

SSQ STRATEGIC STUDIES QUARTERLY

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China's Competitive Strategy: An Interview with Robert O. Work

FEATURE ARTICLE

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Conventional Arms Transfers and US Economic Security

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The Changing Dynamics of Twenty-First-Century Space Power

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China's Competitive Strategy: An Interview with Robert O. Work

Conducted 10 October 2018

This interview is an outgrowth from Secretary Work's 2018 Center for a New American Security annual conference presentation detailing the five-step Chinese competitive strategy against the United States. China's strategy is designed to overcome technological inferiority, move to technological parity, and achieve technological superiority.

SSQ: The first step you mention in China's strategy is industrial and technical espionage (ITE). Did the United States miss or simply ignore this threat?

ROW: We have become increasingly aware of the nature of the threat, which is unlike any we have faced before. During the Cold War, espionage was more about turning agents and getting intelligence agents to turn over documents and reveal adversary agents. However, in the case of China, it is more a cyber-intellectual property threat—getting into systems and exfiltrating data. We were therefore unprepared for the Chinese approach—especially on the industrial wide-scale the Chinese use. Consequently, our response lagged.

Lately, we have been successful in implementing different types of measures to counter their strategy, but the Chinese still pursue industrial espionage in a very big way. Let me give you an example of why this is important. Frank Kendall, the former Office of the Secretary of Defense acquisition executive, did a study and found that once the United States or the Chinese decides to build a new fighter, the time spent in development and production engineering was roughly equal. However, through intellectual property theft and data exfiltration, the Chinese are able to reduce significantly the time spent doing research and prototype engineering. This is why they have been able to field capabilities consistently quicker than we expected. From a historical perspective, the Chinese have been making a concerted effort to acquire US technological capabilities since the late 1990s. What they have been able to accomplish in the past 20 years is quite remarkable.

SSQ: Are we as a nation better at preventing ITE now or do we remain vulnerable?

ROW: We remain vulnerable, but we are much more attuned to the threat. As a result, the US has hardened its networks and its supply chain. In addition, all of our contractors have become much more aware and are hardening their networks. Furthermore, while they may not be able to stop a determined intrusion, they are much more successful in halting data exfiltration. I would not want to declare victory against the threat, however, the US is in a much safer position today than we were three or four years ago.

SSQ: You list *system destruction warfare* as the second aspect of their strategy, which is focused on achieving a decisive advantage in information superiority. Do you see this as feasible today given the complexity and redundancy of the US system?

ROW: Yes, it is certainly feasible if we don't take the threat seriously and prepare to defeat it. System destruction warfare is central to the Chinese theory of victory in high-technology, "informationalized" warfare. This type of warfare sees collisions between what we refer to as *operational battle networks*—what the Russians call *reconnaissance-strike complexes*, and the Chinese refer to as *operational systems*. System destruction warfare concentrates on disabling the sensor, command and control, and effects grids common to all battle networks. If Chinese efforts are successful, they will be able to prevail in a guided munitions salvo competition and gain an enormous advantage at the operational level of war.

So, Chinese planners expend a large amount of time and effort thinking about how to destroy our battle networks. Every single one of our network nodes and links are covered by some type of Chinese electronic warfare capability, including all our radars and sensors. We suspect the Chinese have also developed cyberweapons to attack the Department of Defense (DOD) internet of things (IoT). They have long-range anti-aircraft missiles that can shoot down our Airborne Warning and Control System (AWACS) and Joint Surveillance and Attack Radar System (JSTARS) type aircraft. When surveying all of their capabilities, the Chinese have quite a broad, very well-developed strategy.

If the US ever gets into a fight with the Chinese, we had best be prepared to "weather the storm" and fight through Chinese efforts to cripple

our sensor, command and control, and effects grids. The outcome of the fight will likely be determined by our success in doing so.

SSQ: Where are we most vulnerable and where are the Chinese most vulnerable?

ROW: A great source of information on this subject is the recent Government Accounting Office (GAO) report, titled *Weapons System Cybersecurity*. It focuses on the vulnerability of the DOD IoT, which is probably our greatest cyber vulnerability right now. DOD systems and platforms have all types of attack surfaces through their apertures and control systems, and the services do not spend enough time addressing these vulnerabilities. Doing so is neither glamorous nor inexpensive. Given a choice, most of the services prefer to buy new platforms rather than try to “cyber harden” old platforms. However, as the GAO report states, even the new platforms are not all that cyber resilient. DOD has spent much money over the past five years to harden our networks, and while we remain vulnerable, we are far less so than before. Over the same period, however, we have not spent nearly enough on hardening the DOD IoT. As a result, I believe GAO is right when they say that DOD is just beginning to grapple with the scale of its IoT vulnerabilities. We have a long way to go in this regard.

As for Chinese vulnerabilities, it is difficult for me to answer because this information is classified, and I have not seen recent net assessments. However, in general, their operational systems have the same vulnerabilities as our own battle networks; their sensor, command and control, and effects grids, as well as their IoT, are all vulnerable to intrusion and attack. We also spend much time identifying and planning to exploit these vulnerabilities. However, I cannot say if they are more or less vulnerable than we are.

SSQ: *Firing effectively first* is another part of China’s competitive strategy. How would you assess their capabilities to execute a preemptive first strike today and in the next five years?

ROW: The Chinese have focused on being able to fire effectively first, a key principle of guided munitions warfare. Since guided munitions warfare is an offensive dominant regime, the side that gains an early advantage in attacking the adversary’s battle networks, command and control nodes, and high-value targets starts to accrue advantages right

away, and these compound over time. So there are very high incentives for preemption.

However, Chinese thinking goes well beyond preemptive attacks. They consistently try to build weapons that “out stick”—that is to say, out-range—US weapons. Where successful, Chinese forces will be able to concentrate fire on portions of US forces before the US can bring their own weapons to bear. They also pursue weapons designed to penetrate US defenses with high probabilities of success. For both these reasons, the Chinese have adopted ballistic missiles as their primary kinetic effectors.

Chinese military planners assessed how the US employed airpower during Desert Storm and decided not to try and compete symmetrically—at least initially. Instead, they pursued a world-class ballistic missile force, which is far easier to build, train, and maintain than a world-class air force. And there are other advantages: it is generally easier to extend the range of ballistic missiles than it is to extend the unrefueled range of land-based aircraft. Additionally, ballistic missiles are difficult to shoot down and impose a high burden on US defenses. Moreover, it is easier to plan and prepare a large missile strike with little or no warning than it is for a comparable air force. Preparations for a major air operation would create all sorts of indications of warnings, including aircraft marshaling, munitions buildup, fuel stockpiles, and training. However, a missile force can deploy to their launch points and execute strikes with relatively little notice, especially under cover of a preplanned exercise.

Chinese doctrine thus emphasizes long-range missile warfare and high-density salvos. The Chinese have air-to-air missiles that outrange our own. They have long-range ballistic missiles, sea-based ballistic missiles, and anti-ship cruise missiles with greater ranges than our own. In every case, the Chinese will try to “out stick” us and overwhelm our defenses by using mass salvos. This is part of their strategy and doctrine of firing first effectively.

SSQ: Do you expect the United States and our allies will have indications and warnings of a preemptive strike?

ROW: Generally speaking, if the Chinese decide to fight the United States, I would expect them to launch concentrated surprise attacks against Joint forces in theater. On the other hand, even in times of heightened tensions, it is hard for me to imagine the US launching a surprise preemptive strike against Chinese forces. As a result, US forces

will likely have to take the first punch. This presents the US with a tough asymmetrical disadvantage. Regardless of whether we have the benefit of warning or not, I think we need to accept that in a war with China, the Chinese would likely fire the first salvo to try and preempt us rather than us trying to preempt them. Consequently, US forces must be prepared to survive a surprise preemptive attack and shift immediately to the offensive. This places a high burden on our forces regarding training and preparedness.

SSQ: You listed *secret capabilities* as the fourth step in the strategy that allows China to reveal capabilities to deter and conceal them to win. Is the United States at a great disadvantage in capabilities or is this simply a great unknown?

ROW: We have a lot of so-called “black capabilities” protected by special compartmented information and special access programs. We must assume the Chinese do, too. And the fact of the matter is, we will only know for certain if we are at a disadvantage if we find ourselves in a fight with the Chinese.

