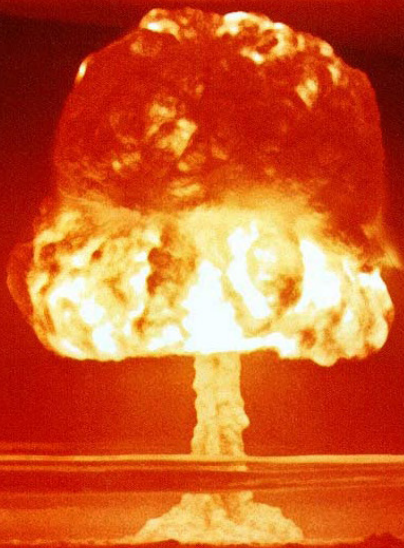


MANAGING NUCLEAR RISKS



by Robert S. Litwak



**Nuclear Proliferation
International
History Project**

Woodrow Wilson International Center for Scholars
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1300 Pennsylvania Avenue NW
Washington, DC 20004-3027

www.wilsoncenter.org

ISBN: 978-1-938027-93-2

September 2020

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Preface and Acknowledgments

Seventy-five years after the atomic bombs were dropped on Japan, nuclear war still poses an existential threat to humanity. This monograph surveys nuclear risks across their three main categories: relations among the existing nuclear-weapon states, the possible proliferation of nuclear weapons to additional states, and nuclear terrorism. It draws on my previous analyses in *Nuclear Crises with North Korea and Iran: From Transformational to Transactional Diplomacy*, published in 2019, and *Deterring Nuclear Terrorism*, published in 2016, as well as a three-part series of books on the normative challenge to international order posed by “rogue states.”

This publication could not have been completed without the help and advice of many colleagues and friends. My thanks begin with Jane Harman for her support of policy-relevant scholarship and writing at the Wilson Center. This monograph is a product of the Center’s Nuclear Proliferation International History Project, directed by Christian Ostermann and Leopoldo Nuti, which uses history as a tool of contemporary policy analysis.

I am especially indebted to Mitchell Reiss, Joseph Pilat, and Zachary Davis for their advice on sharpening the argument. Special thanks go to Shaul Bakhsh, Haleh Esfandiari, Michael Forster, Bruce Hoffman, Paul Stares, Walter Reich, and Sam Wells for their counsel and friendship; Julia Craig Romano for her deft editing of the manuscript; and Henry Cronic for his excellent research assistance. I also gratefully acknowledge those friends and colleagues with whom I discussed the monograph’s argument over the years: Baroness Catherine Ashton, Shahram Chubin, Robert Daly, Abe Denmark, Tom Friedman, Robert Hathaway, Jean Lee, Daniel Poneman, Matt Rojansky, David Sanger, and Joby Warrick.

My sincere thanks go finally to Wilson Center colleagues: Kian Byrne, for coordinating the Nuclear Proliferation International History Project; librarian Janet Spikes; and the Center's communications team—Linda Roth, Suzanne Napper, Lauren Booth, and graphic designers Kathy Butterfield and Kerrin Cuison—for their excellent work expeditiously moving the monograph through production.

This monograph is dedicated to two giants in the field:

Lee Hamilton, former president of the Wilson Center, whose distinguished career exemplifies the ideal of public service.

Bruce Blair, a dear friend who devoted his life to the cause of nuclear disarmament, and whose untimely passing, which occurred during the writing of this book, is deeply mourned.

I was in pandemic lockdown while writing this book, together with my beloved Liz. The circumstances made me treasure, more than ever, what an inspiration and support she has always been.

The views expressed here are my own.

Robert S. Litwak

Washington, D.C.

August 2020



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Books and Monographs by Robert S. Litwak

Nuclear Crises with North Korea and Iran: From Transformational to Transactional Diplomacy

Preventing North Korea's Nuclear Breakout

Deterring Nuclear Terrorism

Iran's Nuclear Chess: After the Deal

Outlier States: American Strategies to Contain, Engage, or Change Regimes

Regime Change: U.S. Strategy through the Prism of 9/11

Rogue States and U.S. Foreign Policy: Containment after the Cold War

Nuclear Proliferation after the Cold War (edited with Mitchell Reiss)

Détente and the Nixon Doctrine: American Foreign Policy and the Pursuit of Stability, 1969-1976

Security in the Persian Gulf: Sources of Inter-State Conflict



Introduction

During the presidential debate, the moderator asked the two candidates, what “is the single most serious threat to the national security of the United States?” “Nuclear proliferation,” answered one; a nuclear weapon “in the hands of a terrorist network,” agreed the other.¹ The year was 2004—three years after the 9/11 terrorist attacks, and one year after the United States had launched a preventive war of regime change in Iraq to prevent the Saddam Hussein regime from acquiring nuclear weapons.

Nuclear risks, broadly defined beyond the challenge of preventing a nuclear 9/11, have since declined in salience. Recent annual threat assessments of the Director of National Intelligence, while addressing nuclear risks, have led with cyberwarfare.² In a public opinion survey of America’s “top fears” in 2019, “nuclear weapons attack” ranked 29th.³ While the world marked the seventy-fifth anniversary of the dropping of atomic bombs on Japan, public consciousness of the awesome destructive power of nuclear weapons has faded. According to the public literature, a single nuclear warhead on a U.S. Trident ballistic-missile submarine has a yield more than thirty times that of the weapon detonated over Hiroshima in World War II.⁴

Yet even as nuclear issues have receded in prominence, rising risks, if not mitigated, could reach a level not seen since the 1962 Cuban Missile Crisis. Consider these developments:

- The bipolar nuclear world of the Cold War has been supplanted by a multipolar one. In 2019 and 2020, two pairs of states possessing nuclear weapons confronted one another along their contested borders. In February 2019, India and Pakistan clashed in the disputed region of Kashmir in a military confrontation that escalated to reciprocal air strikes. In May-June 2020, India and China exchanged deadly gunfire along their frontier in the Himalayas for the first time in 45 years. These incidents, which inherently

Left: A Russian nuclear submarine conducts a test launch of the nuclear-capable Bulava missiles in the White Sea on May 22, 2018 (AP Images/Russian Defense Ministry Press Service)

carried the risk of escalation, highlight the dangerous complexities of the contemporary multipolar nuclear world.

- The demise of the arms control architecture, likely soon including the foundational New START treaty between the United States and Russia, will lead to unconstrained nuclear-force modernization programs. Meanwhile, strategic competition with China and Russia has intensified as U.S. relations with both at their worst since the Cold War. Unbound autonomy could threaten strategic stability and crisis stability.
- Risks of additional nuclear proliferation have grown. North Korea is on the cusp of acquiring the capability to directly target the U.S. homeland with a nuclear weapon. The Iran nuclear deal, constraining that country's pathway to a nuclear weapon through uranium enrichment, faces uncertainties with the U.S. withdrawal in 2018.
- Terrorist groups, such as Al Qaeda and ISIL (Islamic State of Syria and the Levant), motivated by apocalyptic ideologies, remain intent on acquiring a nuclear weapon “to pull off,” what an ISIL publication described as, “something truly epic.”⁵

Nuclear risks have typically been divided into three categories: “vertical proliferation”—the size and characteristics of the arsenals of nuclear-weapon states; “horizontal proliferation”—the acquisition of nuclear weapons by additional states; and terrorism—the acquisition and use of a nuclear weapon by a non-state actor. This study addresses these categories by focusing on a central issue in each.

The chapter on *vertical proliferation*—“Challenges of a Multipolar Nuclear World”—deals with the most likely pathway to conflict between nuclear-weapon states in a multipolar world—the escalation of a regional flashpoint. It examines two traditional dynamics of the Cold War that have been recast in this new era of multipolarity. The first is the so-called “stability-instability paradox”—that strategic stability at the nuclear level could generate instability by empowering rival states to pursue tactical gains through non-nuclear means. The second challenges the

assumption of a stable nuclear deterrent—whether it is, under current and prospective conditions, more “delicate” than robust. While the recent border clashes between nuclear-weapon states on their disputed borders is ostensibly consistent with the stability-instability paradox—a conflict on the periphery within the context of a nuclear standoff—how actually stable is the nuclear stability component of that equation? Developments examined in the chapter suggest that the balance of terror between these states is increasingly delicate and that there is a plausible risk of a direct conventional military clash escalating, potentially to the nuclear level.

The chapter on *horizontal proliferation*—“‘Horizontal’ Proliferation: North Korea, Iran, and Beyond”—focuses on the alternative strategies—a more limited transactional approach versus a sweeping transformational one—advanced to address the challenge of adversarial proliferators, such as North Korea and Iran. Whether the U.S. objective should be to change their behavior or to change their ruling regimes remains the persistent unresolved tension in U.S. policy toward these states designated as “rogues” since the end of the Cold War. Transactional diplomacy, such as that in the 2015 Iran nuclear agreement, focuses on the discrete nuclear issue. Those advocating a transformational strategy regarding Iran argue that a transactional deal focused on changing behavior is inadequate because that dangerous behavior derives from the very character of the Iranian regime. Yet the dilemma is that the timelines for nuclear development and regime change are not in sync: the former is immediate and urgent, whereas the latter is speculative and indeterminate. This chapter makes the case for transactional strategies—delinking the two issues—to pragmatically constrain these states’ nuclear capabilities and buy time as the uncertain regime-change or evolution process plays out.

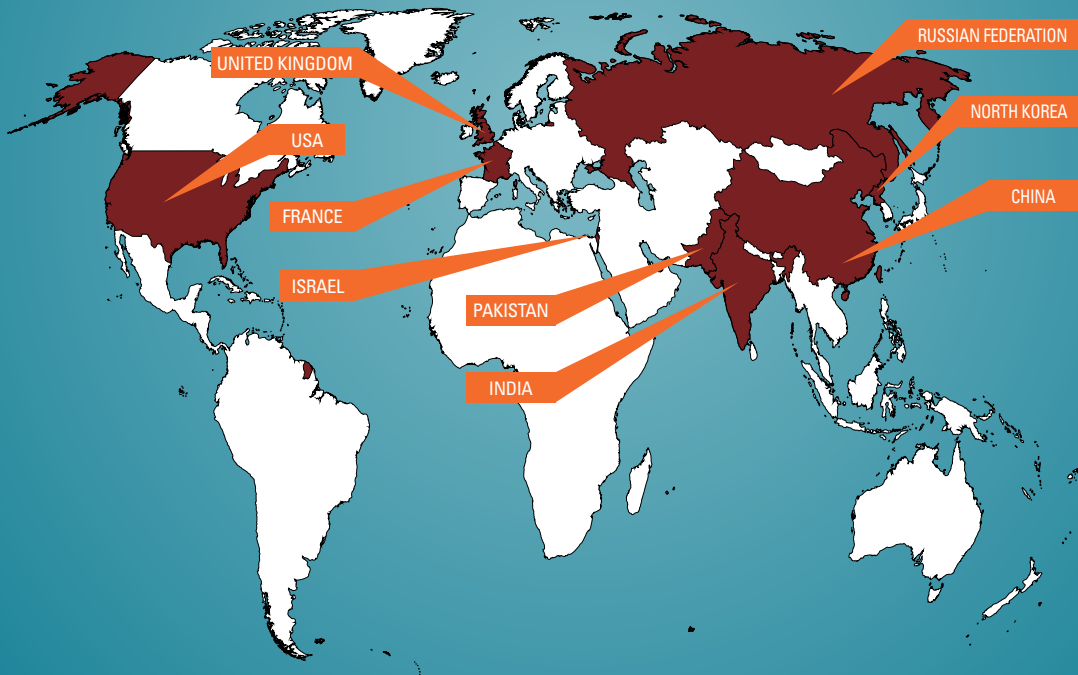
The chapter on *nuclear terrorism*—“Deterring Nuclear Terrorism”—begins with the observation that each of the pathways for terrorist acquisition of a nuclear weapon—buying, stealing, or building one—requires the involvement of a state, whether as a deliberate act of policy by the ruling regime or a failure to exercise sovereign control over weapons and weapons-usable fissile material on its territory. The state dimension of non-state nuclear terrorism is thus essential. The argument advanced in this

chapter is that effective strategies on the *state* level—ones that lock down weapons and weapons-usable material and threaten punitive consequences for the potential transfer of those capabilities—are the prerequisite for addressing *non-state* threats. A repertoire of tailored strategies of deterrence would not completely eliminate non-state terrorist threats, but they would go far in achieving this goal.

The nuclear risks addressed in this study reflect a series of persisting policy tensions: between preventing nuclear war and waging limited conventional wars over territorial stakes, between contending behavior-change and regime-change strategies to forestall nuclear proliferation in “rogue” states, and between differentiated state-based strategies to address the threat of nuclear terrorism by non-state actors. These policy tensions cannot be resolved—but by understanding them clearly, they can be more effectively managed to lower nuclear risks.



Above: China's JL-2 submarine-launched missiles in a Beijing parade on Oct. 1, 2019 (AP Images/Mark Schiefelbein)



NUCLEAR WEAPON STATES (NWS)



Challenges of a Multipolar Nuclear World

In 2019 and 2020, two pairs of states possessing nuclear weapons confronted one another along their contested borders. In February 2019, India and Pakistan clashed in the disputed region of Kashmir in a military confrontation that escalated to reciprocal air strikes. In May-June 2020, India and China exchanged deadly gunfire along their frontier in the Himalayas for the first time in 45 years. These incidents, which inherently carried the risk of escalation, highlight the dangerous complexities of the contemporary multipolar nuclear world.

With the end of the Cold War, what had been the defining reality of international relations—the risk of nuclear war between the superpowers—was transformed. At the same time, because the Cold War’s conclusion coincided with a “hot war” under the UN Security Council’s legitimizing imprimatur to expel Saddam Hussein’s Iraq from Kuwait, the focus of U.S. national security policy shifted to a new emerging threat—the risk of a nuclear weapon or materials falling into the possession of a “rogue” state (a category whose core group was Iraq, Iran, North Korea, and Libya) or a terrorist organization. That threat perception precipitated the launching of the Cooperative Threat Reduction program (aka the “Nunn-Lugar Act”) to secure post-Soviet “loose nukes,” and the reorientation of U.S. defense strategy from NATO contingencies in Europe to regional aggressors—adversarial proliferators—in the Middle East and Northeast Asia. Within this transformed international environment, nonproliferation successes were achieved through nuclear reversals in South Africa, Argentina, and Brazil, as well as in Ukraine, Belarus, and Kazakhstan (with Russia emerging as the sole nuclear successor state to the Soviet Union). In addition, the foundational Nuclear Non-Proliferation Treaty (NPT) was indefinitely extended in 1995.

Starting in the late 1990s and continuing for the next two decades, however, two adverse developments overturned the sanguine assumptions about the end of the

Cold War and President George H.W. Bush's call for the establishment of "a new world order."⁶ First, and foremost, was the revival of great power competition as both an aggrieved Russia under Vladimir Putin and a "risen" China under Xi Jinping are challenging U.S. primacy through strategies of assertive nationalism. Both powers are engaged in active nuclear force modernization programs. The second negative development, after the fortuitous nuclear reversals in the first half of the 1990s, was proliferation on the Indian sub-continent. India, which had carried out a "peaceful nuclear explosion" in 1974, conducted a series of weapon tests in May 1998. Pakistan, to which U.S. intelligence had credited an untested nuclear capability since the late 1980s, quickly followed suit. A year later, between May and July 1999, Indian and Pakistani forces clashed at Kargil in Kashmir—the first direct military confrontation between two states possessing nuclear weapons.

Together these developments have recast two risks of the bipolar Cold War era in an emergent multipolar context. The first is the relationship between nuclear deterrence and the propensity for conflict at lower levels on the continuum of military force. After both the United States and the Soviet Union acquired thermonuclear weapons, British strategist B.H. Liddell Hart speculated in 1954, "To the extent that the H-bomb reduces the likelihood of full-scale war, it increases the possibility of limited war pursued by widespread local aggression."⁷ Policy analysts would later refer to this as the "stability-instability paradox"—that strategic stability at the nuclear level could generate instability by empowering rival states to pursue tactical gains through non-nuclear means. But RAND Corporation strategist Albert Wohlstetter challenged that assumption of a stable nuclear deterrent condition in a 1959 *Foreign Affairs* article, "*The Delicate Balance of Terror*."⁸ Wohlstetter's focus at that time was the vulnerability of the U.S. nuclear deterrent force, specifically manned bombers, to a disarming Soviet surprise attack. His concern was that in a crisis the Kremlin leadership have a perceived incentive to go first—to launch a preemptive strike.

The discrete focus of analysis in this chapter is on the relationship between those two Cold War dynamics, identified respectively by Liddell Hart and Wohlstetter, under the current conditions of multipolarity. The recent border clashes between nuclear-weapon

states on their disputed borders is ostensibly consistent with the stability-instability paradox—a conflict on the periphery within the context of a nuclear standoff. The question, though, asks how stable the nuclear stability component of that equation actually is. Three developments suggest that the “balance of terror” between these states is increasingly delicate and that there is a plausible risk of a direct conventional military clash escalating, potentially to the nuclear level.

The first development is the fragmenting international and regional orders in which the territorial status quo is contested among nuclear-weapon states. During the Cold War, the superpowers fought limited wars (Korea, Vietnam) through proxies but not directly against one another. In the primary Cold War theater—Europe—an accepted territorial status quo existed and that East-West divide was tangibly codified through rival military organizations: NATO and the Warsaw Pact. That clear agreed-upon demarcation, backed by a credible nuclear deterrent, created the conditions for what Cold War historian John Gaddis called “the long peace.”⁹ But those conditions do not pertain to the contemporary multipolar competition. Nuclear powers (India-Pakistan; China-India) have already squared off on their disputed frontier. China is pursuing a strategy of assertive nationalism through its maritime and island claims in the South China and East China Seas. Not recognizing those assertions of sovereignty, the United States has dispatched U.S. naval and air forces to conduct “freedom of navigation operations” in this geographical zone—a countermove that could bring their respective military forces into direct contact. In another challenge to the territorial status quo, though not entailing a direct confrontation with the United States or NATO, Russia’s occupation of the Donbas and annexation of Crimea in 2014 set an important precedent as the first forcible change in a European boundary since World War II.

A second development adversely affecting strategic stability has been the decline of arms control. During the Cold War, arms control negotiations were the primary medium for strategic communications between the superpowers. Agreements such as SALT and the ABM Treaty negotiated by the Nixon administration at the height of détente policy with the Soviet Union in the early 1970s provided a framework for the structuring of each side’s strategic nuclear and defensive systems. In the

post-Cold War era, when U.S.-Russian relations were good and arms control was less central to the relationship, deep reductions in the superpowers' nuclear arsenals were achieved. However, in 2020, when bilateral relations have sharply deteriorated and both countries are modernizing their nuclear forces and developing new missions for low-yield weapons, the continuation of that arms control framework (i.e., New START), and therefore fixing the parameters of their arsenals, is in question. Revitalized arms control negotiations would provide an institutional forum for strategic dialogue among the nuclear-weapon states.

The first two developments—the fragmentation of international order and the decline of arms control—exacerbate the third: uncertainties about deterrence and strategic stability. In a multipolar nuclear order, risks of misperception and miscalculation that could lead to inadvertent escalation are increasing. The extent to which the nuclear powers have a shared understanding of deterrence is unclear. The Trump administration's 2018 *Nuclear Posture Review* raised the possibility that Russia has adopted an “escalate to deescalate” strategy entailing the early use of tactical nuclear weapons. In addition, emergent technologies (such as hypersonic weapons systems and a new generation of low-yield nuclear weapons) could blur the distinction between conventional and nuclear operations, thereby affecting crisis stability. More fundamentally, the persisting issue is whether the role of nuclear weapons is to deter an adversary's nuclear weapons or to limit damage during a conflict (as part of a warfighting strategy).¹⁰ Nuclear deterrence and crisis stability are further affected by competition in new domains—cyber and space—that China and Russia view not in isolation but as integrated components of comprehensive strategies. Indeed, if escalation in a crisis were to occur, the initial actions would likely be in one or both of these domains before the possible introduction of nuclear weapons. The extension of competition among nuclear powers into the cyber and space domains has important implications for deterrence and strategic stability by blurring the threshold between what constitutes conventional warfare and nuclear warfare.

Among the nine states possessing nuclear weapons, this analysis will focus on five—the United States, Russia, China, India, and Pakistan. (As for the other nuclear-weapon states not addressed in this discussion, Britain's and France's

nuclear forces are essentially a hedge against the potential unreliability of the U.S. extended deterrent, while Israel's nuclear capability is undeclared but tacitly acknowledged. North Korea's nuclear challenge is addressed in the following chapter on horizontal proliferation.) These five states are those in which the tension between the two dynamics—the stability-instability paradox and the delicate balance of terror—is most pressingly manifest. They exhibit the salient characteristics: pairs of them are in direct confrontation over contested territory, the development of capabilities aimed at one adversary has strategic implications for another actor (i.e., the shift from dyads to triads—U.S.-Russia-China and China-India-Pakistan), and doctrinal and technological developments could lead decision-makers in a crisis to perceive an incentive to preemptive action with intended, or more unlikely unintended, consequences for escalation control. My analysis will address these issues within the context of the three key developments identified above: fragmenting international and regional orders, the future of arms control, and challenges to deterrence and strategic stability. But to provide context, the analysis will initially focus on the transition from a bipolar to multipolar nuclear order.

From a Bipolar to Multipolar Nuclear World

In *The Absolute Weapon*, RAND strategist Bernard Brodie laid out the fundamentals of nuclear deterrence a year after Hiroshima and Nagasaki. Contrary to those who viewed the atomic bomb as essentially an extension of conventional strategic bombing—how the U.S. Air Force had deployed its massed bomber fleets against German and Japanese cities during World War II—Brodie argued that the utility of these revolutionary weapons was not in their use, but in their threatened use.¹¹ With the Soviet Union's acquisition of the “absolute weapon” in 1949, nuclear bipolarity became the defining feature of the Cold War international order.

The Cold War was a global ideological competition, but not all commitments were vital. The Eisenhower administration found that its “massive retaliation” strategy—threatening the use of nuclear weapons in the defense of less-than-vital interests (such as during the 1954 Quemoy and Matsu crisis)—was simply not credible.

But the more fundamental concern was the one that Wohlstetter had identified—the vulnerability of the U.S. deterrent to a Soviet first strike. The Kennedy administration’s “flexible response” strategy answered the credibility problem by significantly expanding U.S. conventional forces so that limited force could be applied to limited contingencies. Concern about the vulnerability of U.S. strategic nuclear forces was addressed through the deployment of land-based Minuteman intercontinental ballistic missiles (ICBM) in hardened silos and sea-launched ballistic missiles (SLBM) on Polaris submarines.

But the Kennedy administration went further by publicly debunking the “missile gap” myth and additionally asserting that the U.S. numerical advantage (resulting from the deployment of Minuteman and Polaris systems) could allow United States to target Soviet nuclear assets as part of a damage-limitation (or war-fighting, to be more accurate) strategy. The intent was essentially to employ U.S. superiority to gain coercive advantage on the Soviet Union. But the Soviet reaction—deploying medium-range ballistic missiles on Cuba in a desperate bid to redress the strategic balance—precipitated the most dangerous crisis of the Cold War. After the profound shock of the Cuban Missile Crisis, the Soviet Union began to match the U.S. deployment of large numbers of secure second-strike nuclear. The crisis also revealed the potentially catastrophic consequences of “unmanaged competition.”¹² In its aftermath, with the advent of large secure offensive arsenals and limited defensive capabilities, British strategist Lawrence Freedman observed, “the two superpowers began to accept that both sides were locked into a condition of mutual assured destruction (MAD). The search for a plausible first-strike strategy lingered on before it eventually subsided, but caution was now the norm in superpower relations.”¹³

In 1964, China became the fifth nuclear-weapon state (joining the United States, Soviet Union, Britain, and France) and two years later successfully tested a nuclear weapon launched by a ballistic missile. The Kennedy administration had seriously explored the feasibility of a preventive military strike on China’s nascent nuclear capability in the early 1960s.¹⁴ What drove the administration’s consideration was not a general normative concern about proliferation, but rather the perception that China’s threat derived from the character of its ruling regime in possession

of nuclear capabilities. At that time, Mao's China was the functional equivalent of what in the post-Cold War era would be labeled as a "rogue state." In rejecting the option of "unprovoked" military action, President Johnson accepted a State Department assessment—that a nuclear-armed China would not fundamentally change the balance of power in Asia and that it could be deterred from aggression by overwhelming US conventional and nuclear superiority.

