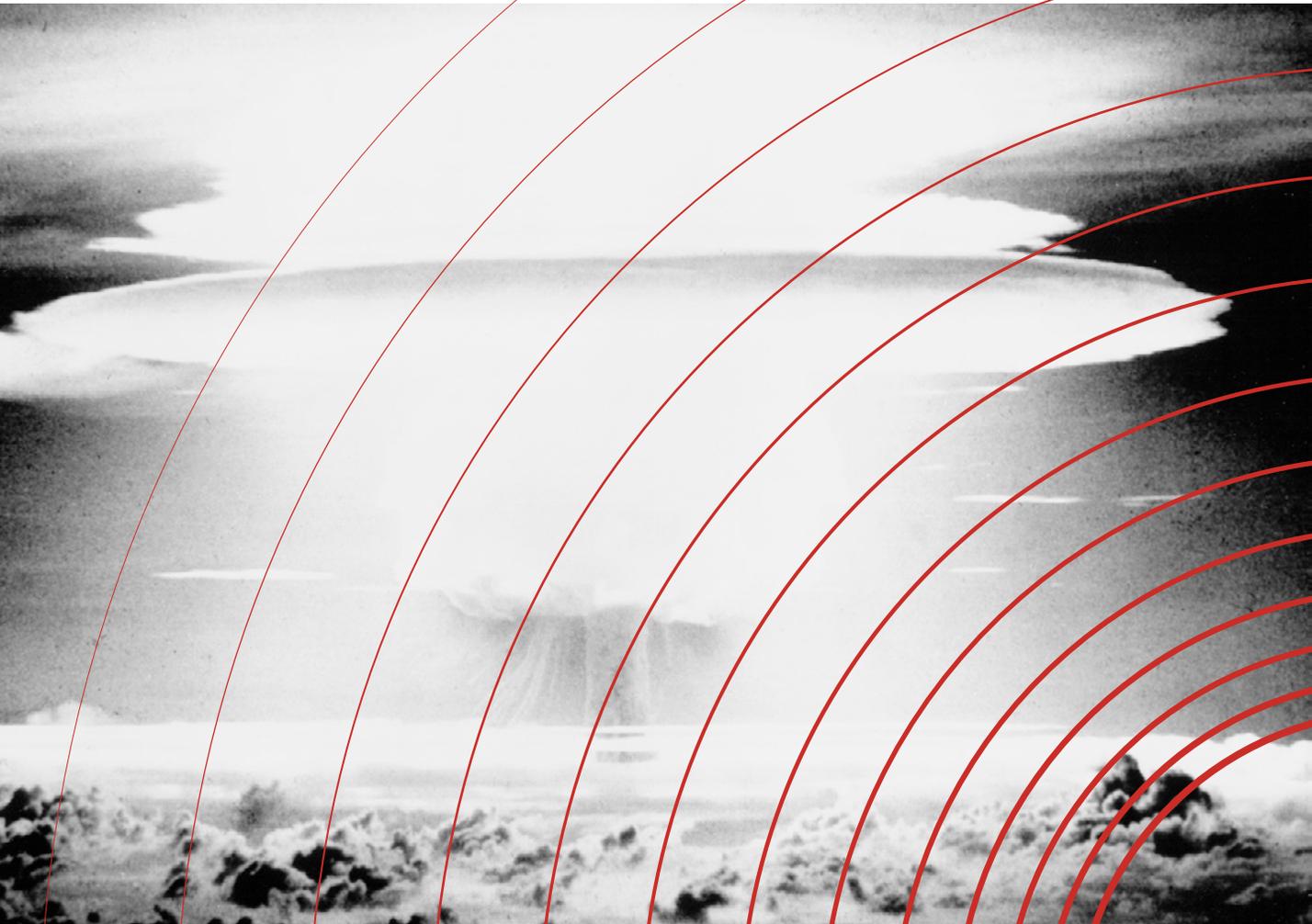




A PRIMER ON ANALYZING NUCLEAR COMPETITIONS

Bruce M. Sugden



Bruce Sugden offers a nuclear primer for analysts studying nuclear competition, urging them to broaden the range of plausible "what if" questions around which their studies are structured.

Just because nuclear war is undesirable and the probabilities of it occurring are very low is no reason not to think about it.¹

—**Secretary of Defense James Schlesinger (1974)**

The U.S. government has recognized that great power competition is the principal feature of the international security environment that puts U.S. national interests at risk. Every public strategy document released in the last two years, including the 2017 *National Security Strategy*, the 2018 *National Defense Strategy*, and the 2019 *Missile Defense Review*, has highlighted the centrality of great power competition.² The 2018 *Nuclear Posture Review* clearly extends the centrality of that competition to the realm of nuclear forces.³

However, while identifying the challenges of nuclear competition — between the United States and Russia on the one hand, and the United States and China on the other — is a crucial first step for making strategic assessments, these strategy documents provide little in the way of guidance for analyzing nuclear competition. This article aims to fill that gap by discussing a strategic-analytic framework for generating useful research on the U.S. competitive position relative to its potential nuclear adversaries.⁴ Several elements of the

framework are discussed within the context of exploring the approaches to analyzing military competitions and, in particular, identifying the key features of a nuclear competition. The final section provides the reader with several cautionary notes for how to avoid analytic traps in designing a strategic assessment of a nuclear competition.

The Role of Nuclear Competitions Between Great Powers

Perhaps beginning with President Barack Obama's foreign policy initiative to "rebalance to Asia and the Pacific," the United States government has been recovering from its post-Cold War holiday. This was a time in which a large proportion of U.S. national security departments and agencies abstained from analyzing and preparing for the potential strategic implications of the growth of the Chinese economy and military, the stabilization of the Russian political economy and the ascendance of the regime of Vladimir Putin, and the decline of the U.S. nuclear weapons enterprise for America's standing in the international security environment and its national security interests.⁵ A key step in that recovery has been acknowledging, as formalized in the 2017 *National Security Strategy*, that the United States must be an active great power competitor

1 *The 1974 Economic Report of the President*, Hearings Before the Joint Economic Committee, Congress of the United States, Ninety-third Congress, Second Sess., Part 4, March 7, 1974, (Washington, D.C., U.S. Government Printing Office, 1974), 905, [https://www.jec.senate.gov/reports/93rd Congress/Hearings/The 1974 Economic Report of the President Part IV \(644\).pdf](https://www.jec.senate.gov/reports/93rd%20Congress/Hearings/The%201974%20Economic%20Report%20of%20the%20President%20Part%20IV%20(644).pdf).

2 *National Security Strategy of the United States*, the White House, December 2017, <https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf>; *Summary of the 2018 National Defense Strategy of the United States of America*, Department of Defense, January 2018, <https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>; and, *Missile Defense Review*, Department of Defense, January 2019, <https://media.defense.gov/2019/Jan/17/2002080666/-1/-1/1/2019-MISSILE-DEFENSE-REVIEW.PDF>.

3 *Nuclear Posture Review*, Department of Defense, February 2018, https://www.defense.gov/News/Special-Reports/0218_npr/.

4 The strategic-analytic framework is based on the net assessment analytic concept as practiced within the Defense Department. The aim of a net assessment is to understand the nature and character of a military competition and one's ability to achieve desired objectives against an opponent, and how that ability changes over time, to help senior managers understand a military problem in a particular way. See Paul Bracken, "Net Assessment: A Practical Guide," *Parameters* 36 (Spring 2006): 90–100, <https://ssi.armywarcollege.edu/pubs/parameters/articles/06spring/bracken.pdf>; and Jeffrey S. McKittrick, "Adding to 'Net Assessment,'" *Parameters* 36 (Summer 2006): 118–19, <https://ssi.armywarcollege.edu/pubs/parameters/articles/06summer/c&r.pdf>. Because critical information about a competitor's view of a particular military problem might be unavailable for constructing a truly "net" assessment, I use "strategic-analytic framework" instead of "net assessment" to describe a useful way to approach analysis of a nuclear competition.

5 "FACT SHEET: Advancing the Rebalance to Asia and the Pacific," The White House, Office of the Press Secretary, Nov. 16, 2015, <https://obamawhitehouse.archives.gov/the-press-office/2015/11/16/fact-sheet-advancing-rebalance-asia-and-pacific>. On the marginalization of Defense Department analysis of the nuclear competitions between 1991 and 2018, see Robert Peters, Justin Anderson, and Harrison Menke, "Deterrence in the 21st Century: Integrating Nuclear and Conventional Force," *Strategic Studies Quarterly* 12, no. 4 (Winter 2018): 26–27, https://www.jstor.org/stable/26533613?seq=1#metadata_info_tab_contents.

if it wants to safeguard its worldwide strategic interests and maintain the credibility of its defense commitments to allies in Europe and in East Asia in the face of challenges from Russia and China.

Since their advent in 1945, nuclear weapons have been part and parcel of great power competition, though as the United Kingdom, France, India, Pakistan, and North Korea demonstrate, nuclear weapons are not the exclusive province of great powers. Like military forces in general, nuclear weapons are tools of statecraft, and, since 1945, great powers have wielded them for a variety of purposes:⁶ to deter nuclear and non-nuclear attacks against a great power's homeland and that of its allies, to conduct military missions and achieve wartime objectives if deterrence fails, to act as a visible sign of assurance to weaker allies of the security patron's commitment to their defense, to coerce other states, and to hedge against geopolitical and technological surprises.⁷ Relatedly, great powers have used their nuclear forces to compensate for what they have perceived as the relative military inferiority of their conventional forces. Take, for example, the U.S. military posture and force planning of the 1950s and 1960s, or Russia's post-Soviet-era reliance on nuclear weapons in its force structure.⁸

Nuclear competitions involving the United States have been a feature of the international security environment for decades.⁹ Russia has remained an active nuclear competitor since the end of the Cold War — it has sustained and modernized a robust nuclear arsenal along with the applicable military doctrine, training, and exercises.¹⁰ China's rise as a major regional power — including its deployment of a diverse array of military forces to deny U.S. forces access to the waters and airspace

between its coastline and the Second Island Chain (stretching roughly from the Japanese island of Honshu, through Guam and on to Indonesia) and its military encroachments on disputed territories within the South China Sea — has corresponded with significant qualitative improvements to its nuclear forces.¹¹ One notable improvement has been the deployment of road-mobile launchers for intercontinental ballistic missiles (ICBMs) and associated hardened underground facilities to enhance their survivability against attack. This development could diminish the effectiveness of a U.S. counterforce attack against Chinese nuclear forces and affect U.S. planning for the defense of regional allies and the U.S. homeland.

In sum, nuclear weapons have gone hand-in-hand with great power competitions since the end of World War II. Because the great powers have continued to strengthen their nuclear forces and use them as tools of statecraft in various ways since the end of the Cold War, nuclear competitions continue to be salient in great power military competitions. With several public U.S. strategy documents pointing to a reinvigorated great power competition, the next section addresses the nature of great power military competitions.

What Are Great Power Military Competitions?

In the nuclear era, a great power can be defined as either the leading state in terms of relative military power, or a state that has sufficient relative military power that it could fight the leading state to the degree that a war of attrition could result. A great

6 For a contemporary treatment of what we know about the role of nuclear weapons in U.S. grand strategy and, more critically, what we do not yet fully understand, see Francis J. Gavin, "Rethinking the Bomb: Nuclear Weapons and American Grand Strategy," *Texas National Security Review* 2, no. 1 (November 2018): 74–100, <https://repositories.lib.utexas.edu/handle/2152/73734>.

7 Some studies that explore how states have employed nuclear weapons for various purposes include Richard K. Betts, *Nuclear Blackmail and Nuclear Balance* (Washington, D.C.: Brookings Institution Press, 1987); Charles L. Glaser, *Analyzing Strategic Nuclear Policy* (Princeton, NJ: Princeton University Press, 1990); Todd S. Sechser and Matthew Fuhrmann, *Nuclear Weapons and Coercive Diplomacy* (Cambridge, UK: Cambridge University Press, 2017); Matthew Kroenig, *The Logic of American Nuclear Strategy: Why Strategic Superiority Matters* (New York: Oxford University Press, 2018); Terence Roehrig, *Japan, South Korea, and the United States Nuclear Umbrella: Deterrence after the Cold War* (New York: Columbia University Press, 2017); and Francis J. Gavin, *Nuclear Statecraft: History and Strategy in America's Atomic Age* (Ithaca, NY: Cornell University Press, 2012).

8 Jim Mitre, "A Eulogy for the Two-War Construct," *Washington Quarterly* 41, no. 4 (Winter 2019): 7–30, <https://doi.org/10.1080/0163660X.2018.1557479>; and Michael Kofman, "Searching for Strategy in Washington's Competition with Russia," *War on the Rocks*, Jan. 30, 2018, <https://warontherocks.com/2018/01/searching-strategy-washingtons-competition-russia/>.

9 Andrew W. Marshall, "Arms Competitions: The Status of Analysis," in *The Western Panacea: Constraining Soviet Power through Negotiation*, Vol. II of *Soviet Power and Western Negotiating Policies*, ed. Uwe Nerlich (Cambridge, Mass.: Ballinger Publishing Co., 1983): 3–19; and Ernest May, John D. Steinbruner, and Thomas W. Wolfe, *History of the Strategic Arms Competition 1945-1972*, Part II (Washington, D.C.: Office of the Secretary of Defense, Historical Office, March 1981), 810. The term "nuclear competition" is a more appropriate term to describe the analytic phenomenon in question rather than the term "arms race," which implies a definitive and foreseeable termination point in the development of nuclear forces and the corresponding strategic and doctrinal developments, as well as the absence of military innovation. Nuclear competition, on the other hand, implies constant military innovation, which is consistent with other forms of military competition.

10 "Nuclear Posture Review, Panel Discussion," at National Defense University, Feb. 16, 2018, C-Span, <https://www.c-span.org/video/?441268-3/nuclear-posture-review-panel-discussion>.