This is an important point. In any long-term military-technical competition, competitors will reveal some capabilities to deter their opponents and will conceal certain capabilities in hopes of gaining a potential war-fighting advantage in the early stages of war. Deciding what capabilities to reveal and what capabilities to conceal is a key part of any competitive strategy. For example, when people think back to the second offset strategy, some say it was all about long-range sensors, precision-guided munitions, and stealth. However, at the time we only revealed our ability to target and fire long-range conventional guided munitions. We did this to deter a Soviet invasion of Europe, and history suggests it helped to do just that. On the other hand, despite much speculation, we never revealed stealth technology until 1989. We opted to conceal our true stealth capabilities for war-fighting advantage should a Soviet attack come.

We must assume the Chinese are following the same playbook. Indeed, they refer to a special category of weapons termed *assassin's mace* in the belief these weapons will be decisive in a conflict with the US. They have opted to reveal some of these capabilities. For instance, they've demonstrated the DF-21 “carrier killer,” a ballistic anti-ship missile with a range of over 800 miles. They also demonstrated the ability to threaten

US satellites with a direct ascent anti-satellite interceptor. Most recently, they've demonstrated a variety of hypersonic weapons. Presumably, they are demonstrating these capabilities to deter any US intervention against them. At the same time, however, President Xi has instructed the Chinese military to conceal "the sharpest weapons of the state." So, despite our best efforts to track and understand Chinese capabilities, we must be prepared for technological surprises on the first day of a war that we hope will never come. Under these circumstances, we must be able to shake off the surprise, quickly develop countermeasures against them, and continue to fight.

Furthermore, let me offer an observation about high-tech weapons. For example, when you look back at Vietnam, the AIM-7 Sidewinder and the AIM-9 Sparrow air-to-air missiles were not nearly as effective in combat as we expected them to be; their observed probability of a kill turned out to be far less than we anticipated. We can anticipate the same thing in a future war between high-technology adversaries. For both sides, some of the weapons will perform better than expected, others will perform worse than expected, and both sides will be confronted by weapons they did not expect. In this high-tech competition, we cannot assume we will always have the advantage and must anticipate a high degree of technological surprise. The force better able to shrug off surprise and continue to operate effectively will likely be the winner.

SSQ: The final area of China's strategy is to *exploit artificial intelligence* (AI) for military superiority and lead in this area by 2030. Can you compare and contrast US-China AI progress to date? Who is leading and where?

ROW: We know the Chinese have a national plan that seeks to catch up with the United States in AI technologies by 2020. I think they've done that already, having achieved broad parity in computer vision, machine learning, and natural language processing. Their next goal is to vault ahead of the Americans not later than 2025 by concentrating on fielding AI applications. For example, in terms of military applications, how might AI improve their missile guidance and performance? What are the most effective applications for vehicles? For decision-making systems? By 2030, the Chinese want to be recognized and unchallenged as the world leader in AI technologies. They believe this is one way to surpass the US as the world's leading military power.

Right now, it is difficult to say who might be ahead of the US as it begins to marshal its resources in response to the Chinese plan. So, the answer is unclear, and frankly, it might not become clear until we get into a conflict. This competition is not like the Cold War when satellites could overfly a country and observe and count forces. During that time—from what we could see—we could assess and predict their combat potential. Today, AI technologies are hidden within command and control and weapons systems, and their full capabilities will not be revealed until the first time they are used. So once again, we need to be prepared for a surprise. This is why when approaching this competition we need to remember the advice of all politicians: always assume you are losing the race.

SSQ: A recent Brookings survey showed mixed approval for integrating AI with military capabilities. Do you have any concerns or fears about doing this?

ROW: To understand this question, you must understand the difference between two types of AI: narrow AI and general AI. Narrow AI is the programmed ability of a machine to create its own courses of action and to choose among them to perform an assigned task. Think for instance, about the parallel parking application in your car. You pull your car abeam the spot, the computer prepares a thousand calculations or courses of action, and it chooses one. It signals you, “I’ve chosen an option, now pull your car forward three feet and stop.” The computer then takes over and executes the task. This is narrow AI. The computer is programmed to perform only a limited function, in this case, parallel parking, not speeding off to Jiffy Mart. We want to inject a wide range of narrow AI applications in US sensor, command and control, and effects grids. By doing so, we think we will be able to make faster and more relevant decisions and apply effects more rapidly and discretely.

By contrast, general AI is the programmed ability of a machine to set its own goals, learn from them, and change them. People are most worried about general AI in a freewheeling machine that can set its own goals more like Skynet and the Terminator. DOD has the very same worry. That is why it has stated it will always seek to have a human in the loop when making a lethal decision on the battlefield.

So, to reiterate, I think that people who are worried about putting AI in weapons are really objecting to the use of general AI. They should,

therefore, be happy to know that DOD neither wants general AI weapons nor is pursuing them. No commander would want an AI weapon deciding what to attack on a given day, and then deciding to change the target. Commanders will much prefer assigning a target to a narrow AI weapon, and letting the weapon decide the best way to attack it. This is similar to other “fire and forget” weapons currently in use. While we need much more debate on this issue, the current debate is being hampered by the lack of common understanding of the actual argument.

SSQ: A recent Geneva meeting of experts began discussions on forming international norms and laws for AI. What are your views on the prospects for success of such norms?

ROW: It is very difficult to envision how international norms on AI could be enforced. There might be some basic international norms that should be created, particularly concerning general AI, but I am skeptical even these basic norms would be feasible. The reason I feel this way is that the march toward smarter decision aids and smarter weapons powered by machine intelligence cannot be stopped and the true capabilities of these technologies will be hidden until they are employed. There may well be certain applications the international community desires to prohibit, but again, I am skeptical any of these could be enforced.

SSQ: In your presentation, you assert that China's competitive strategy is eroding conventional deterrence. How do you see deterrence failure emerging and why?

ROW: It could emerge as a consequence of China's emphasis on firing effectively first. Since guided munitions warfare is offensive dominant, should the Chinese opt for war, incentives for preemption are extremely high. That makes crisis instability more acute. Another issue many people are uncertain of and worry about is, if we rely too much on machines for indications and warning, the machines might make a mistake and therefore undermine deterrence. Now, this is not much different from the problems we had in the past where humans had to interpret a wide variety of different information to decide whether an attack was occurring. However, many people are worried about such a machine-driven scenario and are working through the implications. We do not have all the answers yet.

SSQ: Given that China is unlikely to change its strategy, how should the United States challenge each of these five aspects? What must we do now and in the future?

ROW: There are many things we could and need to do. The first step is to fight back against Chinese industrial and technological espionage and make sure we are meeting this threat head-on. We must take concrete actions to deter the Chinese from continuing these efforts.

In responding to Chinese emphasis on system destruction warfare, we have a lot more to do. In the 1980s, we had a revolution in training where we implemented the *opposition force* concept. The Army started training at the National Training Center, the Air Force had Red Flag, and the Navy had Top Gun. Today, we need an opposing force that is proficient in all aspects of system destruction warfare. Every time we have an exercise, this force should try to take down our networks. This will be the best way to improve our operations and make our systems and tactics, techniques and procedures, more resilient. We must be better at this game than the Chinese! Our force structure must also begin a broad shift toward more survivable platforms. In my opinion, the JSTARS cancellation is the first indicator that we are serious about moving forward. We should be doing the same thing with AWACS. Both of these systems will likely be replaced by a combination of distributed manned and unmanned systems and platforms with high degrees of narrow AI. Also, we must introduce additional and better “cognitive” tactical electronic warfare and cyber capabilities at the forward line of troops like the Army is now planning to do.

The US can do many things to address China’s strategy of firing effectively first. In addition to destroying China’s operational systems to avoid being targeted, we can introduce more long-range weapons and more counterforce weapons of our own. In this regard, the Navy is modifying its Tomahawk missile to allow it to attack ships. The Air Force is extending the range of its stealthy JASSM missile. And the defense department is aggressively pursuing long-range hypersonic weapons.

We must continue to reveal capabilities we think will deter the Chinese. At the same time, we should conceal things we think will provide a war-fighting advantage if and when a conflict begins. We have to also train our force for technological surprise while at the same time being adaptive to it.

Finally, on the AI front, we have to compete as a nation, not just as DOD. This is a national competition that will determine our economic and military competitiveness in the twenty-first century. We must respond to the China challenge by marshaling our national capabilities and competing vigorously.