According to British scholar William Walker, the global nuclear order rested on two "pillars." The first pillar was nonproliferation—international efforts to limit the number of nuclear-weapon states that culminated in conclusion of the 1970 nuclear Non-Proliferation Treaty (NPT), which now has 191 signatory states.¹⁵ Despite this success, a perennial debate in the nuclear field has been whether "more may be better."¹⁶ The issue of horizontal proliferation—why John Kennedy's nightmare vision of a world of 30 nuclear weapon states was avoided—is addressed in the following chapter. The pertinent issue in the context of this discussion is whether a multipolar nuclear order with additional members is more or less stable. The sanguine argument for more is based on the contentious assumption that stable deterrent relationships based on mutual vulnerability can be replicated in additional dyads. Given that the nuclear dyads are now affected by third countries (witness China-India-Pakistan and U.S.-Russia-China), the risk of miscalculation and misperception precipitating a crisis and inadvertent escalation supports the goal (which has normative standing through the NPT) of limiting the number of nuclear states.

The second "pillar" of the bipolar nuclear order, which emerged in the years after the Cuban Missile Crisis, was mutual deterrence based on vulnerability in which neither superpower had an incentive to strike first in a crisis. The arms control framework for stabilizing the bilateral deterrent relationship was negotiated by the Nixon administration with Leonid Brezhnev's Kremlin during the period of superpower détente in the early 1970s. The foundational agreements—the Strategic Arms Limitation Talks (SALT) and the Anti-Ballistic Missile (ABM) Treaty—limited, respectively, ballistic missiles launchers and missile defenses. But the offensive arms build-up that SALT permitted, particularly the deployment of

multiple warheads on new platforms (e.g. Trident), went far beyond the requirements of mutual deterrence based on vulnerability.

In the political realm, though the Nixon-Kissinger diplomacy with the Soviet Union sought to forge “a structure of peace,” *détente* was a condition—not a structure—of international relations.¹⁷ Both superpowers continued to pursue unilateral advantage on the periphery, in what was then called the Third World. During the October 1973 Middle East War, when the Soviet Union threatened to militarily intervene to relieve the Egyptian army surrounded by Israeli forces in the Sinai, the White House signaled its opposition to a unilateral Soviet action by increasing the defense readiness condition (DEFCON) level of U.S. forces worldwide. The Soviet Union’s 1979 invasion of Afghanistan, which was part of a broader pattern of activism in the Third World under Brezhnev, effectively ended the era of superpower *détente*. The sharp deterioration in relations also drew historical analogies to 1914—that a conflict in Middle East or Southwest Asia (along what National Security Advisor Zbigniew Brzezinski called the “arc of crisis”) could lead to inadvertent escalation drawing the superpowers into direct conflict. This catalytic war scenario led to the promulgation of the Carter Doctrine, which declared that the United States was prepared to use force to defend its vital oil interests in the Persian Gulf.

Soviet activism in the Third World, including the invasion of Afghanistan, was consistent with the stability-instability paradox. But within the context of a deterioration in superpower relations, concerns were raised about the stability of the deterrent relationship. In the late 1970s, the focus was on the Soviet heavy missile—the SS-18—and its ability to target the U.S. land-based components of its deterrent triad: bombers and ballistic missiles in fixed silos. The concern was that, in a crisis, the Soviet Union might derive political utility from a perceived asymmetry in military capabilities. This marginal asymmetry hardly undercut stability through mutual vulnerability (as under any attack scenario the United States would retain invulnerable submarine-launched ballistic missiles for retaliation). But this argument nonetheless drove the case for the deployment of the United States’ counterpart to the SS-18, the MX “Peacekeeper” ICBM. By the 1980s, the U.S. and Soviet nuclear arsenals—estimated at 23 thousand and 40

thousand warheads, respectively—were of a magnitude exceeding any rational relation to strategy. (In contrast, China, the state that would eventually become part of a nuclear triad with the superpowers in multipolar nuclear order, then possessed a comparatively meager 225 nuclear weapons—a force structure evidently linked to a strategy of minimum deterrence.¹⁸)

The unexpected end of the Cold War, and the consequent dramatic improvement in superpower relations, led to a decade of landmark arms control diplomacy covering the gamut of nuclear capabilities: the Intermediate Nuclear Forces (INF) Treaty (1987), which eliminated missiles of that range; coordinated unilateral moves to drastically reduce the number of deployed non-strategic or tactical nuclear weapons (1991); the START I agreement limiting the number of missile launchers; and the START II agreement (1993) banning land-based missiles with multiple warheads, an important qualitative development aimed to stabilize deterrence by mutual vulnerability by limiting destabilizing first-strike nuclear capabilities.

Arms control and nonproliferation efforts to expand on this treaty-based framework stalled in the late 1990s as negotiations on an ambitious Strategic Arms Reduction Treaty (START) III agreement were suspended and the U.S. Senate refused to ratify the Comprehensive Test Ban Treaty. As arms-control efforts lost momentum, the norm of nonproliferation (which had been bolstered by nuclear reversals in the first half of the 1990s) was challenged in South Asia as India and Pakistan conducted a series of nuclear-weapon tests in May 1998. Having India and Pakistan join China as nuclear-weapon states led to what Harvard nuclear expert Steven Miller described as “the multilateralization of deterrence relationships”—the transition from a bipolar to multipolar nuclear world.¹⁹ Dyads were being supplanted by triads: China, now modernizing its nuclear forces as part of a shift from its longstanding minimum-deterrence posture, comprised one leg of a strategic triangle with the United States and Russia. In addition, geostrategic forces also inherently implicated China in another nuclear triad with India and Pakistan. Multipolarity created new complexities and attendant risks. The focus of this chapter is how the traditional tension between two Cold War dynamics—the stability-instability paradox (that a nuclear stalemate may embolden lower-level aggression) and the “delicate” balance of terror (calling

into question the stability of the nuclear balance)—will play out in a new multipolar context. Attention now turns to the regional flashpoints that may become the territorial foci of competition, and potential escalation, between nuclear-weapon states.

Fragmenting International and Regional Orders

The Renationalization of Foreign Policies

During the Cold War, policymakers focused on two possible pathways to a U.S.-Soviet war. The first was a bolt-from-the-blue Soviet attack against NATO on the inner German border. Though that was the preoccupying scenario of Western policymakers, the existence of large-standing military forces in NATO and the Warsaw Pact, entrenched in a mutually accepted territorial status quo and backed by nuclear deterrents on both sides, created the conditions for the “long peace.” The more plausible pathway to superpower conflict, particularly after the Soviet invasion of Afghanistan, was inadvertent escalation from a limited war on the periphery—the Third World. But even with the ideological overlay of the Cold War, these stakes were less than vital and the conflicts typically involved one superpower against the proxy forces of the other (e.g., Soviet backing of the North during the Vietnam War, U.S. support for the Afghan Mujahedeen by the Carter and Reagan administrations). These constraints mitigated, but did not eliminate, the risks of escalation. By contrast, in the emergent multipolar system, potential flashpoints between nuclear-weapon states are not peripheral but vital interests—Taiwan and the South China Sea for China, Kashmir for India and Pakistan, and the former Soviet republics for Russia.

When George Kennan, the diplomatic architect of U.S. containment policy, declared the end of the Cold War, he explained that the Soviet Union under Gorbachev had evolved from a revolutionary state into an orthodox great power—the country “should now be regarded essentially as another great power, like other great powers.” As a foreign policy realist, Kennan did not posit the end of great power competition, but rather that it would be conducted within traditional bounds. “Russian aspirations and policies,” Kennan stated, “are conditioned outstandingly by its own geographic

situation, history, and tradition.”²⁰ What Kennan was essentially arguing was that Russia’s post-Soviet foreign policy, stripped of ideology, would be a renationalized version of traditional Russian foreign policy. For Russia, the country spanning 11 time zones with no natural boundaries, the Kremlin’s strategic priorities would start with the “near abroad” abroad of the former Soviet republics abutting the West.

An analogous debate continues on the strategic objectives of a “risen” China. Though continuing as a notionally Communist state, primarily as framework for the regime’s state control, is China an orthodox great power seeking to integrate into an American-designed global order, albeit with influence commensurate to its power in the setting and enforcement of international norms? Or does the Beijing regime seek primacy—global preponderance—that would require a wholesale remaking of the international order? U.S. analysts divide on this foundational question—whether China is a “rising threat to be confronted boldly or a manageable problem to be handled patiently?”²¹ However that longer-term geopolitical process plays out, in the present, China has generated regional tensions (and is at odds with the United States) through its assertive claims of national sovereignty in the South and East China Seas.

In South Asia, religious nationalism, which was the basis for the post-colonial partitioning of the Indian subcontinent into separate Muslim and Hindu states, underlies the persisting Kashmir dispute between India and Pakistan. India’s testing of nuclear weapons in May 1998 followed on the election of a Hindu nationalist party and, in turn, precipitated Pakistan’s reciprocal tests. Though Kashmir is the focal point of Indo-Pakistani enmity, India regards itself as a great power with China (the third leg of this nuclear triad) its primary rival for influence in Asia.

The United States has also experienced a nationalist reorientation of foreign policy under the rubric of “America First” during the Trump administration. “America First” reflects, in part, the public’s inward-focused reaction to two costly and protracted wars in Iraq and Afghanistan, as well as the broader phenomenon of globalization and its adverse effects on the U.S. economy. President Trump, a self-described disrupter, has deviated from what had been America’s winning

grand strategy since the end of World War II. That grand strategy focused on integrating democratic states with market economies into the liberal international order. In Western Europe, the battleground of two world wars, a grand strategy of integration produced unprecedented wealth (the European Union) and security (NATO). Containment was America's default alternative strategy to integration to address outlier states (such as the Soviet Union) that were structurally incapable of integration and that posed a threat to the liberal international order. In the 1990s, when the United States emerged from the Cold War as the sole remaining superpower, the embedding of American power in international institutions made it less threatening and more legitimate to other states (which otherwise would have been expected to band together to balance U.S. "hyperpower").²²

The bipolar nuclear order of the Cold War, which cast U.S.-Soviet competition in a global ideological framework, has been supplanted by a multipolar world in which nationalism, not an abstract ideology, is the driving motivation of nuclear-weapon states. Pairs of them in various regional contexts are squared off in disputes over the territorial status quo whose stakes are vital to each. While a nuclear stalemate might invite unilateral moves lower on the force continuum to alter the status quo, such provocations are fraught with risks of escalation (whether intended or inadvertent) because of the perceived stakes.

Regional Flashpoints

This section provides an overview of the major territorial disputes that may become the occasion for crisis and conflict between nuclear-weapon states with dangerous escalatory potential.

Taiwan—The most likely pathway to war between the United States and China stems from the unresolved status of Taiwan, the island to which the Chinese nationalist government under Chiang Kai-shek fled after the Chinese communists gained power on the mainland in 1949. Taiwan was the focal point of two Cold War crises during brief skirmishes in 1954 and 1958 between the communist People's Republic of China (PRC) and the nationalist Republic of China (ROC) over the islands of Quemoy and Matsu. Though these Cold War crises did not escalate, the

1954 episode included nuclear saber-rattling by U.S. Secretary of State John Foster Dulles. In 1971, with the seismic geopolitical shift in U.S.-PRC relations under President Nixon, the United Nations recognized the PRC as the sole legitimate government in China. In 1979, the United States affirmed a “one China” policy when Washington established diplomatic relations with the PRC, while maintaining unofficial relations with Taiwan. The United States has adopted a policy neither acknowledging the PRC’s sovereignty over Taiwan nor the ROC’s claim that it is an independent sovereign state, and which calls for the two sides to peacefully resolve their cross-strait dispute. This altered relationship between the United States and Taiwan was codified in the Taiwan Relations Act of 1979, which permitted the continued transfer of U.S. defensive arms to Taiwan (the definition of which is an issue of contention between Beijing and Washington). The TRA does not include a U.S. security commitment to Taiwan but maintains what has been described as “strategic ambiguity” about the U.S. response if China attacked Taiwan. In 1996, the so-called Third Taiwan Strait Crisis occurred when China displayed its growing military power during the lead-up to Taiwan’s first direct presidential election. In response to Chinese missile tests and military exercises, President Clinton deployed two U.S. carrier battle groups to the area, one of which sailed through the Taiwan Straits. Under its 2005 Anti-Secession Law, China reserves the right to use force should Taiwan declare independence. In January 2019, President Xi reaffirmed China’s commitment to peaceful reunification, while reserving the right to use force in the face of what he saw as a growing independence movement in Taiwan.²³ Through its contacts with Taiwanese officials, the Trump administration is pushing the envelope of the TRA. Secretary of Defense Mark Esper announced that arms sales to Taiwan would reach \$10 billion, while, in China, hawkish commentators argue that the strategic window for China to seize Taiwan is open. The Chinese military have conducted military exercises simulating the invasion of Taiwan.²⁴ Reflecting Chinese concern about U.S. military cooperation with Taiwan, Li Kexin, minister at the Chinese Washington embassy, declared in October 2018: “The day that a U.S. Navy vessel arrives in Kaohsiung [port in Taiwan] is the day that our People’s Liberation Army unites Taiwan with military force.”²⁵ The amalgam of

these developments create conditions under which a Fourth Taiwan Strait Crisis, with dangerous escalatory risks, could develop.

South China and East China Seas—The resource-rich South China Sea, through which over \$3 trillion in trade transits annually, is a geo-strategic arena of competition between the United States and China, and China’s regional neighbors. China has asserted expansive claims of sovereignty over islands and maritime zones—in the South China Sea (SCS) over the Spratly and Paracel islands (in the face of rival stakes by the Philippines, Vietnam, and other regional states); and in the East China Sea (ECS) over the Diaoyu/Senkaku islands (in contention with Japan). China has declared this vast maritime expanse, holding an estimated 11 billion barrels of untapped oil and 190 trillion cubic feet of natural gas, its exclusive economic zone (EEZ) and has sought to bar foreign militaries access to these international waters and airspace. China has buttressed its claims by establishing facts—building ports and airstrips—and has mounted large-scale engineering projects to enlarge and even create new islands altogether. The Philippines’ challenge to China’s unilateral sovereignty claim was upheld by an Arbitral Tribunal in The Hague in July 2016, but the Beijing regime refused to accept the court’s authority, even though its ruling was based upon the United Nations Convention of the Law of the Sea (UNCLOS) to which China is a signatory.²⁶ The Obama administration objected, but did nothing at the time. The Trump administration called on China to abide by The Hague ruling and rejected Beijing’s assertion of “unilateral dominion.”²⁷ To counter China’s excessive maritime claims, the United States has conducted freedom of navigation operations (FONOPs) in the South and East China Seas “to demonstrate that the United States will fly, sail, and operate wherever international law allows.”²⁸ In October 2018, a Chinese warship came within 45 yards of the U.S. Navy destroyer USS Decatur, which was transiting the South China Sea.²⁹ That the United States will attempt to rebuff China’s unilateral changes in the territorial status quo (as through FONOPS) runs the risk of a military incident that could escalate.

The Sino-Indian Border—In June 2020, Indian and Chinese military forces had their first lethal clash in over four decades on their disputed Himalayan border.³⁰ After 20 Indian and an unknown number of Chinese soldiers were killed, each side

accused the other of crossing the “Line of Actual Control” (LAC), the two countries’ de facto boundary in this mountainous region (elevation 14,000 feet). The territory in contention—the Galwan Valley in western Ladakh—was occupied by Mao Zedong’s China when its forces invaded adjacent Tibet, which is claimed by India as part of the Ladakh region. China’s fear has been that India might use the Aksai Chin territory to destabilize its control over Tibet. (China also has this worry about Indian-occupied and US-recognized Arunachal Pradesh, which includes ethnic Tibetan villages.) Military deployments or infrastructure projects along the LAC has also triggered conflict in Ladakh.³¹ A border war between Indian and Chinese military forces in this inhospitable terrain in October 1962 (coincidental to the Cuban Missile Crisis) left thousands dead. The precipitant of the June 2020 fighting was India’s expansion of infrastructure, which has lagged behind China’s, on its side of the LAC.

South Asian security expert Aidan Milliff notes that the harsh terrain makes a large-scale territorial shift from one side to the other difficult to achieve militarily. For India, as strategic expert Ashley Tellis has observed, the contemporary political context on its Himalayan border is shaped by China’s assertive regional policies and “salami-slicing” tactics on its border.³² The open question is whether provocative marginal shifts in the status quo, such as China’s construction of forward military emplacements in contested territory, will be acquiesced to or precipitate an Indian countermove. Those shifting stakes, combined with the omnipresent chance of misperception and miscalculation, create significant escalatory risks.

Kashmir—The region has been the epicenter of conflict between India and Pakistan since they gained independence from Britain after the partition in 1947. A 460-mile “Line of Control” (LOC), a ceasefire line separating Indian and Pakistani forces and now a de facto border, was established through United Nations mediation to end the fighting in 1949. Pakistan has never recognized Indian sovereignty over this Muslim-majority region. The two countries have since fought two wars over Kashmir—in 1965 and 1999. The May-July 1999 conflict was instigated by the infiltration of Pakistani forces across the LOC, which led to a large-scale Indian counterattack. The war was conducted under a nuclear shadow as Pakistani officials made oblique references to the country’s nuclear capabilities, while India exercised restraint by not crossing the

LOC and further escalating the conflict.³³ Periodic low-level fighting has occurred on the Indian side of the Kashmiri LOC involving Indian counter-terrorism operations against Muslim separatists. Pakistan denies Indian charges that it has abetted the separatist movement in Kashmir and has supported anti-Indian terrorist groups based in Pakistan. Tensions spiked in 2018 after the Indian parliament under nationalist Prime Minister Narendra Modi voted to revoke Kashmir's special status under the country's constitution and assert direct control from Delhi. In February 2019, fighting erupted again in the disputed region after a suicide bombing, perpetrated by a Pakistan-based terrorist group, killing 40 Indian soldiers.³⁴ India conducted retaliatory air strikes on the terrorist group's base in Pakistan, and Pakistan, in turn, bombed targets in Indian-controlled Kashmir. The brief fighting included the first dogfight between Indian and Pakistani aircraft in 50 years. Indian Prime Minister Modi's plan to integrate Kashmir more deeply into the country is viewed by Pakistan as an unacceptable change in the status quo that will be met with "all possible options to counter the illegal steps" taken by India.³⁵

Former Soviet Republics—Russia's invasion of Ukraine and annexation of Crimea in 2014, which led to the imposition of economic sanctions and diplomatic isolation, has reset the debate over Vladimir Putin's revanchist intentions. Indeed, the U.S. Senate Foreign Relations Committee held 2015 hearings on "Russian Aggression in Eastern Europe: Where Does Putin Go Next After Ukraine, Georgia, and Moldova?" The contemporary roots of Russia's relationship with the former Soviet republics constituting the "near abroad" date to 1991 and the dissolution of the USSR. Each of these successor states gained independence and sovereignty based upon their internal Soviet-era borders. All states agreed to respect those borders, but Russia has not abided by that commitment—pressuring Georgia and Moldova through support of breakaway regions, which included direct fighting between Russia and Georgia in 2008 (a harbinger of what would later happen in Ukraine). The Kremlin has asserted a right to "protect" ethnic Russians and Russian speakers beyond Russia's borders (which it says numbers some 25 million people) and has even offered citizenship to millions of ethnic Russians living in neighboring former Soviet republics. This expansive definition of security has important implications for the former Soviet

republics in the Baltic—Latvia, Lithuania, and Estonia—that are NATO members.³⁶ A RAND study concluded that these states, already the target of daily Russian strategic information operations to foment ethnic division and undermine confidence in their governing institutions and NATO, are “vulnerable to low-level, hybrid, and full-scale attacks by Russian special operations and regular military forces deployed close to their borders.”³⁷ As the Baltic states enjoy NATO’s Article V commitment of collective defense, any overt Russian military action would escalate into a confrontation with the United States and the major West European powers. Russian foreign policy, under which Moscow has declared “privileged interests” in the Soviet successor states of the near abroad, essentially entails the assertion of a sphere-of-interest, which, in the case of Crimea crossed into overt revanchism.³⁸

Fragmenting regional orders arise from challenges to the territorial status quo that bring nuclear-weapon states into direct contention. The stability-instability paradox creates the occasion for these states to press their regional claims, but that entails significant escalatory risks—from the conventional military to potentially the nuclear level. Perceptions of an adversary’s military capabilities—whether the nuclear deterrent relationship is “delicate”—would affect escalation in a crisis. The following section addresses the force structures of the nuclear-weapon states, as well as the role of arms control, now in sharp decline, in stabilizing deterrent relationships in a multipolar nuclear world.

Arms Control or Unconstrained Competition?

Arms control, which has played a critical role in promoting strategic stability between nuclear adversaries, faces multiple challenges. Most obviously, the treaty-based arms control architecture erected in the three decades between 1970 and 2000 has been dismantled to the point of near-collapse in the two decades since. The United States, claiming various agreements to have either outlived their purpose or been violated by Russia, withdrew from the ABM Treaty (2002), the INF Treaty (2019), and the Open Skies Treaty (2020). The New START treaty, linear successor to the original SALT agreement will expire in 2021 and, if not extended, would end a half-century

of strategic arms control with Russia. The contentious U.S. debate over the efficacy of arms control reflects the broader U.S. divide over international institutions—whether they serve U.S. interests or constitute an unacceptable constraint on its sovereign freedom of action. The issue is further complicated by nuclear force modernization programs—whether necessary to phase out obsolescent decades-old systems or linked to new capabilities and missions that could affect strategic stability.

Arms control created a forum for strategic dialogue between the superpowers during the Cold War that bound their competition. Negotiations began in the late 1960s after competitive unilateralism had led to the near-catastrophe of the Cuban Missile Crisis.³⁹ The collapse of arms control would mean a dangerous return to unconstrained competition amidst destabilizing developments—deteriorating great power relations, the increased complexities of a multipolar nuclear world, and active modernization programs amongst all the nuclear-weapon states. This conjunction could undermine strategic stability based on mutual vulnerability and allow conditions under which a nuclear-weapon state may perceive an incentive to escalate and use nuclear weapons first. This underscores the central argument of this chapter linking the two key nuclear dynamics—the stability-instability paradox and the “delicate” balance of terror. Consider one of the most plausible scenarios: Pakistan’s development of tactical battlefield nuclear weapons creates an escalatory option should India be prevailing with conventional military forces in a future Kashmir conflict. Unconstrained competition between nuclear-weapon states would recast the persistent tension in nuclear-weapons policy—whether they are for deterrence or warfighting (e.g., “escalate to deescalate”)—in a new strategic environment.