11 *Annual Report to Congress, Military and Security Developments Involving the People's Republic of China 2018* (Washington, D.C.: Department of Defense, May 16, 2018), chap. 3, <https://media.defense.gov/2018/Aug/16/2001955282/-1/-1/1/2018-CHINA-MILITARY-POWER-REPORT.PDF>.

power must also maintain a secure nuclear second-strike capability,¹² without which the leading state could effectively disarm it.

The literature on great power competition and rivalry makes clear that such a competition is a “political-military-economic competition between two states. This competition extends over many decades, even prospectively a century or more.”¹³ Great power competition, however, does not necessarily imply conflict. It lies on a spectrum whose extremes are marked by both conflict and cooperation.¹⁴ In some areas of international politics, two great powers can have a convergence of interests that enables cooperation, such as in nonproliferation of nuclear weapons or in counter-terrorism efforts, while in other areas they can have a conflict of interests, such as in territorial disputes between themselves or between their client states. As the U.S.-China competition demonstrates, competitors can trade goods while also equipping themselves for war with one another. The underlying source of tension remains fear and mistrust between two great powers that cannot be easily subdued with military force and whose intentions cannot be discerned with high confidence.¹⁵

The literature points to a multitude of reasons why great powers compete with one another. Paul Kennedy, for example, finds that the sources of the competition between Britain and Germany in the late 19th century were economic, geographic, and ideological. As he puts it,

[T]he Anglo-German antagonism basically arose from the fact that in the half-century under scrutiny Germany grew out of its position as ‘a cluster of insignificant States

under insignificant princelings’; and from the further facts that this growth gradually threatened to infringe perceived ‘British interests’, that these economic shifts increased the nervousness of British decision-makers already concerned about ‘saving the Empire’, and that they were accompanied by ideas about a German mission which could be adopted by political forces grappling with severe domestic problems.¹⁶

Nuclear competitions involving the United States have been a feature of the international security environment for decades.

Aaron Friedberg echoes Kennedy in describing the causes of the U.S.-China competition.¹⁷ Friedberg argues that, notwithstanding the zero-sum nature of the economic and military aspects of the competition, a central element is that the United States and China maintain a different set of core political beliefs and ideologies. America’s post-Cold War policy for dealing with China has been tied to liberal ideas about the interconnectedness of trade, economic growth, democracy, and the protection of human rights, while China — a single-party state led by the Chinese Communist Party, which is fixated on maintaining its hold on power — has pursued policies that reflect the ruling regime’s authoritarian and illiberal character.¹⁸

In order to understand what a military competition is, analysts can turn to the writings

12 John J. Mearsheimer, *The Tragedy of Great Power Politics* (New York: W.W. Norton, 2001), 5.

13 A. W. Marshall, “Competitive Strategies – History and Background,” March 3, 1988, 1; and James Lacey, ed., *Great Strategic Rivalries: From the Classical World to the Cold War* (New York: Oxford University Press, 2016). On great power competition in the economic sphere, see Markus Brunnermeier, Rush Doshi, and Harold James, “Beijing’s Bismarckian Ghosts: How Great Powers Compete Economically,” *Washington Quarterly* 41, no. 3 (Fall 2018): 161–76, <https://www.tandfonline.com/doi/full/10.1080/0163660X.2018.1520571>.

14 Thomas G. Mahnken, “Thinking about Competitive Strategies,” in *Competitive Strategies for the 21st Century: Theory, History, and Practice*, ed. Thomas G. Mahnken (Stanford, CA: Stanford University Press, 2012), 5. See also Hal Brands, “The Lost Art of Long-Term Competition,” *Washington Quarterly* 41, no. 4 (Winter 2019): 31–51, <https://www.tandfonline.com/doi/full/10.1080/0163660X.2018.1556559>. The Defense Department in early 2019 might still be confused over how to think about great power competition. See Katie Bo Williams, “What’s Great Power Competition? No One Really Knows,” *Defense One*, May 13, 2019, <https://cdn.defenseone.com/a/defenseone/interstitial.html?v=9.2.0&rf=https%3A%2F%2Fwww.defenseone.com%2Fnews%2F2019%2F05%2Fwhats-great-power-competition-no-one-really-knows%2F156969%2F>.

15 Mearsheimer, *The Tragedy of Great Power Politics*; and Sebastian Rosato, “The Inscrutable Intentions of Great Powers,” *International Security* 39, no. 3 (Winter 2014/15): 48–88, https://doi.org/10.1162/ISEC_a_00190. For a counter-argument that intentions can be assessed with high confidence under particular circumstances, see Charles L. Glaser and Andrew H. Kydd, “Correspondence: Can Great Powers Discern Intentions?” *International Security* 40, no. 3 (Winter 2015/2016): 197–202, https://www.mitpressjournals.org/doi/10.1162/ISEC_c_00230.

16 Paul M. Kennedy, *The Rise of the Anglo-German Antagonism: 1860-1914* (London: The Ashfield Press, 1987), 466.

17 Aaron L. Friedberg, “Competing with China,” *Survival* 60, no. 3 (June-July 2018): 7–64, <https://www.tandfonline.com/doi/full/10.1080/00396338.2018.1470755>.

18 Friedberg, “Competing with China,” 8.





of Andrew Marshall, who was a member of the first generation of analysts seeking to understand the nature of the U.S.-Soviet military competition and, most important, how to assess the relative standings of the competitors over time.¹⁹ In his 1966 study, Marshall describes military competition as two countries, or groups of countries, organizing, training, and equipping their military forces to deal effectively with the military forces of the other in one or more potential contingencies.²⁰ This definition encompasses not only weapons systems, but also doctrine, military education and training, command and control, logistics, and military exercises. Moreover, by using the term “military competition,” Marshall makes clear that his focus is on the military sector of the larger strategic competition. The focus on the military aspects of the strategic competition is especially important, as Marshall and James Roche argued in 1976, if the analytic objective is to understand and improve how the Defense Department might better position its investments portfolio for the strategic competition (the Defense Department, after all, is responsible to the president for the military arm of national power).²¹

Analyzing Military Competitions

How, then, should one analyze military competitions and estimate a competitor’s relative military power? There are three analytic approaches to this question, which aim to either forecast a competitor’s future military posture and capabilities or understand the potential outcome of a combat interaction between the competitors’ military forces in a specific military contingency or group of contingencies. For a comprehensive understanding of military competition, it is necessary to incorporate all three approaches.

First, in exploring and characterizing military competitions to forecast a competitor’s future military capabilities and posture, Marshall found that a promising approach is to start with a detailed historical analysis of the evolution of

the competitors’ military forces. This analysis ought to, in turn, highlight whatever is known about asymmetries between competitors’ military thinking, in tactical doctrine, in organizational practices and styles of command and control, as well as the historical preferences of the relevant organizations that provide input or make decisions about military capabilities and posture.²² Such an in-depth and lengthy study, Marshall believed, was needed to understand the long-term decision-making behavior of military organizations and other organizations relevant to shaping a state’s military forces and posture, in order to forecast a competitor’s military power beyond five years.

A second approach is to study the interaction of military forces in a particular military contingency (e.g., the interaction of U.S. and Chinese nuclear forces in a conflict over Taiwan that begins with conventional combat). When Marshall offered a framework of what such an assessment might look like in 1983, he used the military balance in Europe between the North Atlantic Treaty Organization (NATO) and the Warsaw Pact as an example.²³ To conduct such a study, an analyst would begin by selecting a geographic area that can be distinguished from others by the nature of its military problem and then determine and compare what objectives the opposing forces would try to achieve and with what ways and means. If, in such a comparison, the U.S. objective is to deter a military attack, then the analysis would initially emphasize the competitor’s assessment of the military balance. The competitor’s assessment should be that the balance favors the United States — that is, the competitor cannot achieve its objectives through military operations. In analyzing the balance of military forces, the analyst should select a military contingency that covers a range of plausible situations that will test the capabilities of the forces: for example, U.S. power projection to a region not normally considered a likely combat zone, or the competitor’s military deception operations.²⁴

Interestingly, some analysts make the mistake of

19 Marshall also founded the Defense Department’s Office of Net Assessment and was its director for over 40 years. For more on the intellectual structure behind how the Office of Net Assessment analyzed military competitions, see Andrew W. Marshall, J.J. Martin, and Henry S. Rowen, eds., *On Not Confusing Ourselves: Essays on National Security Strategy in Honor of Albert and Roberta Wohlstetter* (Boulder, Co: Westview Press, 1991), esp. chaps. 9, 15, and 16.

20 A.W. Marshall, “Problems of Estimating Military Power,” prepared for presentation at the American Political Science Meetings (Santa Monica, Calif.: RAND Corporation, 1966), 2.

21 Andrew W. Marshall and James Roche, “Strategy for Competing with the Soviets in the Military Sector of the Continuing Political-Military Competition,” Department of Defense Memorandum, 1976, 3, <http://goodbadstrategy.com/wp-content/downloads/StrategyforCompetingwithUSSR.pdf>.

22 Marshall, “Problems of Estimating Military Power,” 6, 13–17, and 21.

23 Marshall, “Arms Competitions.”

24 Aaron Friedberg, too, addressed the question of how statesmen should measure relative military power. See Aaron L. Friedberg, “The Assessment of Military Power: A Review Essay,” *International Security* 12, no. 3 (Winter 1987/88): 190–202, doi:10.2307/2538805.

characterizing conventional balances as being set in stone and unable to evolve.²⁵ To these analysts, the United States has enjoyed such significant and enduring conventional advantages over potential nuclear adversaries since the early 1990s that it may safely dismantle its nuclear capabilities or force-employment capacities, or impose upon itself doctrinal restraints with minimal or no consideration for how long it might take to reconstitute these capabilities or capacity levels. Yet, in the span of less than 10 years, amid signs that the U.S. competitive position in the military balances in Europe and East Asia has declined, it appears that those analysts' earlier assessments of the conventional balances have not withstood the test of time.

It is important to recognize that military balances — whether conventional or nuclear — between the United States and its military competitors change in reaction to various actions taken by competitors, including procurement of different types of weapon systems, training military forces for particular missions, and developing and exploiting technological breakthroughs.²⁶ The evidence since 1995, for example, suggests that China's investment in conventional precision-strike capabilities has eroded U.S. military advantages in plausible Western Pacific conflict scenarios.²⁷ The Chinese military is better equipped in 2019 than it was in 1995 to at least delay the sustained intervention of U.S. air and naval surface forces in a China-Taiwan theater of operations — if not completely deny them access.²⁸ In addition, China's deployment of mobile ICBM launchers, which increases the survivability of its nuclear forces, suggests the nuclear balance between China and the United States might be less favorable to the latter than it was 20 years ago.

Likewise, the conventional military balance in Europe between the United States and Russia does not favor U.S. forces in 2019 to the same degree

that it did two decades ago.²⁹ Gen. Philip Breedlove, former commander of U.S. European Command, stated in 2015 that U.S. European Command was seeing growing Russian capabilities and significant military modernization. As a result of those developments, Breedlove characterized U.S. European Command as assuming "significantly greater risk. Our timelines are longer, our preparations are less robust, and our fundamental ability to deter and defeat in a timely and effective manner is less sure than it could be."³⁰ In 2018, Gen. Curtis Scaparrotti, Breedlove's successor at U.S. European Command, clarified that understatement in testimony before the U.S. Congress: "I don't have all the forces I need in Europe today, and we have got to continue to invest and establish the posture that is required."³¹

Military balances in general are not based solely on the number of units or weapon systems each competitor has deployed in likely theaters of operations. To be comprehensive, any analysis of a military balance should incorporate the competitors' concepts of operations and how they practice warfare.³² Other useful elements to consider might include, but are not limited to, the readiness levels of theater-based forces, the rates at which the competitors could reinforce those forces, the security of their lines of communications, abilities to sustain effective combat units, and command-and-control capabilities. For protracted war scenarios that could include the intermittent use of nuclear weapons, understanding the abilities of competitors' conventional forces to fight amidst the after-effects of a nuclear weapon strike (i.e., blast, thermal radiation, prompt and residual radiation, and electromagnetic pulse) could be critical to developing an accurate assessment of the military balance.

Interestingly, Richard Betts' 1980s argument remains relevant to thinking about contemporary

25 Barry Blechman and Russell Rumbaugh, "Bombs Away: The Case for Phasing Out U.S. Tactical Nukes in Europe," *Foreign Affairs* 93, no. 4 (July/August 2014), <https://www.foreignaffairs.com/articles/europe/2014-05-29/bombs-away>; and Michael S. Gerson, "No First Use: The Next Step for U.S. Nuclear Policy," *International Security* 35, no. 2 (Fall 2010): 7–47, https://www.mitpressjournals.org/doi/pdf/10.1162/ISEC_a_00018.

26 Bruce M. Sugden, "Nuclear Cruise Missile Opponents Are Pushing a Dangerous Line," *War on the Rocks*, Jan. 14, 2016, <https://warontherocks.com/2016/01/nuclear-cruise-missile-opponents-are-pushing-a-dangerous-line/>.

27 James Stavridis, "China's military power already on par with US in East Asia," *Nikkei Asian Review*, Nov. 22, 2017, <https://asia.nikkei.com/Politics/China-s-military-power-already-on-par-with-US-in-East-Asia>.

28 *Military and Security Developments Involving the People's Republic of China 2018*, chap. 5.

29 Scott Boston, Michael Johnson, Nathan Beauchamp-Mustafaga, and Yvonne K. Crane, *Assessing the Conventional Force Imbalance in Europe: Implications for Countering Russian Local Superiority* (Santa Monica, Calif.: RAND Corporation, 2018), https://www.rand.org/pubs/research_reports/RR2402.html.

30 "Department of Defense Press Briefing by General Breedlove in the Pentagon Briefing Room," Defense Department, April 30, 2015, <https://dod.defense.gov/News/Transcripts/Transcript-View/Article/607046/departement-of-defense-press-briefing-by-general-breedlove-in-the-pentagon-brief/>.

31 Matthew Cox, "EUCOM Commander Downplays 'Bleak' Report of Russian Military Strength," *Military.com*, March 8, 2018, <https://www.military.com/daily-news/2018/03/08/eucom-commander-downplays-bleak-report-russian-military-strength.html>.