And let me end with this thought. China is, without question, going to be the most difficult competitor the US has ever faced. However, it is important to note that neither the national security nor national defense strategies refer to China as an adversary or an enemy. Instead, they refer to China either as a geopolitical rival or a strategic competitor. This choice of words signals we don't believe a war with China is inevitable. However, both strategies make clear we are in a long-term strategic competition where the Chinese aim to surpass the US as the number one economic and military power in the world. The United States faces a choice: either respond to this challenge or succumb to it. Should we choose to confront the challenge, the US *must* take steps to remain competitive and become even more competitive.

SSQ: Secretary Work, on behalf of team SSQ and our SSQ audience, allow me to thank you for sharing your ideas on what may well be the greatest challenge to US national security in the twenty-first century. **SSQ**

Pessimism and Nostalgia in the Second Nuclear Age

Christopher J. Fettweis

Abstract

The “second nuclear age” created a renaissance in theorizing about nuclear weapons with conclusions and speculation that were uniformly pessimistic. However, the second nuclear age is likely to be substantially less dangerous than the first. Why, then, does pessimism dominate? This article evaluates the literature of the second nuclear age and tries to understand why pessimism, and even nostalgia for the Cold War, is so common among its theorists. Drawing heavily on insights from psychology, it explains the origins of such nostalgia and explains why for so many people the past always seems better than the present, even when—as in the case of nuclear weapons—it is, by all empirical measures, far better.



There's nobody that understands the horror of nuclear better than me.

—Donald J. Trump, 15 June 2016

The ever-present threat of nuclear annihilation was one of the Cold War's less charming features. Although rational calculations from elites suggested deterrence would maintain a stable peace, to the average, helpless civilian, mutually assured destruction never seemed terribly reassuring. Many people were resigned to the notion that, sooner or later, the klaxon would sound and World War III would begin.

Today, the “horror of nuclear,” to use President Trump's phrase, seems to have receded. Superpower arsenals are 10 percent of what they once were, and the chances of nuclear holocaust have diminished. Our average,

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helpless civilian might be surprised to discover, however, that those same elites who were so calm in the face of past nuclear dangers are more worried about the present. Proliferation, instability, regional wars, and catastrophic terrorism are widely expected to be hallmarks of this “second nuclear age.”¹ Expectations for the new, post–Cold War era have been quite negative regarding many aspects of security, particularly nuclear weapons. Why does pessimism dominate today, when by all accounts the unipolar world is significantly better in almost every respect than the one that preceded it?²

The end of the Cold War ushered in a broad renaissance in nuclear weapons studies. This article examines the predictions, evidence, and psychology of this second nuclear age. It reviews the assertions commonly made during this renaissance and compares them to the evidence that has accumulated over the past 25 years. It renders judgment, to the extent possible, on the relationship between nuclear weapons and unipolarity, arguing that the second nuclear age is likely to be substantially less dangerous than the first. The article concludes by examining the psychological foundation of nuclear pessimism, including the puzzling nostalgia for the Cold War that pervades so much of this literature. Popular perceptions regarding nuclear weapons are once again different from those of the experts, and this time they seem more rational.³

Predictions of the Second Nuclear Age

The moment when many people began to take seriously the possibility of fundamentally new nuclear rules came in 1998 when India and Pakistan conducted a round of tests. “Atomic weapons have returned for a second act,” wrote one of this literature’s major figures, Paul Bracken. For him, “1998 was the turning point.”⁴ Once South Asia “had broken free of Western nuclear controls,” he argued, other countries in the “arc of terror” would surely follow.⁵ Others mark its beginning somewhat earlier, but all those who write about the second nuclear age (SNA) attempt to describe and predict behavior regarding nuclear weapons in a unipolar world. “It is a second age,” according to Bracken, “because it has nothing to do with the central fact of the first nuclear age, the cold war.”⁶ Taken as a whole, these analysts are a rather pessimistic lot, skeptical about the prospects for stability and nonproliferation in the absence of a superpower to balance the United States. This basic structural dynamic would lead to a number of unpleasant outcomes.

First and most obviously, the SNA would likely be marked by a great deal more proliferation than the first. According to Bracken, the “overarching theme” of the age will be the “breakdown of the major power monopoly over the bomb.”⁷ Unipolarity provides strong incentives for smaller states, who have no hope of balancing the United States, to pursue nuclear weapons. No matter how much effort the United States puts into non- and counterproliferation, “nuclear weapons will nevertheless spread, with a new member occasionally joining the club,” predicted Kenneth Waltz.⁸ “The most likely scenario in the wake of the Cold War,” argued John Mearsheimer, “is further nuclear proliferation in Europe,” and “it is not likely the proliferation will be well managed.”⁹ Instability and insecurity would spread, as would nuclear weapons, throughout the Global South.¹⁰ Since new nuclear states were almost inevitable, both Waltz and Mearsheimer felt that it was in the interest of the West to attempt to manage, and indeed even to encourage, gradual proliferation to help stabilize the system.

These chains of proliferation will lead to new, potentially unstable nuclear rivalries. Were North Korea to be accepted as the ninth nuclear-weapons state, Graham Allison warned in 2004, South Korea and Japan would build their own arsenals “by the end of the decade.”¹¹ The second nuclear age would be “much more decentralized,” with “many independent nuclear decision centers.”¹² A “multipolar nuclear order” is on the horizon, if it has not already arrived.¹³

The new nuclear powers are not likely to resemble the old. The second major assumption of the SNA literature is that proliferation will reach less enlightened parts of the globe, those led by unpredictable, semi-rational tyrants. The old rules of deterrence may not apply, since the motivations of these actors are not only less knowable but often ruled by passions and nationalism. “The idea of budding defense intellectuals sitting around computer models and debating strategy in Iran or Pakistan defies credulity,” at least in Bracken’s estimation, since in these states “hysterical nationalism” overrules rationality.¹⁴ The “overdetermined” cascades of proliferation across Asia will bring a host of new, less trustworthy actors into the nuclear camp, from rogue states to nonstate actors, all of whom will be essentially undeterrable by traditional means.¹⁵ Their motivations will be less rational or simply less transparent to the outside world.

In the second nuclear age, not just an accidental but the intentional use of nuclear weapons by new nuclear actors cannot be ruled out.¹⁶

Rogue states do not seek nuclear weapons for the reasons that motivated earlier proliferants. While all US observers believe that Washington's arsenal exists for defensive purposes, to deter any attack that our enemies would otherwise contemplate, the primary use of new nuclear weapons will be offensive. The possibility for irrationality in new nuclear powers inspired the United States to scrap the Anti-Ballistic Missile Treaty and begin thinking about how to "tailor" deterrence to target smaller actors.¹⁷ A nuclear Iran will use its weapons to bully, or even attack, not deter. In 2017, experts warned that North Korean intercontinental ballistic missiles would be coercive, to extract concessions from US allies. "North Korea's contempt for its neighbors suggests that it would hold them hostage with its nuclear weapons," wrote widely respected Ambassador Chris Hill. "Would proliferation stop with South Korea and Japan? What about Taiwan?"¹⁸ As a result, the basic assumptions of deterrence need to be rethought.

Third, preventive wars will be much more likely in the second nuclear age than they were in the first.¹⁹ The unipolar state is an essentially status quo power with strong incentives to prevent nuclear proliferation, especially if it involves states with disconcertingly inconsistent relationships with rationality.²⁰ The process of nuclearization, always profoundly unstable, will be even more dangerous now. Since many states may be interested in developing their own nuclear programs very soon, the risk of counterproliferation wars should increase.²¹

Fourth, preventive wars might not be the only ones becoming more frequent. Another characteristic of the new age expected by those who described it was an intensification of regional rivalries. The removal of the stabilizing influence of the superpowers will encourage local actors to take new steps to assure their security. Regional powers may well feel simultaneously less safe without the backing of their former patron and less constrained in their own actions. In nuclear terms, this means that the reach of nuclear umbrellas has shrunk. Extended deterrence (the promise to retaliate if one's allies are attacked), something upon which few smaller allies could completely depend during the Cold War, is particularly hard to take seriously now that it is over. The credibility of US commitments to its partners will decrease along with their strategic significance. Threats to retaliate in the periphery will not be as effective, and more wars—even nuclear wars—may be on the horizon.²² As a result, many expected to see the re-emergence of security dilemmas,

regional arms races, and their attendant negative effects on international relationships.