United States, Russia, and the New START Treaty

The strategic nuclear forces of the United States and Russia are currently bound by the constraints of the New START treaty. Ratified in 2011 and set to expire in 2021, the treaty achieved a significant reduction in the number of U.S. and Russian nuclear warheads relative to the size of their arsenals at the height of the Cold War. The treaty’s complex counting rules limit each side to 1550 warheads on ICBMs, SLBMs, and heavy bombers, with sub-limits on how many of those missiles and bombers can be deployed. (Russia and the United States retain in reserve a

stockpile of 4310 and 3800 warheads, respectively, as well as some 2000 warheads each that have been retired or are awaiting dismantlement.)⁴⁰

Dating to the Obama administration's 2010 Nuclear Posture Review, the United States decided to retain the nuclear triad of ICBMs (for prompt responsiveness), SLBMs (for survivability), and bombers (for the ability to recall). The United States is extending the life of current systems and planning the new triad: a new ICBM, provisionally called the Ground-Based Strategic Deterrent scheduled to become operational around 2029; a new Columbia-class submarine to replace the Trident fleet beginning in 2031; and a new stealth heavy bomber with intercontinental range, the B-21, to replace the B-2 fleet.⁴¹ Critics have questioned the need for a land-based ICBM replacement, arguing that their primary mission is nuclear war-fighting against Russia. Modernization plans also include the development of a low-yield nuclear warhead for the Trident D5 missile, with proponents viewing it as a response to what U.S. analysts call Russia's "escalate to deescalate" strategy, while critics contend that it increases the risk of war by lowering the threshold for nuclear use.⁴²

Russia has reduced its number of deployed nuclear warheads to meet the New START treaty's constraints, but the Putin regime, while open to a "clean extension" for five years, could readily upload additional warheads onto the country's ballistic missiles should the treaty expire.⁴³ Russia has invested in nuclear capabilities as they are a tangible symbol of great power status and less expensive than conventional military forces for a country that was in economic distress in the post-Cold War era. Russia's modernization program has been underway for two decades and is already at an advanced stage, with Putin claiming that over 80% of the country's nuclear triad is comprised of advanced systems. The new generation of Russian systems, such as the Avangard hypersonic glide vehicle (a maneuverable warhead deployed on the SS-19), were designed to penetrate an antiballistic missile system—a reflection of Russian concern about the absence of constraints on defensive systems since the United States withdrew from the ABM Treaty.

The Trump administration, opposing a clean extension of New START, has argued that China must be included in a follow-on agreement to take into account its rising

nuclear capabilities.⁴⁴ The administration's position is that it is neither feasible nor realistic to negotiate constraints on U.S. and Russian forces when China is free to move ahead unrestricted. The administration's chief negotiator, Ambassador Marshall Billingslea, declared in May 2020, "Arms control is now a three-way street."⁴⁵ A Chinese Foreign Ministry official replied that the country would "be happy" to participate in trilateral negotiations once the United States and Russia reduced the size of their nuclear arsenals to that of China's level.⁴⁶ While the prospects for a New START renewal remain in question, the demise of this bilateral agreement would remove the last cornerstone of the traditional arms control architecture and usher in a renewed era of unconstrained nuclear competition, the dangers of which were manifest in successive Cold War crises.

China's Posture: Minimum Deterrence?

Even as China has "risen" to be a global superpower economically rivaling America, it possesses a small strategic nuclear force relative to the United States and Russia. According to a 2019 study by Hans Kristensen and Matt Korda of the Federation of American Scientists (FAS), China possesses a nuclear force of approximately 290 warheads (only one-fifth of that allowed the United States and Russia under the New START treaty), which could be delivered by 180-190 land-based ballistic missiles,⁴⁸ sea-based ballistic missiles, and bombers. The Defense Intelligence Agency, essentially confirming those findings in May 2019, stated, "We estimate... the number of warheads the Chinese have is in the low couple of hundreds."⁴⁷ Strikingly however, none of China's nuclear warheads is actually deployed on delivery systems, according to the FAS study, as "China's Central Military Commission has long resisted handing out nuclear warheads to the armed services to deploy on missiles under normal circumstances."⁴⁸

China faces a contemporary strategic environment with a range of potential adversaries possessing nuclear weapons—the United States (deeply enmeshed in the region Beijing considers its sphere-of-influence), Russia (which as the Soviet Union in 1969, amidst border skirmishes, had reportedly considered an attack on China's nuclear infrastructure), India (with which it just had a border clash on its disputed Himalayan border), and even North Korea (with which Beijing has a complicated relationship).

Since acquiring nuclear weapons in 1964, China has pursued what Western analysts characterize as a doctrine of “minimum deterrence.” Nuclear expert Vipin Narang describes the debate over Chinese capabilities:

“The puzzle of why China adopted a characteristically different nuclear force posture from its primary adversaries—the USSR and then the United States—has attracted much attention. Some scholars... have averred that China’s nuclear choices were a function of technological determinism, that China adopted the posture that its technical capabilities enabled and articulated post hoc rationalizations for it. Others have argued that China’s minimalism is a result of the enduring legacy of Maoist strategic culture that viewed China as a resource-constrained state and that only a few nuclear weapons were sufficient to achieve China’s security aims.”⁴⁹

Whatever strategy is driving China’s nuclear posture, it is currently modernizing its strategic nuclear forces by replacing obsolescent liquid-fueled, slow-launching (vulnerable) missiles with a new generation of longer-range, road-mobile, solid-fuel, quicker-launching (more survivable) missiles. A new generation ICBM capable of carrying multiple warheads is likely intended to penetrate U.S. missile defenses.⁵⁰ Ambassador Billingslea characterized China’s modernization program as a “crash nuclear buildup” and a “highly alarming effort” to achieve nuclear parity with the United States and Russia.⁵¹

The central question is whether China’s nuclear modernization program, which reportedly includes nuclear-capable cruise missiles, is intended to maintain an assured retaliatory capability consistent with a minimum deterrence doctrine or is intended to develop new warfighting capabilities, particularly at the theater level. As Carnegie Endowment expert Tong Zhao observes, “The fear is that such capabilities may enable Beijing to use nuclear weapons in more tailored ways and make Chinese leaders more inclined to escalate past the nuclear threshold during military crises.”⁵²

Concern about Chinese theater-range missiles, both nuclear and many more conventional, was a major factor underlying the Trump administration’s February 2019

decision to withdraw from the INF Treaty. The administration asserted that Russia was violating the INF Treaty and that the agreement, which banned an entire category of missiles based on range, was blocking the U.S. ability to meet the growing Chinese missile threat to its Asian allies.⁵³ The Trump administration announced the follow-on decision to test a new intermediate-range missile with East Asia as its intended theater of deployment. Though China has eschewed trilateral negotiations on strategic nuclear arms, the demise of the INF Treaty could create an incentive for the Beijing regime to engage Washington on theater missiles to forestall a regional arms race.

India, Pakistan, and the Nuclearization of South Asia

Though the nuclearization of South Asia is accelerating, the strategic environment for India and Pakistan is shaped by important asymmetries. India is a continental power, rich in resources, and has a GDP of \$3 trillion, which is ten times larger than Pakistan's. That economic asymmetry has translated into India's ability to field much larger conventional military forces, which drives Pakistan's emphasis on nuclear weapons in response to the conventional imbalance. Whereas the Pakistan nuclear program is focused exclusively on India, the Indian program is intended to deter the dual threats New Delhi perceives emanating from China as well as Pakistan. India has viewed nuclear weapons primarily as instruments for deterrence, and therefore has focused on developing second-strike systems to have an assured retaliatory capability. By contrast, Pakistan has a more expansive view on the role of nuclear weapons, which goes beyond the core deterrence requirement to include war-fighting capabilities on the tactical level.⁵⁴

India and Pakistan, each possessing some 150 nuclear warheads, are expanding their arsenals (as well as their production of weapons-usable fissile material) and modernizing the delivery vehicles that would carry them. Mirroring the nuclear-force structures of the nuclear great powers, they have developed their own triads—with land-based and sea-based weapons, as well as bombers. The Clinton administration proposed arms control negotiations in the wake of the India's and Pakistan's reciprocal weapons tests in May 1998, but the diplomatic initiative came to naught. As South Asia nuclear expert Michael Krepon observes, these non-signatories of the NPT "have

not accepted any constraints on their strategic autonomy.⁵⁵ India and Pakistan remain locked in an unconstrained nuclear-arms competition.

Consistent with the very limited role nuclear weapons play in Indian strategy, India has not matched Pakistan's development of tactical nuclear weapons and it still lacks a missile capable of targeting all of China.⁵⁶ Maintaining an assured retaliation posture, India has deployed eight nuclear-capable delivery systems: two aircraft, four land-based ballistic missiles, and two sea-based ballistic missiles. But China's increased regional assertiveness, which India has experienced in 2020 on its Himalayan border, is driving the modernization of its force posture. India is developing the Agni V, its first ICBM, which will permit India to target all of China, including the leadership in Beijing.⁵⁷ According to the nuclear scholar Vipin Narang, this reorientation may lead to a "decoupling" of Indian nuclear strategy toward Pakistan and China. India's acquisition of advanced nuclear delivery platforms to maintain a credible assured retaliation against China, Narang argues, "may allow it to pursue more aggressive strategies—such as escalation dominance or a 'splendid first strike'—against Pakistan."⁵⁸

Pakistan is modernizing and augmenting all legs of its nuclear triad to provide a broad continuum of capabilities from tactical nuclear weapons for the battlefield to strategic ballistic missiles with increased range. Pakistan's nuclear investment remains focused on countering the conventional imbalance with India. The concern is that these capabilities, particularly the development of short-range nuclear systems for the battlefield, could lower the nuclear threshold and thereby increase the risk of inadvertent during a crisis.⁵⁹ As Director of National Intelligence Daniel R. Coats stated in his "Worldwide Threat Assessment of 2019," "The continued growth and development of Pakistan and India's nuclear weapons programs increase the risk of a nuclear security incident in South Asia, and the new types of nuclear weapons will introduce new risks for escalation dynamics and security in the region."⁶⁰

Deterrence, Escalation, and Strategic Stability

Two senior national security figures, former Secretary of Energy Ernest J. Moniz and former Georgia Senator Sam Nunn, commenting on the likely demise of the New START treaty, offered this sobering assessment: “The United States and Russia are now in a state of strategic instability... Not since the 1962 Cuban missile crisis has the risk of a U.S.-Russian confrontation involving the use of nuclear weapons been as high as it is today.”⁶¹ Yet this dangerously deteriorating bilateral relationship is only one, albeit the dominant, facet of an emergent multipolar nuclear world. To recap the key elements of the analysis so far, this new strategic environment is being shaped by a confluence of conditions:

- *Multipolarity*—Nuclear dyads are being supplanted by triads (U.S.-Russia-China; India-Pakistan-China) in which an action by one power affects the other two.
- *Unconstrained arms competition*—The major agreements that constituted U.S.-Russian arms control architecture has been dismantled to the point of near collapse. China, India, and Pakistan always operated outside regulatory constraints. For nuclear-weapon states, strategic autonomy is the watchword of this emerging era of unregulated competition.
- *Territorial competition*—The nuclear-weapon states are engaged in strategic competition over the territorial status quo in areas of vital interest. This contrasts with the Cold War era in which the superpowers engaged in competition, outside Europe, in the regions of the Third World, which were clearly of peripheral interest.
- *Risks of inadvertent escalation*—Technological, political, and military doctrinal and operational factors could precipitate inadvertent escalation during a crisis between nuclear-weapon states.

These conditions will exacerbate the traditional tension between two Cold War dynamics—the stability-instability paradox (that a nuclear stalemate may embolden lower-level aggression) and the “delicate” balance of terror (calling into question the stability of the nuclear balance). This section addresses the challenges of this new strategic environment across three key categories of nuclear-weapons states’ interactions: deterrence, escalation, and strategic stability.

Deterrence

British strategist Philip Windsor commented that the most important arms control development of the Cold War was the creation of survivable second-strike nuclear delivery systems. Those capabilities, making assured retaliation a certainty, ostensibly removed the possibility of a disarming first strike. That nuclear stalemate was captured in the acronym MAD (mutual assured destruction). But as political scientist Robert Legvold observes, the United States and Russia have shared a “long-standing uneasy reconciliation” with mutual assured destruction, particularly now with China’s augmentation of its nuclear arsenal. The aversion to MAD has led to a focus on its alternative—damage limitation or war-fighting with the goal of leveraging numerical superiority (occasioned by the large-scale deployment of Minuteman and Polaris missiles) for diplomatic bargaining advantage. The Kennedy administration’s effort to pursue this strategy precipitated Khrushchev’s desperate bid to redress the imbalance through nuclear deployments in Cuba. An analogous dynamic is currently evident in U.S. nuclear strategy toward China, which has a nuclear arsenal some one-quarter America’s size. Chinese nuclear expert Li Bin, expressing Chinese concern about a theoretical U.S. first-strike capability and its challenge to China’s assured retaliatory capability, writes: “In the United States, some nuclear experts believe that damage limitation vis-à-vis China is a feasible and desirable strategy. Some Chinese strategists therefore worry about the possibility that China’s very thin nuclear retaliatory capability would be denied by some U.S. damage limitation approaches, such as missile defense or conventional strikes.”⁶² In short, the combination of a U.S. first-strike (made possible by superior

numbers) in tandem with ballistic missile defenses could deny China an assured retaliatory capability. These factors, in addition to strong U.S. rhetoric bordering on a call for regime change in Beijing, could prompt China to reevaluate its minimum deterrent posture and build up to parity with the United States and Russia.

The tension between assured retaliation and damage limitation (war-fighting) is also evident in the deterrent relationship between India and Pakistan. Indian Defense Minister Rajnath Singh has called into question India's continued commitment to a "no first use" policy. Scholars Christopher Clary and Vipin Narang observe that India's nuclear modernization program, as well as its investments in intelligence capabilities and an Israeli-origin ballistic missile system, "might make first use attractive as a means to disarm an adversary."⁶³

The crux of Wohlstetter's "delicate" balance argument was that vulnerable nuclear weapons invited surprise attack by an adversary in a crisis. In turn, that perception could lead the nuclear-weapon state with the vulnerable systems, fearing a "use-them-or-lose them" situation, to strike first to avoid preemption. In a multipolar nuclear world, as in the bipolar superpower system after the Cuban Missile Crisis, the key to strategic stability, however unpalatable to policymakers, is mutual vulnerability based on survivable nuclear forces that eliminate the incentive for a first strike. Robust deterrence based on assured retaliation would not preclude lower-level conflict (consistent with the stability-instability paradox), but it would decrease the risk of escalation.

Escalation

The recent border conflicts between two pairs of nuclear-weapon states—India and Pakistan in 2019, and India and China in 2020—were consistent with the stability-instability paradox. Though the risks of military escalation were evident, neither escalated. During the Cold War, nuclear strategist Herman Kahn famously used the rungs of a ladder as a metaphor to convey how the United States could raise or lower escalatory threats or the actual use of force, including nuclear weapons. In assessing potential conflicts at regional flashpoints in a multipolar nuclear world, an alternative metaphor would better convey various factors: circuit breakers (which

would limit escalation) and conveyer belts (which would heighten escalatory risks).⁶⁴ This analysis will highlight dimensions affecting escalation: conventional military actions, the role of nuclear weapons, and the extension of competition into other domains (cyber and space).

Conventional Military Actions

- ***Geographical scope:*** Does conflict at a regional flashpoint remain territorially bound? In the 2019-2020 crises involving India and Pakistan and India and China, respectively, the conflicts were contained within discrete territorial bounds. However, India did set a precedent—and sent a signal—by conducting air strikes deeper in Pakistan than Kashmir to target terrorist bases; Pakistan retaliated in kind within Indian-controlled Kashmir. Indian strategic planners are concerned about the contingency of a two-front crisis simultaneously with Pakistan and China, which are closely aligned.
- ***Gray-zone or hybrid tactics:*** India has accused Pakistan of utilizing gray-zone tactics through its support of Kashmiri separatist terrorist groups. Along with its nuclear weapons, terrorism is an asymmetrical instrument utilized by Pakistan, raising questions about their degree of control over these terrorist groups. A major concern in South Asia is whether a catastrophic terrorist attack by a Pakistan-abetted group might precipitate a major escalatory response by India. Russia has also employed gray-zone instruments on its periphery, notably in Ukraine utilizing military irregulars without insignia (aka “little green men”), to exert its influence and control.
- ***Conventional asymmetries***—A significant asymmetry in conventional capabilities hinders escalation control during the crisis. Though Pakistan may be able to match India conventionally in Kashmir, Pakistan’s nuclear arsenal reflected the Islamabad regime’s intent to redress the overall conventional imbalance through asymmetrical means. Russia and China are developing the conventional capabilities to dominate their emerging

spheres of interest. China has invested heavily to develop offshore military capabilities (naval forces and island bases) to bolster its territorial and maritime sovereignty claims. The net effect is to erode U.S. power projection capabilities. To be sure, during a crisis, the United States could deploy carrier battle groups to the region, but China's forward-based capabilities make for a more vulnerable environment in which U.S. forces would have to operate. These moves point to China's intent to develop the conventional capabilities for escalation in its geographical sphere.

The Role of Nuclear Weapons

- *Nuclear weapons and limited conflicts*—South Asian nuclear expert George Perkovich argues that Pakistan was emboldened to move against India in Kargil, a year after its 1998 nuclear-weapons test.⁶⁵ Pakistan has used its nuclear-weapons program for signaling purposes, such as during the 2019 border clash in Kashmir when the Islamabad regime announced that it had convened a meeting of its National Command Authority. In the Sino-Indian border conflict in the 2020, neither side referred to their nuclear capabilities. A recent Carnegie Endowment study found that Chinese analysts view nuclear weapons as having a stabilizing effect in deescalating conventional conflicts.⁶⁶ The clash in the Himalayas has given renewed impetus to India's nuclear modernization program, which calls for the development of robust capabilities to deter China. If a broader clash between China and India should erupt, a potential source of inadvertent escalation is the collocation of nuclear and conventional capabilities, and the use of ballistic missiles capable of carrying either type of warhead.⁶⁷
- *Non-strategic nuclear weapons*—The concern with so-called tactical nuclear weapons is that their low yields could increase the likelihood of their use. Ashley Tellis argues that Pakistan views their utility “mainly to threaten escalation to strategic levels in order to force war termination after a conventional conflict has already begun.”⁶⁸ This stance could be characterized as threaten to escalate to deescalate. Experts are divided on whether Russia has adopted a similar stance. The Trump administration's

2018 Nuclear Posture Review claims that Russia, with an arsenal of tactical nuclear weapons estimated in the low thousands, has an “escalate to de-escalate” nuclear doctrine. The concern is that in a European crisis, Russia “could attempt to force a withdrawal by NATO forces defending an exposed ally or to terminate a conflict on terms favorable to Russia.”⁶⁹ The issue of Russia’s large arsenal of non-strategic nuclear weapons has been a point of contention with those in the U.S. Senate opposed to a clean extension of the New START treaty.

Cross-Domain Escalation

- ***Escalation in cyber and space***—Military escalation has traditionally been conceived as progressing from conventional to nuclear. In a multipolar system, and with the advent of new technologies, escalation during a crisis may occur in a non-traditional domain—cyber or space. Conflict escalation could plausibly take the form of a cyberattack to interfere with an adversary’s communications with its nuclear systems or an attack on reconnaissance satellites to blind an adversary. Such actions hold uncertain, potentially destabilizing, implications that could increase nuclear risks.
- ***Deterrence by denial***—Deterring cross-domain attacks through threats of punishment face formidable challenges (e.g., attribution). Deterrence by denial strategies would focus on hardening cyber and space assets to deny an adversary the benefits of an attack.

Strategic Stability

Scholars Christopher Chyba and Robert Legvold, writing in a special issue of *Daedalus* devoted to nuclear issues, bring analytical clarity to the concept of strategic stability, which encompasses both crisis stability and arms race stability:

“Strategic stability is usually taken to include both crisis stability and arms race stability. Crisis stability means that even in a conventional war or faced with a possible nuclear attack, states would not use nuclear

weapons for fear that such escalation would bring certain disaster. Crisis stability must be robust even against inadvertent or mistaken nuclear escalation. Arms race stability means that nuclear powers do not have incentives to pursue weapons or weapon deployments resulting in action-reaction cycles that undermine crisis stability.”⁷⁰

However, strategist and Nobel laureate Thomas Schelling reminds us that the nuclear powers in a complex and dangerous multipolar system view the world through their own prisms, which can give rise to misperception, miscalculation, and inadvertent escalation. Compared to the advent of the nuclear age in 1945, Schelling writes, “the world is so much changed, so much more complicated, so multivariate, so unpredictable, involving so many nations and cultures and languages in nuclear relationships, many of them asymmetric, that it is even difficult to know how many meanings there are for ‘strategic stability’”—or whether states define the prerequisites for stable deterrence the same way.

The focus of this chapter has been how the traditional tension between two Cold War dynamics—the stability-instability paradox (that a nuclear stalemate may embolden lower-level aggression) and the “delicate” balance of terror (maintaining stable and robust deterrence)—is manifest in a multipolar system. This tension can be managed, but it cannot be resolved. Key elements—some aspirational, others operational, many surrounded by uncertainty—will affect the prospects for successful management:

- ***Resolving/managing regional flashpoints***—The best way to avoid conflict among nuclear-weapon states is to redouble diplomatic efforts to address the territorial disputes that could precipitate it. To be sure, if these territorial issues were easy to resolve, they would have been. In some instances, domestic politics in one or both parties may be an impediment to resolution; in others, the discrete territorial issue may be a proxy for a more deeply rooted source of enmity or grievance. If resolution is not possible, conflict management may be. For example, the Code for Unplanned Encounters at Sea (CUES), to which both China and the United States are signatories, may be a mechanism for managing maritime tensions between their navies.

- *Maintain the residual arms control architecture*—Though the fate of the new START treaty remains uncertain, its extension until 2026 would provide certainty and time for Russia and the United States to agree on a successor arrangement and outstanding issues (such as non-strategic nuclear weapons and engaging or taking Chinese capabilities into account).
- *Mitigating the risks of unconstrained competition*—In the absence of an arms control architecture, each nuclear power in the multipolar system will have strategic autonomy to structure its offensive and defensive systems. Under these circumstances, arms race stability—defined as eschewing capabilities that could undermine crisis stability—may be challenged. All of the nuclear-weapon states have had what Legvold characterized as a “long-standing uneasy reconciliation” with mutual assured destruction. But since the Cuban missile crisis, assured retaliation—*eliminating incentives for a surprise first strike*—has been the sine qua non of strategic stability. The risk for crisis stability is that arms race instability (unregulated numbers of offensive and defensive systems, in tandem with new weapons technologies and cross-domain threats to space and cyber assets) could revive those incentives, making the deterrent relationships more “delicate.” In the past, arms control negotiations provided a forum for strategic discourse. In their absence, less structured government-to-government contacts and unofficial “Track II” expert contacts could yield understandings short of formal agreements about force structures and doctrines to bolster stability. “On a bilateral or a multilateral basis,” Chyba and Legvold argue in *Daedalus*, “the United States, Russia, and China should pursue discussions intended to improve understanding of one another’s strategic concerns and views on which actions by an adversary would be especially concerning or dangerous.”⁷¹
- *Avoid blurring conventional and nuclear operations to prevent inadvertent escalation*—Placing conventional warheads on ballistic missiles, such as that envisioned through the “Conventional Prompt Global

Strike,” has utility (the ability to reach any target on the globe in under one hour), but runs the risk that Russia may perceive (and respond to) the launch of a ballistic missile that it associates with U.S. nuclear capabilities as the initiation of such an attack. Another potential driver of inadvertent escalation, first identified during the Cold War by political scientist Barry Posen, is the targeting of an adversary’s conventional capabilities that are colocated with its nuclear capabilities. Concern that the use of conventional military weapons could escalate a conflict by placing nuclear assets at risk has been raised most acutely with respect to the strategic competition between the United States and China.⁷²

- *Managing complex linkages in a multipolar system*—Actions taken to address one adversary in a triadic relationship can affect the other. The U.S. withdrawal from the INF Treaty was occasioned by Russian cheating (with deployment of a new cruise missile), but was precipitated by the theater-missile threat in East Asia posed by a risen China. Though U.S. allies in Europe are unlikely to accept new intermediate-range systems, Russian experts have warned that a U.S. deployment in Europe could prompt the Putin regime to adopt a policy of preemption.⁷³ These complex linkages were also evident in China’s response to the U.S. deployment of the THAAD antimissile system in South Korea that was precipitated by North Korea’s ballistic missile advances, but which the Beijing regime perceives as the precursor to a more elaborate defensive capability aimed to neutralize China’s nuclear deterrent.⁷⁴ Whether or not Russian and Chinese concerns are firmly based, the initiation of a strategic dialogue could provide a forum to address different perspectives and policies.