32 Eliot A. Cohen, "Toward Better Net Assessment: Rethinking the European Conventional Balance," *International Security* 13, no. 1 (Summer 1988): 50–89, <https://www.jstor.org/stable/2538896>.

and emerging conventional military balances: History demonstrates that the initial phase of war might be as bad for the defender — even one that enjoys a numerical advantage — as worst-case estimates would suggest for two reasons. First, a defense posture and plan cannot account for all plausible regional military contingencies with a given competitor. Rather, strategists and planners will whittle down plausible contingencies to those most likely to occur. Second, attackers have time to assess the defense and develop offensive operations that will exploit observable weaknesses.³³

In the end, it pays to take a long view of the balance of military forces between the United States and its competitors, rather than painting a static picture. A 2016 Institute for Defense Analyses report showed that, since the late 1980s, the median time required for major defense acquisition programs (including initial development) to reach initial operational capability was approximately eight years. This included aircraft, ground systems, space systems, and ships.³⁴ Therefore, analysts should look at key trends that will shape particular military balances over a minimum of 10 years to give Defense Department senior managers sufficient time to direct changes in investment portfolios to sustain U.S. advantages or to develop new ones.

The third analytic approach to understanding military competition is to describe and assess the implications of the military investment balance.³⁵ Undertaking such an assessment will require looking at the allocation of national resources to research and development efforts in technological areas that might serve as latent military power (i.e., designed but unproduced military capabilities) that a competitor could exploit in the future, perhaps during a protracted conflict. An assessment of the military investment balance can shed light on how

seemingly nonmilitary investments, such as those from a nondefense organization, might have utility in a military balance or its evolution. It would also better capture a competitor's defense-related investments and how that competitor might seek to sustain or gain advantages in particular areas of a military competition. For example, a country's deep underground facilities are also a means to defend senior leaders or other critical personnel against conventional and nuclear attack. Or consider this: During the Cold War, the U.S. nuclear weapons complex — a Department of Energy responsibility — exercised all phases of its nuclear weapons life-cycle process, from the research phase, all the way through production, and eventually, retirement and dismantlement. However, according to the Defense Department, "U.S. nuclear weapons have not undergone the full life-cycle phase process since the completion of the W88 [warhead] Phase 5 in 1991."³⁶ What if U.S. competitors have been exercising all, or most, of the life-cycle phases for their nuclear weapons, particularly research and development of different weapon designs and effects, something that the United States has abstained from for nearly thirty years? What might be the implications for how nuclear competitions will evolve? Moreover, what might disparities in dormant weapons-production capacity mean for a nuclear competition if one competitor mobilizes that capacity during a crisis or conflict?³⁷

Prior to discussing the remaining elements of a framework for analyzing nuclear competitions, it is important to keep in mind that military competition occurs within a broader strategic competition wherein the economic resources of the competitors need to be addressed. A comparative economic analysis should shed light on how efficient and effective competitors are relative to one another in

33 Richard K. Betts, "Conventional Deterrence: Predictive Uncertainty and Policy Confidence," *World Politics* 37, no. 2 (January 1985): 169–70, <https://www.cambridge.org/core/journals/world-politics/article/conventional-deterrence-predictive-uncertainty-and-policy-confidence/E8F0FF5653C50150F2C06828993EE20F>.

34 David M. Tate, *Acquisition Cycle Time: Defining the Problem (Revised)*, IDA Document NS D-5762 (Alexandria, Va.: Institute for Defense Analyses, October 2016), <https://www.ida.org/-/media/feature/publications/a/ac/acquisition-cycle-time-defining-the-problem-revised/d-5762.ashx>.

35 I thank Jeffrey McKittrick for sharing his description of a military investment balance and its usefulness for understanding nuclear competition.

36 *Nuclear Matters Handbook*, Office of the Deputy Assistant Secretary of Defense for Nuclear Matters, 2016, 155, https://www.acq.osd.mil/ncbdp/nm/nmhb/docs/NMHB_2016-optimized.pdf.

37 These questions are suggested by the U.S. Defense Intelligence Agency's 2019 unclassified assessment of Russian and Chinese nuclear modernization trends. See Lt. Gen. Robert P. Ashley, Jr., "Russian and Chinese Nuclear Modernization Trends," remarks at the Hudson Institute, Washington, D.C., May 29, 2019, <https://www.dia.mil/News/Speeches-and-Testimonies/Article-View/Article/1859890/russian-and-chinese-nuclear-modernization-trends/>. A recent assessment of the potential for the U.S. Department of Energy to meet the 2030 requirement to achieve a plutonium pit production capacity of 80 per year illustrates the sub-optimal state of the U.S. nuclear weapons complex compared to the late 1980s. See David E. Hunter, Rhiannon T. Hutton, et al., *Independent Assessment of the Two-Site Pit Production Decision: Executive Summary* (Alexandria, Va.: Institute for Defense Analyses, 2019), <https://www.energy.gov/sites/prod/files/2019/06/f63/NNSA-IDA-study-introduction.pdf>.

allocating a proportion of their economic resources for a long-term military competition.³⁸ Marshall suggested that there are several components to being an effective and efficient competitor: being a low-cost producer of effective military forces while bringing about higher costs for the competitor; maintaining the health of key areas of the defense-industrial base; steering the competition into areas where one has advantages and enjoys enduring technological leadership; and choosing to trail in areas of military competition where one might be much less effective and efficient in sustaining a military advantage.³⁹

Relatedly, at a broader level, analyzing the political economy of a competitor can serve as a backdrop to understanding its “fitness” for long-term military competition. David D’Lugo and Ronald Rogowski’s analysis of the Anglo-German naval race offers insights into thinking about the extent to which a competitor’s political institutions and social actors (e.g., labor unions or industrial blocs) support resource extraction from the economy to generate military power.⁴⁰ In another case, there is evidence suggesting that the U.S. nuclear force structure and posture during the Cold War were principally driven by the political economy of U.S. military commitments to Europe.⁴¹

Key Features of Nuclear Competitions

What is special about nuclear competitions? First, nuclear weapons possess enormous destructive power and, when mated to high-speed missiles, can be quickly delivered to targets over

long distances. The speed of delivery makes a nuclear strike extremely difficult to defend against. Second, nuclear weapons, unlike conventional weapons, have the potential to produce long-term, wide-area effects due to radioactive fallout. Finally, in most, if not all, nuclear states, the policy for using nuclear weapons is determined to a great extent at the most senior level of leadership.⁴² Lower-level officials, planners, and analysts in military organizations — and some in nonmilitary organizations — however, are the ones generating the options that are ultimately presented to senior leaders in order to make these policy decisions.

The next three features to be discussed are applicable to all military competitions, not just to nuclear ones. Nevertheless, some arguments and debates about U.S. nuclear policy and strategy and the state of nuclear competitions have obscured or ignored these features. Therefore, they will be described and analyzed in terms of how they relate to understanding a nuclear competition.

The Importance of the Competitive Context When Considering Nuclear Strategy

A key feature of nuclear competition — oftentimes obscured by histrionics in debates about nuclear policy, strategy, and forces — is that competitive interaction is the foundation for thinking through the issues surrounding nuclear forces and doctrine. U.S. nuclear forces and nuclear doctrine are not designed in a vacuum. And yet, some analysts have given short shrift to the competitive political and military setting in which nuclear operations would take place.⁴³ This oversight often leads to two analytic

38 Andrew W. Marshall, *Long-Term Competition with the Soviets: A Framework for Strategic Analysis* (Santa Monica, Calif.: RAND Corporation, 1972), 23–28, <https://www.rand.org/pubs/reports/R862.html>. Valuable investigations of the burden of military expenditures on national economic resources include John M. Hobson, “The Military-Extraction Gap and the Wary Titan: The Fiscal-Sociology of British Defense Policy 1870–1913,” *Journal of European Economic History* 22, no. 3 (1993): 461–506; the chapters by David F. Epstein and Stephen M. Meyer, in Henry S. Rowen and Charles Wolf, Jr., eds., *The Impoverished Superpower: Perestroika and the Soviet Military Burden* (San Francisco: Institute for Contemporary Studies, 1990); Andrew W. Marshall and Abram N. Shulsky, “Assessing Sustainability of Command Economies and Totalitarian Regimes: The Soviet Case,” *Orbis* 62, no. 2 (Spring 2018): 220–43, <https://www.sciencedirect.com/science/article/pii/S0030438718300164?via%3Dihub>; Marc Trachtenberg, “Assessing Soviet Economic Performance During the Cold War: A Failure of Intelligence?” *Texas National Security Review* 1, no. 2 (March 2018), <https://doi.org/10.15781/T2QV3CM4W>; and Austin Long, “Rubles, Dollars, and Power: U.S. Intelligence on the Soviet Economy and Long-Term Competition,” *Texas National Security Review* 1, no. 4 (August 2018), doi.org/10.15781/T2NV99X6Q.

39 Marshall, *Long-Term Competition with the Soviets*, 33–34.

40 David D’Lugo and Ronald Rogowski, “The Anglo-German Naval Race and Comparative Constitutional ‘Fitness,’” in *The Domestic Bases of Grand Strategy*, ed. Richard Rosecrance and Arthur A. Stein (Ithaca, NY: Cornell University Press, 1993), 65–95. On how the U.S. political economy shaped the extraction of resources from the U.S. economy during the Cold War, see Aaron L. Friedberg, *In the Shadow of the Garrison State: America’s Anti-Statism and Its Cold War Grand Strategy* (Princeton, NJ: Princeton University Press, 2000).

41 Austin Long, “The Least Miserable Option: The Political Economy of U.S. Nuclear Counterforce, 1949–1989,” *American Political Science Association 2011 Annual Meeting Paper*, available at Social Science Research Network: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1900396; and Francis J. Gavin, *Gold, Dollars, and Power: The Politics of International Monetary Relations, 1958–1971* (Chapel Hill: University of North Carolina Press, 2004).

42 Robert Jervis, “The Political Effects of Nuclear Weapons: A Comment,” *International Security* 13, no. 2 (Fall 1988): 80–90, [doi:10.2307/2538972](https://doi.org/10.2307/2538972); and David Alan Rosenberg, “Reality and Responsibility: Power and Process in the Making of United States Nuclear Strategy, 1945–68,” *Journal of Strategic Studies* 9, no. 1 (1986): 35–36, <https://www.tandfonline.com/doi/abs/10.1080/01402398608437247>.

43 James E. Doyle ignores the competitive interaction between the United States on the one hand, and China and Russia on the other, in his article, “Mini-nukes: Still a bad choice for the United States,” *Bulletin of the Atomic Scientists*, April 17, 2017, <https://thebulletin.org/2017/04/mini-nukes-still-a-bad-choice-for-the-united-states/>.

weaknesses. First, downplaying the competitive context results in the failure to account for how changes in a competition might render particular U.S. forces and doctrine ill-suited to achieving U.S. policy objectives. Furthermore, U.S. forces may be less effective against an emerging competitor if they have been designed and postured with another competitor predominantly in mind. Second, it also leads to an underappreciation of the uncertainty about how U.S. leaders might react to a variety of political and military conditions surrounding a future conflict, as well as the uncertainty about how U.S. competitors might view America's willingness and ability to effectively use military forces against their own forces to achieve wartime objectives. With the competitive context in mind, analysts are better positioned to understand how a nuclear competition is evolving and to construct the bridge between U.S. policy objectives (including potential war aims) and the ways in which available military instruments may be used against a dynamic opponent in today's — and tomorrow's — strategic setting.⁴⁴

Investigating the strategic and operational adequacy of U.S. nuclear forces within the competitive context will help analysts explicitly incorporate into their research designs a number of questions: How effective might America's military forces and those of its competitor be in particular conflict scenarios (e.g., comparing training and readiness, tactics and operational concepts, and how well those tactics and operational concepts exploit existing technologies in the operational environment)? How might forces be employed in pursuit of different national objectives, and what types of force employment concepts might constitute escalation and warrant a nuclear response?⁴⁵ With the competitive framework

anchoring the analysis, the issue of how potential nuclear adversaries might defend their ability to wage military campaigns against U.S. attempts to halt them ought to garner more of the analyst's attention. To wit, what ought to be debated is not whether the United States should deploy new types of low-yield weapons, but whether current low-yield weapons are allocated to the most capable delivery systems or platforms in light of likely operational environments.⁴⁶

Failing to account for the competitive context, moreover, could lead some analysts to inaccurately identify the possible decisions that U.S. and adversary leaders would make in potential conflict scenarios as well as the plausible range of combat outcomes between opposing forces.⁴⁷ To be clear, such analyses do not reveal careful consideration of the range of variables that might shape combat outcomes, operational planning, and strategic decision-making.⁴⁸

Further muddying the task of identifying the plausible range of conflict conditions and combat outcomes between opposing forces, it is axiomatic that in any military competition, competitors seek to complicate one another's planning to gain advantages in future conflicts.⁴⁹ Their tools for doing so include information denial, deception, ambiguous declaratory policies, and forces capable of performing multiple military missions.⁵⁰ In a crisis and wartime scenario, competitors might try to conceal their true political and military objectives to throw off the other's efforts to gain advantages.⁵¹

Times of crisis and war will create unforeseen pressures and dynamics that will influence decision-makers. They can predict neither the full scope of options that will be available to a

44 Colin S. Gray, *The Strategy Bridge: Theory for Practice* (New York: Oxford University Press, 2016); and Colin S. Gray, "Nuclear Strategy: the Case for a Theory of Victory," *International Security* 4, no. 1 (Summer 1979): 54–87, <https://www.jstor.org/stable/2626784>.

45 Gary Anderson, "The Challenge of Fighting Small Wars While Trying to Adequately Prepare for Big Ones," *Small Wars Journal*, April 11, 2019, <https://smallwarsjournal.com/jrnl/art/challenge-fighting-small-wars-while-trying-adequately-prepare-big-ones>.

46 Janne Nolan and Brian Radzinsky, "Continuity from Ambiguity: The Real Role of Nuclear Posture Reviews in U.S. Nuclear Strategy," *War on the Rocks*, Feb. 19, 2018, <https://warontherocks.com/2018/02/continuity-ambiguity-real-role-nuclear-posture-reviews-u-s-nuclear-strategy/>.