Fifth, other observers have been more concerned about dangers arising from reverse vertical proliferation. The erosion of Russian spending on (and attention to) its arsenal led some to question the viability of mutual assured destruction (MAD) in the second nuclear age. The United States appears to be approaching “nuclear primacy” as a result, and the results could be destabilizing.²³ A Kremlin without full confidence in its aging early-warning radar systems might grow increasingly concerned about its vulnerability to the dreaded bolt-from-the-blue attack. “To the extent that great power peace stems from the pacifying effects of nuclear weapons,” explained Keir Lieber and Daryl Press in a widely read piece, “it currently rests on a shaky foundation.”²⁴ That foundation grows shakier as the second nuclear age, and US technology, advances. Second-strike capabilities might no longer be what they once were.²⁵

Finally, contributors to the nuclear-studies renaissance worried a great deal about the potential for catastrophic terrorism. The “Managing the Atom” project at Harvard’s Belfer Center leads the concern. “If terrorists do get their hands on a nuclear device or on highly enriched uranium or plutonium,” warned Graham Allison, the project’s founder, “they could easily make a bomb operational within a year.”²⁶ He and others have repeatedly claimed that anyone with a master’s (or, at times, merely a bachelor’s) degree in physics could assemble a nuclear weapon if they acquired fissile material. Daniel Deudney worried about “nuclear leakage” to unsavory characters, which would lead to an age of “omniviolence.”²⁷

Perhaps some SNA theorists realized that their rhetoric was a bit overheated at times, but they rationalized their occasional use of hyperbole as a necessary tool to shock society into awareness regarding the ongoing dangers posed by nuclear stockpiles. A skeptic might suggest that perhaps some had also noted the ease with which fear sells books. Even if the SNA literature had more than one inspiration, its tone is homogenous: pessimism dominates, with most theorists arguing that the risk of nuclear use has risen dramatically in the unipolar world. As of this writing, the “Doomsday Clock” maintained by the *Bulletin of the Atomic Scientists* stands at two-and-a-half minutes to midnight, which is closer to Armageddon than at almost any time in the past.²⁸ Bracken has even wondered whether it will be “possible for countries to survive the second nuclear age.”²⁹

The Second Nuclear Age: Evidence

The removal of the Cold War rivalry has indeed had a rather dramatic effect on the world's relationship with its nuclear weapons—but not quite in the way described above. Most seasoned observers of international politics would agree that, so far, there have been no regional nuclear wars, and no cities have disappeared under a terrorist's mushroom cloud. While those SNA concerns may remain without much discussion, others might deserve a bit more examination.

Proliferation

The first quarter-century of unipolarity has been remarkably good for the nonproliferation regime. As it turns out, the great powers did not take Mearsheimer up on his recommendation to aid would-be proliferators. Thus far, at least, the second nuclear age has been much less dangerous than the first.

Proliferation comes in two forms, horizontal and vertical. The former refers to the spread of weapons capability from country to country, while the latter concerns the accumulation and development of weapons within countries. The superpowers tried to discourage horizontal proliferation during the Cold War while engaging in rather gaudy vertical proliferation of their own. Neither form has occurred since its end.

Two states founded the nuclear club in the 1940s (the United States and the USSR), one more joined in the 1950s (the United Kingdom), and two each in the 1960s (France and China), 1970s (India and Israel), and 1980s (Pakistan and South Africa). In the 1990s, there were no new members, and only one has joined in the new century. The same number of states possesses nuclear capability in 2017 as did in 1990, for a net horizontal proliferation rate of zero.

Table 1. Horizontal Proliferation in the Second Nuclear Age

Nuclear Weapons States, 2017	Nuclear Weapons States, 1990
United States	United States
Russia	USSR
United Kingdom	United Kingdom
France	France
China	China
Israel	Israel
India	India
Pakistan	Pakistan
North Korea	South Africa

Three states that inherited part of the Soviet arsenal (Belarus, Ukraine, and Kazakhstan) peacefully surrendered the weapons, against the advice of some outside observers.³⁰ At the time of this writing, the beginning of 2018, for the first time in eight decades no country is actively pursuing nuclear weapons, which is an underappreciated development. Nuclear testing has effectively ground to a halt outside of the Korean peninsula.

Meanwhile, the number of nuclear-capable states continues to grow. Although enthusiasm for nuclear power waxes and wanes alongside oil-price fluctuations and climate-change fears, the process is not secret. In April 2017, 449 nuclear reactors generated power for 30 different countries.³¹ All industrialized states, and quite a few less industrialized ones, are capable of building nuclear weapons.³² As Nick Miller's recent work has shown, nuclear energy programs rarely lead to warheads.³³

The supposedly landmark events that began the second nuclear age in earnest have proven profoundly unimportant. No proliferation cascades followed the 1998 Indian and Pakistani tests, which, it is helpful to recall, were only a reminder of what was already widely known: both countries had nuclear arsenals.³⁴ India conducted its first test in 1974, insisting that it was a "peaceful nuclear device."³⁵ Pakistan was unconvinced and developed its own weapons by the 1980s, although it refrained from testing. Domestic political calculations changed in 1998, not international conditions.³⁶ The tests were irrelevant to both the nonproliferation regime and geopolitics of the subcontinent.

Only one state has acquired nuclear weapons during unipolarity, but it is a prominent one. The anxiety generated by the new North Korean arsenal and its evolving delivery system may outweigh any optimism generated by otherwise negative proliferation momentum. Perhaps it is not the quantity of proliferation that should worry us, but the quality; one North Korean nuclear program may well be the functional equivalent, in terms of its ability to inject instability into the system, as six nuclear programs within Canada and the Nordic countries. In March 2017, then-Secretary of State Rex Tillerson announced that the era of "strategic patience" with North Korea was over and preventive action was a real possibility.³⁷ Former Ambassador John Bolton is not alone in worrying that accurate long-range missiles would allow them to become a "full-fledged" nuclear state.³⁸ Apparently North Korea has only been a partially fledged nuclear state since 2006, when it tested its first weapon.

Since that time, however, the so-called “hermit kingdom” has hardly acted irrationally. Indeed, its basic behavior has not changed. Pyongyang engaged in a consistent series of aggressive actions long before it acquired nuclear weapons, including assassinating dissidents, seizing US Navy vessels (and torturing captured crews), shooting down US reconnaissance aircraft, sinking South Korean ships, infiltrating special forces into the South, and other misdeeds. The pace of North Korean missile testing has increased over the last couple of years, but overall Kim is no more aggressive today than were his father and grandfather during the first nuclear age.

Pyongyang (and Trump’s Washington) provides strong evidence for one of the most basic lessons from foreign policy analysis: much more wisdom comes from watching what countries do than from listening to what their leaders say, since the latter is often primarily designed for domestic audiences. North Korean rhetoric is maniacal, but its actions are usually somewhat rational and restrained, far more so than commonly perceived.³⁹ The world’s newest nuclear-weapons state has not used its weapons for offensive purposes and appears to be just as deterrable as all those that preceded it. It is worth remembering that the Soviet Union joined the nuclear club when its leader was at the height of his paranoid mania and in complete control of his arsenal, yet even Stalin acted rationally when it came to atomic affairs.

Predictions of further rogue state proliferation have not been borne out by events. The most obvious example of this is Iran, whose program has been halted, at least temporarily. The controversial and awkwardly named “Joint Comprehensive Plan of Action” (JCPOA) dramatically complicated Tehran’s path toward a bomb for 15 years, and probably more, if it had been renegotiated and renewed in 2030.⁴⁰ No contributor to the SNA literature anticipated that agreement or offered much hope for the prospect that Iran could be kept nonnuclear without what might be euphemistically called preventive counterproliferation. Indeed, a number of analysts called openly for a preventive strike on Iran, an outcome they deemed preferable to trusting Tehran’s basic rationality. “Iran’s rapid nuclear development will ultimately force the United States to choose between a conventional conflict and a possible nuclear war,” wrote Matthew Kroenig in support of the former option.⁴¹ Six days before the framework for the deal was announced, former ambassador John Bolton warned that “Iran will not negotiate away its nuclear program. . . . Mr. Obama’s fascination

with an Iranian nuclear deal always had an air of unreality,” he wrote. “The inconvenient truth is that only military action . . . can accomplish what is required.”⁴²

These predictions may well still come true, now that President Trump has withdrawn the US from the JCPOA. As of this writing, the agreement outline remains in place and the Iranians have not violated it despite renewed US sanctions. Much consultation is taking place in European capitals as supporters of the agreement try to salvage its benefits. The nuclear proliferation so many anticipated throughout the Middle East may have been given new life by the master dealmaker currently in the White House.

