament advocate is not technically and politically credible, their participation in the process will largely be irrelevant.

Taking for granted the advocate's credibility, how can the advocate harness the social norm of fairness to facilitate nuclear disarmament? Unlike a typical negotiation context, the disarmament advocate probably views the bargaining zone as consisting of a single point: zero nuclear weapons.¹⁶⁷ In this situation, there is no cooperative surplus to divide between the parties, thus the typical norms of distributive justice (equity, equality, and need) seem insufficient in the disarmament context.¹⁶⁸ Similarly, because the problems associated with nuclear weapons are so unique and technologically complex, looking to past examples of arms-control agreements, such as the Land Mine Convention,¹⁶⁹ are unlikely to be a good guide for the nuclear-disarmament process. Thus, fairness as convention is unlikely to be a good model.¹⁷⁰ What remains is fairness embodied in procedural norms, and here the disarmament advocate can play a significant role.

There is a strong social norm that demands reciprocity in negotiation.¹⁷¹ When one party gives something of value, there is a strong expectation that the other party will reciprocate with something of value.¹⁷² In the iterative disarmament process, this suggests that significant disarmament and nonproliferation steps should proceed more or less in tandem. A major disarmament

166. One disarmament advocate proposed simply dipping nuclear weapons into molasses. Though I suspect such a proposal is largely in jest, the implied suggestion that disarmament is easy, and is merely a matter of will, undermines the technical credibility of the advocate community. See, e.g., Tova Fuller, *The 2010 NPT Review Conference: May 5th*, IPPNW PEACE & HEALTH BLOG (May 5, 2010), <http://peaceandhealthblog.com/2010/05/05/the-2010-npt-review-conference-may-5th/> (recounting the proposal that disarmament could be achieved by dipping nuclear weapons in molasses).

167. KOROBKIN, *supra* note 129, at 157 (discussing various types of negotiators and their bargaining zones).

168. *Id.* (discussing the difficulties negotiators have assessing the bargaining zone).

169. Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on Their Destruction, Sept. 18, 1997, 2056 U.N.T.S. 211.

170. KOROBKIN, *supra* note 129, at 211 (discussing fairness norms).

171. *Id.* at 184.

172. *Id.*

landmark should warrant a significant development on the nonproliferation front, and vice versa. For example, the most recent disarmament treaty between the United States and Russia, New START,¹⁷³ could warrant an agreement on mandatory Security Council action in response to belligerent withdrawal from the NPT. The first major agreement among all five NPT nuclear-weapon states could warrant mandatory participation in a multilateral nuclear fuel-supply mechanism. Right now, nuclear-weapon and non-nuclear-weapon states both view the other as one-sided in the disarmament nonproliferation debate.¹⁷⁴

Disarmament advocates could play an important role in establishing the reciprocity norm at the international level. The practical opposite of reciprocity, Boulwarism, in which one party proposes a single take-it-or-leave-it offer, almost always is perceived as an act of bad faith.¹⁷⁵ Unfortunately, this appears dangerously close to what nuclear disarmament advocates currently are proposing with a nuclear-weapons convention.¹⁷⁶ A nuclear-weapons convention can be the goal, but an iterative approach to disarmament, based on reciprocity, will almost surely be better received by the necessary parties.¹⁷⁷

Finally, it should be noted that the reciprocity norm should not be viewed as prohibiting one-sided disarmament or nonproliferation action when it is warranted. For example, if the United States decides that it no longer needs several hundred nuclear weapons to meet its security requirements, it should not necessarily wait to dismantle them until the international community is ready to adopt significant new nonproliferation obligations. Similarly, if a hole in the nonproliferation regime is exposed by some crisis, the world should not wait until significant disarmament steps are taken before fixing that hole. Reciprocity should be a norm in the formal disarmament process; it should not prevent "one-sided" action when such action is necessary.

V. CONCLUSION

Advocates of nuclear disarmament have been influential in convincing world leaders to take nuclear disarmament seriously. As

173. Treaty Between the United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms, U.S.-Russ., Apr. 8, 2010, S. TREATY DOC. NO. 111-5 (2010), available at <http://www.gpo.gov/fdsys/pkg/CDOC-111tdoc5/pdf/CDOC-111tdoc5.pdf>.

174. Mueller, *supra* note 163.

175. KOROBKIN, *supra* note 129, at 194.

176. Burroughs et al., *supra* note 29.

177. KOROBKIN, *supra* note 129, at 194–95 (discussing the reciprocity norm).

work turns toward the practical challenges of ridding the world of such weapons, however, advocates risk their continued relevance if they do not adapt to focus on helping states overcome the significant technological and political impediments that stand in the way of nuclear disarmament.

Based on lessons from behavioral economics and negotiating theory, this Note proposes that advocates embrace an iterative approach to disarmament to combat loss aversion and discourage framing effects. A significant new role for the advocate could be to help assess just how much loss nuclear-weapon states could tolerate at each step in the disarmament process, taking account of current threat perceptions, military planning, and alliance structures. Between such steps, advocates could either work to encourage the reduction of insecurities or the development of alternative deterrence structures that would allow for successive nuclear disarmament steps.

Regarding non-nuclear-weapon states, advocates could encourage commitment devices to enforce nonproliferation norms and reframe risk perceptions of nuclear supply arrangements; after all, nuclear disarmament will remain an elusive goal if nonproliferation is not taken seriously. Because people often discount future events, commitment devices, such as *ex ante* agreement on Security Council action for violations of nonproliferation norms, could be encouraged to provide more reliable enforcement of the nonproliferation regime. Additionally, to combat risk aversion related to alternative nuclear fuel-supply mechanisms, disarmament advocates should work to decrease the perceived benefit of the status quo or increase the odds of achieving an agreeable alternative.

Finally, because of the strong norm of fairness in negotiations, advocates should first work to establish their technological and political credibility to serve as third-party participants, and second, should focus their efforts on the procedural fairness of the formal disarmament process. Traditional norms of distributive justice are less persuasive in the disarmament context, because there is no cooperative surplus to divide; for the advocate, the bargaining zone consists of a single point: zero nuclear weapons. Likewise, fairness based on convention or other arms-control efforts is likely to be insufficient in the nuclear-disarmament context, because the problems associated with nuclear weapons are so unique and technologically complex.

NGAs have provided a strong moral voice for the total disarmament of nuclear weapons, but if they are to remain credible participants in the disarmament process, they must redouble their efforts to assist in the difficult technical and political obstacles that stand in the way of a world without nuclear weapons. They must account for how states actually behave, not just how they would like them to behave. In this respect, behavioral economics can provide

clues to the construction of a modern, more effective nuclear-disarmament advocacy.

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