47 Vipin Narang, "The Discrimination Problem: Why Putting Low-yield Nuclear Weapons on Submarines Is So Dangerous," *War on the Rocks*, Feb. 8, 2018, <https://warontherocks.com/2018/02/discrimination-problem-putting-low-yield-nuclear-weapons-submarines-dangerous/>; Jon Wolfsthal, "Say No to New, Smaller Nuclear Weapons," *War on the Rocks*, Nov. 22, 2017, <https://warontherocks.com/2017/11/say-no-new-smaller-nuclear-weapons/>; and Doyle, "Mini-nukes."

48 One chapter in an Adelphi Series publication is a notable exception. See James E. Doyle, "Deterrence and Flexibility," in Doyle, *Renewing America's Nuclear Arsenal: Options for the 21st Century*, Adelphi Series 56, no. 462 (2016), <https://doi.org/10.1080/19445571.2016.1375309>.

49 Sugden, "Nuclear Cruise Missile Opponents Are Pushing a Dangerous Line."

50 Henrik Praks, "Hybrid or Not: Detering and Defeating Russia's Ways of Warfare in the Baltics – the Case of Estonia," NATO Defense College, Research Paper no. 124 (December 2015), https://icds.ee/wp-content/uploads/2015/Henrik_Praks_-_Deterring_and_Defeating_Russia_s_Ways_of_Warfare_in_the_Baltics.pdf; Tom Shugart and Javier Gonzalez, "First Strike: China's Missile Threat to U.S. Bases in Asia," Annual Conference Transcript, Center for a New American Century, June 28, 2017, http://conference.cnas.org/wp-content/uploads/2017/07/CNAS2017_Transcript_First-Strike.pdf; "Destroyers – DDG," United States Navy Fact File, accessed April 11, 2019, https://www.navy.mil/navydata/fact_display.asp?cid=4200&tid=900&ct=4; "B-52 Stratofortress," U.S. Air Force Fact Sheet, last modified Dec. 16, 2015, <https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104465/b-52-stratofortress/>; and Nolan and Radzinsky, "Continuity from Ambiguity."

51 Michael Kofman, Katya Migacheva, Brian Nichiporuk, Andrew Radin, Olesya Tkacheva, and Jenny Oberholtzer, *Lessons from Russia's Operations in Crimea and Eastern Ukraine* (Santa Monica, Calif.: RAND Corporation, 2017), 23–24.

competitor nor the options that will be available to themselves. Analysts should acknowledge that they are constrained in the same way.⁵² In a hypothetical conflict in the Baltic states, for example, Russia's deployment of nonstrategic nuclear weapons and dual-capable delivery systems raises the possibility that the first use of a nuclear weapon could be at sea involving a Russian anti-ship strike against a U.S. surface combatant, perhaps an aircraft carrier, or it could be against U.S. aircraft approaching Russian airspace.⁵³ At the same time, Russia could use other levers to generate political fissures within NATO — between Western Europe and the Baltic states, between Europe and the United States, and between the citizens of European states and their governments. Perhaps Russian leaders calculated that nuclear use at sea or in the air would not elicit a larger U.S. nuclear response, or that an equivalent U.S. response would come at the cost of deeply fracturing NATO (something Russian leaders would be delighted to see). Or perhaps the Russians miscalculated.

The Role of Non-Nuclear Technologies in Shaping Nuclear Competition

A second key feature of nuclear competitions is that, due to current and anticipated technical advances in a wide range of military capabilities, the proliferation of non-nuclear systems will shape nuclear competition to a greater degree in the future than it did before 1991. Critics of U.S. nuclear policy sometimes emphasize the ability of U.S. military forces to carry out cross-domain deterrence: for example, threatening to carry out

a non-nuclear attack to deter a nuclear one.⁵⁴ Yet, cross-domain deterrence does not necessarily mean relying solely on one or two favored types of weapons or domains of military operations (i.e., air, sea, ground, or cyber) to deter threats. It is really about coordinating and synchronizing forces and different types of weapons to generate credible threats in the eyes of adversaries. Some of those responses could utilize a combination of arms and a cross-domain approach to enhance their

In a crisis and wartime scenario, competitors might try to conceal their true political and military objectives to throw off the other's efforts to gain advantages.

effectiveness. Thus, figuring out how a competitor might deploy and employ nuclear forces during the next 20 to 30 years requires accounting in some useful way for the non-nuclear forces that will be available for use alongside them. A competitor's non-nuclear forces may affect how it uses nuclear weapons in a crisis or conflict to achieve a particular objective, and that use might, in turn, shape competitors' deployment of non-nuclear and nuclear forces or their decision to employ nuclear weapons to achieve their objectives.

As critics of new low-yield nuclear weapons point out, conventional precision-strike systems are capable of conducting effective strikes against some types of targets that were once only assigned to nuclear weapons systems.⁵⁵ This does not mean, however, that conventional capabilities will completely crowd out nuclear weapons in countries' operational plans. Tailored nuclear weapons, for

52 Doyle, "Deterrence and Flexibility," 32–33.; Colin S. Gray, "Deterrence Resurrected: Revisiting Some Fundamentals," *Parameters* (Summer 1991): 100–101, <https://ssi.armywarcollege.edu/pubs/parameters/articles/2010winter/Gray.pdf>; and Antulio J. Echevarria II, "On Schelling and the Fallacy of Positive Doctrines," *Infinity Journal* 6, no. 2 (Summer 2018): 10–14, https://www.infinityjournal.com/article/205/On_Schelling_and_the_Fallacy_of_Positive_Doctrines/.

53 TNI Staff, "Meet Russia's Tu-22M3 Backfire, The Bomber That Could Sink a Navy Aircraft Carrier," *National Interest*, June 5, 2018, <https://nationalinterest.org/blog/the-buzz/meet-russias-tu-22m3-backfire-the-bomber-could-sink-navy-26137>; Megan Eckstein, "Truman Carrier Strike Group Operating North of Arctic Circle; First Time for US Navy Since 1991," *USNI News*, Oct. 19, 2018, <https://news.usni.org/2018/10/19/truman-carrier-strike-group-operating-north-arctic-circle-first-time-us-navy-since-1991>; and Michael Kofman, "Revise and Resubmit: An Unconvincing Proposal for Permanent U.S. Troops in Poland," *War on the Rocks*, Nov. 1, 2018, <https://warontherocks.com/2018/11/revise-and-resubmit-an-unconvincing-proposal-for-permanent-u-s-troops-in-poland/>.

54 Adam Mount, "Trump's Troubling Nuclear Plan: How It Hastens the Rise of a More Dangerous World," *Foreign Affairs*, Feb. 2, 2018, <https://www.foreignaffairs.com/articles/2018-02-02/trumps-troubling-nuclear-plan>; and James Scouras, Edward Smyth, and Thomas Mahnken, *Cross-Domain Deterrence in US-China Strategy* (Laurel, MD: The Johns Hopkins University Applied Physics Laboratory, 2014), 2, <https://www.jhuapl.edu/Content/documents/CrossDomainWeb.pdf>.

55 Michael Krepon, "The Folly of Tactical Nuclear Weapons," *Defense One*, Oct. 2, 2017, <https://www.defenseone.com/technology/2017/10/folly-tactical-nuclear-weapons/141440/>

example, might be the most effective for destroying particular hardened targets when non-nuclear means cannot be relied on to do the same or to degrade the target's military effectiveness.⁵⁶ When used in the role of missile defense, the radiation output of a nuclear weapon is likely to produce a lethal radius exceeding that of conventional weapons, thereby increasing the chance of disabling an incoming delivery vehicle that is inadequately hardened against radiation effects.⁵⁷

Many nuclear competitors seem to believe that non-nuclear active missile defenses hold the prospect of being more effective today than when first deployed decades ago; however, in some cases, the size of a missile raid and the use of counter-measures could reduce their effectiveness.⁵⁸ Thus, the possibility of intercepting inbound nuclear-armed delivery vehicles has implications for nuclear escalation.⁵⁹ In addition, computer network attack and defense could affect nuclear command, control, and communications in a crisis or conflict, while a competitor's views of the wartime survivability and effectiveness of its own space-based capabilities — intelligence, surveillance, and reconnaissance; communications; and missile early warning systems — might affect how it sees its chances in a nuclear conflict.⁶⁰ For example, the loss of space-based platforms with multiple-mission payloads in an ongoing non-nuclear conflict might lead to a nuclear response.

Conventional and Nuclear Operations Are Interdependent

The third key feature of a nuclear competition, somewhat related to the role of non-nuclear technologies, is that assessing how the character

of the nuclear competition under peacetime conditions might look different under wartime conditions cannot be completely divorced from other areas of the military competition. Thus, policy and strategy debates would benefit from examining the plausible multidomain dynamics and complexities of potential conflicts, including nuclear-use scenarios, through an operational lens to better understand the relative strengths and weaknesses of U.S. warfighting capabilities.⁶¹

Analysis of and planning for integrated conventional and nuclear operations is important for at least two reasons. First, how nuclear operations evolve during a conflict will, to some extent, depend on how conventional operations play out, and vice versa. For example, if U.S. forces were to conduct conventional suppression of enemy air defense operations against Russia's integrated air defense system within its Western Military District, Russian leaders could perceive the effort as threatening the security of the state, thereby provoking the use of nuclear weapons to compel U.S. de-escalation. Similarly, Chinese leaders might interpret U.S. conventional strike operations against the People's Liberation Army Rocket Force units and command-and-control infrastructure as a way to degrade China's nuclear deterrent.⁶² Such an interpretation could result in Chinese nuclear strikes against U.S. military targets in the Pacific region.

Second, nuclear strikes can be used in tandem with conventional precision-strike systems to make offensive operations more effective.⁶³ For example, if a competitor fears the effectiveness of an opponent's terminal-phase missile defense system — the last opportunity to intercept a missile before it hits its target — it might initiate a broad

56 *Effects of Nuclear Earth-Penetrator and Other Weapons*, National Research Council (Washington, DC: The National Academies Press, 2005), <https://doi.org/10.17226/11282>.

57 Richard L. Garwin and Hans A. Bethe, "Anti-ballistic Missile Systems," *Scientific American* (March 1968): 259–68, <https://www.tandfonline.com/doi/abs/10.1080/00396336808440897>.

58 Ronald O'Rourke, *Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress*, Congressional Research Service, updated Feb. 6, 2019, <https://fas.org/sgp/crs/weapons/RL33745.pdf>; Theodore A. Postol, "Lessons of the Gulf War Experience with Patriot," *International Security* 16, no. 3 (Winter 1991/92): 119–71, <https://muse.jhu.edu/article/447288/pdf>; Max Fisher, Eric Schmitt, Audrey Carlsen, and Malachy Browne, "Did American Missile Defense Fail in Saudi Arabia?" *New York Times*, Dec. 4, 2017, <https://www.nytimes.com/interactive/2017/12/04/world/middleeast/saudi-missile-defense.html>; and Andrew M. Sessler, et al., *Countermeasures: A Technical Evaluation of the Operational Effectiveness of the Planned US National Missile Defense System*, Union of Concerned Scientists and MIT Security Studies Program, April 2000, https://www.ucsusa.org/sites/default/files/legacy/assets/documents/nwgs/cm_all.pdf.

59 Stephan Fruhling, "Managing escalation: Missile Defence, Strategy and US Alliances," *International Affairs* 92, no. 1 (January 2016): 81–95, <https://doi.org/10.1111/1468-2346.12501>.

60 Erik Gartzke and Jon R. Lindsay, "Thermonuclear Cyberwar," *Journal of Cybersecurity* 3, no. 1 (March 2017): 37–48, <https://doi.org/10.1093/cysec/tyw017>; and, *Russia Military Power: Building a Military to Support Great Power Aspirations*, Defense Intelligence Agency, 2017, <https://www.dia.mil/Portals/27/Documents/News/Military%20Power%20Publications/Russia%20Military%20Power%20Report%202017.pdf>.

61 See, for example, James John Tritten, "Are Nuclear and Non-Nuclear War Related?" *Journal of Strategic Studies* 11, no. 3 (1988): 365–73, <https://www.tandfonline.com/doi/abs/10.1080/01402398808437347>.

62 Vincent A. Manzo, "After the First Shots: Managing Escalation in Northeast Asia," *Joint Forces Quarterly* 77 (2nd Quarter, 2015): 96–97, https://ndupress.ndu.edu/Portals/68/Documents/jfq/jfq-77/jfq-77_91-100_Manzo.pdf.

63 Thomas G. Mahnken, "Weapons: The Growth & Spread of the Precision-Strike Regime," *Daedalus* 140, no. 3 (Summer 2011): 45–57, https://www.mitpressjournals.org/doi/10.1162/DAED_a_00097.

conventional-strike campaign by first detonating a nuclear weapon at high altitude to disrupt the transmission of radar waves with the intent of degrading the opponent's missile defenses.⁶⁴

Perhaps, just as during the Cold War phase of the U.S.-Russia nuclear competition, U.S. conventional forces must be organized, trained, and equipped to survive and remain effective in a battlefield that sees the use of nuclear weapons to have any chance of providing decision-makers with non-nuclear options for warfighting and deterrence. Although the Russian government would prefer to conduct military operations under the threat of nuclear weapons use rather than their actual use, the combination of Russia's limited conventional strike force structure, likely regional adversaries, and potential war aims translates into the Russian military planning and practicing for a nuclear battlefield.⁶⁵ In Russian exercises and war games, the use of nuclear weapons in battlefield-support missions can mark the early and middle phases of conflicts — and the Russian military is trained and equipped accordingly.⁶⁶

One key difference between the Russian and the Chinese militaries is that the former is better equipped for integrated conventional-nuclear operations. For many political reasons, both international and domestic, the Chinese military might improve its position in this area of the U.S.-China competition in the near future. With advances in Chinese long-range conventional precision-strike technologies, for example, the rocket force could transfer those technologies to its nuclear forces and broaden the range of operational concepts available to Chinese war planners.⁶⁷

Meanwhile, there is no open-source evidence to suggest that U.S. conventional forces are better off than they were in 2011 when the Department of Defense's Defense Science Board concluded that

“the survivability, effectiveness, and adaptation of [conventional forces] to [a battlefield in which nuclear weapons have been used] is at best unknown.”⁶⁸ No wonder that the 2018 *Nuclear Posture Review* stated that combatant commands and service components will plan, train, and exercise to integrate nuclear and non-nuclear forces and to operate in a nuclear battlefield.⁶⁹

The Defense Department will need to invest in increasing the ability of U.S. conventional forces to operate in a nuclear battlefield, especially if the United States wants the option of refraining from an in-kind nuclear response to a hypothetical Russian nuclear strike against NATO forces, as some analysts have recommended.⁷⁰ These recommendations raise the question of how to configure U.S. conventional forces for a possible protracted conflict in which only one side is utilizing nuclear weapons. U.S. nuclear restraint in this scenario might invite Russia to continue to use nuclear weapons and lead to the rapid degradation of U.S. and allied conventional forces (in addition to undermining U.S. extended deterrence commitments and nuclear nonproliferation efforts).