It is also surely worth noting that Iran may not have been as determined to develop nuclear weapons as has been widely assumed. Both US and Israeli intelligence believe that Tehran never made any final decisions to nuclearize. According to the *2007 US National Intelligence Estimate*, which remains the assessment of the entire community, Iran essentially abandoned its efforts to develop a bomb in 2003.⁴³ Tehran’s insistence that it had no active program was dismissed by those whose judgments were based not on inside information but on distrust of Iran, which led them to believe that they thought they understood the Islamic Republic better than did intelligence professionals (who rarely have an incentive to underestimate). Thus, the JCPOA might have put an end to a program that had already effectively ended.

Despite widespread concerns to the contrary, the nonproliferation regime has proven even more robust in the second nuclear age than it was in the first. The story is even better regarding vertical proliferation: There are far fewer nuclear weapons on the planet after the first 25 years of unipolarity. The largest arsenals shrank the most precipitously, decreasing the overall number of warheads by over 70 percent. The United Kingdom and France maintain far fewer weapons than they did during the Cold War, and despite threats to build a new generation of warheads following the election of Trump, thus far the Chinese arsenal remains essentially unchanged.⁴⁴ Only India and Pakistan experienced meaningful vertical proliferation in the first decades of the second nuclear age.

Table 2. Vertical proliferation in the Second Nuclear Age⁴⁵

Total warheads	USA	Russia	China	UK	France	India	Pakistan	Israel	North Korea	South Africa	Global total
1990	21,392	37,000	230	422	420	7	4	53	0	6	59,534
2017	6,800	7,000	260	215	300	110	140	~80	~10	0	14,915

Meanwhile, Moscow has taken steps to address its eroding second-strike capabilities. The Russians embarked upon a nuclear modernization program in 2011, spending billions to upgrade systems and replace older weapons with new ones.⁴⁶ This renewed activity may or may not imperil bilateral arms-control treaties, but if it continues it should alleviate concerns that the United States is about to achieve nuclear primacy, with all its attendant, potentially destabilizing tensions. While the capability to take out an opponent’s arsenal with a bolt-from-the-blue attack has been a concern of theorists since the dawn of the nuclear age, no state has appeared eager to put theory into practice. Reluctance to use nuclear weapons, whether as a result of a taboo or merely prudent caution, is a central feature of both the first and second nuclear ages.⁴⁷ Improvements in targeting or intelligence have not (yet?) weakened the basic logic of MAD, which was put to the test far more often in the first nuclear era.

Nuclear experts are perpetually identifying tipping points at which the world stands. Despite a vast decrease in the number of weapons and net-zero horizontal proliferation, the world always finds itself on the precipice of disaster, only a few minutes from midnight. Fortunately, the nonproliferation regime is far less fragile than SNA theorists feared. The pace of proliferation in the second nuclear age has thus far been substantially slower than most predicted.⁴⁸

Preventive War

How much credit can prevention take for these negative proliferation trends? The only unambiguously preventive war of the second nuclear age—the 2003 invasion of Iraq—had nothing to do with nuclear weapons, even if it was occasionally (and disingenuously) sold that way. “We know he [Saddam Hussein] has been absolutely devoted to trying to acquire nuclear weapons,” Vice President Dick Cheney said on *Meet the Press* four days before the tanks rolled. “And we believe he has, in fact, reconstituted nuclear weapons.”⁴⁹ It is unclear who the vice president meant by “we,” because no one in the US government or security community thought that Iraq had “reconstituted” nuclear weapons in March

2003.⁵⁰ Erroneous beliefs regarding other weapons of mass destruction were among the reasons for the war, but it was not the kind of preventive strike on a nuclear program foreseen by SNA theorists.

Iran was not the only rogue state to abandon its nuclear program without a fight. At times de-nuclearization occurred by choice, as with South Africa and Libya, while at other times nonproliferation was thrust upon states, as was the case with the inchoate Syrian program. Colonel Mu'ammār Gadhafi's motivation for his decision to shut down his WMD programs has been the subject of ferocious and heavily partisan debate. At issue is the extent to which the war in Iraq affected his calculations: Was Gadhafi concerned about being the next target of US counterproliferation, or was his decision a reflection of a broader effort to remove his government from the list of international pariahs? Supporters of the Bush administration posit a direct connection between the war and Gadhafi's sudden change of heart. Negotiations with him had begun some years earlier under the Clinton administration, however, leading a number of observers to conclude that Libya would have abandoned its program regardless of what happened in Iraq.⁵¹ More recent work on the issue suggests that fear of being next on the US target list did affect Gadhafi's thinking and can at the very least account for the timing of his offer to disarm.⁵² "Disarm" is probably not the right word, however, since Libya had nowhere near the requisite state capacity to build a bomb, and Gadhafi probably knew it. International Atomic Energy Agency inspectors found centrifuges and other crucial materials in their original packing crates, where they had apparently been for years.⁵³ Libya may have announced it would not be joining the nuclear club following the invasion of Iraq, but that was likely a conclusion it had reached some time before. For these purposes, it is sufficient to note that Libya abandoned its program for the foreseeable future. Diplomacy worked, the nonproliferation regime held, and the rogue-state list shrank by one member.⁵⁴

While it cannot yet be said that the 2007 Israeli airstrikes on a reactor construction site permanently removed the possibility of a Syrian nuclear weapon, the program has not restarted since the attack. Three-and-a-half years passed between those strikes and the current civil war, during which Assad presumably had plenty of time to re-establish his reactors, should he have desired to do so. Instead it appears that his government abandoned its efforts, which had not progressed very far

anyway.⁵⁵ American intelligence had never been confident about Syria's desire to build nuclear weapons in the first place, in large part because additional facilities required for such an effort were not under construction.⁵⁶

Overall, while prevention occurred in the second nuclear age, its pace is not increasing.⁵⁷ Israel, for example, struck facilities of its Arab neighbors during the first nuclear age as often as in the second. Non-proliferation in the Middle East has come in different forms in the unipolar era, from high-level diplomacy to air strikes. But the outcomes have been roughly the same, and nightmares of a region in a "nuclear context," or a gallery of nuclear-armed rogues, have not come to pass.

Terrorism

Finally, despite the string of bleak and terrifying projections from a variety of experts, nuclear weapons have remained well beyond the capabilities of the modern apocalyptic terrorist. The great fear of the SNA literature, that scientific knowledge and technology would gradually become more accessible to nonstate actors, has remained only a dream. Nor does there appear to be a great reservoir of fissile material in the world's various black markets waiting to be weaponized.⁵⁸

Just because something has not yet occurred does not mean that it cannot or will not occur eventually. However, it is worth noting that the world has not experienced any close calls regarding nuclear terrorism. Forecasting future unique events is a necessarily dicey enterprise, but one way to improve accuracy is to examine events that have already or almost happened. Given the many complexities involved with nuclear weapons, especially for amateurs as any terrorists would almost certainly be, it is not unreasonable to expect a few failures, or near misses, to precede success. While it is possible that we might not know about all the plots disrupted by international law enforcement, keeping the lid on nuclear near misses would presumably be no small task. As of this writing, the public is aware of no serious attempts to construct, steal, or purchase nuclear weapons, much less smuggle and detonate one. "Leakage" does not seem to be a problem, yet.⁵⁹

The uniformly pessimistic projections about the second nuclear era have not, at least thus far, been borne out by events. Post-Cold War trends have instead been generally moving in directions opposite to these expectations, with fewer nuclear weapons in the hands of the same number of countries and none pursuing more. Why, then, does

nuclear pessimism persist? What are the roots of the current fashionable unwillingness—or even inability—to detect positive patterns in nuclear security?