When Einstein was once asked how he could unravel the structure of the atom but was unable to devise political means to prevent it from destroying humanity, he famously replied, because “politics is more difficult than physics.” Current nuclear risks are even more complex and dangerous because of the multiplicity of actors, emergent technologies, and the absence of an institutional framework to manage competition.



“Horizontal” Proliferation: North Korea, Iran, and Beyond

President John Kennedy’s famous nightmare vision of a world of 30 nuclear weapon states by the 1970s, or other predictions of an impending proliferation cascade, did not come to pass.⁷⁵ “Horizontal” proliferation—the acquisition of nuclear weapons by non-nuclear states”—has extended to nine states: the United States, Russia, Britain, France, China, India, Pakistan, Israel (undeclared but acknowledged), and North Korea.⁷⁶ Those countries that have “gone nuclear,” as well as those seeking to acquire nuclear weapons, represent the full range of regime type—democratic, authoritarian, and military. Democratization can increase political transparency and accountability, as well as facilitate open debate and scrutiny of motivation, but it does not per se restrain proliferation. Indeed, a majority of the states in the nuclear club are established democracies. The diversity of political systems among nuclear weapon states underscores this dynamic: *regime intention, not regime type, is the key proliferation determinant.*⁷⁷

The extensive literature on nonproliferation highlights a range of domestic and international factors that have led states to abstain from or acquire nuclear weapons. For each state facing that choice, the strategic calculus has been highly context dependent. During the Cold War, the structure of bipolarity inhibited proliferation: the United States and the Soviet Union implemented strategies of extended deterrence within their competing alliance systems to assuage the security concerns of their smaller allies. For that reason, NATO, which institutionalized the extended deterrent commitment of the United States, was one of the most effective nonproliferation instruments in history.

Nuclear abstinence and voluntary reversal have also been attributed to the combination of U.S. pressure in tandem with security guarantees (Taiwan, South Korea), transformations in civil-military relations (Brazil, Argentina), domestic

political changes (Ukraine, South Africa), and the Non-Proliferation Treaty (NPT)'s normative constraint on nuclear acquisition.⁷⁸ The attitude of a state's ruling government or regime toward the international order is another key determinant. According to political scientist Etel Solingen, "states [such as Japan, South Korea and Taiwan] whose leaders or ruling coalitions advocate integration in the global economy... have incentives to avoid the political, economic, reputational, and opportunity costs of acquiring nuclear weapons... [whereas] leaders and ruling coalitions rejecting internationalization incur fewer such costs and have greater incentives to exploit nuclear weapons as tools in nationalist platforms of political competition and for staying in power."⁷⁹ The nuclear issue is thus inextricably linked to the broader question of societal evolution. For North Korea and Iran, that is the bind: their regimes' perception that international integration is a threat to regime survival influences their nuclear intentions.

But what of nuclear-armed Israel, India, and Pakistan? The United States may assert a general commitment to the norm of nonproliferation, but in practice, Washington focuses on adversarial proliferators—the states who combine nuclear capabilities with hostile intent. From a U.S. national security perspective, none of those three falls under the category of adversarial proliferator. Of the three, however, the country of increasing proliferation concern is Pakistan, which the George W. Bush administration designated as a "major non-NATO ally" in the "war on terrorism." As examined in the next chapter, the perceived threat emanating from Pakistan is not that the Islamabad government would purposefully *transfer* a nuclear weapon to a terrorist group. Rather, a security breach within Pakistan's program (facilitated, in the most widely discussed scenario, by Islamic extremists who had infiltrated the country's nuclear establishment) could result in the inadvertent *leakage* of a weapon to a terrorist group.

Unlike Israel, India, and Pakistan, which exercised their sovereign right not to accede to the NPT, North Korea and Iran signed the NPT and cheated within it. The violation of a treaty obligation by the Pyongyang and Tehran regimes became the basis for securing broad international support to impose economic sanctions with the goal of bringing them into compliance with their NPT obligations. This is

a classic case of coercive diplomacy to bring about a change of behavior by these states' ruling regimes, not to change the regimes themselves.

Behavior change or regime change? That remains the persistent unresolved tension in U.S. policy toward the adversarial proliferators—the states designated as “rogues” since the end of the Cold War. Regime type may not be the lead indicator of proliferation, but it does shape threat perception. Hence, notwithstanding Washington's avowed commitment to the norm of nonproliferation, in practice, with reason, the focus of U.S. proliferation concern is North Korea and Iran, not Israel and India.

North Korea, which first tested an atomic bomb in 2006, is now on the cusp of acquiring the capability to target the U.S. homeland with a nuclear weapon. That was the precipitant of the current crisis with the Pyongyang regime, which coincided with the inauguration of the Trump administration in 2017. U.S. officials view Iran as a more dynamic regional threat than North Korea but has a less advanced nuclear program. Its uranium enrichment program creates a pathway for the acquisition of weapons-usable fissile material. The nuclear deal concluded in 2015 between Iran and the world's major powers did constrain the nuclear program but did not address the Tehran regime's regional and other “malign activities,”⁸⁰ as the Trump administration has put it. By focusing on the discrete nuclear issue, the deal was *transactional*, not *transformational*. Those advocating a transformational strategy argue that a transactional deal focused on changing behavior is inadequate because that dangerous behavior derives from the very character of the Iranian regime. A similar dynamic is evident in U.S. diplomacy toward North Korea. Yet the dilemma is that the timelines for nuclear development and regime change are not in sync: the former is immediate and urgent, whereas the latter is indeterminate. We simply cannot wait for an indeterminate process of regime change (or evolution) to play out in Pyongyang and Tehran while these two states, which the Trump administration has designated as “rogues,”⁸¹ increase their nuclear capabilities. This tension can be managed, not resolved. The issue here is not some preoccupation with the language of diplomacy, but rather the policy prescriptions that flow from different conceptual frameworks.

The “Rogue State” Challenge

The term “rogue state” entered the U.S. foreign policy lexicon as the Cold War ended and after the 1991 Gulf War to reverse the Iraqi invasion of Kuwait. Saddam Hussein’s Iraq was the rogue archetype: a regime pursuing weapons of mass destruction (WMD) and employing terrorism as an instrument of state policy. The Clinton administration designated the “rogues”—whose core group was Iraq, Iran, North Korea, and Libya—as a distinct category of states in the post-Cold War international system.

Rogue state was a unilateral American political concept—without foundation in international law—that was analytically soft and applied selectively against a diverse set of states hostile to the United States. The concept also proved problematic in practice. Once a state was relegated to this category “beyond the pale,” the default strategy was comprehensive containment and isolation. Diplomatic engagement, as when the Clinton administration concluded a nuclear deal with North Korea in 1994, was castigated by hardline critics as tantamount to appeasement. The administration recognized that the term had become a political straitjacket, frustrating its ability to apply differentiated strategies tailored to the circumstances in each country, so it was expunged from the U.S. diplomatic lexicon by the Clinton State Department in June 2000 and replaced with the awkward moniker: “states of concern.”

Though the term was revived by the George W. Bush administration *before* 9/11, “rogue” rhetoric came back with a vengeance *after* the terrorist attacks of September 11, 2001. Despite assertions that “everything has changed” and likening the date to a demarcation as stark as B.C. and A.D., 9/11 did not change the structure of international relations. But it did lead to a redefinition of threat. In its 2002 *National Security Strategy*, the Bush administration explicitly argued that the dangers of the post-9/11 world derived from the very character of America’s adversaries—irredeemable “rogue states” and undeterrable terrorist groups, such as Al Qaeda, whose only constraints are practical and technical, not moral or political. WMD proliferation and terrorism created a deadly nexus of capabilities

and intentions. U.S. policymakers were driven by the nightmare scenario of a “rogue state” transferring a nuclear, biological, or chemical capability to a terrorist group in order to carry out a mass-casualty attack on the American homeland.

The redefinition of threat precipitated a major shift in strategy. The 2002 *National Security Strategy* elevated the use of force as “a matter of common sense and self-defense” not only *preemptively*, against imminent threats (based on an interpretation of UN Charter Article 51),⁸² but also *preventively*, against “emerging threats before they are fully formed.”⁸³ This assessment propelled the shift from a pre-9/11 strategy of *containment and deterrence* to a post-9/11 emphasis on *regime change*. Changing the conduct of rogue states was deemed unlikely and inadequate because their threatening behavior was inextricably linked to the character of their ruling regimes: it derived from “their true nature,” as President George W. Bush put it.⁸⁴

Precedents of 2003: Iraq and Libya

Iraq became the test case for the new strategy. Before 9/11, Saddam Hussein was likened by Secretary of State Colin Powell to a “toothache.”⁸⁵ Afterwards, the asserted nexus between proliferation and terrorism—Saddam’s resistance to the WMD disarmament mandated by the UN Security Council and the Iraqi regime’s purported links to Al Qaeda—provided the rationale for preventive military action to topple this rogue regime as a matter of urgency.⁸⁶ Secretary of Defense Donald Rumsfeld later acknowledged that the decision to go to war was based not on new intelligence, but rather on viewing old intelligence “through the prism of 9/11.”⁸⁷

After the successful U.S. military march on Baghdad in April 2003 to oust Saddam, Bush administration officials described the intervention in Iraq as a “type”—a model of coercive nonproliferation through regime change.⁸⁸ In the heady weeks after the cessation of “major combat operations,” before the onset of the deadly Iraqi insurgency against U.S. forces, President Bush stated that the Iraq precedent had implications for how the United States would approach the challenges posed by other “rogue states,” specifically North Korea and Iran. In Iraq, he claimed, America had

“redefin[ed] war” by demonstrating the ability of the United States to decapitate a regime without inflicting unacceptable collateral damage on the civilian population.⁸⁹

Just eight months after the fall of Baghdad, in December 2003, Libyan dictator Muammar Qaddafi announced that his country was voluntarily terminating its covert WMD programs and voluntarily submitting to intrusive international inspections to certify compliance. The surprise announcement, which came on the heels of a financial settlement for the terrorist bombing of Pan Am 103 over Lockerbie, Scotland in 1988, was hailed by President Bush as an essential step that would permit Libya to “rejoin the international community.” In January 2004, a month after Qaddafi’s surprise announcement, more than 25 tons of nuclear and ballistic missile components were airlifted from Libya to the United States. Inspectors began the complicated process of destroying Libya’s stockpile of chemical agents and munitions, and Russia removed highly enriched uranium from Libya’s Soviet-designed nuclear research reactor.⁹⁰ The Bush administration reciprocated by lifting sanctions to permit American commercial activities in Libya, establishing diplomatic liaison offices in Tripoli and Washington, and ending U.S. opposition to Libya’s entry into the World Trade Organization.⁹¹

If Iraq had set an important precedent—nonproliferation through a change *of* regime—Libya offered the alternative: nonproliferation through change *in* a regime. Competing narratives were advanced to explain Qaddafi’s strategic turnabout. Bush administration officials proclaimed it a dividend of the Iraq war. Qaddafi had been “scared straight” (as several analysts put it) by the demonstration effect of the regime-change precedent. Alternatively, former Clinton administration officials, who had been involved in negotiations with Libya since the late 1990s, argued that the decision culminated a decade-long effort by the Libyan dictator to shed his country’s pariah status and reintegrate into the global system in response to escalating domestic economic pressures. The respective external and internal factors emphasized in these competing narratives were necessary but not sufficient conditions for change. The crux of the Libyan deal was the Bush administration’s tacit but clear assurance of security for the regime: in short, if Qaddafi halted his objectionable external behavior with respect to terrorism and proliferation,

Washington would not press for a change of regime in Tripoli. Without such a credible security assurance, what incentive would Qaddafi have had to relinquish his WMD arsenal? Logically, the belief that he would still be targeted by the U.S. administration for regime change regardless of any change in his behavior would have created a powerful incentive for him to accelerate his regime's efforts to acquire unconventional weapons as a strategic deterrent.

The contrasting nonproliferation precedents of 2003—a change *of* regime in Iraq; a change *in* a regime in Libya—provided the political backdrop for the escalating nuclear crises with North Korea and Iran. North Korea was viewed by Bush administration officials as essentially a xenophobic failed state with an advanced nuclear weapons program whose leadership's all-consuming priority was regime survival. The collapse of the U.S.-North Korean Agreed Framework, negotiated by the Clinton administration in 1994 to freeze the North's plutonium-production capability, created the occasion for the Pyongyang regime's move toward nuclear weaponization. Iran had a less advanced nuclear program, but it was perceived to be the more dynamic threat because of its oil wealth, its unpredictable president's radicalism and incendiary rhetoric, and its sponsorship of terrorism and destabilizing regional policies.

The Bush administration was caught between the Iraq and Libya precedents. It could not replicate the Iraq model of coercive nonproliferation through regime change in North Korea and Iran, and regime collapse in either country was not an immediate prospect. At the same time, the administration's hardline rhetoric (Vice President Cheney's bald declaration, "We don't negotiate with evil, we defeat it") negated the possibility of offering assurances of regime security that were central to Libya's accession to comprehensive and verifiable WMD disarmament.⁹² Senior administration officials from the president down sent out a mixed message, never clarifying whether the U.S. policy goal was to change regimes or to change their conduct—and achieved neither. The second Bush administration did pursue diplomatic engagement with Iran (through talks led by the European Union) and North Korea (through the Six-Party Talks), but it was not able to get beyond the legacy of the first. Both countries crossed important red lines: North Korea tested a nuclear

device in October 2006, while Iran mastered the process of uranium enrichment, an important technological threshold for the production of weapons-grade fissile material.

The Obama Administration: From “Rogue” to “Outlier”

The rogue reset was evident in President Obama’s offer in his January 2009 inaugural address to “extend a hand [to adversaries] if you are willing to unclench your fist.”⁹³ The Obama administration eschewed regime-change rhetoric and reframed the challenges posed by North Korea and Iran in terms of their non-compliance with established international norms rather than with reference to a unilateral American political concept. In keeping with that approach, Obama eschewed the term “rogue,” instead characterizing them as “outlier” states.⁹⁴ In his December 2009 Nobel Peace Prize acceptance speech, Obama declared, “Engagement with repressive regimes lacks the satisfying purity of indignation.... [But] no repressive regime can move down a new path unless it has the choice of an open door.”⁹⁵

In its May 2010 *National Security Strategy* document, the Obama administration stated that the United States sought the further development of a “rules-based international system” that offered “adversarial governments” a structured “choice”: abide by international norms (and thereby gain the tangible economic benefits of “greater integration with the international community”) or remain in non-compliance (and thereby face international isolation and punitive consequences).⁹⁶ The Obama administration unpacked the Bush administration’s mixed message, making clear its openness to a Libya-type agreement. But the adversarial states rebuffed the extended hand and refused to walk through the open door: North Korea conducted a second nuclear test in May 2009 and sank a South Korean naval vessel; Iran balked at a proposed agreement by the P5+1 (the permanent members of the UN Security Council plus Germany) to bring the country’s nuclear program into NPT compliance.

In 2011, the U.S.-assisted overthrow of the Qaddafi regime in Libya set another important precedent. The UN Security Council authorized the intervention on humanitarian grounds and was calculatedly silent on the question of regime change

so as not to create a divisive split on the Council, as in 2003 on Iraq. A UN-authorized intervention that began under a humanitarian rationale morphed within weeks into an overt regime change mission on NATO's part. The argument advanced by the Western powers spearheading the military action was essentially that only the removal of the Libyan dictator could ensure the achievement of the resolution's humanitarian objective. Russia and China issued pro forma objections to this mission creep but ultimately acquiesced. Neither power saw Qaddafi's ousting as a major challenge to its strategic interests, but Moscow did make explicit that Libya did not set a precedent applicable to other cases, notably Syria.⁹⁷

That Qaddafi was toppled under a humanitarian rather than counter-proliferation rubric was a distinction without a difference from the perspective of Pyongyang and Tehran. The crux of the Libyan deal in 2003 had been a tacit but clear security assurance: the United States would not attempt to replicate the Iraq precedent if Qaddafi accepted verified WMD disarmament. The open question after his 2011 ouster and death was whether the United States had priced itself out of the security assurance market with both North Korea and Iran.

The Obama administration continued to pursue a dual-track strategy of pressure and engagement toward the outliers. Washington made clear that the U.S. objective was behavior change—bringing both North Korea and Iran into compliance with the international nonproliferation norm—not regime change. In the case of North Korea, which had crossed the nuclear threshold in 2006 with a weapons test, the Obama administration conducted secret negotiations with the Kim Jong-un regime that yielded the so-called Leap Day Agreement of February 29, 2012.⁹⁸ That agreement, which froze North Korean nuclear and missile tests in return for U.S. food aid, was halted after North Korea launched a satellite, which it claimed was for civilian purposes. The Obama administration then pivoted to a strategy of “strategic patience,” premised on the assessment that renewed negotiations should await a change in the Kim regime's behavior.

Iran offered a more promising negotiating opportunity with the election of a reformist president, Hassan Rouhani, who had campaigned on a platform of

negotiating a resolution of the nuclear issue to win relief from international sanctions. Rouhani was given a narrow writ for negotiations focused solely on the nuclear issue by Iran's Supreme Leader Ali Khamenei. The ensuing negotiation with the United States and the world's other major powers (the P5+1, or EU3-3) culminated in the Joint Comprehensive Plan of Action (JCPOA) in July 2015. The JCPOA was a deal, not a grand bargain with Iran—transactional, not transformational. The deal constrained Iran's uranium enrichment program, thereby blocking the Tehran regime's access to weapons-usable material for at least 15 years. That the JCPOA was limited in scope, confined just to the nuclear challenge, became the focal point of criticism. Congressional critics called for a “better deal”—a transformational one—addressing the full range of international concerns about Iran, notably the Tehran regime's destabilizing regional policies.

Trump's Rogue Redux

A telling symbol of the Trump administration's strategy toward North Korea and Iran, as well as its general inclination to break decisively with the foreign policies of its predecessor, was its revival of the term “rogue” state. The White House's 2017 *National Security Strategy* starkly characterized the threat to international order posed by “the rogue states of Iran and North Korea”:

The scourge of the world today is a small group of rogue regimes that violate all principles of free and civilized states. The Iranian regime sponsors terrorism around the world. It is developing more capable ballistic missiles and has the potential to resume its work on nuclear weapons that could threaten the United States and our partners. North Korea is ruled as a ruthless dictatorship without regard for human dignity. For more than 25 years, it has pursued nuclear weapons and ballistic missiles in defiance of every commitment it has made. Today, these missiles and weapons threaten the United States and our allies. The longer we ignore threats from countries determined to proliferate and develop weapons of mass destruction, the worse such threats become, and the fewer defensive options we have.⁹⁹

The evolution of the Trump administration's policies toward North Korea and Iran will be examined, respectively, in the sections that follow. Pertinent to this discussion is how President Trump's revival of the "rogue" category influenced the evolution and execution of those policies.

The "rogue" term inextricably links the threat posed by the "rogue" state to the character of its regime. Therefore, as was argued in the lead up to the Iraq war, merely addressing that state's dangerous conduct does not resolve the threat to U.S. security if the ruling regime remains unchanged. Viewed through this optic, the core problem with *transactional* diplomacy, such as the JCPOA with Iran, is that it is not *transformational*. That is the essence of Trump's rogue redux. This shift from Obama's transactional approach to the transformational dashed hopes of JCPOA proponents that the Iran precedent of constraining an adversarial state's nuclear capabilities could be replicated with North Korea,—with its advanced program now on the verge of a strategic breakout through acquisition of the capabilities to target the U.S. homeland with a nuclear weapon.

The blunt instrument of the Trump administration's transformational strategy toward North Korea and Iran has been comprehensive economic sanctions under the rubric of "maximum pressure." The administration has roiled relations with allies, as well as Russia and China by threatening to impose extraterritorial (so-called secondary) sanctions on foreign commercial entities that continue to conduct business in Iran. The strategy of maximum pressure has revived the question whether the U.S. objective is behavior change or the maximalist one of regime change.

With Iran, Secretary of State Michael Pompeo's 12 parameters linked the nuclear issue to a comprehensive set of demands to make Iran a "normal" country.¹⁰⁰ Though the administration has declared that its objective is not regime change, Iranian compliance would essentially require just that. With North Korea, the administration has pressed for the transformational goal of full denuclearization prior to U.S. economic sanctions relief. But the U.S. intelligence community's

assessment is that North Korea is not going to give up nuclear capabilities viewed as essential to regime survival. For Pyongyang, nuclear capabilities serve twin functions—a deterrent to external attack and a perennial bargaining chip to leverage food and other economic aid. The concept of “zero warheads” is simply not on the table as long as the Kim family rules in Pyongyang.

By defining threat in terms of the character of regimes, Trump’s rogue redux undergirded the administration’s shift from transactional to transformational strategies toward North Korea and Iran. But the rogue revival carried an additional important connotation—the view that these are essentially crazy states. As during the lead up to the Iraq War in 2003, the imputation of irrationality, linked to regime type, has been central to the argument for preventive military action to deny “rogue” states these capabilities. In 2017, when North Korea was conducting nuclear and long-range missile tests and Washington and Pyongyang were trading threats (such as Trump’s “fire and fury” comments), then National Security Advisor H.R. McMaster asserted that “classical deterrence theory” does not “apply to a regime like the regime in North Korea.”¹⁰¹

Though the summits between Trump and Kim have not led to a breakthrough on denuclearization, the meetings have changed the psychology of the crisis. In touting his personal relationship with Kim, Trump has normalized the Pyongyang regime. North Korea is no longer characterized as a crazy state that is undeterrable. That change in perception pushes off consideration of preventive military action and creates space for diplomacy—the realistic goal of which would be to initially freeze North Korea’s nuclear and missile capabilities. But despite the initiation of a diplomatic track, the U.S. goal of full denuclearization upfront is transformational in that it would require the Kim family to relinquish the capability that it views as essential to regime survival. In short, the end-state goal of “CVID” (complete, verifiable, and irreversible denuclearization) would require a change of regime in Pyongyang.

With Iran, the Trump administration’s abrogation of the JCPOA, in tandem with the reimposition of U.S. sanctions to create “maximum pressure” has led the Tehran regime to push the envelope of the 2015 nuclear agreement—for example,

by exceeding the stockpile limit of low-enriched uranium that Iran is permitted. National Security Advisor John Bolton said that this Iranian action is a deliberate effort to shorten the breakout time to a weapon—which is the longstanding U.S. redline.¹⁰² Compounding the danger is the risk of misperception and miscalculation. In late June 2019, the Iranian downing of an unmanned drone almost precipitated a U.S. military strike—but Trump reportedly rescinded the order just before the commencement of military action. Having campaigned on a platform of extricating the United States from Middle East conflicts, Trump pulled back from military action fraught with escalatory potential. In the immediate aftermath of this episode, the president said that the overriding U.S. goal was to prevent Iran from possessing nuclear weapons. Trump said that an Iran without nuclear weapons would be prosperous and would have the U.S. president as “a best friend.”¹⁰³ Though Iran, perhaps posturing, asserts no interest in resuming diplomacy with Washington, the aftermath of the drone incident—and Trump pulling back from the brink of conflict—creates a potential opening.