Nuclear self-restraint and reliance on conventional operations after a competitor has used nuclear weapons raise a number of challenges for the U.S. military's current and planned force structure and posture, especially regarding a possible conflict in Europe. For example, in light of the 2011 Defense Science Board report and U.S. European Command's post-2001 emphasis on operations outside of NATO members' borders, U.S. airbases overseas are less capable of supporting flight operations for extended periods of time due to a lack of training and equipment geared toward reconstituting the bases' capabilities following a nuclear strike.⁷¹ In addition, while the U.S. Army

64 Samuel Glasstone and Philip J. Dolan, eds., *The Effects of Nuclear Weapons*, Third Edition (Washington, D.C.: Departments of Defense and Energy, 1977), 47, https://www.dtra.mil/Portals/61/Documents/NTPR/4-Rad_Exp_Rpts/36_The_Effects_of_Nuclear_Weapons.pdf; and Garwin and Bethe, "Anti-ballistic Missile Systems."

65 Lester W. Grau and Charles K. Bartles, *The Russian Way of War: Force Structure, Tactics, and Modernization of the Russian Ground Forces* (Fort Leavenworth, KS: Foreign Military Studies Office, 2016), 25, 46, 48, 51, and 61, <https://www.armyupress.army.mil/Portals/7/Hot%20Spots/Documents/Russia/2017-07-The-Russian-Way-of-War-Grau-Bartles.pdf>.

66 In particular, see the remarks of Gregory Weaver, "Nuclear Posture Review, Panel Discussion."

67 Eric Heginbotham, Michael S. Chase, et al., *China's Evolving Nuclear Deterrent: Major Drivers and Issues for the United States* (Santa Monica, Calif.: RAND Corporation, 2017), esp. chaps. 2 and 3, https://www.rand.org/pubs/research_reports/RR1628.html.

68 *Interim Report of the Defense Science Board (DSB) Task Force on the Survivability of Systems and Assets to Electromagnetic Pulse (EMP) and other Nuclear Weapon Effects (NWE)*, Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, August 2011, <https://www.acq.osd.mil/dsb/reports/2010s/ADA550250.pdf>.

69 *Nuclear Posture Review*.

70 Michael Krepon and Joe Kendall, "Beef Up Conventional Forces; Don't Worry About A Tactical Nuke Gap," *Breaking Defense*, March 28, 2016, <https://breakingdefense.com/2016/03/beef-up-conventional-forces-dont-worry-about-a-tactical-uke-gap/>; Krepon, "The Folly of Tactical Nuclear Weapons"; and Wolfsthal, "Say No to New, Smaller Nuclear Weapons."

71 Brian Bahret, "Breedlove to command EUCOM, SHAPE," Royal Air Force Mildenhall, May 8, 2013, <https://www.mildenhall.af.mil/News/Article-Display/Article/270505/breedlove-to-command-eucom-shape/>.

should be re-assessing its tactics for resolving the dilemma between how its ground forces mass for effective attack versus how they space out units to avoid presenting themselves to enemy forces as inviting targets as Russia continues to improve its ability to conduct conventional precision strikes, it should also be taking steps to ensure it can conduct effective operations on a nuclear battlefield. Such steps may include hardening its equipment against the effects of a nuclear strike, reviewing its decontamination procedures and possibly enhancing its decontamination equipment, and planning how to regain the battlefield initiative and its control of the tempo of operations following a nuclear strike.⁷²

The challenges of ensuring survivable conventional forces in a potential European nuclear battlefield suggest that it will not be easy to terminate a conflict on favorable terms against an adversary using nuclear weapons while U.S. forces use only conventional operations and other non-nuclear tools. They also indicate that both conventional *and* nuclear forces constitute the anti-access and area denial problem that the U.S. military has been fixated on for years (an adversary's anti-access and area denial systems increase the distance between its assets and areas from which the United States can operate its military forces with impunity).⁷³ Analysts should consider this area fertile ground for more comprehensive examination.

Avoiding Pitfalls in Analyzing Nuclear Competitions

There are five additional considerations, or guidelines, to keep in mind while analyzing a nuclear competition or structuring an assessment of a given nuclear balance involving the United States that will help to avoid analytic weaknesses that will derail the integrity of the findings or of the diagnosis. First, U.S. extended deterrence commitments and alliance politics complicate U.S. nuclear policy and strategy and force structure decisions, as well as combined allied military planning. If the aim of

analysis is to ensure the adequacy of U.S. military capabilities, then the potential for additional and novel problems to surface for Defense Department planners and U.S. decision-makers during a crisis or war should not be excluded from the analysis or substituted with rosy assumptions. Second, because analysts are limited in their ability to foresee all of the critical circumstances of a future battle space and to discern an adversary's future intentions, they should not discount the possibility of the limited use of nuclear weapons. Third, strategic analysts should be skeptical about the utility of social scientific theories and models of complex human interactions under the nuclear shadow, unless those theories and models account for how key features of a nuclear competition, based on empirical evidence, will influence its peacetime evolution and how those features might shape military operations. Fourth, competitors' peacetime nuclear declaratory policies are inadequate guidelines for bounding the scope of an analysis of a nuclear competition. These policies could change quickly once the leadership confronts the reality of a crisis or war. Fifth, the nature of a nuclear war will ultimately be defined by politics. The possibility of one or more belligerents making concessions to bring the war to a close means that nuclear annihilation is not the only possible outcome after the initial use of nuclear weapons.

No *A Priori* Resolution of U.S. Extended Deterrence Problems

Some critics of enhanced U.S. nuclear weapon capabilities or posture are dismissive of the military and political challenges that U.S. extended deterrence commitments might pose for U.S. decision-makers over the next 20 to 30 years.⁷⁴ These critics are convinced that, in the eyes of potential adversaries, the United States and its allies have a credible deterrent. But they are unclear about what specific actions can be deterred and under what particular conditions, what factors make the deterrent credible to adversaries, and for how long adversaries may believe the U.S. deterrent threats to be credible.⁷⁵ Sometimes, these

72 *Field Manual 100-30 Nuclear Operations* (Washington, D.C.: Headquarters, U.S. Army, 1996), 2–5, <https://fas.org/irp/doddir/army/fm100-30.pdf>; and Samuel Cranny-Evans, Mark Cazalet, and Christopher F. Foss, "The Czar of Battle: Russian Artillery use in Ukraine Portends Advances," *Jane's International Defence Review*, accessed May 26, 2019, https://www.janes.com/images/assets/111/80111/The_Czar_of_battle_Russian_artillery_use_in_Ukraine_portends_advances.pdf.

73 Richard Fontaine and Julianne Smith, "Anti-Access/Area Denial Isn't Just for Asia Anymore," *Defense One*, April 2, 2015, <https://www.defenseone.com/ideas/2015/04/anti-accessarea-denial-isnt-just-asia-anymore/109108/>; and Nathan Jennings, Amos Fox, and Adam Taliaferro, "The US Army is Wrong on Future War," *Modern War Institute*, Dec. 18, 2018, <https://mwi.usma.edu/us-army-wrong-future-war/>.

74 Adam Mount, "Questioning the Case for New Nuclear Weapons," *Bulletin of the Atomic Scientists*, accessed Aug. 21, 2015, <https://thebulletin.org/2015/08/questioning-the-case-for-new-nuclear-weapons-2/>; and Steve Andreasen, "Rethinking NATO's Tactical Nuclear Weapons," *Survival* 59, no. 5 (2017): 47–53, <https://www.tandfonline.com/doi/full/10.1080/00396338.2017.1375225>.

75 Blechman and Rumbaugh, "Bombs Away."

critics seem to suggest that potential adversaries perceive robust coupling between the U.S.-based nuclear arsenal and the local defense of U.S. allies; however, adversaries' perceptions and how they might change over time are usually opaque or indeterminate to external observers.⁷⁶

Because of this significant uncertainty, a key element of U.S. defense planning has been to deploy and posture forces to minimize the ability of and the incentives for potential adversaries to devise and implement operational plans for achieving their war aims. U.S. leaders have also tried to assure a disparate set of allies of the

History suggests that decision-makers will want a toolkit equipped with multiple nuclear and non-nuclear capabilities to manage alliance politics, deter different forms of aggression, and mitigate operational challenges.

U.S. commitment to their defense and keep them aligned on policy and strategy.⁷⁷ U.S. leaders from both major political parties have long wanted a robust set of military options for dealing with a nuclear competitor's potential challenges to U.S. extended deterrence commitments. The takeaway, though, is not that the United States should simply develop and deploy all possible types of nuclear options so that it can have in-kind responses ready for the many ways competitors might use nuclear weapons. Rather, it is that it is reasonable to expect that future U.S. decision-makers will not want the

United States to accept being a strategic hostage to an adversary's ability to launch a nuclear strike at the U.S. homeland. Nor will decision-makers want to cede the initiative to an adversary in regional conflicts that threaten U.S. overseas interests. History suggests that decision-makers will want a toolkit equipped with multiple nuclear and non-nuclear capabilities to manage alliance politics, deter different forms of aggression, and mitigate operational challenges.

The act of deterring a particular adversary action is essentially to sustain a threat to impose costs on the adversary or deny it a benefit, if it commits that action.⁷⁸ The effectiveness of the threat, moreover, is inextricably connected to whether the adversary believes that the defender is willing to absorb the costs that may come with fulfilling that threat. The higher the costs that are thought to be associated with fulfilling the deterrent threat, the less credible the deterrent threat is likely to be in the mind of the adversary. In concrete terms, nothing is more important to a nuclear competitor than the security of its homeland. Thus, analysts have generally viewed threats of large-scale costs in response to an adversary launching major conventional or nuclear attacks against a country's homeland to be more credible than threats meant to deter an adversary from committing small-scale attacks against the country's homeland that cause limited damage, or to protect distant allies against attack.⁷⁹

The debate surrounding the 2018 *Nuclear Posture Review* shows that, just like during the Cold War phase of the U.S.-Russia nuclear competition, extended deterrence commitments remain a key challenge in formulating U.S. nuclear policy and strategy.⁸⁰ To some extent, echoes of the Nixon administration's nuclear thinking — which was centered on its belief that the ability of the Soviet Union to respond to a large-scale U.S. nuclear attack with a devastating nuclear counter-attack against the continental United States had nullified the U.S. extended nuclear deterrent — continued

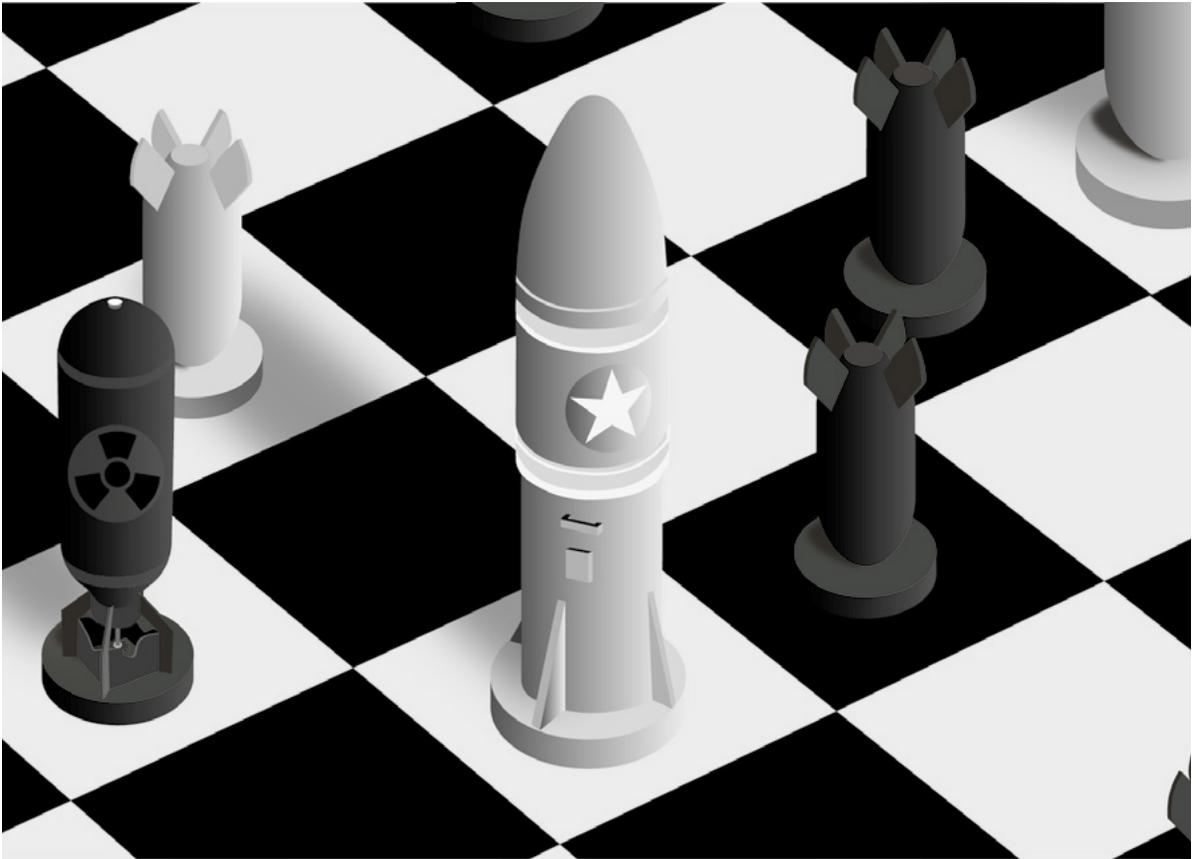
76 Earl C. Ravenal, "Counterforce and Alliance: The Ultimate Connection," *International Security* 6, no. 4 (Spring 1982): 26–43, <https://www.jstor.org/stable/2538676>.