Psychology and the Second Nuclear Era

“I look back wistfully at the Cold War,” said James Inhofe, the ranking Republican in the Senate Armed Services Committee, in February 2014. “There were two superpowers, they knew what we had, we knew what they had, mutually assured destruction meant something. It doesn’t mean anything anymore.”⁶⁰ Inhofe is hardly alone. When he was secretary of defense, Robert Gates was fond of noting that the Cold War was “less complex” than the current era.⁶¹ Then-Secretary of State Rex Tillerson expressed this clearly in his first major address to his department in May 2017. “In many respects the Cold War was a lot easier,” he said:

Things were pretty clear, the Soviet Union had a lot of things contained, and I had a conversation with Secretary-General Guterres at the UN. He described it as during the Cold War, we froze history. History just stopped in its tracks because so many of the dynamics that existed for centuries were contained. They were contained with heavy authoritarianism. And when the Cold War ended and the Soviet Union broke up, we took all of that off and history regained its march. And the world got a whole lot more complicated. And I think that’s what we see. It has become much more complicated in terms of old conflicts have renewed themselves because they’re not contained now.⁶²

Former Chairman of the Joint Chiefs Martin Dempsey waxed nostalgic for the Soviet era over and over, repeatedly claiming that the world had become more dangerous than at any point in his lifetime.⁶³

On its face, this point of view, no matter how widespread, demonstrates a significant lack of perspective. As all who study international politics know—or should know—the post-Cold War era has not only been far more stable than the one that preceded it, but it has also been the most peaceful in all of human history. It will not be news to tell this community of readers that great power war has been absent for more than a half century, or that interstate conflict is rarer than ever, or that intrastate wars like civil and ethnic conflicts are also at historically low levels.⁶⁴ The total numbers tell only part of the story: By almost any measure the world has become significantly more peaceful, with measurable declines in coups, repression, the chances of dying in battle, territorial and border disputes, conquest, and genocide and other forms of violence

against civilians.⁶⁵ Peace settlements have proven to be more durable over time, and fewer new conflicts are breaking out than ever before.⁶⁶ Whether these trends represent a fundamental change in the rules that govern state behavior or a temporary respite between cataclysms is not yet clear, but there is no doubt the post–Cold War era has been far more stable and peaceful than any that preceded it.

Since these trends in conflict are the subject of great debate in the field, particularly over their cause and significance, healthy skepticism persists.⁶⁷ Popular perceptions about warfare certainly do not match empirical reality. Anxiety and unease about the state of the world remain high. The bloody mess in Syria in particular has blinded many observers to the broader security trends, which remain essentially unchanged. Security is after all relative; absolute safety is an illusion, something promised by leaders but unattainable in a world of imperfect actors. Stability has meaning only in comparison to other times. And when the current era—as dangerous as it may seem—is compared to any other, the verdict is clear: this is a golden age of peace and security, one in which the odds of dying in warfare are lower than ever before.

Even if the “New Peace” remains controversial, the trajectory of proliferation and nuclear issues is not.⁶⁸ The verdict on the second nuclear age is plain and irrefutable: thus far, it has been better in most ways than the first. The world is far less dangerous than it was during the Cold War, when many thousands more nuclear weapons stood on alert in superpower arsenals. States might not always have been able to cooperate, or even agree, over the course of the last 25 years, but at no time have tensions risen to the heights reached by a dozen or more Cold War crises. General Dempsey was born in 1952, so although he missed the Berlin Airlift by a few years, he was alive for the Korean War, Cuban Missile Crisis, Vietnam, Yom Kippur War, Soviet invasion of Afghanistan, 1983’s “Able Archer” scare, and a host of other perilous moments that have no post–Cold War equivalents. The unipolar era has not seen serious analysts urging the use of nuclear weapons on nonnuclear states, as happened in the United States in 1950 and 1954 (and in the Soviet Union in the early 1960s). It has seen nothing remotely similar to China’s Great Leap Forward, where as many as 30 million people perished.⁶⁹ Massive, bloody wars occurred during General Dempsey’s lifetime that dwarf even the horror in Syria, some of which involved the United States. Somewhere around 2 million people died in Vietnam alone while

the general was a teenager. The attacks of 9/11 shook this country to its core, but terrorism since has not been as dangerous to Americans as have bathtubs, cows, lightning, deer, and even the televisions that bring the frightening images into their living rooms.⁷⁰ By any reasonable measure, the Cold War was not only bloodier and less stable than the period since its end, but it also was less safe for the United States.

How soon so many in our national security establishment forget the consistent, nagging fear that hung over much of the Cold War, which was stronger at some times than others but could rarely be dismissed entirely: at times it seemed as if the West was losing. In retrospect, this seems rather silly, given the advantages of the first world over the second in nearly every measurable category of power, but back then the concern was real. Disasters seemed cumulative, as long as one interpreted them correctly. The Chinese civil war, Sputnik, Vietnam, and other occasional setbacks fed the impression that momentum was on the other side. The ultimate outcome of the struggle was not clear, which led to a steady waxing and waning of national anxiety. Today, no such fear exists. No matter what happens during the current “war on terror,” no major Western country is going to be speaking Arabic when it is over. Defeat is unimaginable, regardless of what time frame one uses.⁷¹ Today’s modern industrialized state faces no imminent existential threats.

Cold War nostalgia is particularly inappropriate regarding nuclear weapons. Almost all of those who write about the second nuclear age look back wistfully at the simpler, rational, predictable first. This claim overlooks the fact that many specialists and laymen alike were unconvinced that the Soviet leadership was rational, and some were fully convinced that it was not. Moscow sought not stability, hardliners endlessly warned, but revolution. Richard Pipes was typical when he argued that significant danger arose from the fact that “we consider nuclear war unfeasible and suicidal for both, and our chief adversary views it as feasible and winnable for himself.”⁷² Anyone attributing basic rationality to Soviet leaders engaged in naïve “mirror imaging,” the mistaken assumption that they were essentially like us.⁷³ The Soviets could not even be trusted to oppose the deaths of hundreds of millions, as long as such sacrifice advanced the cause of communism somehow. When today’s analysts look back wistfully at a time when US rivals were rational and predictable, they are recalling a fantasy, one that did not reflect the reality of the time.

The People's Republic of China seemed even less rational. A half century of Chinese nuclear behavior makes it easy to forget just how fast and loose Beijing once played with its rhetoric. Mao appeared quite sanguine regarding a global nuclear conflict, since it would result in the "total elimination of capitalism." He told Soviet leader Nikita Khrushchev in 1957 that in such a war "we may lose more than 300 million people. So what? War is war. The years will pass and we'll get to work producing more babies than ever before."⁷⁴ His bluster turned out to be just that, for since China tested its bomb it has acted quite responsibly. This was hardly predictable in the early 1960s as it was nuclearizing. As historian Francis Gavin observed, "No country in the post-World War II period—not Iraq, Iran, or even North Korea—has given U.S. policymakers more reason to fear its nuclearization than China."⁷⁵ All this was enough to encourage the superpowers to contemplate large-scale preemption, even during the supposedly stable and predictable first nuclear era.⁷⁶

The amorphous, generalized anxiety pervasive in the United States today is of a fundamentally different character and intensity than the existential dread that accompanied the Cold War. Nuclear war would have meant death not only for the individual but for civilization, the total annihilation of the past and future, which for many people seemed worse than mere death.⁷⁷ Threats of apocalypse permeated all layers of society, affecting the general mental health in ways that no terrorist, no matter how frightening, can match.⁷⁸ To keep their rosy memories intact, nostalgics have to forget or suppress the ever-present danger of World War III that hung over the Cold War and the utter terror and helplessness it produced.

Explaining Cold War Nostalgia

Expectations of a calamitous second nuclear age, as well as the general refusal to recognize the relative safety of the New Peace, are symptomatic of a larger, rather puzzling phenomenon. A lingering nostalgia for the Cold War has accompanied the unipolar era, a plaintive longing for an earlier, supposedly simpler, more predictable, and less dangerous time. Such nostalgia is the result of a few related phenomena working together, subconsciously making that dangerous past seem preferable to the much safer present. They are all related to one of the classic subjects in psychology: the manner in which memory operates.

A good deal of research has been done on how people remember. Psychologists have long known that memory is an active process, one that involves the purposeful reconstruction of events, opening the door to the influence of a variety of identifiable cognitive and motivational biases.⁷⁹ Over the years, researchers have identified many factors that shape the reconstruction and reinterpretation we call our memories. This process produces noticeable patterns that, when taken together, help account for the common tendency to look back upon earlier eras with unearned, positive feelings, in both SNA theorists and the general public.