The politics of nuclear diplomacy—whether talks with North Korea can be resuscitated and be initiated with Iran—are uncertain. But one can analytically identify the conditions for success. A pivot by the Trump administration from a transformational to transactional strategy would entail decoupling the nuclear issue from that of regime change. The clocks for the two are not in sync. Whereas the former is immediate and urgent, the timeline for the latter is uncertain and indeterminate. Transactional diplomacy through coercive engagement would aim to constrain, not eliminate, these adversarial proliferators’ capabilities to buy time and prevent bad situations from getting worse.

Nonproliferation Strategies

Transformational versus Transactional

Nonproliferation strategies divide along James MacGregor Burns’s classic policy dichotomy between transformational and transactional. A transformational strategy would entail a wholesale change in the target state’s strategic culture and nuclear

intentions, which typically would require a change of regime. A transactional strategy, by contrast, does not entail a near-term change of that magnitude, instead focusing on shifting the regime's calculus of decision on a cost-benefit basis.

South Africa's nuclear reversal in 1994, in which it dismantled its small nuclear arsenal, occurred after a change of regime from minority to majority rule, and, with that altered political environment, a shift in the strategic perspective that had been the impetus for acquiring nuclear weapons. South Africa's transformational change, driven primarily by internal forces, contrasts with that in Iraq in 2003, which was controversially accomplished through external agency in the form of a U.S.-led preventive war of regime change. Post-Saddam Iraq has not revived its nuclear ambitions because the country now has a different relationship with Iran, and the nuclear program, which never crossed the threshold of weaponization, was a manifestation of the megalomania of that dictator. A transformative nuclear reversal also occurred in Libya in 2003, when Qaddafi gave up his nascent capabilities in return for a tacit but clear assurance of regime security.

A successful transformational strategy—one leading to full nuclear disarmament—requires a far-reaching change *of* regime (South Africa, Iraq) or *within* a regime (Libya). The dilemma with North Korea and Iran is that the two clocks—the nuclear and regime-change timelines—are not in sync. The nuclear challenge is urgent, whereas the prospects for regime change or evolution in Pyongyang and Tehran is uncertain. Policymakers can't wait for an indeterminate regime-change process to unfold as these states develop threatening military capabilities. This disjunction calls for decoupling the immediate nuclear issue from the long-term question of regime change. That logic supports the pursuit of transactional diplomacy to constrain, not eliminate, capabilities (i.e., arms control vice disarmament). Cold War arms control in the 1970s offers a pertinent precedent. Pragmatically pursuing strategic arms limitations with the Soviet Union to reduce the risk of nuclear war, the Nixon administration did not link transactional diplomacy on that essential issue to transformational progress in other areas (such as Soviet activism in what was then called the Third World and the Kremlin's human rights record).

But the bind with North Korea and Iran is that the perceived threat posed by these “rogue” states derives not solely from their capabilities, but from the character of their ruling regimes. They are hostile proliferators that combine dangerous capabilities with hostile intent. The JCPOA negotiated between Iran and the P5+1 was a quintessential example of *transactional* diplomacy. As a deal, not a grand bargain, the agreement focused on the discrete, urgent nuclear issue. The Obama administration made the pragmatic, though controversial, determination to narrow the scope of negotiations to solely the nuclear issue. The administration did so based on the assessment that a broadened scope of negotiations encompassing all issues of concern with Iran (such as its longstanding support for Hezbollah) would have doomed the talks. Before the 2016 presidential election, proponents of the JCPOA viewed it as a precedent for transactional diplomacy that could be applied to North Korea, which was on the cusp of acquiring the breakout capacity to target the U.S. homeland with a nuclear weapon.

President Trump embraced the position of JCPOA opponents, whose criticism was that the agreement was not *transformational*—that it did not address Iran’s “malign activities” beyond its scope. Withdrawing from the JCPOA (even while insisting that the Tehran regime should remain within the agreement and abide by its constraints on Iran’s nuclear program), the Trump administration adopted a transformational strategy in the form of Secretary of State Pompeo’s comprehensive list of 12 “very basic requirements” or “musts”.¹⁰⁴ While administration officials have declared that the objective of U.S. policy is not regime change, Iranian compliance with the sweeping U.S. demands for behavioral change would basically necessitate a change of regime in Tehran. Moreover, the Trump administration’s “maximum pressure” campaign to deny the Tehran regime any oil revenues, coupled with its appeals to the Iranian people to voice their objections to the Tehran regime’s “malign activities,” point to regime change as the tacit objective of U.S. policy.

With North Korea, the Trump administration’s transformational strategy is less explicit. Nonetheless, Washington’s goal of full denuclearization upfront in return for sanctions relief is at odds with the Pyongyang regime’s core strategic interest.

The Kim family views nuclear weapons in the dual role of deterrent to external attack and a source of leverage to extract economic benefits from the United States, South Korea, and Japan. The U.S. intelligence community has assessed that the Kim family will not relinquish military capabilities that it perceives as essential to regime survival. That is the crux of the ongoing diplomatic impasse between Washington and Pyongyang. The open question is whether the Trump administration and subsequent administrations will be willing to break the impasse by pivoting from the transformational to the transactional. Transactional diplomacy would aim to prevent North Korea from acquiring the breakout capability of targeting the U.S. homeland with an intercontinental ballistic missile (ICBM) fitted with a nuclear weapon. Ironically, a transactional deal with North Korea could become a precedent for reengaging Iran, where the objective with respect to the nuclear program would be to keep Iran's latent nuclear capability latent. But a revived diplomatic track to negotiate a JCPOA "plus" or "2.0" could broaden the scope by incorporating discrete priority issues among Secretary Pompeo's 12 parameters (such as limiting ballistic-missile ranges) on which the Tehran regime is prepared to negotiate.

The (Problematic) Military Option

"All options are on the table" has been the mantra across U.S. administrations to indicate that force remains a policy instrument to be employed should the target state cross a designated "red line." With Iran, significantly, that line was set not on uranium enrichment, but on weaponization. North Korea has a much more advanced nuclear program, with an estimated arsenal weapons in the 30-60 range and a demonstrated ICBM capability. The Kim family regime ignored the calls for restraint from the United States and China when North Korea first tested a nuclear weapon in 2006. Now the focus of U.S. policymakers has been on preventing the North from acquiring the capability to target the U.S. homeland with a nuclear weapon. In January 2017, President-elect Trump tweeted his red line, "It won't happen."¹⁰⁵

The challenge of enforcing a red line, when elusive or ambiguous proof makes it appear wavy, was evident in the case of Syria in August 2013, when the Assad regime used chemical weapons against domestic insurgents. The Obama administration initially said that it lacked "airtight" evidence that the Assad regime

had crossed a U.S.-declared “red line.” That December, a UN report found credible evidence of chemical attacks, but was precluded by its Security Council mandate to identify whether the attack was carried out by the Assad regime or the opposition.

The uncertainty about the Assad regime’s *actual* use of chemical weapons as a trigger for U.S. action would pale in comparison to the inherent uncertainty surrounding Iran’s or North Korea’s opaque nuclear programs. Indeed, with Iran, the challenge of determining whether it has crossed the “red line” of weaponization is compounded by the Tehran regime’s hedge strategy, which cultivates ambiguity about its nuclear capabilities and intentions. Iran, now responding to U.S. “maximum pressure” by testing the limits of the JCPOA’s constraints on its program, has made progress along the technological continuum toward weaponization, but would be unlikely to make a dramatic move (such as conducting a nuclear test or withdrawing from the NPT) that would openly cross the red line of weaponization—even in the event of the JCPOA’s full breakdown. So far as Iranian progress falls short of overt weaponization, such as the shortening of Iran’s breakout time to a few months or weeks, it would be hard for the U.S. administration to sustain the case for military action at home or abroad. After Iraq, when flawed intelligence on Saddam Hussein’s WMD programs was central to the Bush administration’s case for preventive war, the United States would simply not get the benefit of the doubt. And doubt there would be in the absence of hard evidence of weaponization. With North Korea, the uncertainty centers on whether it has mastered the complex integrated set of technologies required to target the United States—that is, a miniaturized nuclear warhead, a ballistic missile capable of being fitted with a nuclear warhead and with adequate range, and a warhead able to survive reentry into the earth’s atmosphere and strike with accuracy.

The “all options on the table” formulation of U.S. policymakers is an oblique reference to the possibility of American airstrikes on Iran’s and North Korea’s nuclear infrastructures. With each, that openly debated option—what would be the most telegraphed punch in history—runs up against four major liabilities.

First, military action would only set back the programs, not end them. Iran, which has mastered the uranium enrichment process to acquire the requisite material for

a weapon, could reconstitute the program. In November 2011, Secretary of Defense Leon Panetta estimated that an attack would only delay the Iranian program by three years.¹⁰⁶ North Korea has an even larger, more diversified nuclear program, likely including several clandestine sites (which may or may not be known to U.S. intelligence). In that case, military strikes would set back, not eliminate a nuclear program, which could be reconstituted over time.

Second, an American attack could generate a nationalist backlash within Iran or North Korea with the perverse consequence of bolstering the regimes. Analyses arguing that a military strike on Iran's nuclear sites would essentially be the starting gun of a counterrevolution against the regime are not persuasive. In North Korea, which is ruled by a family cult that has made the nuclear program a symbol of national pride, the anticipated backlash (if the regime directed it) would be intense.

Third, military strikes on "hot" sites containing nuclear weapons or toxic fissile material (e.g., uranium hexafluoride, enriched uranium, plutonium, etc.) could have disastrous environmental consequences. The proximity of Iranian sites to population centers poses a potential radiological risk to thousands of civilians.¹⁰⁷ The threat of collateral damage to the environment and civilian population has been a major constraint on the use of force in past cases (e.g., in the case of Iraq's Osiraq reactor in 1981, Israel struck before nuclear fuel was loaded; during Operation Desert Fox against Saddam's Iraq in 1998, the United States eschewed attacks on suspect chemical and biological weapons sites).

And fourth, perhaps most fundamentally, military action would be viewed by North Korea and Iran as the initiation of a regime-toppling war. With Iran, the envisioned scope of U.S. military action would reinforce that Iranian perception: an air campaign would likely be of the magnitude of Operation Desert Fox in Iraq, which spanned four days in late December 1998, rather than a single mission like Israel's lightning air strike on the Iraqi Osiraq reactor in 1981. Khamenei has warned that U.S. military action would lead to Iranian retaliation against U.S. interests worldwide. Even a "limited" attack on Iran's nuclear sites could well escalate into a regional conflict. With North Korea, the escalatory risks are even more acute. No

U.S. policymaker could embark on military action against North Korea’s nuclear and missile infrastructure—even a limited so-called “bloody nose” strike—while discounting the likelihood of large-scale conventional or even nuclear retaliation.¹⁰⁸ Seoul, South Korea’s capital and megalopolis that is as close to the DMZ as Washington is to Baltimore, is particularly vulnerable.

That the U.S. “red lines” on weaponization pushed off a decision on the use of force as an alternative to diplomacy, as was the case in Syria, is a reflection of how unattractive and problematic the military option would be.

While a major preventive air campaign against Iran’s nuclear infrastructure would have these liabilities, covert action and sabotage have reportedly been conducted by the United States and Israel to degrade Iran’s capabilities. The Stuxnet cyberattack in 2009-2010 destroyed centrifuges at Iran’s uranium enrichment facility at Natanz. In July 2020, Natanz was struck again either from a planted explosive device or a cyberattack triggering an explosion, which experts estimating that the Iranian program was set back a year.¹⁰⁹ Such attacks are at a lower level on the force continuum but still carry escalatory potential by precipitating Iranian retaliation (e.g., missile attacks on Iraqi bases with U.S. forces).

A Pivot to Transactional Diplomacy

North Korea

After the three Trump-Kim summits, negotiations are at an impasse. With North Korea rejecting the transformational objective of full nuclear disarmament, the United States should pivot to transactional diplomacy. The near-term diplomatic objective should be to prevent North Korea’s quantitative and qualitative breakout—the ability to target the United States—by negotiating a freeze on North Korea’s nuclear and missile programs. Siegfried Hecker, former director of the Los Alamos National Laboratory, calls these goals the “Three Nos”: (1) no new weapons (by freezing North Korean production of plutonium and enriched uranium), (2) no testing of weapons or ballistic missiles, and (3) no exports of nuclear technology or weapons.¹¹⁰ A freeze

would preclude the additional testing that North Korea probably still needs to master warhead miniaturization, reliable long-range missiles, and warhead reentry and guidance (a capability North Korea has yet to demonstrate).

The initiation of a diplomatic track after the Singapore summit in June 2018 created an opportunity to achieve a freeze agreement—one that, in the near term, *optimizes* the interests among all the major parties. Such an interim agreement would forestall a North Korean nuclear breakout (the urgent U.S. interest), while preventing the collapse of the North Korean regime and the loss of a buffer state (the Chinese interest) and leaving the Kim family regime in power with a minimum nuclear deterrent (the paramount North Korean interest). An interim agreement that constrained North Korea’s capabilities would make the best of a bad situation. The American narrative would be that a freeze agreement is an interim step toward the long-term goal of denuclearization.

The U.S. and China have a mutual interest in preventing a North Korean strategic breakout. This conjunction of interest creates the political space for coordinated diplomacy to freeze North Korean capabilities. But that prospect is complicated by Sino-American tensions over trade and China’s assertive sovereignty claims in the South China Sea. The best argument is an appeal to China’s self-interest—that a North Korean nuclear breakout would have adverse consequences for Chinese strategic interests in northeast Asia as Japan, South Korea, and the United States respond.

With the Singapore and Hanoi summits, and the Trump–Kim meeting at the DMZ, the sense of imminent crisis has abated and both China and South Korea have made clear that the period of “maximum pressure” is over. In this new political environment, transactional diplomacy should employ coercive engagement to induce or compel North Korean acceptance of constraints on its nuclear program. That said, the decline of multilateral support for economic sanctions in the wake of Singapore undercuts that strategy.

The sanguine rhetoric of Singapore has given way to the hard reality of negotiating constraints on North Korea’s ballistic missile and nuclear programs. The Kim

regime reportedly rejected a U.S. proposal for North Korea to immediately reduce its nuclear stockpile by between 60 and 70 percent. North Korea's history gives new meaning to the traditional arms control challenge of trust but verify. And the United States rejected a North Korean proposal at Hanoi to shut its Yongbyon facility in return for the lifting of sanctions.¹¹¹

The Kim family regime excels at dilatory tactics and will exploit any ambiguity in an agreement. A telling indicator of the current challenge is that after North Korea signed onto the Nuclear Nonproliferation Treaty, in 1985, the Pyongyang regime didn't declare its nuclear materials to be put under International Atomic Energy Agency safeguards for more than six years. North Korea is currently balking at an essential prerequisite for negotiations—a declaration of its nuclear and missile facilities (including a suspected covert uranium-enrichment site). The North Koreans evidently believe that providing such a declaration would essentially be providing the United States with a target list should negotiations fail.

Nevertheless, the impact of the landmark Singapore summit is palpable in both strategic and psychological dimensions. One manifestation of how the summit meeting changed the psychology of the nuclear crisis was Trump's characterization of Kim. Before the summit, the imputation of irrationality was a driver of consideration of the military option. After the Singapore summit, Trump declared that he and Kim "have developed a very special bond" and that he can "trust" the North Korean dictator.¹¹² The message was essentially that he now regarded North Korea as a conventional adversary rather than a "rogue" state ruled by a "madman." Should nuclear diplomacy stall or fail, this change in perception makes it more acceptable to consider the strategic option that the Trump administration has hitherto rejected: deterrence.

The current nuclear crisis with North Korea (the third since the early 1990s) is shaped by the outcome of the previous two crises. Incredibly, North Korea has a nuclear arsenal that could expand to almost half the size of the United Kingdom's by the early 2020s. On July 4, 2020, North Korea again declared that it had no interest

in a further round of negotiations with the United States until Washington ceased its “hostile” policies. North Korea watchers see the Kim regime waiting on the outcome of the United States’ 2020 presidential election. At the same time, the COVID-19 pandemic has generated pressure on North Korea worse than international sanctions because China (following public health concerns) has closed its border, which is the essential conduit for vital resources and trade upon which the Kim regime is dependent.¹¹³ That pressure may bring Pyongyang back to the negotiating table. However, a near-term full rollback of the North’s nuclear and missile capabilities is not a realistic possibility. An interim freeze agreement constraining those capabilities—that is, bending the curve—is what a revived round of diplomacy could aim to achieve. Such an agreement would buy time—one of the major goals of nonproliferation policy—and allow the indeterminate timeline for a change or evolution of the regime in Pyongyang to play out.

Iran

In June 2019, military tensions between the United States and Iran countries spiked after Iranian-attributed attacks took place on shipping in the Persian Gulf and Iran downed an unmanned U.S. drone. The risk was compounded by the possibility of misperception and miscalculation, which could lead to inadvertent conflict and escalation. Acknowledging the risk, U.S. Special Representative for Iran Brian Hook stated, “It’s important we do everything we can to de-escalate [tensions with Iran].”¹¹⁴

A major driver of those tensions was the U.S. strategy of “maximum pressure,” which has essentially amounted to an economic war on Iran. The Trump administration has pressed to end all Iranian oil exports to deny the Tehran regime revenues and bar foreign commercial activities. The U.S. imposition of extraterritorial secondary sanctions has roiled relations with Washington’s European allies. Major European corporations, such as Siemens, when threatened with the choice of conducting commerce in the United States or Iran, have withdrawn from the latter. These tensions over trade compound the resentment expressed over the Trump administration’s reneging on the JCPOA in May 2018—an agreement requiring years of complex multilateral diplomacy to achieve and with which Iran was in compliance at the time according to the IAEA.

The combination of the JCPOA withdrawal and secondary sanctions diplomatically isolated the United States. The Trump administration's 12 "musts" fueled the perception among the world's major powers who had partnered with United States on the JCPOA that the U.S. objective was regime change. It also has led to concern that the U.S. "maximum pressure" would prompt Iran to respond by surpassing the JCPOA's limits on uranium enrichment—and, in turn, that the breach would be seized upon in Washington as a pretext for military action. Some noted the similarities between the Trump administration's saber rattling and the Bush administration's rhetoric in 2002 and 2003 during the lead up to the Iraq War. In July 2019, amidst heightened tensions in the Persian Gulf, Prime British Minister Boris Johnson told President Trump that the UK would not support U.S. military strikes against Iran.¹¹⁵ A European Union official depicted a linkage, stating, "The original sin causing the current escalation in the Gulf is the U.S. violation of the Iran nuclear deal."¹¹⁶

After aborting the military strike on Iran in late June 2019, President Trump declared that he was "not looking for war," was open to negotiations with Iran without preconditions, and that his goal was not regime change. "They can't have a nuclear weapon," Trump declared. "We want to help them. We will be good to them. We will work with them. We will help them in any way we can. But they can't have a nuclear weapon."¹¹⁷ That reprised Trump's statement in a press conference with Japanese Prime Minister Shinzo Abe: "We're not looking for regime change. I want to make that clear. We're looking for no nuclear weapons."¹¹⁸ These statements suggest an opening, the possibility of political space for a revived diplomatic track for "a JCPOA 2.0."¹¹⁹

The negotiators of the JCPOA had not envisioned it as a standalone agreement. The intention had been to expand on the deal to address other discrete issues, not part of the original JCPOA deal. In spring 2018, before the U.S. withdrawal announcement in May, French President Macron had sought to initiate such a move. A "JCPOA 2.0 plus" would be an extension of transactional diplomacy. A prerequisite for the revival of a diplomatic track would be a pivot by the Trump administration from its transformational strategy by prioritizing among Pompeo's 12 parameters.

Negotiations on a JCPOA 2.0 could encompass the following issues:

Sunset Provisions—Between 10 and 15 years after the implementation of the JCPOA, the constraints on Iran’s uranium enrichment are lifted. In 2026, Iran may begin to modernize its uranium enrichment program with the installation of more advanced centrifuges. In 2031, the 300 kg limit on Iran’s stockpile of enriched uranium expires, and Iran will be permitted to enrich uranium above the 3.67 percent level of U-235. The expiration of these limits would shorten the breakout time required for Iran to acquire a nuclear weapon to less than 12 months.¹²⁰ As Iran has no urgent necessity to acquire the bomb, and indeed the maintenance of a hedge option is Iran’s strategic sweet spot, the Tehran regime may be open to an extension of the sunset provisions, perhaps extending them for another decade.

Ballistic missiles—Iran’s Supreme Leader Khamenei has imposed a 2000-kilometer limit on the range of its ballistic missiles. The missile program got its impetus during the Iran-Iraq War during the 1980s (when Iraq targeted Iranian cities with Scud missiles) and makes up for Iran’s lack of a modern capable air force. The JCPOA did not cover ballistic missiles, but a separate UN Security Council resolution in 2015, coinciding with the signing of the nuclear accord, called on Iran to refrain from conducting tests of a ballistic missile that could carry a nuclear weapon. Denying Iran an ICBM capability (similar to the capability North Korea is on the cusp of achieving to threaten the U.S. homeland) should be a priority. JCPOA 2.0 negotiations should aim to codify Khamenei’s 2000-kilometer limit on ballistic missile ranges.

Regional issues—Since the revolution, the Tehran regime has viewed its external mission (such as supporting Hezbollah) as a source of domestic legitimation. But the costs of Iran’s foreign expeditionary activities have also become a focal point of domestic criticism at a time of economic crisis and scarce resources at home. Across the region, the record is not one-sided. In Iraq, in the fight against Islamic State (ISIL) forces, U.S. and Iranian interests align; elsewhere—Lebanon, Syria, Yemen—they sharply diverge. The JCPOA 2.0 negotiating agenda could focus on measures to reduce the risk of regional conflict. For example, limitations on missile and military infrastructure in Lebanon and Syria could avert war between Israel and

Iran.¹²¹ In addition, the United States and Iran could discuss procedures to prevent inadvertent escalation and conflict in the Persian Gulf. That was the impetus behind the U.S.-Soviet Incidents at Sea Agreement of 1972, which could serve as a model.

Sanctions relief—Iran will not consider accepting the elements of a JCPOA 2.0 without tangible economic relief. That would require the Trump administration to lift the sanctions it reimposed on Iran after withdrawing from the JCPOA and revoke the secondary sanctions that essentially make it impossible for foreign firms to conduct business in Iran.

Security assurances—Just as the JCPOA included language from Khamenei’s *fatwa* codifying Iran’s intent not to acquire nuclear weapons, a JCPOA 2.0 could reprise language from the 1981 Algiers Accords on non-interference and President Trump’s affirmation that the United States does not seek regime change in Iran.

The Trump administration has run up to the limits of “maximum pressure” with the Tehran regime. Iran will not accept the 12 “musts” that it views as an imperative to commit regime suicide. By breaching the JCPOA’s limits on uranium enrichment and employing an asymmetrical strategy to threaten shipping in the Persian Gulf, the Tehran regime has met “maximum pressure” with its own pressure. The attendant risks of conflict and inadvertent military escalation have spiked.

Iran’s Supreme Leader, ruling out resumed negotiations with the United States, baldly declared in May 2019: “We will not negotiate with America, because negotiation has no benefit and carries harm... We will not negotiate over the core values of the revolution. We will not negotiate over our military capabilities.” This statement came on the heels of President Rouhani raising the possibility of talks with Washington. Foreign Minister Zarif subsequently asserted that Iran’s breaching of the JCPOA’s limits on uranium enrichment could be reversed if the United States rejoined the nuclear agreement. Iran has a record of backtracking from previously staked-out positions—Ayatollah Khomeini famously drank “the chalice of poison” when he acquiesced to ending the Iran-Iraq War under pressure. Within the current political context, a complication for the resumption of diplomacy is that those who championed

the JCPOA, notably Rouhani and Zarif, were undercut by the Trump administration's withdrawal and the re-imposition of economic sanctions that triggered a deep recession. If a diplomatic track is revived, the Tehran regime cannot be expected to accept an expanded JCPOA 2.0 if all the United States is prepared to put on the table are the benefits that Iran was due to receive under JCPOA 1.0.