77 Frank A. Rose, "As Russia and China Improve their Conventional Military Capabilities, Should the US Rethink Its Assumptions on Extended Nuclear Deterrence?" The Brookings Institution, Oct. 23, 2018, <https://www.brookings.edu/blog/order-from-chaos/2018/10/23/as-russia-and-china-improve-their-conventional-military-capabilities-should-the-us-rethink-its-assumptions-on-extended-nuclear-deterrence/>; Paul Dibb, "Should Australia Develop Its Own Nuclear Deterrent?" *The Strategist*, Australian Strategic Policy Institute, Oct. 4, 2018, <https://www.aspistrategist.org.au/should-australia-develop-its-own-nuclear-deterrent/>; and Kofman, "Revise and Resubmit."

78 Thomas C. Schelling, *The Strategy of Conflict* (Cambridge, MA: Harvard University Press, 1960), 187–88.

79 Glaser, *Analyzing Strategic Nuclear Policy*, 54; Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Ithaca, NY: Cornell University Press, 1990), 38–40; and Kroenig, *The Logic of American Nuclear Strategy*, 4.

80 Draft Memorandum from Secretary of Defense McNamara to President Kennedy, "Subject: Recommended Long Range Nuclear Delivery Forces 1963-1967," Sept. 23, 1961, *Foreign Relations of the United States, 1961-1963*, Vol. VIII, National Security Policy, <https://history.state.gov/historicaldocuments/frus1961-63v08/d46>; Marc Trachtenberg, *History and Strategy* (Princeton, NJ: Princeton University Press, 1991), chaps. 4–5; and Ravenal, "Counterforce and Alliance."



to reverberate during the Clinton and Obama administrations.⁸¹ A declassified and heavily redacted *Nuclear Supplement to Joint Strategic Capabilities Plan For FY 1996* suggests that some form of escalation control and limited nuclear options were retained in Department of Defense planning.⁸² Though the Obama administration sought to downplay the role of nuclear weapons in U.S. national security strategy and to elevate the role of non-nuclear capabilities, it nevertheless insisted that U.S. nuclear forces “be postured and planned” so that the “United States should have a wide range of effective response options available to deter potential regional threats.”⁸³

In sum, because U.S. extended deterrence commitments generate a wide range of foreseeable and unforeseeable strategic and operational

problems for U.S. planners and decision-makers, analysts should ensure that such problems are incorporated into their assessments as much as practicable, and not simply assume the problems will fail to materialize and complicate future U.S. military operations.

Limited Nuclear Wars Are Possible

Analysts can neither foresee the full range of circumstances that will factor into an adversary’s decision to be the first to use nuclear weapons in support of a military campaign, nor can they predict the circumstances that would shape a response. Therefore, analysts should not rule out the possibility of limited nuclear use, whereby an adversary’s use of nuclear weapons is not designed

81 William Burr, “The Nixon Administration, the ‘Horror Strategy,’ and the Search for Limited Nuclear Options, 1969-1972,” *Journal of Cold War Studies* 7, no. 3 (Summer 2005): 34–78, <https://www.mitpressjournals.org/doi/10.1162/1520397054377188>; Richard Nixon, “National Security Decision Memorandum 242,” Jan. 17, 1974, <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB173/SIOP-24b.pdf>; James R. Schlesinger, *The Theater Nuclear Force Posture in Europe*, A Report to the United States Congress in compliance with Public Law 93-365 (Washington, D.C.: Department of Defense, April 1, 1975), partially declassified, 1–2, <https://www.archives.gov/files/declassification/iscap/pdf/2013-066-doc01.pdf>; and “Notes on NSC Meeting 14 February 1969,” <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB173/SIOP-6.pdf>.

82 *Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)*, Chairman of the Joint Chiefs of Staff Instruction 3110.04, Feb. 12, 1996, partially declassified, A-2, D-1, H-3, and GL-11, http://www.nukestrat.com/us/jcs/98-53h_AnnexC96.pdf.

83 *Nuclear Posture Review Report*, Department of Defense, April 2010, https://dod.defense.gov/Portals/1/features/defenseReviews/NPR/2010_Nuclear_Posture_Review_Report.pdf; and *Report on Nuclear Employment Strategy of the United States Specified in Section 491 of 10 U.S.C.*, Department of Defense, June 12, 2013, 8, <https://apps.dtic.mil/dtic/tr/fulltext/u2/a590745.pdf>.

to destroy or overthrow the government of its opponent.⁸⁴ Instead, they should plan for such a possibility and think about how U.S. general purpose and nuclear forces would conduct sustained combat operations in an environment defined by the constant threat of nuclear weapons use as well as the actual intermittent use of such weapons.⁸⁵

Perhaps most important, the open-source literature indicates that the Russian military believes that limited nuclear wars are indeed possible. According to Dave Johnson, an analyst in the NATO International Staff Defence Policy and Planning Division, Russian military writings suggest “a role for nuclear weapons, including their limited use, in wars of various scales and intensities.”⁸⁶ One scenario that has become salient in discussions about a possible U.S.-Russian nuclear conflict is a Russian invasion of one or all of the Baltic states of Estonia, Latvia, and Lithuania, all of which are NATO members.⁸⁷ In a 2016 Center for American Progress table-top exercise looking at a short-warning Russian invasion of the Baltic states, participants recommended that U.S.-NATO forces continue to wage a conventional campaign rather than employ nuclear weapons to halt or reverse the Russian offensive.⁸⁸ Russian military documents and the published works of Russian military authors, however, suggest an alternative scenario wherein Russia conducts limited nuclear escalation — perhaps against U.S. military targets on European territories or in the littoral waters — in defense of gains it has made and to thwart U.S. intervention. In other words, Russia would extend its nuclear umbrella over seized territory to shore up its *fait accompli* against a NATO counter-attack.⁸⁹

In response to Russia’s nuclear use in the European theater, the onus would be on the United States to refrain from a nuclear response; to conduct a nuclear strike that the Russians might perceive as equivalent to their own, thereby perhaps lessening the pressure for Russian escalation; or to conduct a much larger set of nuclear strikes against military targets, which the Russians might see as highly escalatory.⁹⁰ In the Baltic states *fait accompli* scenario, it would be challenging for U.S. and NATO forces to continue conventional operations without also conducting supporting nuclear strikes to re-establish intra-war deterrence of Russian nuclear use.

Discounting the possibility of the limited use of nuclear weapons could exclude numerous plausible military scenarios from being studied in the effort to determine whether U.S. military forces are adequately prepared for the use of nuclear weapons in a conflict.

A Nuclear Revolution? Disagreements About Deterrence and Strategic Stability

In order for any analysis of nuclear competitions to be meaningful to Defense Department planners and national security policymakers, it should be based on empirical data as much as possible. However, the dearth of adequate information on how each competitor views its standing in a nuclear competition against the United States and the potential effectiveness of its ways and means to achieve its objectives might lead some analysts and policymakers to fall back on a small collection of social scientific theories and models of the military requirements of deterring nuclear weapons use or of achieving war aims, such as the “nuclear

84 Donald Stoker, “Everything You Think You Know About Limited War Is Wrong,” *War on the Rocks*, Dec. 22, 2016, <https://warontherocks.com/2016/12/everything-you-think-you-know-about-limited-war-is-wrong>.

85 John K. Warden, *Limited Nuclear War: The 21st Century Challenge for the United States*, Livermore Papers on Global Security no. 4 (July 2018), https://cgsr.llnl.gov/content/assets/docs/CGSR_LP4-FINAL.pdf.

86 Dave Johnson, *Russia’s Conventional Precision Strike Capabilities, Regional Crises, and Nuclear Thresholds*, Livermore Papers on Global Security no. 3 (February 2018): 16, <https://cgsr.llnl.gov/content/assets/docs/Precision-Strike-Capabilities-report-v3-7.pdf>.

87 David A. Shlapak and Michael W. Johnson, “Reinforcing Deterrence on NATO’s Eastern Flank: Wargaming the Defense of the Baltics,” RR-1253-A, RAND Corporation, 2016, https://www.rand.org/content/dam/rand/pubs/research_reports/RR1200/RR1253/RAND_RR1253.pdf.

88 Adam Mount, “The Case Against New Nuclear Weapons,” Center for American Progress, May 4, 2017, 24–25, <https://www.americanprogress.org/issues/security/reports/2017/05/04/431833/case-new-nuclear-weapons/>.

89 Keir Giles, “Russia’s ‘New’ Tools for Confronting the West: Continuity and Innovation in Moscow’s Exercise of Power,” Chatham House Research Paper (March 2016), 19, <https://www.chathamhouse.org/sites/default/files/publications/2016-03-russia-new-tools-giles.pdf>; and Johnson, *Russia’s Conventional Precision Strike Capabilities*, 52.

90 Jay Ross, “Time to Terminate Escalate to De-escalate — It’s Escalation Control,” *War on the Rocks*, April 24, 2018, <https://warontherocks.com/2018/04/time-to-terminate-escalate-to-de-escalateits-escalation-control/>.



revolution” perspective or the “superiority-brinkmanship synthesis theory.”⁹¹ They should be cautious in surrendering to that temptation at the early stages of their research and analysis.

nuances reflected in evolving technologies, military operational concepts, and doctrine; the rise and fall of influential national security organizations; and new decision-making processes — that might be

Therefore, while social scientific theories and models can offer insights and intriguing perspectives, strategic analysts should approach them with a skeptical eye.

critical to understanding areas of potential U.S. leverage in a nuclear competition. Most important, the early adoption of some theories or models could result in the analyst foreclosing promising avenues of investigation, such as how U.S. competitors

The discussion so far suggests a divergence between the nuclear revolution school — the main school of nuclear thought in academia — and the strategic-analytic framework discussed in this paper. Although it is outside the scope of this article to close the gap between these two approaches, it is important to highlight some of the areas of disagreement and concern about deterrence requirements and the issue of strategic stability, as well as with how the United States could best develop its nuclear capabilities and nuclear posture to achieve its national security objectives.⁹² Analysts adopting the strategic-analytic framework discussed in this article should be mindful that social scientific theories and models — by simplifying complex interactions of human, organizational, and inter-state behaviors in a quest for parsimonious explanations and predictive power — do not explain or help analysts understand the exceptions to the models that are found in histories of military competitions. It is these exceptions — the complexities and

actually assess the nuclear balance and whether they would be deterred from initiating war to achieve their objectives. Therefore, while social scientific theories and models can offer insights and intriguing perspectives, strategic analysts should approach them with a skeptical eye.⁹³

In brief, the leading proponents of the nuclear revolution school, Robert Jervis and Charles Glaser, argue that under the condition of mutual assured destruction, wherein each nuclear competitor’s major population centers are vulnerable to annihilation, the likelihood of one side attacking the other is low and the quest for capabilities that would allow a disarming first strike is therefore futile. Moreover, because neither competitor can spare its population from serving as a hostage, the competitor willing to accept greater risk in a crisis or conflict will prevail.⁹⁴ Political outcomes, according to this school of thought, will be based on a competition in risk-taking rather than the nuclear balance.⁹⁵

Critics have countered, however, that the nuclear

91 Andrew W. Marshall, "Commentary: Strategy as a Profession in the Future Security Environment," in *Nuclear Heuristics: Selected Writings of Albert and Roberta Wohlstetter*, ed. Robert Zarate and Henry Sokolski (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, January 2009): 625–36; Marshall, "Arms Competitions," and Francis J. Gavin, "Breaking Discipline and Closing Gaps? – The State of International Relations Education," *War on the Rocks*, Feb. 5, 2015, <https://warontherocks.com/2015/02/breaking-discipline-and-closing-gaps-the-state-of-international-relations-education>. On the importance of being "ruthlessly empirical" in one's analytic approach to understanding a military competition, see the remarks of Tom Ehrhard, a former military assistant in the Defense Department's Office of Net Assessment, in "Remembering Andy Marshall," *Defense & Aerospace Report Podcast*, March 29, 2019, <https://soundcloud.com/defaeroreport/special-defense-aerospace-report-podcast-mar-29-2019-remembering-andy-marshall>. For the nuclear revolution perspective, see Jervis, *The Meaning of the Nuclear Revolution*; for the superiority-brinkmanship synthesis theory, see Kroenig, *The Logic of American Nuclear Strategy*.

92 Analysis of the disputes between different schools of thought within the nuclear analytic community during the 1980s, much of which remains relevant to contemporary nuclear issues, can be found in Glaser, *Analyzing Strategic Nuclear Policy*, chaps. 2–3.

93 On the relative merits of analyses based on deductive and inductive methods, see Robert Jervis, "Rational Deterrence: Theory and Evidence," *World Politics* 41, no. 2 (January 1989): 183–207, <https://www.cambridge.org/core/journals/world-politics/article/rational-deterrence-theory-and-evidence/AB53D05487AEAB567F868A4407C35142>.

94 Jervis, *The Meaning of the Nuclear Revolution*, chap. 3; Robert Jervis, "Why Nuclear Superiority Doesn't Matter," *Political Science Quarterly* 94, no. 4 (Winter 1979–1980): 617–33, https://www.jstor.org/stable/2149629?seq=1#page_scan_tab_contents; and Glaser, *Analyzing Strategic Nuclear Policy*, esp. chap. 11. For application of the nuclear revolution framework to the U.S.-China nuclear competition, see Charles L. Glaser and Steve Fetter, "Should the United States Reject MAD? Damage Limitation and U.S. Nuclear Strategy Toward China," *International Security* 41, no. 1 (Summer 2016): 49–98, https://www.mitpressjournals.org/doi/10.1162/ISEC_a_00248.