First, psychologists describe a phenomenon sometimes referred to as rosy retrospection, according to which the past seems better in memory than it was in reality.⁸⁰ A strong line of research suggests that people often engage in “active forgetting” of negative events, for a variety of reasons, and focus instead on the positive.⁸¹ The human mind has an incentive, in a sense, to minimize the details and duration of unpleasant experiences. As a result, there tends to be a positivity bias to memory, which makes it easier to recall positive events or outcomes than negative ones. Our memories of the past are left rosier than our experiences of the present, and nostalgia forms.

For example, a number of studies have looked at the ways people remember enjoyable events, such as vacations and festivals.⁸² Participants consistently report greater satisfaction with their experiences after they return than they did while the event was taking place. They focus on the positive moments and forget those that were disappointing, frightening, or just plain boring. Lying by the pool seemed pretty nice while it was happening but great once they were back in the office. The same basic dynamics may well apply to bipolar standoffs; we are more likely to focus on the good events and forget the less pleasant or terrifying. Rosy retrospection encourages people to remember the moon landings more clearly than Sputnik or Reagan’s speech at the Berlin Wall more than that of Khrushchev at the UN. Most of all, we remember the end, when the wall fell, the Soviet Union collapsed, and the West emerged victorious.

Second, according to what psychologists call the immediacy bias, people experience current emotions more intensely than they do older ones.⁸³ The fear, dread, and pessimism of the Cold War faded long ago, while emotions generated by events of the present era remain powerful in our minds. In the argot of the field, recent events are more easily available in our memories than those of the past, so the emotions they

engender are more salient. As a result, for example, more recent humanitarian crises are more likely to attract the attention of outsiders than persistent problems, regardless of objective level of need.⁸⁴ Immediate emotions are often more powerful than older ones that, over time, may have lost their affective edge.

The present always outweighs the past, and as a result the Cold War seems less dangerous than it was, especially when compared to current events. Temporal distance makes 9/11 far more terrifying than the Cuban Missile Crisis, Iraq appear more heartbreaking than Vietnam, and ISIS as scary as the Soviets. Although a detached assessment might suggest that the reverse is true, people rarely make detached assessments. Current problems lead stereotypical teenagers to declare every few weeks that they are experiencing the worst day of their entire life and perhaps even seasoned generals to decide that no time is more dangerous than the present.⁸⁵

The third explanation for Cold War nostalgia has to do with how memory operates. People might look back fondly upon that era in part because they simply do not remember it accurately. For our purposes here, the important point is that the more events fade into the past, the more abstractly people tend to remember them.⁸⁶ The concrete, day-to-day details are lost to time, leaving behind only overall impressions. “As we move away from direct experience of things, we have less information about those things.”⁸⁷ The act of abstraction allows actors to retain certain features in their memories while omitting those deemed less important or less central. High levels of abstraction open the door to incomplete or incorrect reconstruction of memory, leaving actors with representations of the past that are “simpler, less ambiguous, more coherent, more schematic, and more prototypical than concrete representations.”⁸⁸ In other words, people impose order on their memories, even if no such order existed when the events occurred. The past appears simpler, more coherent, and—whether regarding nuclear weapons or other geopolitical threats—less dangerous.

The relationship between psychological distance and abstraction is complicated and just beginning to be understood. A couple of issues seem clear, however, that relate to the way people remember the Cold War. First of all, affective memory appears to fade faster than cognitive aspects of memory. In other words, people tend to remember facts but forget the intensity of emotions they generated. The terror of the Cuban

Missile Crisis fades, but the general story remains. This process only accelerates as the psychological distance grows. Furthermore, in many instances, negative emotions fade faster than positive ones.⁸⁹ Yaacov Trope and Nira Liberman use the example of houseguests: Soon after they leave, we may remember both the inconvenience they produce and the good times we had with them. Over time, though, the former fades, and we recall the positive emotions more clearly and are ready to welcome new guests.⁹⁰ The research therefore supports the notion of rosy retrospection, offering even more reason to believe that people tend to remember the positive aspects of the past more than the negative.

Finally, and perhaps most importantly, all memory of the Cold War is filtered through the lens of certainty. We know how the bipolar era ended, and we know that the world managed, through some combination of skill, luck, and/or inertia, to avoid a nuclear holocaust. Khrushchev blinked during the Cuban Missile Crisis. Zbigniew Brzezinski chose not to wake up President Carter when his military aides erroneously detected hundreds of inbound Soviet missiles in 1979.⁹¹ On the other side, a heroic Soviet lieutenant colonel disobeyed orders and refused to start a chain reaction after detecting a similarly false radar signature, averting an accidental nuclear war.⁹² Not only did the species survive, but the West won, and communism was essentially vanquished.

In contrast, no one knows what the future holds, either for the next would-be terrorist or the unipolar moment. One of the most robust findings in psychology, supported by behavioralists and neuroscientists alike, is that uncertainty is profoundly stressful.⁹³ The past might not have been uniformly pleasant, but its outcome is known, and it had a more-or-less happy ending. The present carries no such guarantees. No one can say for sure what North Korea or Vladimir Putin will do, or what plots ISIS is working on, or what catastrophes the warming climate will bring. The unknown unknowns, to borrow from Donald Rumsfeld, keep people awake at night.⁹⁴

These four psychological processes help explain why so many continue to believe the Cold War was somehow more predictable and less complicated than the current era. Without the natural bias regarding the past commonly created by memory, more reasonable evaluations of the current security environment would be possible, regarding nuclear weapons and all other imaginable categories. For many people, life is

always better in the rearview mirror, no matter what the facts say and no matter how strong the empirical case of those who argue otherwise.


Conclusion

Throughout the Cold War, the millions of words devoted to deterrence were all based on a series of assumptions that could never be tested. Foremost among them was the notion that the desire to attack was omnipresent or at least occasionally present between the superpowers. Without that desire, nothing would actually be deterred. In practice, it was impossible to determine when exactly states were deterred from attacking by guarantees of retaliation and when they were simply not contemplating aggression.⁹⁵ Superpower peace and the existence of enormous stockpiles of nuclear weapons may be merely coincidental.⁹⁶ The current era poses particular challenges to those seeking to ascertain whether nuclear weapons are actually deterring anything. Cross-border attacks with the goal of conquest have been just as rare in regions with no nuclear weapons as in those supposedly kept secure by deterrence. Would today's leaders really contemplate assaults on other states if nuclear weapons were absent? What if the world's nuclear weapons are essentially deterring no one, because the will to attack is essentially absent? In a system where conquest has been rendered so rare as to be obsolete, deterrence may be an illusion. The New Peace has tremendous implications for deterrence theory, in other words, none of which are currently captured by the current thinking on the second nuclear age.

If policy makers and leaders would realize that any nostalgia for the Cold War is being affected by predictable biases, they might be able to recognize their biases and correct their perceptions. They might be able to keep current threats in perspective, separate the major threats from the minor, and make better decisions. Fortunately, the international system today contains precious few major threats. No matter how many times it is repeated, we are not living in more dangerous times, when compared to any other.

Theorizing about the second nuclear age seems like security studies at its best. The parameters are well defined, the puzzles clear, the expectations elegant and logical. The only problem is the evidence, which stubbornly refuses to cooperate. Proliferation has not increased, regional rivalries have not deepened, and omniviolence has not materialized. Instead unipolarity has diminished the importance of nuclear weapons for

all but a handful of states. The second nuclear age is indeed different from the first; contrary to most expectations, however, thus far it has been significantly better. The end of the Cold War has improved nuclear security in every measurable way. Many observers are unlikely to realize the extent of these improvements as long as they remain unaware of the deeper psychological biases that make the past seem better than it was.

John Mueller once described the tendency of people to romanticize the past, elevating prior ages over the present, no matter how irrational. Human beings have a “tendency to look backward with misty eyes, to see the past as much more benign, simple, and innocent than it really was,” he observed. No matter how much better the present gets, the past gets better in reflection, and we are, accordingly, always notably worse off than we used to be. Golden ages, thus, do happen, but we are never actually in them: they are always back there somewhere (or, sometimes, in the ungraspable future).⁹⁷ As big problems become resolved, he continued, “we tend to elevate smaller ones, sometimes by redefinition or by raising standards, to take their place.”⁹⁸ The second nuclear age may turn out to be a golden one, but human nature might make it impossible for citizens and scholars alike to appreciate its benefits. 