Implications

Nuclear diplomacy with North Korea and Iran is at an inflection point. U.S. policymakers face three interrelated policy challenges raised by this analysis:

first, whether a pivot from a transformational to a transactional approach can be executed;

second, whether, in the absence of agreements constraining these adversarial proliferators' capabilities, effective crisis management can prevent inadvertent conflict and military escalation with the United States; and

third, whether North Korea's crossing of the nuclear threshold and Iran's development of a latent nuclear capability create a "tipping point" that will precipitate a new wave of proliferation in other countries?

Transactional or Transformational Diplomacy?—The 2015 nuclear agreement between Iran and the world's major powers (subsequently codified by the UN Security Council) set an important nonproliferation precedent by constraining the nuclear aspirant's capabilities—most notably, the uranium enrichment program that offers a pathway to the acquisition of weapons-usable fissile material. The goal was to keep Iran's latent nuclear capability latent. When the Trump administration assumed office, proponents of the JCPOA believed this precedent of transactional diplomacy (focused on the discrete nuclear challenge) was applicable to North Korea. Yet with both of these adversarial proliferators, President Trump's revival of the unilateral American term "rogue" state (eschewed by President Obama) framed the threat posed by Iran and North Korea in terms of the character of their regimes.

Accordingly, Trump rejected the transactional JCPOA, castigating it as “the worst deal ever,” and adopted a *transformational* approach embodying Secretary of State Pompeo’s 12 parameters—comprehensive demands that would essentially necessitate a change of regime in Tehran. The U.S. withdrawal from the JCPOA, in tandem with the imposition of extraterritorial “secondary” sanction on foreign commercial entities engaged in trade with Iran, diplomatically isolated the United States. With North Korea, the administration’s strategy was less overtly transformational. The U.S. demand for full denuclearization would deny North Korea capabilities needed to deter what the Kim regime has long perceived as an existential external threat. At the same time, the U.S. offer of integrating autarkic North Korea into the global economy if it denuclearizes carries the regime-changing risk of political contagion.

This study makes the *analytical* case for a pivot from transformational to transactional diplomacy with Iran and North Korea. Yet given the historical record, it is fair to question if that analytical option is *politically* feasible in either case.

With Iran, the political headwinds are strong. After the U.S. withdrawal from the JCPOA the Trump administration’s “maximum pressure” campaign (with its implicit objective of regime change) and its targeted killing of IRGC Major General Qasem Soleimani in January 2020, it is questionable whether the Tehran regime would conclude another deal—a “JCPOA plus.” On the U.S. side, proponents of a transformational strategy (premised on the assumption that Iran’s “malign activities” derive from the character of the regime) are likely to reject any transactional approach (even if expanded to missiles and regional low-hanging fruit) that does not fundamentally change the regime. The political fight in the U.S. Congress to lift sanctions on Iran would be formidable. The counter argument is that Iran, now coping with an economic crisis (compounded by pandemic and low oil prices) and not facing an existential threat necessitating nuclear weapons, may remain open to transactional diplomacy. That should be put to the test.

With North Korea, after the U.S. regime takedowns in Iraq and Libya, the United States may have priced itself out of the market for a deal—certainly one that would

entail complete denuclearization denying the Kim family the capability it considers essential to regime survival. A former U.S. diplomat quipped, North Korea does not respond to pressure, but without pressure, it does not respond. But pressure to what end? Decades of sanctions and privation have not precipitated the oft-predicted regime collapse or even a more flexible openness to diplomacy. It is certainly not an assumption on which to base policy while North Korea augments its nuclear and missile capabilities, including the capability to hit the U.S. homeland. So, if external pressure is not sufficient to collapse the regime and zero warheads are not on the table, then a transactional deal—one that circumscribes the program through a freeze on nuclear and long-range ballistic missile testing and the production of weapons-usable fissile materials—should be the objective.

Under a variation of coercive diplomacy that political scientist Alexander George termed “conditional reciprocity,” North Korean steps toward the aspirational goal of denuclearization, starting with a freeze, would precipitate the progressive lifting of economic sanctions. In advocating for transactional diplomacy as an interim measure to prevent an already bad situation from getting worse, one must acknowledge the downsides. First, U.S. allies in the region, South Korea and Japan, would still face a formidable North Korean nuclear and ballistic missile threat. Second, limitations on North Korea’s capabilities would pose a daunting verification challenge in the absence of intrusive inspections, which the Kim regime is likely to reject. And third, transactional diplomacy, which would entail reciprocal sanctions relief in tandem with negotiated limits on North Korean capabilities, carries the moral hazard of propping up an odious regime.

With North Korea, which now has an advanced nuclear-weapons program, there are no good options, only bad and worse ones. As challenging as a transactional diplomatic approach might be, it is worth attempting versus relying primarily on enhanced deterrence on the Korean peninsula.

Crisis Management—Against the backdrop of the nuclear impasse, the U.S. drone strike killing General Qassim Suleimani in Baghdad in early January 2020 brought the United States “closer to war with Iran than we’ve been in the last 40

years,” according to former Secretary of Defense Leon Panetta.¹²² The Tehran regime retaliated with a salvo of missile strikes on two U.S. bases in Iraq. Fortunately, an escalatory spiral was averted in this episode. Though hardliners are ascendant in both Washington and Tehran, and there has been a complete breakdown in trust, neither side wants war. Autarky through a “resistance economy,” now under the compounded stress of the pandemic, allows Iran to muddle through, but is not a viable long-term strategy in the face of the country’s demographic and other critical societal challenges. This conjunction of factors could create political space for revived diplomacy of the kind mooted by French President Macron at the United Nations in September 2019. An urgent priority is to bring Iran back into compliance with the constraints on its uranium enrichment program under the JCPOA. That would require reciprocation from the Trump or a successor administration—for example, waiving the controversial extraterritorial sanctions on Iran’s oil exports and international commerce.

With North Korea, the diplomatic impasse with the United States over denuclearization could trigger a renewed crisis. While the summits with President Trump conferred international stature and legitimacy to Kim Jong-un, the three summit meetings failed to yield tangible results, specifically sanctions relief. Failed summitry and economic distress, compounded by the effects of the pandemic, may prompt the Kim regime to revert to brinkmanship to regain leverage with the United States, Japan, and South Korea through resumed nuclear and missile tests.¹²³ But resumed tensions, such as that in 2017—the year of “fire and fury”—carries significant escalatory risks. In a crisis, what the United States perceives as a move to bolster deterrence (e.g., through the deployment of stealth aircraft to South Korea) could be perceived in Pyongyang as the prelude to preventive military action. That South Korean war planning includes precision strikes to decapitate the Kim regime could fuel that North Korean concern.¹²⁴ As Harvard nuclear expert Steven Miller observes, “Pyongyang combines substantial vulnerability to attack with deep (and possibly warranted) fears of attack, a mix that could prove sharply escalatory in a crisis, especially in view of North Korea’s preemptive nuclear doctrine.”¹²⁵ The military and diplomatic components of U.S. policy, especially if tensions should again flare, should be carefully coordinated to mitigate the risks of inadvertent escalation and conflict.

A Proliferation Tipping Point?—The historical record of nuclear proliferation reveals a striking disjunction: although Kennedy’s nightmare scenario of a world of 30 nuclear weapon states did not come to pass, some 20 to 30 states (by various estimates) did consider acquiring what strategist Bernard Brodie called the “absolute weapon” at some stage. Yet only a relatively small number of states made the national decision to act on it. That is testimony to how few countries’ leaderships perceived a national security imperative to acquire nuclear weapons, and that nuclear intent has been over-attributed to states acquiring dual-use technologies.¹²⁶ Hence, the NTI Nuclear Security Index lists 22 countries (down from 36 in 2012) with weapons-usable fissile material, but only nine have crossed the weaponization threshold.¹²⁷

In 2006, North Korea became the ninth nuclear-weapon state when it conducted its first test. A decade later, North Korea was on the cusp of mastering the complex integrated set of technologies to target the U.S. homeland with a nuclear weapon. During roughly the same period, Iran, which according to the CIA had an active weapons program until 2003, has developed a latent capability inherent in its uranium enrichment program, which provides a pathway to the acquisition of weapons-usable fissile material. These regional developments have not yet triggered Japan and South Korea or Saudi Arabia and Turkey to reverse their non-nuclear status. Yet the developments in North Korea and Iran could still affect their regional neighbors’ regime intention, which is the lead proliferation indicator.

Nuclear intention occurs along a continuum of policy choice. As highlighted in the Iranian case, dual-use nuclear technologies create a latent capability for a weapon. The JCPOA was a bargain in which Iran was permitted to retain a latent capability (in lieu of the military option) in return for assurances that the Tehran regime’s weapons program was terminated. With North Korea, the Trump administration’s goal of denuclearization, which aims to leave the North with no latent capability, sets a higher bar.¹²⁸

But under what conditions does *latency give rise to hedging*, which Ariel Levite defines as “a national strategy of maintaining, or at least appearing to maintain, a viable option for the relatively rapid acquisition of nuclear weapons, based on

an indigenous technical capacity to produce them within a relatively short time frame ranging from several weeks to a few years”¹²⁹ As Iran’s nuclear program is avowedly intended to produce low-enriched uranium for nuclear reactors that neither exist or are on the drawing board, the conclusion that the program is a hedge to maintain the viability of a weapons option is evident. From a national security perspective, the nuclear hedge (which the Tehran regime retains under the agreement) is Iran’s strategic sweet spot—maintaining the potential of a nuclear option, while avoiding the regional and international costs of actual weaponization. As former President Hashemi Rafsanjani candidly admitted in 2005: “As long as we can enrich uranium and master the [nuclear] fuel cycle, we don’t need anything else. Our neighbors will be able to draw the proper conclusions.”¹³⁰

The likely prognosis is that the nuclear programs of North Korea and Iran will not precipitate overt weaponization but instead hedging by states such as Japan and South Korea, and Saudi Arabia and Turkey, respectively. That position along the continuum of nuclear acquisition would constitute a response by these states while not triggering the adverse international consequences of crossing the weapon threshold. Within this context, the analytical challenge, as Toby Dalton argues, is to develop “models that situate latency and hedging in a broader political, normative, and technical context.”¹³¹ For U.S. officials, the policy challenge is to fashion tailored strategies—employing the full array of instruments from extended deterrence to forward-deployed conventional forces—to reinforce nuclear restraint and forestall a tipping point.



Deterring Nuclear Terrorism¹³²

In a 2010 interview with *The Washington Post*'s Bob Woodward, then-President Barack Obama judged the United States generally resilient to terrorist attacks, but qualified that “a potential game changer would be a nuclear weapon in the hands of terrorists, blowing up a major city.”¹³³ This game-changing scenario, which had been a concern since the chaotic breakup of the Soviet Union in the early 1990s, had arisen just four months after Obama's inauguration: a CIA intercept between two Taliban leaders in northwestern Pakistan revealed that the terrorist group claimed to have acquired “nuclear devices.” The CIA concluded that the reference was more plausibly to a dirty bomb (designed to disperse radioactive material) rather than a functioning nuclear weapon. Nonetheless, according to an administration official, “The entire U.S. policymaking community was very alarmed. It was an all-hands-on-deck mentality.”¹³⁴ In May 2015, a hyperbolic article in the Islamic State's propaganda magazine, *Dabiq*, raised the “hypothetical” that ISIL (the Islamic State in Iraq and the Levant), having seized banks with billions of dollars, could tap sympathizers in “Pakistan to purchase a nuclear device through weapons dealers with links to corrupt officials in the region.” The article proclaimed that the terrorist group was seeking “to pull off something truly epic.”¹³⁵

Like its predecessors since 9/11, the Trump administration has affirmed, “Nuclear terrorism remains among the most significant threats to the security of the United States, allies, and partners.”¹³⁶ An administration report on WMD terrorism noted, “Al Qaeda is thought to have pursued a homegrown nuclear weapon capability, a prospect made even more sobering by the knowledge that on at least 18 occasions since the early 1990s weapons-usable nuclear material has been seized outside of regulatory control.”¹³⁷ The stark reality is that terrorist groups like Al Qaeda and ISIL remain intent on acquiring a nuclear weapon—and would have no compunction about using it. Former British Prime Minister Tony Blair observed that the constraints are practical and technical, not political or moral. Thus,

the key to preventing nuclear terrorism is blocking the terrorists' acquisition of the capability that would allow them to act on their *intention*.

For terrorists, there are three pathways to the bomb: they can buy, steal, or build one. Each of these routes requires the involvement of a state, whether as a deliberate act of policy by the ruling regime or a failure to exercise sovereign control over weapons and weapons-usable fissile material on its territory. The state dimension of non-state nuclear terrorism is thus essential: Al Qaeda does not have its own uranium-enrichment program to produce weapons-usable material.

An ominous aspect of the threat ISIL posed during its occupation of a large swath of Iraqi and Syrian territory was the access to infrastructure and materials (such as the 88 pounds of uranium compounds ISIL seized at Mosul University) that could have allowed this non-state actor to acquire state-like nuclear capabilities (i.e., in this instance, a radiological device). Hence, the centerpiece of the U.S. strategy was to roll back ISIL's territorial gains, which culminated in the successful Iraqi army offensive, backed by U.S. Special Forces, to expel ISIL from Mosul in 2017. The focus in this section is therefore on states and their centrality in addressing nuclear terrorism. ISIL, Al Qaeda, and other terrorist groups are pertinent to this analysis to the extent that such non-state terrorist entities take on the attributes of a state.

The 9/11 terrorist attacks were a horrific mass-casualty attack on Washington and New York that turned hijacked commercial aircraft loaded with jet fuel into low-tech cruise missiles with a chemical agent. Yet that catastrophic event highlighted the still more dire threat posed by the nexus of nuclear proliferation and terrorism. 9/11 led to a redefinition of threat by the George W. Bush administration and generated a wave of analytical work from think tanks and the academy on strategies of deterrence to mitigate that threat of WMD terrorism.

Nearly two decades after 9/11, evolving circumstances necessitate a recalibration of these deterrent strategies. First, two countries of major proliferation concern—Pakistan and North Korea—have significantly increased their stocks of nuclear weapons and weapons-usable materials. Second, the Iran nuclear deal, which

offered an important relevant precedent in which arms control (a variant of deterrence) aimed to constrain the Tehran regime's access to weapons-grade fissile material, now has an uncertain future after the Trump administration's decision in 2018 to withdraw the United States from the agreement. Third, nuclear security remains a primary concern in Russia, which inherited the Soviet Union's vast nuclear arsenal and stocks of fissile material and has terminated cooperation with the United States to secure these capabilities under the Cooperative Threat Reduction (aka Nunn-Lugar) program.

The utility of instruments to deter nuclear terrorism highlights this section's main theme: effective strategies on the state level—ones that lock down weapons and weapons-usable material and threaten punitive consequences for the potential transfer of those capabilities—are the prerequisite for addressing non-state threats. A repertoire of tailored strategies of deterrence would not eliminate non-state terrorist threats but would go far in achieving this goal. Designing such strategies of deterrence to mitigate risks requires a delineation of the pathways by which a non-state terrorist group could acquire nuclear weapons or weapons-usable fissile material from states.

Pathways to Nuclear Acquisition

How can non-state terrorist groups like Al Qaeda and ISIL acquire the capabilities to match their millenarian intentions? The three broad pathways to nuclear weapons acquisition by a terrorist group are: (1) *transfer*—the deliberate handoff or sale of a weapon from a state; (2) *leakage*—an unauthorized transfer or theft of a weapon from an inadequately secured site; and (3) *indigenous production*—manufacture of a nuclear device from leaked weapons-grade fissile material and bomb components.

Transfer

After 9/11, the Bush administration's *National Strategy to Combat Weapons of Mass Destruction* declared that “current and potential future linkages between terrorist groups and state sponsors of terrorism are particularly dangerous and require priority attention.”¹³⁸ The nexus between terrorism and proliferation was

the primary impetus underlying the elevation of military preemption as an option in the Bush administration's post-9/11 strategy. The transfer scenario was central to the Bush administration's urgent case for preventive war in 2003 to topple the Saddam Hussein regime, which was then accused (contrary to the CIA's assessment) of having had direct links to Al Qaeda. The commonly attributed motivation for a "rogue regime" to hand off a nuclear weapon or technology to a terrorist group is a convergence of strategic interest between them. Yet even when a state-sponsorship link exists, as between Iran and Hezbollah, major constraints exert a powerful deterrent effect. State sponsors employ terrorist groups as instruments of policy, and that implies a high degree of control. A WMD transfer would be an extraordinary act—both in its escalatory character and in its consequent threat to regime survival. Crossing that Rubicon would mean relinquishing control of the most valuable military asset in the state's arsenal. The transferring state would be taking the risk that the unconventional weapon employed by the terrorist group could be traced to it and thereby trigger a devastating U.S. retaliatory strike. For example, Iran has not provided chemical weapons to its important proxy Hezbollah out of concern about regime security. Iran experts Steven Simon and Ray Takeyh note that the Islamic Republic's leadership is "risk-averse to actions that could threaten regime survival—and that the transfer of nuclear arms to potentially uncontrollable clients would expose the regime to an unacceptable risk."¹³⁹

The only strategic interest that could plausibly justify the risk of a state-to-non-state transfer would be regime survival itself. Of particular relevance to this issue is the controversial National Intelligence Estimate (NIE) of October 2002 on Iraq, which concluded that Saddam Hussein, "if sufficiently desperate ... might decide that the extreme step of assisting the Islamist terrorists in conducting a [WMD] attack against the United States would be his last chance to exact vengeance by taking a large number of victims with him."¹⁴⁰ Ironically, the course upon which the George W. Bush administration was about to embark at the time of that NIE was the very scenario in which a "desperate" Saddam Hussein would most plausibly hand off unconventional capabilities to a terrorist group.

Another possible motivation for WMD transfer to a non-state actor, cited with respect to impoverished North Korea, is economic. North Korea's status as an economic basket case with an advanced nuclear weapons program creates a chilling conjunction of dire need and dangerous capabilities. Past experience makes black-market sales a cause of concern, since the Kim Jong-un regime has relied on illicit activities—from passing counterfeit money to selling drugs and ballistic missiles—to maintain power. Then-Secretary of Defense Robert Gates famously described impoverished North Korea as willing to “sell anything they have to anybody who has the cash to buy it.”¹⁴¹ To date, however, North Korea has exercised caution by engaging in covert nuclear commerce only on the *state-to-state* level: most notably with Libya in 2007, with the sale of uranium hexafluoride (the feedstock of uranium enrichment); and with Syria, by providing a prototype nuclear reactor that Israel bombed in September 2007.

Leakage

Though the deliberate *transfer* scenario focused on Iraq, Libya, Iran, and North Korea has dominated the post-9/11 security debate, the more likely route by which terrorists might gain access to nuclear weapons or materials would be through unintended *leakage* from inadequately secured nuclear sites. This acute concern centers primarily on Russia (which, as discussed in a section below, has an enormous legacy nuclear force and infrastructure from the Cold War) and Pakistan (which is rapidly expanding its nuclear arsenal and could overtake Britain as the world's fifth-largest nuclear power, behind the United States, Russia, China, and France). Moreover, with China's announced plan to provide two civilian nuclear-power reactors to Pakistan, the scope of the potential leakage problem will expand in tandem with Pakistan's increased production of fissile material.¹⁴² In 2004, the existence of a long-suspected nuclear smuggling ring headed by A.Q. Khan, the so-called father of Pakistan's nuclear-weapons program, was publicly confirmed. In a tearful “confession” on Pakistani television, Khan stated that his network had transferred nuclear components to Iran, Libya, and North Korea over a 15-year period, but that the government had not authorized these illicit activities.¹⁴³

In addition to the leakage of sensitive technologies from the A.Q. Khan network to unpredictable states, another highly disturbing development was a reported meeting of Pakistani nuclear scientists with Osama bin Laden only weeks before 9/11. Supporters of the Taliban's ultra-orthodox version of Islamic rule and jihadist causes, the scientists expressed the belief that Pakistan's nuclear capability is "the property of the whole Muslim community."¹⁴⁴ The episode underscored Al Qaeda's driving intention to carry out a mass-casualty attack employing still more powerful unconventional weapons.

The Islamabad government responded to the embarrassing revelations about the Khan network by instituting additional measures to ensure the physical security of the country's nuclear stockpile against theft and unauthorized use. When questioned about the threat of Pakistani nuclear weapons falling into the hands of the Taliban or Al Qaeda, then-President Obama expressed confidence in 2009 that "we can make sure that Pakistan's nuclear arsenal is secure, primarily... because the Pakistani army... recognizes the hazards of those weapons falling into the wrong hands. We've got strong military-to-military consultation and cooperation."¹⁴⁵ That assurance notwithstanding, Pakistan expert Stephen Cohen warned that the system of nuclear safeguards "could be circumvented in a determined conspiracy."¹⁴⁶

Indigenous Production

The third pathway to nuclear-weapons acquisition is indigenous production—the possibility that, without the direct assistance of a state, a non-state actor could translate its *aspiration* to acquire an unconventional weapon into the construction of a homegrown WMD *capability*. A 1982 National Intelligence Estimate reflected the prevailing Cold War assessment of the nuclear threat: "During the period of this Estimate, the ability of subnational groups to acquire nuclear materials and to fabricate a workable nuclear device probably will remain low. The technical skills required probably will remain beyond the capabilities of well-known terrorist groups, and special nuclear material will remain difficult to acquire."¹⁴⁷ In October 2001, however, the CIA concluded that "fabrication of at least a 'crude' nuclear device was within Al Qaeda's capabilities, if it could obtain fissile material."¹⁴⁸

Expert opinion remains divided over the feasibility and likelihood of this acquisition route—specifically, whether the primary constraint on a non-state actor’s ability to construct a nuclear weapon is mere access to the requisite nuclear material. On one side are those who argue that terrorists could build a “simple” gun-type device based on illicitly obtained highly enriched uranium.¹⁴⁹ A 1977 report by the U.S. Congress’s Office of Technology Assessment famously concluded that “a small group of people (possibly terrorists or criminals), none of whom have ever had access to classified literature, could possibly design and build a crude nuclear explosive device.”¹⁵⁰ While enriched uranium would offer the easier pathway to a weapon, some analysts go further, even claiming that the construction of a more complex implosion-type weapon using plutonium was potentially within a sophisticated terrorist group’s technical grasp. Other experts, however, are skeptical of this technical assessment. For example, Stephen Younger, a physicist long-experienced in nuclear-weapons design at the Los Alamos National Laboratory, observes: “‘Just put a slug of uranium into a gun barrel and shoot it into another slug of uranium’ is one description of how easy it is to make a nuclear explosive. Really? ... [D]esign problems can be solved by experimentation, as indeed all nuclear states solved them in the design of their own weapons, but that requires a level of technical resources that, until recently, few *countries* could draw upon....”¹⁵¹

In addition to weapons-grade fissile material and a workable bomb design, a terrorist group would require sophisticated machine tools, a high-explosive testing range for triggering the device, and additional infrastructure. But notwithstanding these constraints, nuclear experts Matt Bunn and Anthony Wier conclude: “A nuclear attack might be one of the difficult missions a terrorist group could hope to try, but if a highly capable group acquired a stolen nuclear bomb or enough nuclear material to make one, there can be few grounds for confidence that they would be unable to use it.”¹⁵² Concern that a non-state terrorist group could cross this technological threshold to construct a nuclear-weapons capability has invigorated efforts to globally secure weapons-grade fissile material. President Obama made this one of the pillars of the comprehensive arms control and nonproliferation agenda

that he laid out in his Prague speech in 2009. A major objective of the four Nuclear Security Summits convened by the Obama administration after 2010 and involving some 50 world leaders had been to secure the estimated 2,000 metric tons of highly enriched uranium and separated plutonium worldwide. An essential complement to securing materials is denying a terrorist group a scientific-technological infrastructure and financing rivaling that of a state—for example, of the kind acquired by the Islamic State through its occupation of Mosul. Unfortunately, those Nuclear Security Summits, which provided a clearinghouse for international cooperation, have been discontinued by the Trump administration.