95 Glaser, *Analyzing Strategic Nuclear Policy*, 53; and Thomas C. Schelling, *Arms and Influence* (New Haven, CT: Yale University Press, 1966): 92–125.

revolution school does not explain nuclear reality.⁹⁶ Keir Lieber and Daryl Press argue that through technological change and innovative military operational concepts, nuclear competitors can put one another's seemingly invulnerable retaliatory forces in jeopardy. They further note that the United States has invested heavily in capabilities to undermine the survivability of its competitors' forces.⁹⁷ Brendan Green and Austin Long, using declassified sources, contend that Soviet leaders during the latter half of the Cold War believed that mutual assured destruction was tenuous due to U.S. competitive pressure on the Soviet nuclear force structure and posture.⁹⁸ In addition, Matthew Kroenig uses his "superiority-brinkmanship synthesis theory" to argue that advantages in the nuclear balance increase a competitor's willingness to engage in the competition in risk-taking. In contrast, an inferior nuclear competitor is less likely to run great risks and initiate military aggression against a superior competitor.⁹⁹ Taken together, these critics of the nuclear revolution school assert that nuclear advantages *are* achievable and *do* matter to political outcomes.

Several areas of tension between the nuclear revolution school and its critics come to the surface in discussions of how the United States can use nuclear forces to maintain its overseas defense commitments to allies and deter both nuclear and non-nuclear attacks on their homelands. First, to enable the United States to demonstrate its resolve in support of the defense of its overseas interests and enhance its bargaining position with an adversary, the nuclear revolution school favors small-scale nuclear strikes against nonmilitary targets, such as economic and industrial assets, or even demonstration strikes against remote, unpopulated geographic areas simply to show resolve, rather than nuclear strikes against military targets, especially nuclear forces.¹⁰⁰ Correspondingly, the school asserts that under the condition of mutual assured destruction and in line with the logic of deterrence by punishment,

the costs of counterforce strikes actually result from harm caused to the adversary's population, not from the loss of military capabilities. Moreover, according to this school of thought, U.S. counterforce capabilities could end up encouraging escalation.

In contrast, Elbridge Colby, who served as deputy assistant secretary of defense for strategy and force development when the 2018 *National Defense Strategy* and *Nuclear Posture Review* were published, contends that small-scale nuclear strikes against military targets, such as conventional forces, could enable the United States to demonstrate both resolve and restraint.¹⁰¹ Colby suggests that an adversary might see a difference between U.S. strikes against military forces that weaken its ability to achieve its objectives, and strikes against targets that might result in additional harm to civilians. If so, that difference could allow the United States to shift the burden of escalation onto the adversary. If the adversary were to assess the nuclear balance and recognize this potential outcome, it might be dissuaded from initiating a conflict in the first place. The nuclear revolution school overlooks this possibility.

Second, and related, the nuclear revolution school sees little value in retaliating in kind against military targets following an adversary's counterforce attack for several reasons: First, destroying forces while bargaining under the condition of mutual assured destruction does not inflict substantial costs on the adversary (assuming the forces are not near population centers); second, small-scale attacks against nonmilitary targets do inflict costs while also conveying U.S. restraint and the implicit promise of future costs if the adversary does not reciprocate this restraint; finally, attacking the adversary's nuclear forces sends a much less clear message in terms of demonstrating restraint and the promise of future costs, as there is little logic to attacking redundant nuclear forces when the adversary will retain a survivable nuclear retaliatory capability.¹⁰²

96 For a more extensive survey of the nuclear revolution school and its critics, see Gavin, "Rethinking the Bomb."

97 Keir A. Lieber and Daryl G. Press, "The New Era of Counterforce: Technological Change and the Future of Nuclear Deterrence," *International Security* 41, no. 4 (Spring 2017): 9–49, https://www.mitpressjournals.org/doi/10.1162/ISEC_a_00273.

98 Brendan R. Green and Austin Long, "The MAD Who Wasn't There: Soviet Reactions to the Late Cold War Nuclear Balance," *Security Studies* 26, no. 4 (2017): 606–41, <https://doi.org/10.1080/09636412.2017.1331639>.

99 Kroenig, *The Logic of American Nuclear Strategy*, 3–4, and 15–20.

100 Jervis, "Why Nuclear Superiority Doesn't Matter," 632; and Glaser, *Analyzing Strategic Nuclear Policy*, 219–20, and 229.

101 Elbridge Colby, "Against the Great Powers: Reflections on Balancing Nuclear and Conventional Power," *Texas National Security Review* 2, no. 1 (November 2018): 149–51, <https://repositories.lib.utexas.edu/handle/2152/73731>.

102 Glaser, *Analyzing Strategic Nuclear Policy*, 230. The nuclear revolution school judges that costs are only associated with levels of damage to a country's society, not with the loss of military forces or capabilities for command and control. This judgment rests on the assumption that political leaders value their population more than their military forces. Thus, it follows from the logic of deterrence by punishment that a state inflicts costs by striking the targets of highest value to the adversary. I thank Charles Glaser for clarifying his views of the issues raised in this paragraph via e-mail correspondence, July 10, 2019.



Using the strategic-analytic framework, however, an analyst cannot rule out *a priori* the possibility that adversary leaders would perceive circumstances differently from how U.S. leaders perceive them. Indeed, the analyst following this framework would seek empirical evidence of how the adversary assesses the loss of military capabilities compared to the loss of a certain portion or demographic sector of its population, and how it conceives of restraint and escalation in the use of force. For example, empirical research might uncover that adversary leaders would likely interpret American ICBMs en route to their country as more provocative — potentially eliciting a prompt nuclear response against the U.S. homeland — than the use of U.S. nuclear freefall bombs delivered by aircraft in a conflict far from U.S. territory. Thus, the types of weapons employed might be important in demonstrating U.S. restraint and in manipulating the adversary's thresholds for escalation.¹⁰³

Third, the nuclear revolution school argues that maintaining significant counterforce capabilities to help limit the damage to one's homeland is dangerous because it reduces strategic stability.¹⁰⁴ Strategic stability is usually used in U.S. nuclear policy debates to mean that the mutual vulnerability of each competitor's population *and* the mutual invulnerability of deterrent forces would eliminate any incentive to initiate an attack against the other's national security interests during a crisis.¹⁰⁵ This core concept undergirding mutual assured destruction calls for the United States to eschew nuclear capabilities that would support large-scale counterforce targeting in an extended deterrence scenario and to limit damage to the U.S. homeland.

As discussed above, however, the threat of a major nuclear response following an attack on a competitor's homeland is generally judged as more credible than the threat of such a response following an attack on its allies. Gaining insight into the adversary's assessment of U.S. capabilities,

credibility, and resolve might lead analysts to look into whether instability that favors the United States in a competition (e.g., U.S. counterforce capabilities to increase the vulnerability of an adversary's nuclear forces) might enhance the U.S. ability to deter aggression against its allies.¹⁰⁶ Furthermore, in light of the possibility that America's adversaries could be risk-prone or could miscalculate U.S. resolve and capabilities, U.S. counterforce capabilities might serve as a hedge.

The last and perhaps most fundamental disagreement between the nuclear revolution school and its critics when it comes to understanding nuclear competitions is that the nuclear revolution school turns a blind eye to investigations into the historical preferences of the relevant organizations that provide input or make decisions about nuclear capabilities and posture.¹⁰⁷

In contrast, the strategic-analytic framework described in this article encourages analysis of competitors' internal decision dynamics, research and development efforts, and procurement programs to discern key factors underlying current and evolving states of the competition. Such analysis, in the case of the Soviet nuclear buildup during the Cold War, for example, might have uncovered the different roles played by Soviet civilian leaders, senior military leaders, and the Soviet defense industry in making decisions about nuclear forces and strategy.¹⁰⁸ As Caroline Milne found in her study of the perceptions of mutual vulnerability within the U.S.-Soviet Union nuclear competition and the U.S.-China nuclear competition,

mutual vulnerability can be very difficult for (at least two sets of) nuclear rivals to accept in perpetuity. For a variety of reasons, it is much preferable to try to solve or at least ameliorate this strategic dilemma. Accordingly, while theories about the stability of reciprocal second-strike

103 Schelling, *Arms and Influence*, 141–51.

104 Glaser, *Analyzing Strategic Nuclear Policy*, 15 and 45. For different definitions and assessments of the utility of the term "strategic stability," see Elbridge A. Colby and Michael S. Gerson, eds., *Strategic Stability: Contending Interpretations* (Carlisle Barracks, PA: U.S. Army War College Press, 2013), <https://publications.armywarcollege.edu/pubs/2216.pdf>.

105 Derived from Michael S. Gerson, "The Origins of Strategic Stability: The United States and the Threat of Surprise Attack," in Colby and Gerson, *Strategic Stability*, 34.

106 Kroenig, *The Logic of American Nuclear Strategy*, 132–33, refers to this instability as "positive instability." The nuclear revolution school seems confident that the inescapable risk of escalation to large-scale counter-homeland strikes — Schelling's "threat that leaves something to chance" — will make a competitor's military threat against U.S. allies unlikely in the first place. See Jervis, "Why Nuclear Superiority Doesn't Matter," 620; Glaser and Fetter, "Should the United States Reject MAD?" 95; and Schelling, *The Strategy of Conflict*, 187–203.

107 I am indebted to Caroline Milne for bringing this area of disagreement to my attention.

108 Steven J. Zaloga, *The Kremlin's Nuclear Sword: The Rise and Fall of Russia's Strategic Nuclear Forces, 1945–2000* (Washington, D.C.: Smithsonian Institution Press, 2002): chap. 5; and John A. Battilega, "Soviet Views of Nuclear Warfare: The Post-Cold War Interviews," in *Getting MAD: Nuclear Mutual Assured Destruction, Its Origins and Practice*, ed. Henry D. Sokolski (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, November 2004): chap. 5. Analysis of relevant data, especially a competitor's closely held data, requires that the data has been collected and made available to analysts in the first place.

capabilities may be elegant, they presume a lack of agency that participants will find challenging to resign themselves to.¹⁰⁹

The takeaway is not that social scientific theories and models are worthless. It is that analysts seeking to understand the character of future warfare and a nuclear competition should emphasize a wide-ranging investigation and empirical evidence — such as U.S. and competitors' military capabilities, targeting policy, doctrine, and concepts of operations — rather than rely on social scientific theories that tend to prematurely guide research and analysis into an area of limited breadth and depth — an area that might keep the analyst from considering key factors that could shape the balance of nuclear forces as well as perceptions of that balance.

Declaratory Policies and Published Doctrine Are of Limited Predictive Value

Incredible as it may seem, even U.S. analysts with the requisite foreign language skills can hold divergent views about a competitor's policy documents and doctrinal texts. Thomas Christensen and Gregory Kulacki, for example, both trained in Mandarin Chinese, interpret the 2004 edition of *The Science of Second Artillery Campaigns* (the Second Artillery being the predecessor to the People's Liberation Army Rocket Force) in starkly different ways.¹¹⁰ Christensen takes a much less sanguine view of the document's implications for Chinese nuclear escalation in what has, thus far, been a conventional conflict than Kulacki, who is adamant that the text proscribes China's first use of nuclear weapons. Kulacki maintained this more optimistic view of Chinese nuclear restraint when the Chinese Academy of Military Sciences published a new edition of *The Science of Military Strategy*.¹¹¹

And yet, even if analysts did agree, what an adversary claims it would do in a crisis or during wartime might only be as solid as the paper it is written on. As Christensen recognizes, competitors cannot be assured that peacetime declaratory policies will persist during the stressful and violent circumstances of conflict. The same thing can be said about relying on published military doctrine.¹¹² In 1975, Secretary of Defense James Schlesinger noted that neither national leaders nor military forces are constrained by doctrine in a wartime environment.¹¹³ Because the nuclear thresholds and practices of potential adversaries are always shrouded in uncertainty, it would behoove U.S. analysts to conduct sensitivity analyses to see how their findings might change.

Other perceptive analysts of Russian and Chinese nuclear thinking have written about the ambiguities and vague expressions found in the two countries' nuclear declaratory policies. With Russia planning — if not fully funding — the deployment of a strategic weapon arsenal consisting of long-range conventional precision-strike weapons, nonstrategic nuclear weapons, and strategic nuclear weapons, the objective seems to

Because the nuclear thresholds and practices of potential adversaries are always shrouded in uncertainty, it would behoove U.S. analysts to conduct sensitivity analyses to see how their findings might change.

be to give Russian leadership maximum flexibility and a range of options to deal with both anticipated and unforeseen contingencies.¹¹⁴ Russia's 2014 military doctrine states that Russia reserves the right to respond with nuclear weapons when "the very existence of the state is threatened." However, because it does not list the criteria by which Russian leaders would assess threats to the state, there

109 Caroline R. Milne, "Hope Springs Eternal: Perceptions of Mutual Vulnerability Between Nuclear Rivals," PhD Dissertation, (Princeton, NJ: Princeton University, 2017), 205.

110 Thomas J. Christensen, "The Meaning of the Nuclear Evolution: China's Strategic Modernization and US-China Security Relations," *Journal of Strategic Studies* 35, no. 4 (2012): 447–87, <https://www.tandfonline.com/doi/abs/10.1080/01402390.2012.714710>; and Rachel Oswald, "U.S.-China Nuclear Talks Stymied by Distrust and Miscommunication," *Atlantic*, Oct. 3, 2011, <https://www.theatlantic.com/international/archive/2011/10/us-china-nuclear-talks-stymied-by-distrust-and-miscommunication/247589/>.

111 Gregory Kulacki, *The Chinese Military Updates China's Nuclear Strategy* (Cambridge, MA: Union of Concerned Scientists, 2015).