“Dirty Bombs”

Given the significant hurdles of buying, making, or stealing a weapon, nuclear terrorism is most likely to take the form of a so-called “dirty bomb” (also referred to as a radiation dispersal devices, or RDD), which uses dynamite or some other conventional explosive to disperse radioactive material. A dirty bomb would not require weapons-grade fissile material, but could use radioactive sources, such as cesium and strontium, which are employed commercially or in hospitals. The immediate casualties from a dirty bomb attack would result from the blast effect of the device’s conventional explosive rather than its radioactive core. The number of victims resulting from a dirty bomb’s radiological effects would depend on a number of factors—the most significant of them being the ability of the device to aerosolize the radioactive material, thereby causing further human contamination through dissemination by wind. Though casualty estimates derived from models of RDD attacks vary significantly, they are of a scale such that a report from the National Defense University in Washington, D.C. concluded, “contrary to popular beliefs, RDDs are not weapons of mass destruction.”¹⁵³ The consequences of a “dirty bomb” attack would be primarily economic, social, and psychological, as local, state, and federal governments undertake a lengthy and expensive clean-up, and civilians shun areas they consider contaminated even when that clean-up process has been completed. Because public fear of radiation could well trigger mass panic, RDDs have been called weapons of mass *disruption*.¹⁵⁴ The only dirty bomb incident was carried out by the Chechen resistance movement, whose leaders repeatedly

threatened a chemical, biological, radiological, and nuclear (CBRN) attack against Russia in the 1990s. In November 1995, a Chechen separatist leader contacted the media to warn that a dirty bomb containing cesium had been buried in a Moscow park. The Russian authorities deactivated the dirty bomb, which was probably deployed by the Chechens as an instrument of psychological warfare.

Though terrorists can mount mass-casualty attacks using conventional means, apocalyptic groups such as Al Qaeda and ISIL retain an interest in RDDs because they are capable of generating large-scale socio-economic disruption and are far easier to acquire than a nuclear weapon. The Aspen Homeland Security Group soberly concluded: “The acquisition and dispersal of small quantities of radioactive materials such as cesium and cobalt, which are regularly used in medical and industrial activities, are far less technologically challenging than building and detonating a nuclear bomb. It is, therefore, somewhat surprising terrorists have not taken this path.”¹⁵⁵ After the Brussels bombing in March 2016, the press reported that an ISIL sympathizer had worked and committed an act of sabotage at Belgium’s Doel nuclear power plant before joining ISIL in Syria. Fears that ISIL was plotting an attack on Belgium’s nuclear facilities were fueled by a video of a top Belgian nuclear official seized in the apartment of a terrorist suspect.¹⁵⁶ In Iraq, ISIL reportedly seized 88 pounds of uranium compounds stored at Mosul University, which, though fortunately not weapons-grade, could presumably have been utilized in a radiological device.¹⁵⁷

The Origins of Nuclear Terrorism

The specter of nuclear terrorism has been a major concern since the creation of the first atomic bomb. In 1946, a year after two atomic bombs were dropped on Japan to end World War II and three years before the Soviet Union tested its own weapon, J. Robert Oppenheimer, the technical director of the Manhattan Project, was asked in a closed Senate hearing whether a nuclear bomb could be smuggled into New York. Oppenheimer answered, “Of course, it could be done, and [a few] people could destroy New York.” Oppenheimer was pessimistic about the practical possibility of preventing nuclear terrorism. When a startled senator asked “what instrument

would you use to detect an atomic bomb hidden somewhere in a city,” Oppenheimer quipped, “a screwdriver” to open every crate.¹⁵⁸

The USSR’s successful test of an atomic bomb in 1949 fueled concern that the Soviet regime might launch a sneak attack on the United States through nuclear terrorism. A 1950 National Intelligence Estimate (NIE) warned that “the Soviet Union has the capability for clandestine atomic explosions in ports and selected inland areas.”¹⁵⁹ An updated NIE on Soviet intentions and capabilities in 1951 identified different smuggling scenarios, including the specter of the Soviet Union’s secreting a “disassembled” bomb into “an isolated section of the U.S.” Along with capabilities, the CIA estimate also saw potential Soviet intent to utilize this unorthodox mode of attack: “The USSR will have no scruples about employing any weapon or tactic which promises success in terms of over-all Soviet objectives.”¹⁶⁰ Against this background of perceived threat from America’s Cold War adversary—the second nuclear-weapon state—an interagency group involving the Department of Defense and the Atomic Energy Commission (the precursor to the Department of Energy) examined possible defenses. The resulting “Screwdriver report,” so-named after Oppenheimer’s famous quip, concluded that wide-area detection of nuclear weapons and materials was not technically feasible, but that reasonably good point detection could be provided at key points of entry to detect kilogram-quantities of weapons-grade plutonium and uranium.¹⁶¹ The recommendations of the “Screwdriver Report” were implemented through *Project Doorstep* during the 1950s and 1960s. Among the measures taken to address the covert threat was the setting up of instruments at the main ports of entry used by Soviet-bloc diplomats to detect nuclear materials.

The Cuban Missile Crisis and the Mao regime’s testing of an atomic bomb in 1964 generated renewed concern about the vulnerability of the United States to a clandestine nuclear attack from the Soviet Union or China. A 1968 National Intelligence Estimate warned that the Beijing regime might attempt to smuggle a nuclear weapon into the United States to deter the Johnson administration from launching a preemptive strike on China. Though successive NIEs during the 1950s and 1960s laid out various potential scenarios, the CIA never considered such a

clandestine attack to be likely—nor does the available evidence (including some archival evidence) indicate that the option was ever seriously contemplated by Moscow or Beijing.¹⁶² The general view of state-sponsored nuclear terrorism by the Soviet Union and China was that such an attack would be the prelude to the initiation of general war. Once the United States (and the Soviet Union) acquired secure second-strike capabilities in the 1960s (thereby negating the possibility of a decapitating first strike), the concern about state-derived threats abated.

During the 1980s, concern about the nexus of terrorism and proliferation focused on certain Third World countries—a group eventually designated by U.S. officials as “rogue states.” A critical development in this evolution was the inauguration of the Department of State’s official listing of countries employing terrorism as an instrument of state policy. The Secretary of State was mandated by Congress to make this determination on an annual basis under a provision of the Export Administration Act of 1979. The step ushered in a heightened U.S. focus on the problem of state-sponsored terrorism that continued under the Reagan administration.

The proliferation of ballistic missile programs in the Third World and the Saddam Hussein regime’s use of chemical weapons against Iran during the 1980s symbolized the emerging nexus of terrorism and proliferation. After the 1991 Gulf War to reverse the Iraqi invasion of Kuwait, Saddam Hussein’s Iraq was the rogue archetype: a regime pursuing weapons of mass destruction and employing terrorism as an instrument of state policy.

At the end of the Cold War, the conventional wisdom was that the threat of nuclear war between the great powers had declined, but the use of a single weapon by a terrorist group had increased. This new calculus of threat reflected not only the rise of terrorist groups, notably Al Qaeda, with the *intention* of carrying out mass-casualty attacks, but also the increased concern that these groups could acquire this *capability* through the sale or handoff (transfer) of a weapon from a state or through the theft (“leakage”) of a nuclear weapon or weapons-grade fissile material that would permit terrorists to construct a rudimentary bomb. The nightmare scenario

of a “rogue state” transferring a nuclear weapon to a terrorist group was central to the Bush administration’s case for a war of regime change in Iraq in the transformed international security environment after the 9/11 terrorist attacks.

Deterrence and the Nexus of Proliferation and Terrorism after 9/11

Since 9/11, the concept of deterrence has been retooled to address the threats of a new era. Millenarian terrorist groups, like Al Qaeda and ISIL, aspiring to conduct mass-casualty attacks, may not be deterred by the threat of retaliation, but states, existing in an international system with laws and norms to govern state behavior, are subject to leverage to affect their behavior. In 2004, the United Nations Security Council (UNSC) unanimously passed Resolution 1540, which recognizes non-state WMD terrorism as a “threat to international peace” and requires member states to adopt and enforce corresponding domestic regulatory measures. A violation of UNSCR 1540 would be referred to the Security Council for appropriate punitive action under the UN Charter’s Chapter VII. UNSCR 1540 added an additional normative and legal layer to the nonproliferation regime whose bedrock agreement is the Non-Proliferation Treaty, or NPT.

As examined above, the principal pathways for a non-state terrorist entity to acquire a nuclear weapon or the weapons-usable materials to build one—deliberate transfer or theft (“leakage”)—from a state have been countered, respectively, by two updated variants of traditional deterrence. *Deterrence by punishment* seeks to affect the intention of a state to carry out a hostile act through the credible threat of a punitive response, whereas *deterrence by denial* seeks to affect the *capabilities* of the target state (either by blocking the acquisition of those means or through the adoption of defensive measures to render them ineffective).¹⁶³ It is worth noting that an inherent tension exists between the twin variants of deterrence—punishment and denial. An over-emphasis on the punitive threat of the former potentially undercuts the target state’s incentive for cooperating in the implementation of the latter. The policy tension between punishment and denial can be managed but not resolved.

Deterrence by Denial

The vast majority of work done in the nonproliferation area to counter nuclear terrorism falls under the rubric of *deterrence by denial*. This covers a range of activities, such as export controls to limit access to technology as well as physical security at sensitive sites to lock down fissile material to prevent illicit diversion, an objective pioneered through the U.S. Cooperative Threat Reduction program which the Obama administration had proposed expanding to regions beyond its original focus on the former Soviet Union. But some forms of deterrence by denial can be non-cooperative—a notable example of which is the interdiction of contraband cargoes through the multinational Proliferation Security Initiative (PSI) to prevent the trafficking of WMD technologies.

The Obama administration pursued “cooperative threat reduction”—a deterrence-by-denial strategy—through a series of four Nuclear Security Summits, the last of which was held in Washington, DC in April 2016 and brought together some 50 heads of state. A signature accomplishment of the summit process was the reduction in the number of countries with weapons-usable nuclear materials from 32 in 2010 to 24 by the end of 2015.¹⁶⁴ Overall, the summits resulted in the removal of approximately 3,000 kilograms of highly enriched uranium (HEU), enough for some 100 bombs. But to put that in perspective, that accounted for only four percent of global HEU stocks because the summit initiative focused only on “civilian” programs and excluded those devoted to military use.

Meanwhile, Pakistan, China, India, and Japan are planning facilities that will add to their stocks of plutonium. In addition, Russia, which has some of the largest stockpiles of HEU and plutonium, boycotted the 2016 summit in Washington to express Putin’s political pique with the United States over Ukraine sanctions.¹⁶⁵ Yet the Nuclear Security Summit process globally extended the cooperative security approach. As Harvard University’s Graham Allison concludes, “By convening heads of state on a biannual basis, the Nuclear Security Summits raised awareness of this threat, galvanized high-level attention to actions nations could take to reduce risks, and spurred real commitments.”¹⁶⁶ However, that momentum has dissipated

since the Nuclear Security Summits—which the United States spearheaded—have not continued under the Trump administration. Calls to institutionalize the Nuclear Security Summit or develop a multilateral alternative reflect the continued urgency of the problem and the efficacy of this deterrence-by-denial strategy—that increased efforts by *states* to secure nuclear weapons and weapons-usable materials will impede the ability of a *non-state* terrorist group to buy, build, or steal a bomb.

Deterrence by Punishment

The impetus for the Bush administration’s decision to launch a preventive war to topple the Saddam Hussein regime in Iraq in 2003 was the nightmare scenario that a “rogue state” would transfer a nuclear weapon to a terrorist group, yet the Bush administration did not issue a deterrent threat to prevent such a transfer from state to non-state actor until the North Korean nuclear test in October 2006. Dating back to the collapse of the Agreed Framework in 2003, President Bush had warned North Korea that its efforts to acquire nuclear weapons would “not be tolerated.”¹⁶⁷ Nonetheless, North Korea greatly augmented its stock of weapons-grade fissile material by separating plutonium from its Yongbyon reactor’s spent fuel rods. Only after North Korea actually conducted a nuclear test in October 2006 and became a self-proclaimed nuclear weapon state did President Bush enunciate a policy of deterrence by punishment: “The transfer of nuclear weapons or material by North Korea to states or non-state entities would be considered a grave threat to the United States, and we would hold North Korea *fully accountable* for the consequences of such action” [emphasis added].¹⁶⁸

While Bush’s statement specifically referenced North Korea, the administration subsequently broadened that formulation into a general policy in February 2008.¹⁶⁹ Yet the difficulty of enforcing red lines was evidenced after the North Korean nuclear test and the Bush administration’s deterrent threat, when Pyongyang conducted a *state-to-state transfer* with Syria by providing a prototype nuclear reactor. Citing concerns about the “low reliability” of intelligence, the Bush administration did not respond militarily. However, Israel took unilateral action, bombing the Syrian site in September 2007.¹⁷⁰

The Obama administration's *Nuclear Posture Review* of 2010 included a verbatim repetition of the Bush policy on transfer: "renewing the U.S. commitment to hold fully accountable any state, terrorist group, or other non-state actor that supports or enables terrorist efforts to obtain or use weapons of mass destruction, whether by facilitating, financing, or providing expertise or safe haven for such efforts."¹⁷¹

But what does "fully accountable" mean in practice? To the dismay of arms control proponents who hold that the sole purpose of nuclear weapons should be to deter other states' nuclear weapons, the Obama administration's calculated ambiguity left open "the option of using nuclear weapons against foes that might threaten the United States with biological or chemical weapons or transfer nuclear material to terrorists."¹⁷² The Trump administration's *Nuclear Posture Review* of 2018, which paralleled the previous administrations' formulations, went further, directly threatening retaliation: "For effective deterrence, the United States will hold fully accountable any state, terrorist group, or other non-state actor that supports or enables terrorist efforts to obtain or employ nuclear devices. Although the role of U.S. nuclear weapons in countering nuclear terrorism is limited, our adversaries must understand that a terrorist nuclear attack against the United States or its allies and partners would qualify as an 'extreme circumstance' under which the United States could consider the ultimate form of retaliation."¹⁷³

Deterrence by punishment addresses the deliberate transfer of a nuclear weapon or technologies by a state to a non-state actor. Yet the "fully accountable" formulation also raises the stakes for states to ensure that those capabilities do not come into the possession of terrorist groups. In this context, as examined below in the discussion of attribution technologies, the fear of deterrence by punishment creates a powerful incentive for states to implement deterrence-by-denial measures to secure these capabilities.

Deterrent Challenges

“No leader of any nuclear country other than North Korea,” nuclear expert Michael Levi observed, “has any meaningful incentive to deliberately transfer nuclear weapons or materials to a terrorist group.”¹⁷⁴ More likely than the direct transfer of unconventional weapons from a rogue state to a terrorist group is the inadvertent “leakage” of nuclear and other WMD-related materials to terrorist groups from states that exert inadequate controls over these dangerous technologies. For this pathway to terrorist acquisition, the countries of primary concern are not the “rogues”—Iran and North Korea—but rather Russia and Pakistan.

Technical advances in the area of nuclear “attribution” will increasingly permit experts to determine the *source* of fissile material should an attack occur.¹⁷⁵ Toward that goal, the George W. Bush administration established the National Technical Nuclear Forensics Center within the Department of Homeland Security in 2006. According to this DHS unit’s mission statement, “Nuclear forensics may support attribution efforts that serve to bolster U.S. defenses against nuclear threats, across a wide spectrum, by *encouraging* nations to ensure the security of their nuclear and radiological materials or weapons to help prevent unwitting transfers to third parties through loss of control” [emphasis added].¹⁷⁶ The United States has an interest in publicizing its attribution capabilities so that states of proliferation concern will know that they need to take possibility of detection, and the attendant risk of retaliation, into account.¹⁷⁷ Indeed, even without nuclear forensics, with its vast network of intelligence assets and relationships with allied services, the United States has been able to trace some three-quarters of past high-casualty terrorist attacks back to the perpetrators.¹⁷⁸ No state would likely run the risk that the transfer or illicit diversion of a nuclear weapon or technologies would escape detection.

In the thorny case of Pakistan, political scientist Caitlin Talmadge argued, “It is difficult to imagine that the Pakistani government would turn a blind eye to a future A.Q. Khan if it believed that nuclear material or technology could be traced definitively back to Pakistan and that its people and infrastructure would suffer the consequences if those items were used in an attack against the United States.”¹⁷⁹

But should states be encouraged or explicitly threatened in order to ensure that they safeguard nuclear materials? A highly controversial proposal would extend the deterrent threat to these potentially negligent countries by enunciating a policy of “expanded deterrence” under which the country of origin of the fissile material used in a nuclear terrorist strike on the U.S. homeland would be held responsible.¹⁸⁰ The Trump administration’s Nuclear Posture Review cultivates ambiguity on this contingency. Yet despite improving attribution capabilities, the United States might be unable to conclusively determine the source of the material after an attack; and even if it could attribute it to the originating states, the United States would not want to be locked into automatic retaliation against a negligent state, such as Russia, which has a large nuclear weapons stockpile of its own. Opponents of “expanded deterrence” hold that “threatening retaliation against countries like Russia and Pakistan in response to terrorist attacks stemming from lax security practices is unwise. It undercuts efforts to work cooperatively with those states to improve their nuclear security, dissuades [them] from informing others if they discover that their nuclear weapons or materials [have been] stolen, [thereby] undermining any efforts to recover them, and makes it difficult to work with [them] in the aftermath of an attack to prevent further detonations.”¹⁸¹

The deterrent threat captured in the calculatedly ambiguous phrase “fully accountable” does not currently commit the United States to a retaliatory response against any country of origin. This declaratory policy straddles the alternatives of “expanded deterrence” and that of non-retaliation. The aim would be to compel countries that need to improve fissile material security to do more to deny terrorists access to nuclear and other WMD capabilities. In short, the fear of *deterrence by punishment* could lead countries that are the potential sources of nuclear leakage to implement more effective strategies of *deterrence by denial*.

Deterring Accountable States

Understanding exactly how to deter countries also involves understanding who are the most likely candidates to be deterred. There are nine nuclear weapons

states—the United States, Russia, China, Britain, France, India, Pakistan, Israel (undeclared but acknowledged), and North Korea. An additional fifteen states possess weapons-usable materials—highly enriched uranium (HEU) and plutonium. If the game changer—a nuclear 9/11—occurred, from which *state* would the bomb the terrorists used most likely have come? A poll of proliferation experts would likely yield three suspects: Pakistan, North Korea, and Russia.

The country missing from this list is the one that the State Department calls the most active state sponsor of terrorism—Iran. The counterintuitive reason for this striking omission is that the 2015 nuclear agreement reached between Iran and the world’s major powers, if it continues after the U.S. withdrawal from the JCPOA in 2018, will block Iran’s pathways to a weapon or weapons-usable material for another decade. In short, the leading state sponsor of terrorism would not be among the leading suspects if the worst form of terrorism occurred. Nevertheless, the countries of primary concern with respect to the nexus of proliferation and terrorism—Pakistan, North Korea, Russia, and Iran (despite the nuclear deal, it is still the leading state sponsor of terrorism)—are each at an inflection point, and for very different reasons.

The Iran Nuclear Precedent: Constraining Capabilities

In July 2015, Iran was at an inflection point as Joint Comprehensive Plan of Action (JCPOA), negotiated between the Tehran regime and the world’s major powers, promised to constrain its access to weapons-usable nuclear materials for fifteen years. By bounding Iran’s capabilities, this arms control agreement was a form of deterrence by denial. The nuclear agreement was transactional (since it addressed a discrete urgent threat to prevent an Iranian nuclear breakout to the bomb), but it was not transformational (as the accord was limited to just the nuclear portfolio). Iran remains designated a state sponsor of terrorism by the U.S. State Department, but the JCPOA, if successfully implemented, would essentially eliminate the risk of Iran transferring a nuclear weapon or weapons-usable materials to a terrorist group.

The Obama administration’s strategy of “pressure and engagement” to attain the nuclear accord with Iran exemplified the successful management of the twin variants of deterrence—punishment and denial. The administration did threaten deterrence

by punishment—widely interpreted as a potential military strike on Iran’s nuclear infrastructure—if Iran crossed the technological threshold of weaponization. President Obama also clarified the mixed message of the Bush administration—making clear that the U.S. goal was to change Iranian behavior (by bringing Iran’s nuclear program into compliance with its NPT obligations), not the maximalist objective of regime change. By narrowing the focus to Iranian conduct that violated established international norms, the Obama administration generated multilateral support, which included Russia and China, to exert meaningful pressure on Iran.

The Iran nuclear accord set an important nonproliferation precedent. Proponents of the JCPOA expressed hope that this approach—*deterrence by denial* through arms control—could be applied to constrain the nuclear capabilities of North Korea, which is on the verge of acquiring the capabilities to directly target the U.S. homeland. But as examined in the previous section, President Trump withdrew the United States from the nuclear agreement, which he castigated as the “worst” deal ever, on the avowed grounds that it permitted Iran to maintain its nuclear program and did not address Iran’s “malign regional activities” in Syria, Iraq, and elsewhere.¹⁸² Iran has responded to the U.S. withdrawal by remaining within the JCPOA, for now, but pushing the envelope of the agreement’s constraints on uranium enrichment and denying the IAEA access to suspect sites.

North Korea: Deterring Leakage or Transfer

The projected growth of North Korea’s nuclear arsenal creates an increased risk of nuclear terrorism. Since 9/11, North Korea has both offered assurances that it would not transfer nuclear weapons to terrorists and threatened to do so. In 2005, two years after the U.S. invasion of Iraq to topple the Saddam Hussein regime, a North Korean vice foreign minister warned that the regime had no plans to transfer but would not rule it out “if the United States drives [us] into a corner.”¹⁸³

Director of National Intelligence James Clapper warned about “the possibility that North Korea might again export nuclear technology.”¹⁸⁴ Though information about North Korea’s record of nuclear exports is scant, two prominent *state-to-state* transfers are known: first, in 2001, the Pyongyang regime sold uranium hexafluoride

(the feedstock for centrifuges) to Libya via Pakistan's A.Q. Khan; and second, in September 2007, the Israeli Air Force bombed a nuclear reactor in Syria (not yet operational) provided by North Korea.¹⁸⁵ The urgent threat is that North Korea's increased production of weapons-grade uranium potentially creates "a new cash crop" for the financially strapped regime.¹⁸⁶

After North Korea's nuclear test in 2006, the Bush administration declared that the Kim regime would be held "fully accountable" if it transferred nuclear weapons or material to states or non-state entities. But, as previously discussed, "fully accountable" can mean a host of things. An alternative to calculated ambiguity would be an explicit red line: the deliberate transfer of WMD capabilities by a state to a non-state actor could trigger a non-nuclear, regime-changing response from the United States. Such a stance, which goes beyond current U.S. declaratory policy, could prove an effective form of *deterrence by punishment*. Further advances in nuclear forensics—the ability to attribute fissile material to its country of origin—would bolster the credibility of this threat.

Tightened UN Security Council sanctions, passed in March 2016 after North Korea's fourth nuclear weapons test, requires states to inspect all cargo passing through their territory to or from the DPRK.¹⁸⁷ This interdiction measure, in tandem with sanctions curtailing North Korea's access to funding and technology for its nuclear program, falls under the rubric of *deterrence by denial*. As with the four other major UN sanctions imposed on North Korea since 2006, effectiveness depends on Chinese enforcement, which has been tepid. China has turned a blind eye to the DPRK's sophisticated procurement network utilizing front companies and transshipment arrangements to import sensitive dual-use (i.e., civilian and military) technologies prohibited under UN sanctions.¹⁸⁸

A Harvard Kennedy School study on preventing nuclear terrorism laid out alternative futures for 2030: a "high-security scenario," in which North Korea's nuclear capabilities have been "verifiably eliminated or capped at a low level, pending elimination;" and a "low-security scenario," in which the North "continues to expand its arsenal, to well over 100 nuclear weapons."¹⁸⁹ A complete rollback

of North Korea's nuclear program in the near term is not feasible with a regime that regards nuclear weapons as both a deterrent vital to regime survival and a bargaining chip to extract economic concessions. That policy duality for North Korea has its analogue in the United States' twin strategy of deterrence: a "punishment" variant that threatens regime-changing retaliation should a North Korean-origin nuclear weapon or weapons-grade fissile material be transferred to a terrorist group; and a "denial" variant (through efforts to negotiate a freeze of its nuclear activities) that requires North Korean compliance and entails U.S. concessions (i.e., sanctions relief) that are potentially regime-extending.

President Trump's three meetings with Kim Jong-un since 2018 have changed the psychology of the nuclear crisis by pushing off the prospect of a preventive U.S. military strike. But as the diplomatic impasse persists, North Korea continues to build up its arsenal and stocks of weapons-usable fissile material. In 2018, NTI's authoritative Nuclear Security Index rated North Korea the greatest risk of theft among 22 countries with weapons-usable material.¹⁹⁰

The Pakistani Threat

Pakistan presents the striking contrast of a fragile state with a struggling economy (ranked 204th among states in per capita GDP and on a trajectory to become the world's fourth-largest nuclear-weapon state in terms of population).¹⁹¹ Its doctrine of credible deterrence has entailed the development of tactical nuclear weapons more vulnerable to theft. Pakistan, rated worst for "risk environment" among 22 states with weapons-usable nuclear materials in NTI's Nuclear Security Index, faces a formidable homegrown jihadist threat that threatens the country's domestic stability.¹⁹² The U.S. intelligence community's "classified budget" for 2013, a copy of which was obtained by The Washington Post, belied the confidence about Pakistan's nuclear security expressed publicly by U.S. officials. The document warned that "knowledge of the security of Pakistan's nuclear weapons and associated material encompassed one of the most critical set of...intelligence gaps." Those blind spots were especially worrisome, the document said, "given the political instability, terrorist threat and expanding inventory [of nuclear weapons]

in that country.” The magnitude of concern within the intelligence community is such that the budget section for preventing the illicit transfer of nuclear weapons is divided into two categories: Pakistan and all other countries.¹⁹³

To counter the threat of nuclear leakage in Pakistan, the Obama administration implemented a policy of deterrence by denial in the country through a \$100 million program to secure Pakistan’s nuclear laboratories and weapons (e.g., by separating warheads from triggers and missiles). Yet, U.S. officials remain concerned about scientists who support radical Islamic causes infiltrating Pakistan’s nuclear establishment and, more broadly, about the remote (but not unthinkable) possibility of an acute regime-threatening political crisis during which nuclear security is breached and a warhead falls into the hands of Islamic extremists.¹⁹⁴

Indeed, the unilateral U.S. military strike on Osama bin Laden’s compound in Abbottabad in 2011 that violated Pakistani sovereignty heightened the preexisting Pakistani apprehension about such a U.S. commando threat to their nuclear arsenal. Hence, in a statement to Parliament after the bin Laden raid, the Pakistani Prime Minister, Yusuf Raza Gilani, reaffirmed Pakistan’s strategic relationship with the United States, but went on to warn, “Any attack against Pakistan’s *strategic assets* [code for the country’s nuclear arsenal] whether overt or covert will find a matching response. Pakistan reserves the right to retaliate with full force” [emphasis added].¹⁹⁵ The bin Laden episode and its aftermath reflected the political tension inherent in a relationship in which each views the other both as partners and threats.

The Obama administration reportedly floated a deal that would cap Pakistani nuclear capabilities (in particular, the expansion into vulnerable tactical nuclear weapons for battlefield use) in return for relaxing the strict controls on nuclear exports to Pakistan. The proposal would have essentially traded off Pakistani restraint and transparency for measures to normalize the Pakistani nuclear program, essentially on par with the nuclear cooperation deal the Bush administration concluded with India in 2006.¹⁹⁶ However, the prospects for such nuclear diplomacy in South Asia to decrease the risk of nuclear leakage from Pakistan have dimmed. The Trump administration has generally backed off international diplomacy

and relations with the Islamabad regime deteriorated over counterterrorism and Afghanistan. In addition, regional tensions, with dangerous escalatory potential, are running high: Pakistani and Indian forces clashed in Kashmir in February-March 2019, and Chinese and Indian forces skirmished along their contested border in June 2020. Within this fraught context, the NTI Nuclear Security Index, while noting enhancements of insider threat prevention in Pakistan since 2016, concluded that nuclear security conditions remain “adversely affected by continued increases of weapons-usable nuclear materials, by political stability and corruption challenges, and by the judgment that groups interested in and capable of illicitly acquiring nuclear materials are present.”¹⁹⁷

Russia: The End of Cooperative Threat Reduction?

Since the early 1990s, when the disintegration of the USSR raised concerns about the security of the vast Soviet nuclear arsenal, U.S. measures to deter nuclear terrorism have garnered bipartisan support. Former Secretary of Defense William Perry referred to the Cooperative Threat Reduction (CTR) program as “defense by other means.”¹⁹⁸ By significantly reducing the threat that a Russian “loose nuke” could be illicitly transferred by sale or theft to a terrorist group, CTR was an effective form of deterrence by denial. The end of CTR raises concerns about Russian backsliding—whether, for example, the financially strapped Putin regime will continue to fund the U.S.-financed security upgrades at Russian nuclear sites.

The NTI’s Nuclear Security Index ranked Russia as having the next-to-worst “risk environment” (only Pakistan was lower) among 22 countries with weapons-usable nuclear materials.¹⁹⁹ Russia’s attitude is contradictory: on one hand, the Putin regime helped achieve the nuclear deal with Iran as a member of the P5+1; on the other hand, it boycotted the Nuclear Security Summit convened by the Obama administration in April 2016 in the wake of the Ukraine crisis and the resulting imposition of U.S. and EU sanctions on Russia.

The basis for revived U.S.–Russian cooperation exists both in the Global Initiative to Combat Nuclear Terrorism, an international partnership of 86 nations established by the United States and Russia in 2006 to strengthen global capacity to prevent, detect, and respond to nuclear terrorism, and in UN Security Council Resolution 1540, which requires member states to prevent the proliferation of weapons of mass destruction to non-state actors.²⁰⁰ The International Atomic Energy Agency (IAEA), which Russia alluded to in announcing its decision not to participate in the 2016 Nuclear Security Summit, could be positioned to facilitate revived nuclear cooperation.

Former senators Sam Nunn and the late Richard Lugar, who pioneered the Cooperative Threat Reduction program as the Cold War ended, proposed an agenda for a new U.S.–Russian partnership on nuclear security: “accelerating efforts to repatriate and eliminate U.S. and Russian-origin highly enriched uranium from other countries; collaborating on research and development of innovative nuclear security technologies; expanding nuclear security best-practice exchanges; and utilizing the extensive U.S. and Russian technical expertise to help support nuclear security improvements in other countries with nuclear materials.”²⁰¹ A monograph on preventing nuclear terrorism by Harvard University’s Belfer Center argues for “a package of cooperation” on security that would also encompass nuclear energy, which would be an incentive of particular economic interest to Rosatom.²⁰²

Given the overriding importance of nuclear security and counterterrorism, neither the United States nor Russia should not link nuclear security cooperation to other issues, such as Ukraine. Even during the Cold War, the United States and Soviet Union pursued nuclear arms control and eschewed linkage to other issues, such as Vietnam, because of their strong mutual interests. In the current era, however, as a political matter, the open question is whether pragmatic cooperation to address the urgent persisting threat of nuclear terrorism can be reestablished and insulated from the vicissitudes of the troubled U.S.–Russian relationship. The Trump administration’s expressed desire to improve relations with Russia has not translated into the resumption of nuclear security cooperation. Russia is far from indifferent to the risks of a terror group getting hold of sufficient fissionable material to construct a rudimentary nuclear device or a dirty bomb. After all, Russia has suffered

terror attacks perpetrated by Chechen separatists with overall civilian casualties comparable to those from the 9/11 attacks. Yet a challenge in reviving cooperation to mitigate the threat of nuclear terrorism is that the Putin regime perceives the United States as an even greater threat to its national security and vital geopolitical interests than terrorism.²⁰³

Deterring Non-State Actors

When declaring the initiation of U.S. military operations against ISIL in August 2014, President Obama stated that the Islamic State in Iraq and Syria was neither Islamic nor a state. But by occupying territory in Syria and Iraq and declaring that geographical area a caliphate, ISIL has assumed some of the attributes of a state (though is now experiencing territorial setbacks with the Iraqi army's offensive in the region between Baghdad and Mosul). By contrast, Al Qaeda under Osama bin Laden preferred operating in a weak state like Afghanistan and viewed the establishment of a caliphate as a visionary goal.

ISIL's control of a major city like Mosul provided this terrorist organization the technological and engineering assets of a magnitude comparable to a state that could have allowed it to develop WMD capabilities. ISIL, which has a declared interest in acquiring WMD capabilities, also had an active chemical weapons program. ISIL's control of a major city provides it assets that could allow it to develop WMD capabilities. For instance, the group exploited a well-stocked chemistry lab at the University of Mosul to produce mustard gas for use against Kurdish fighters in northern Iraq.²⁰⁴ ISIL propaganda touted the possibility that, with the funds seized from banks in Mosul and other cities, the terrorist organization could tap its sympathizers in Pakistan to purchase a nuclear weapon from corrupt officials. Rolling back ISIL's control over territory in Iraq and Syria blocked its access to the financial and technological capabilities of a state.²⁰⁵ Such a strategy of deterrence by denial does not eliminate ISIL's threat of WMD terrorism, but substantially reduces it.

This study has focused on the role of deterrence in preventing catastrophic nuclear terrorism by a non-state actor involving an actual weapon bought or stolen from a

state. This nightmare scenario is the classic deterrence challenge—mitigating the threat of a low-probability event of highest consequence. A much more likely event of lower consequence would be the detonation of a radiological dispersal device (RDD)—a so-called “dirty bomb”—by ISIL or another terrorist group. After ISIL’s deadly attack in Brussels in March 2016, Belgian investigators discovered that the terrorist cell that conducted the operation had also surveilled a nuclear power plant and videotaped a scientist at a nuclear research facility.²⁰⁶ ISIL is motivated to conduct a dirty bomb attack in the United States or Europe because it would generate the group’s desired result—mass terror.²⁰⁷ RDDs have been called “weapons of mass disruption” because their consequences would be primarily economic and psychological. Though the cleanup of radioactive materials wrapped into an RDD’s conventional explosive could cost billions of dollars, fatalities would likely be limited to those in the blast zone. More serious would be an attack on a nuclear power plant.

A strategy of deterrence by denial would aim both to block ISIL’s (or any other terrorist group’s) access to RDD capabilities and to deploy defenses to prevent a successful attack on a nuclear power plant. The former would entail securing radiological materials as is being done with weapons and weapons-usable materials. But radiological isotopes are in pervasive use throughout society in medicine and business, so a denial approach, while necessary, cannot realistically eliminate the RDD threat. As a dirty bomb event is more likely than not to occur in the future, governments should mount a public education campaign on RDDs, and how they differ from nuclear weapons, to increase national resiliency and stave off mass panic in the wake of an attack.²⁰⁸ A telling indicator of the urgent concern about the dirty bomb contingency is that at the Nuclear Security Summit in April 2016, world leaders were asked to role-play in a scenario devised by the White House in which a terrorist group acquires radioactive isotopes stolen from a hospital and plots an attack. The United States and Britain agreed to conduct a joint war game to assess the resilience of nuclear power stations to a terrorist attack, but that plan was shelved with the change in U.S. administrations.²⁰⁹ The starting point for preventing nuclear terrorism is a strategy of deterrence by denial—securing radioactive materials in *states*—to block access to non-state actors who would perpetrate an attack. For the United

States, where the concern is not just foreign terrorist organizations but also domestic extremists aiming to conduct an RDD attack, the General Accountability Office uncovered serious gaps in U.S. controls over radioactive materials.²¹⁰

State-Focused Strategies of Deterrence to Counter Non-State Threats

The Trump administration has not matched up its rhetoric about the seriousness of the threat of nuclear terrorism with actions to mitigate the risks. Indeed, the administration has reduced funding to the Department of Energy programs responsible for coordinating nuclear security efforts with other countries, while the National Technical Nuclear Forensics Center has been “effectively gutted” (according to a *Los Angeles Times* report) and the Department of Homeland Security’s International Cooperation Division, which has the lead in preventing nuclear smuggling, has been disbanded.²¹¹

In 2004, Harvard political scientist Graham Allison published *Nuclear Terrorism: the Ultimate Preventable Catastrophe*, which sounded the alarm about a dire threat—one increasingly inevitable but also preventable through an agenda of feasible and affordable actions.²¹² A telling symbol of the threat was the video that Osama bin Laden released after the 9/11 terrorist attacks, exalting in its success and climaxing with a mushroom cloud superimposed over a city. Though the U.S. counterterrorism campaign and other measures against Al Qaeda have helped forestall that threat, they have not eliminated it. Since nuclear terrorism is a low probability event with high consequence, and the costs of mitigating the risk are modest, policymakers should implement a multifaceted agenda of actions.²¹³

Nuclear terrorism encompasses a spectrum of threats—the detonation of a nuclear bomb, an attack on a civil nuclear installation, or the dispersal of radiological materials through a “dirty bomb.” Each differs in probability and consequence. But the strategies adopted to counter these variegated threats share a fundamental characteristic. Their focus is on state actors, who through either their intent or laxness,

would be the source countries of the weapons, nuclear technology, and radioactive materials that terrorists would use to perpetrate attacks. This underscores the central focus of this analysis: Effective strategies of deterrence, which effectively integrate both the denial and punishment variants, on the *state* level remain the prerequisite for countering the *non-state* threat of nuclear terrorism. While twenty-two countries have weapons-usable nuclear materials, the states of greatest concern remain Russia, North Korea, and Pakistan, and Iran. The collapse of U.S.-Russian nuclear cooperation, stymied nuclear diplomacy with North Korea, the continued growth of Pakistan's arsenal (including tactical nuclear weapons), and uncertainty about the Iran nuclear agreement's future create a new constellation of risks.

Restoring U.S. leadership on nuclear security—by making it a top governmental priority and providing the requisite resources—is key to reviving the political momentum that has dissipated since 9/11. A comprehensive blueprint of specific political and technical measures to improve nuclear security are delineated in a 2019 report of Harvard University's Belfer Center.²¹⁴ Prominent among the recommendations are steps to bolster the international framework—including U.S. bilateral security cooperation with willing states possessing weapons-usable nuclear materials. With respect to the hard cases, the United States should not link cooperation with Russia, and conceivably Pakistan and India, to other policy issues given the paramount importance of nuclear security to the global order. Further, as examined in the previous section on horizontal proliferation, transactional diplomacy with Iran (by maintaining the JCPOA's constraints) and North Korea (through an interim deal to cap the North's production of weapons-usable nuclear materials) offer a plausible path analytically, though the political impediments remain formidable. A former senior U.S. official once quipped: problems have solutions; dilemmas have horns. The dilemmas of nuclear risk reduction—in short, making the best of a bad situation—can be managed, but not resolved through prudent policymaking.



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Conclusion

Humanity faces three catastrophic, if not existential, threats—a pandemic, climate change, and nuclear war. In 2020, the coronavirus (COVID-19) pandemic has precipitated a global disruption, while the harbingers of climate change have been manifest in unprecedented extreme weather, wildfires, and polar melting. In contrast, the nuclear threat does not similarly command attention through disruption of our daily lives. Opinion polls reflect that the fear of nuclear war or nuclear terrorism has receded in the public consciousness since the end of the Cold War. Recent “Worldwide Threat Assessments” by the Director of National Intelligence have led with the threat of a cyberattack. Yet a nuclear event would be a global game changer—and the risks of that have risen to their highest level since the Cuban Missile Crisis.

This heightened risk is evident across the three major nuclear categories addressed in this study: relations among the existing nuclear-weapon states, the possible proliferation of nuclear weapons to additional states, and nuclear terrorism. In the emergent multipolar nuclear world, the acute risk is conflict between nuclear-armed adversaries. Consider these recent events: With North Korea, Bob Woodward’s book, *Rage*, reveals that during the 2017 crisis the United States, according to President Trump, was “much closer” to war than publicly known amidst concern that the Kim regime could launch a nuclear-armed missile at the U.S. homeland. In 2019 and 2020, two pairs of states possessing nuclear weapons—India and Pakistan, and India and China, respectively, confronted one another along their contested borders. These clashes, even though they only involved conventional military forces, inherently carried the risk of escalation to the nuclear level. They occurred against the backdrop of the renationalization of foreign policies, the demise of the arms control architecture that had constrained competition, and robust nuclear force-modernization programs (including the incorporation of low-yield nuclear weapons and delivery systems that could blur the distinction between conventional and nuclear military operations). These developments could lead to a dangerous new

Left: On the floor of The 2016 Nuclear Security Summit, held in Washington, D.C. on March 31 and April 1, 2016
(Photo courtesy of whitehouse.gov)

conjunction of historical precedents—1914 (inadvertent escalation from a regional flashpoint resulting in WWI) and 1962 (the instability of a “delicate” balance of terror resulting in the Cuban Missile Crisis).

This study did not consider the elimination of nuclear weapons—that visionary objective (the desirability and feasibility of which remains debated) is not on the policy horizon. It instead explored utilitarian options to ameliorate nuclear risks. Contemporary dangers across the three nuclear categories present policy tensions that cannot be resolved, but, if clearly understood, can be better managed.

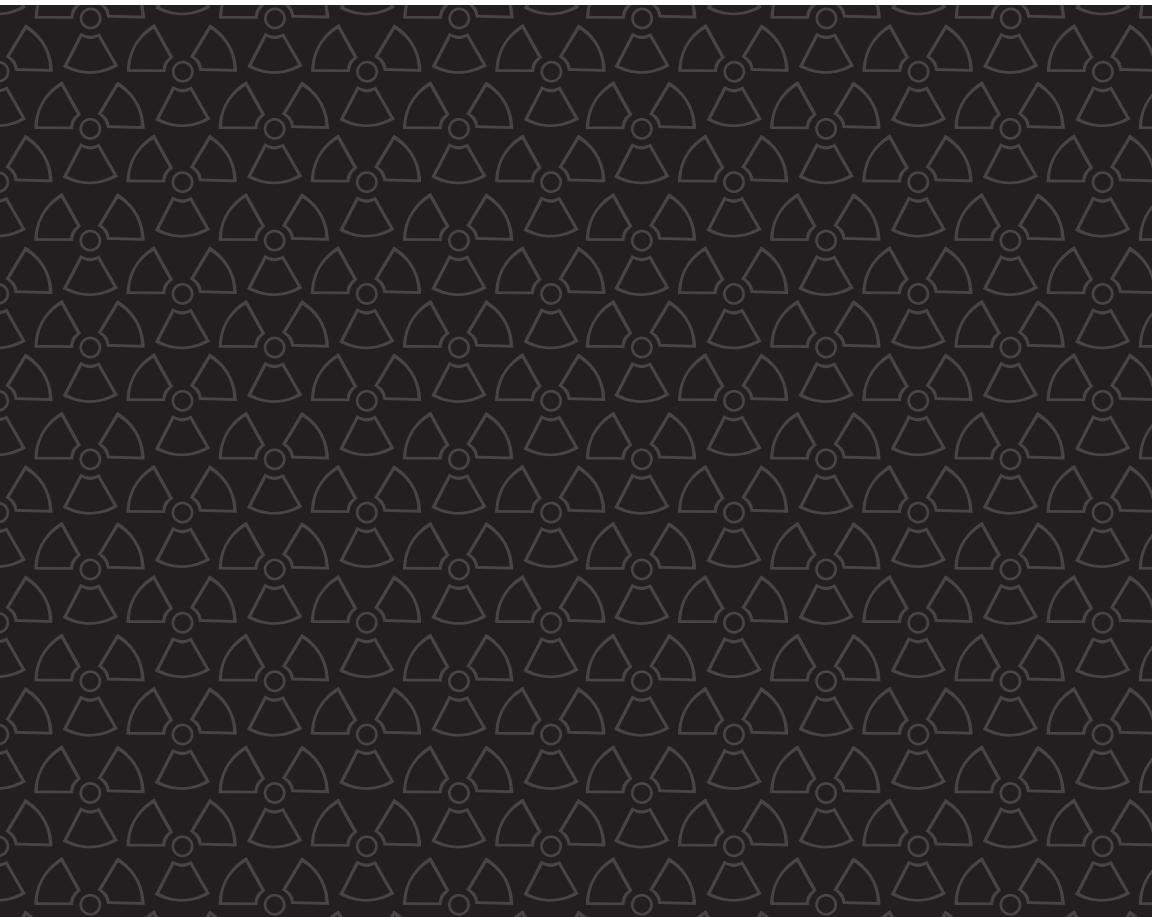
With respect to relations among nuclear-weapon states, the study focused on addressing the regional flashpoints that could give rise to conflict (through diplomacy to resolve these flashpoints or confidence-building measures to avert crises) and maintaining the stability of nuclear deterrent relationships (even though that entails acceptance of the uncomfortable reality of mutual vulnerability). An arms control architecture reflecting the complexities a multipolar nuclear world would mitigate the risk of unconstrained competition among the nuclear-weapon states.

With respect to the challenge of “horizontal” proliferation, the study focused on the persisting dilemma that the perceived threat posed by the adversarial proliferators of concern—the “rogues,” Iran and North Korea—arises from the character of their regimes. The Trump administration has pursued comprehensive objectives through transformational strategies that would essentially require changes of regime in both countries. This study made the case for the alternative—transactional strategies, focused on the discrete nuclear issue, to pragmatically constrain these states’ capabilities and buy time as the uncertain regime-change or evolution process plays out.

With respect to nuclear terrorism, the starting point of analysis was recognition that each of the pathways for terrorist acquisition of a nuclear weapon—buying, stealing, or building one—requires the involvement of a state, whether as a deliberate act of policy by the ruling regime or a failure to exercise sovereign control over weapons and weapons-usable fissile material on its territory. Effective strategies of deterrence on the state level—ones that lock down weapons and weapons-usable material and

threaten punitive consequences for the potential transfer of those capabilities—will not eliminate non-state threats but are instrumental in achieving that objective.

The global dangers of pandemics, climate change, and nuclear war have a critical factor in common—all transcend state boundaries, and none can be addressed on an exclusively national level. All require coordinated international cooperation in which the United States plays its traditional leadership role. In the year that the world marked the 75th anniversaries of the last time nuclear weapons were used, it is timely and appropriate to remind ourselves what is at stake in maintaining the nuclear peace. It will remain for the next administration to devote the focus and resources necessary to ensuring that the world continues to avoid the unthinkable. Einstein’s observation that “politics is more difficult than physics” will be put to the test.



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