112 Williamson Murray, *Military Adaptation in War: With Fear of Change* (New York: Cambridge University Press, 2011).

113 Schlesinger, *The Theater Nuclear Force Posture in Europe*, 15.

114 Dave Johnson, *Nuclear Weapons in Russia's Approach to Conflict* (Paris: Fondation pour la Recherche Stratégique, November 2016), <https://www.frstrategie.org/web/documents/publications/recherches-et-documents/2016/201606.pdf>; and Michael Frankel, James Scouras, and George Ullrich, *Nonstrategic Nuclear Weapons at an Inflection Point* (Laurel, MD: The Johns Hopkins University Applied Physics Laboratory LLC, 2017), 14–17, <https://www.jhuapl.edu/Content/documents/NonstrategicNuclearWeapons.pdf>.



may be multiple U.S.-NATO conventional courses of action — including rolling back the Western Military District's integrated air defense system or launching an air-missile raid against the Northern Fleet's naval facilities on Russia's Kola Peninsula — that could create perceptions of a growing threat against the Russian state and elicit different types of Russian military reactions.

China, on the other hand, has officially maintained a no-first-use pledge since it became a nuclear power in 1964. However, that pledge has not escaped the criticism of Chinese strategists.¹¹⁵ For the past ten years, scholars have noted a debate within Chinese military circles “about whether to discard or place conditions” on Beijing's declaratory policy.¹¹⁶ Apparently, concerns over the effects of conventional strikes against China's nuclear deterrent generated the debate. Some Chinese writers have argued for increasing the pledge's ambiguity to create additional uncertainty in the minds of China's adversaries. Others have suggested that China conduct a nuclear counter-attack in response to an enemy's conventional counter-nuclear attack. More recently, analysts have reasoned that the continued publication of articles in China arguing for official exemptions to the no-first-use pledge reflects the authors' frustration that China is not leveraging the potential political effects of its nuclear forces.¹¹⁷

As in the Russian military literature, so-called “warfighting concepts” are found in Chinese military writings: for example, the possibility of nuclear strikes of varying scale against an array of military, political, and economic targets.¹¹⁸ In the Chinese military literature, according to a 2017 RAND study, “warfighting concepts” refer to “an approach that involves conducting multiple waves of strikes of various scales against different types of targets in a nuclear conflict of extended duration, designed to control escalation or to compel an end to hostilities on favorable terms.”¹¹⁹ What is

potentially troubling for the U.S. military is that the continuing debate within China over the merits of its no-first-use pledge could interact with these warfighting concepts and result in China's leaders sanctioning the first use of nuclear weapons during a conventional conflict with the United States. This situation might be more likely were China losing a high-stakes conflict with the United States, perhaps failing to secure beachheads on Taiwan due to a U.S. military intervention.¹²⁰

While far from certain, the central ingredients seem to be in place to create the wartime circumstances that could pressure China to ostensibly violate its declaratory policy and use nuclear weapons first.¹²¹ First, Chinese military writings emphasize the benefits of seizing and retaining the initiative throughout a conflict.¹²² Second, U.S. analysts have noted that China likely judges computer network attacks and counter-space operations to be warranted early in a conflict to paralyze the enemy's command-and-control system.¹²³ Third, one of the guiding principles, or fundamental doctrinal tenets, for the People's Liberation Army Rocket Force is “key point counter-attacks” to reduce the enemy's will to fight. Taken in combination, these factors suggest, but do not prove, that Chinese leaders and military planners could find reason to justify China using nuclear weapons first to obtain an advantage over the United States in a conflict.

In short, because policies developed under peacetime conditions can change quickly once policymakers confront the reality of a crisis or war, countries' nuclear declaratory policies are poor guidelines for defining the scope of an analysis of a nuclear competition.

Victory Is Possible in Some Nuclear Wars

The preceding sections demonstrate that, like conventional warfare, nuclear warfare can come in all shapes and sizes. As is always the case, the

115 Alastair Iain Johnston, “China's New “Old Thinking”: The Concept of Limited Deterrence,” *International Security* 20, no. 3 (Winter, 1995-1996): 5–42, https://www.jstor.org/stable/2539138?seq=1#page_scan_tab_contents.

116 M. Taylor Fravel and Evan S. Medeiros, “China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure,” *International Security* 35, no. 2 (Fall 2010): 80, https://www.mitpressjournals.org/doi/pdf/10.1162/ISEC_a_00016; and Heginbotham, et al., *China's Evolving Nuclear Deterrent*, 129–33.

117 Heginbotham, et al., *China's Evolving Nuclear Deterrent*, 131.

118 Fravel and Medeiros, “China's Search for Assured Retaliation,” 70 and 76.

119 Heginbotham, et al., *China's Evolving Nuclear Deterrent*, 136.

120 Scouras, Smyth, and Mahnken, *Cross-Domain Deterrence in US-China Strategy*, 14–16, and 63.

121 Christensen, “The Meaning of the Nuclear Evolution,” 453–54, and 475–78.

122 Alison A. Kaufman and Daniel M. Hartnett, *Managing Conflict: Examining Recent PLA Writings on Escalation Control*, CNA China Studies (February 2016), chap. 5, https://www.cna.org/cna_files/pdf/DRM-2015-U-009963-Final3.pdf.

123 Burgess Laird, *War Control: Chinese Writings on the Control of Escalation in Crisis and Conflict* (Washington, D.C.: Center for a New American Security, February 2017), 17–18, <https://s3.amazonaws.com/files.cnas.org/documents/CNASReport-ChineseDesalation-Final.pdf?mtime=20170328141457>.

meaning of victory in war is shrouded in politics.¹²⁴ Leaders will define what “victory” is in terms that they deem favorable in order to bring an end to hostilities, but even an authoritarian regime will want the public to support the basis for the cessation of hostilities to avoid domestic political upheaval. The possibility of a limited nuclear war means that the world might only see small-scale use of nuclear weapons — perhaps only a single detonation — before belligerents cease military operations and de-escalate tensions. In light of the psychological shock, physical damage, and military effect that just a handful of nuclear strikes might cause, one or more belligerents may very well acquiesce to the political demands of the adversary that launched nuclear weapons. This acceptance could constitute a political victory in the eyes of the adversary’s leaders and body politic, as well as in those of the opponents. On the other hand, nuclear use could result in belligerents changing their war aims and modifying their campaign plans accordingly. In the end, because different forms or types of victory may be achievable, analysts should not buy into the mantra that “no one wins a nuclear war” and allow it to shape their assessments of nuclear competitions.¹²⁵

Planning a Road Trip through Terra Incognita

There is too much uncertainty surrounding potential crises and conflicts between the United States and nuclear adversaries for analysts to provide iron-clad assurances that a particular U.S. nuclear or regional defense posture will deter acts of aggression or establish a ceiling on nuclear escalation. Even former Secretary of

Defense William Perry, a prominent advocate of disarmament measures and the non-use of nuclear weapons, acknowledged that “we have no experience with escalation in a nuclear war, and we have no way of being confident what the ultimate outcome would be of a first use of nuclear weapons.”¹²⁶ Likewise, Jervis, a critic of U.S. “escalation control” planning, has noted that analysts and strategists have little empirical basis for guiding nuclear strategy. The United States is the only state that has conducted nuclear strikes — and it was against a non-nuclear opponent. “Our knowledge of nuclear deterrence,” according to Jervis, “is largely deductive.”¹²⁷ Yet, the deductions and parsimonious models that some analysts rely upon are unmoored from the operational and political challenges surrounding the initial use of nuclear weapons in a future conflict and the threat of their continued use as that conflict potentially develops into a protracted war.¹²⁸

The preceding sections, in combination, have contended that warfighting capabilities are inextricably foundational to protecting U.S. overseas interests and maintaining and fulfilling extended deterrence commitments. The only way to avoid the connection between warfighting capabilities and deterrence of a wide range of adversary actions and do minimal harm to U.S. vital interests is for the United States to abandon its alliance commitments and adopt a minimum deterrence posture solely to safeguard the U.S. homeland.¹²⁹ Perhaps recognizing the challenges that extended deterrence poses for U.S. policymakers and strategists, in 2010 several analysts affiliated with the U.S. Air Force called on the United States to withdraw its extended deterrence commitments.¹³⁰

Needless to say, while the United States plans on retaining disparate overseas defense

124 Colin S. Gray, *War, Peace and Victory: Strategy and Statecraft for the Next Century* (New York: Touchstone, 1991), 12–13, 38–39, 325, and 341–46; and Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976).

125 “Reps. Frankel, Lieu Introduce Bill to Prevent Nuclear Arms Race,” Website of Congresswoman Lois Frankel, Press Release, Feb. 14, 2019, <https://frankel.house.gov/news/documentsingle.aspx?DocumentID=874>; Colin S. Gray and Keith Payne, “Victory is Possible,” *Foreign Policy*, no. 39 (Summer 1980): 14–27, <https://www.jstor.org/stable/1148409>; and Colin S. Gray and Michael Howard, “Correspondence: Perspectives on Fighting Nuclear War,” *International Security* 6, No. 1 (Summer 1981): 185–87, https://www.jstor.org/stable/2538536?seq=1#page_scan_tab_contents. On expansion of war aims, see Eric J. Labs, “Beyond Victory: Offensive Realism and The Expansion of War Aims,” *Security Studies* 6, no. 4 (1997): 1–49, <https://doi.org/10.1080/09636419708429321>.

126 Quoted in “There’s No Such Thing as ‘Limited’ Nuclear War,” William J. Perry Project, March 7, 2017, <http://www.wjperryproject.org/notes-from-the-brink/no-such-thing-as-limited-nuclear-war>.

127 Robert Jervis, *The Illogic of American Nuclear Statecraft* (Ithaca, NY: Cornell University Press, 1984), 38.

128 Matthew Hallex and Bruce Sugden, “Nuclear Weapons: Thinking about Strategy and Nuclear Weapons,” in *Personal Theories of Power: Exploring Strategy Through the Eyes of Emerging Leaders*, ed. Nathan Finney, Richard Ganske, Mikhail Grinberg, and Tim Wolfe, The Bridge and CIMSEC Compendium (June 2014), 41–43, <https://static1.squarespace.com/static/5497331ae4b0148a6141bd47/t/5682ef1d841abae3b7dfa/ea4/1451421469882/Personal+Theories+of+Power+Compendium.pdf>.

129 Draft Memorandum from Secretary of Defense McNamara to President Kennedy, “Subject: Recommended Long Range Nuclear Delivery Forces 1963-1967.” A minimum deterrence posture is defined as the United States having the ability to conduct a retaliatory nuclear attack against an adversary’s major population centers but not a counterforce attack to disarm it of its military forces.

130 James Wood Forsyth Jr., B. Chance Saltzman, and Gary Schaub Jr., “Minimum Deterrence and its Critics,” *Strategic Studies Quarterly* (Winter 2010): 3–12, https://www.airuniversity.af.edu/Portals/10/SSQ/documents/Volume-04_Issue-4/Forsythsaltzmanschaub.pdf.



commitments, analysis that fails to work through seemingly intractable military problems and strategic challenges — while only providing assertions of how future conflicts will unfold and how different leaders will make decisions about the use of nuclear weapons — cannot be justified. Such analysis is clearly not useful to informing debates and decisions about future U.S. nuclear capabilities and posture. Recall President Dwight Eisenhower's thoughts on the value of diligent planning. In a speech at the National Defense Executive Reserve Conference in 1957, he stated,

Plans are worthless, but planning is everything. There is a very great distinction because when you are planning for an emergency you must start with this one thing: the very definition of 'emergency' is that it is unexpected, therefore it is not going to happen the way you are planning.

So, the first thing you do is to take all the plans off the top shelf and throw them out the window and start once more.

But if you haven't been planning you can't start to work, intelligently at least. That is the reason it is so important to plan, to keep yourselves steeped in the character of the problem that you may one day be called upon to solve—or to help to solve.¹³¹

With the U.S. government's renewed emphasis on engaging in great power competition, there is a pressing need for objective analyses to inform an accurate diagnosis of the character of future warfare and the relative standing of U.S. military forces in the U.S.-China and U.S.-Russia nuclear competitions. Such analyses could also shape and influence associated U.S. nuclear policy and strategy debates — they would help Defense Department senior managers and members of Congress as they choose investments that will shape the structure, posture, and doctrine of U.S. military forces during the next 20 to 30 years. The strategic-analytic framework described in this article accentuates the use of a broadly scoped investigation and empirical evidence regarding U.S. and competitors' forces to better understand their adequacy in performing military missions to

achieve national objectives in peacetime and under wartime conditions, and to identify key military challenges, risks, and opportunities for the United States.¹³² Such an approach is centered on the interaction between competitors, which improves the analyst's chances of capturing the major factors shaping the evolution of nuclear balances, the role of non-nuclear technologies and forces upon the balances, and the interdependence between conventional and nuclear operations.

As long as the United States maintains its extended deterrence commitments, analysts need to account for the array of problems associated with maintaining the credibility of U.S. security guarantees and projecting military power against other nuclear competitors. To be deterred from committing a broad range of aggressive acts against U.S. interests, nuclear competitors must fear that the courses of action that they are equipped to take, including measures to deter and defeat U.S. military operations, face a level of risk sufficient to make them doubt that they can achieve their war aims at less cost than accepting the status quo for an extended period of time.¹³³ It is incumbent upon analysts to set aside any normative concerns and policy preferences they may harbor and to broaden the range of plausible "what if" questions around which their studies on nuclear competition are structured. 📌

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Photo: National Nuclear Security Administration

131 Dwight D. Eisenhower, "Remarks at the National Defense Executive Reserve Conference," The American Presidency Project, online by Gerhard Peters and John T. Woolley, accessed April 19, 2019, <https://www.presidency.ucsb.edu/node/233951>.

132 "Department of Defense Directive 5111.11, Director of Net Assessment," Department of Defense, Dec. 23, 2009, 1, <https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodd/511111p.pdf>.

133 Michael E. Brown, *Deterrence Failures and Deterrence Strategies: Or, Did You Ever Have One of Those Days When No Deterrent Seemed Adequate?* (Santa Monica, CA: RAND Corp., 1977): 2, 4, and 23–24, <https://www.rand.org/pubs/papers/P5842.html>.