Notes

1. Paul Bracken may be most closely associated with the “second nuclear age,” but he did not coin the term. See his *Fire in the East: The Rise of Asian Military Power and the Second Nuclear Age* (New York: Harper Collins, 1999), and *The Second Nuclear Age: Strategy, Danger, and the New Power Politics* (New York: Henry Holt, 2012). See also Keith B. Payne, *Deterrence in the Second Nuclear Age* (Lexington: University Press of Kentucky, 1996); Colin S. Gray, *The Second Nuclear Age* (Boulder, CO: Lynn Rienner, 1999); Toshi Yoshihara and James R. Holmes, eds., *Strategy in the Second Nuclear Age: Power, Ambition, and the Ultimate Weapon* (Washington, DC: Georgetown University Press, 2012), 81–98; and those cited below.

2. Although the assertion that the world is unipolar would not be accepted by all observers, an extensive defense of the proposition is outside the scope of this paper. “The question [of polarity] is an empirical one,” wrote Kenneth Waltz some time ago, “and common sense can answer it.” Kenneth N. Waltz, *Theory of International Politics* (Reading, MA: Addison-Wesley Pub. Co., 1979), 131. The United States towers over all potential competitors in all measurable (and many less-than-measurable) categories. See Stephen G. Brooks and William C. Wohlforth, *World Out of Balance: International Relations and the Challenge of American Primacy* (Princeton, NJ: Princeton University Press, 2008); the essays in G. John Ikenberry, Michael Mastunduno, and William C. Wohlforth, eds., *International Relations Theory and the Consequences of Unipolarity* (New York: Cambridge University Press, 2011); and Christopher J. Fettweis, “Unipolarity, Hegemony, and the New Peace,” *Security Studies* 26, no. 3 (Fall 2017): 423–51, <https://doi.org/10.1080/09636412.2017.1306394>.

3. This paper is a revised, updated and (hopefully) improved version of an argument that first appeared in Christopher J. Fettweis, *Psychology of a Superpower: Security and Dominance in U.S. Foreign Policy* (New York: Columbia University Press, 2018), used by permission.

4. Bracken, *Second Nuclear Age*, 1, 105.

5. Bracken, *Fire in the East*, 95.

6. Bracken, 96.

7. Bracken, *Second Nuclear Age*, 10.

8. Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: A Debate* (New York: W. W. Norton, 1995), 1.

9. John J. Mearsheimer, "Back to the Future: Instability in Europe after the Cold War," *International Security* 15, no. 1 (Summer 1990): 37 and 39, <https://www.jstor.org/stable/2538981>. See also Benjamin Frankel, "The Brooding Shadow: Systemic Incentives and Nuclear Weapons Proliferation," *Security Studies* 2, nos. 3/4 (Spring/Summer 1993): 37–78, <https://doi.org/10.1080/09636419309347519>.

10. John J. Mearsheimer, "Disorder Restored," in *Rethinking America's Security: Beyond Cold War to New World Order*, ed. Graham Allison and Gregory F. Treverton (New York: W. W. Norton, 1992), 225. For specific predictions of proliferation in the Third World, see 234–35.

11. Graham Allison, *Nuclear Terrorism: The Ultimate Preventable Catastrophe* (New York: Henry Holt, 2004), 186.

12. Bracken, *Second Nuclear Age*, 95. Not everyone foresaw increased proliferation, of course: Jacques E. C. Hymans, *The Psychology of Nuclear Proliferation: Identity, Emotions, and Foreign Policy* (New York: Cambridge University Press, 2006).

13. Bracken, *Second Nuclear Age*, 3. See also Fred Charles Iklé, "The Second Coming of the Nuclear Age," *Foreign Affairs* 75, no. 1 (January-February 1996): 119–28, <http://dx.doi.org/10.2307/20047472>.

14. Paul Bracken, *Fire in the East: The Rise of Asian Military Power and the Second Nuclear Age* (New York: Harper Collins, 1999), 113. On the same page, Bracken demonstrates that he is one who believes "penultimate" means "extra ultimate." Bracken's history of ethnocentrism is reviewed by Victor D. Cha in "The Second Nuclear Age: Proliferation Pessimism versus Sober Optimism in South Asia and East Asia," *Journal of Strategic Studies* 24, no. 4 (December 2001): 79–120, esp. 100–101, <https://www.tandfonline.com/doi/abs/10.1080/01402390108437857>.

15. Cha makes the point about overdetermination in "The Second Nuclear Age," 79 and thereafter, and Payne worries about undeterrable actors throughout his *Deterrence in the Second Nuclear Age*, but esp. 40–52.

16. See Rebecca Davis Gibbons and Matthew Kroenig, "Reconceptualizing Nuclear Risks: Bringing Deliberate Nuclear Use Back In," *Comparative Strategy* 35, no. 5 (October 2016): 407–22, <https://doi.org/10.1080/01495933.2016.1240995>. The authors claim to "marshal empirical evidence" to support the claim that the danger of intentional use of nuclear weapons is increasing.

17. "Tailored deterrence" made its debut as a concept in the 2006 Quadrennial Defense Review of the US Department of Defense. White House, "Quadrennial Defense Review Report" (Washington, DC: Department of Defense, 6 February 2006), <archive.defense.gov/pubs/pdfs/QDR20060203.pdf>.

18. This is a rather bizarre line of argument, since North Korea had nuclear weapons for a decade without such bullying. Chris Hill, "Avoiding the Temptation to do Nothing," *Time*, 3 April 2017, 42, <https://www.scribd.com/article/342952711/Avoiding-The-Temptation-To-Do-Nothing>.

19. Nuno P. Monteiro, *Theory of Unipolar Politics* (New York: Cambridge University Press, 2014), 14–15.
20. Bracken, *Second Nuclear Age*, 160.
21. The terms “nonproliferation” and “counterproliferation” are often conflated. The former aims at preventing proliferation, while the latter (an invention of the US Department of Defense in the 1990s) essentially refers to rolling back existing WMD programs. According to Barry Schneider of the USAF Counterproliferation Center, the basic difference is that nonproliferation “features the velvet glove of the diplomat,” and counterproliferation, “the iron fist of the military.” Barry R. Schneider, “Military Responses to Proliferation Threats,” in *Pulling Back from the Nuclear Brink: Reducing and Countering Nuclear Threats*, ed. Barry R. Schneider and William L. Dowdy (London: Frank Cass, 1998), 306.
22. Payne, *Deterrence in the Second Nuclear Age*, 118.
23. Keir A. Lieber and Daryl G. Press, “The End of MAD? The Nuclear Dimension of U.S. Primacy,” *International Security* 30, no. 4 (Spring 2006): 7–44, <http://dx.doi.org/10.1162/isec.2006.30.4.7>.
24. Lieber and Press, 8.
25. Austin Long and Brendan Rittenhouse Green, “Stalking the Secure Second Strike: Intelligence, Counterforce, and Nuclear Strategy,” *Journal of Strategic Studies* 38, nos. 1–2 (February 2015): 38–73, <https://doi.org/10.1080/01402390.2014.958150>; and Keir A. Lieber and Daryl G. Press, “The New Era of Counterforce: Technological Change and the Future of Deterrence,” *International Security* 41, no. 4 (Spring 2017): 9–49, http://dx.doi.org/10.1162/ISEC_a_00273.
26. Allison, *Nuclear Terrorism*, 120.
27. Daniel Deudney, “Unipolarity and Nuclear Weapons,” in *International Relations Theory and the Consequences of Unipolarity*, ed. G. John Ikenberry, Michael Mastunduno, and William C. Wohlforth (New York: Cambridge University Press, 2011), 308.
28. The clock was at two minutes until midnight between 1952 and 1960, and dipped down to three minutes from 1983 to 1988. Its timeline can be accessed at <http://thebulletin.org/timeline>.
29. Paul Bracken, *The Second Nuclear Age: Strategy, Danger, and the New Power Politics* (New York: Henry Holt, 2012), 7.
30. John J. Mearsheimer, “The Case for a Ukrainian Nuclear Deterrent,” *Foreign Affairs* 72, no. 3 (Summer 1993): 50–66, <https://www.foreignaffairs.com/articles/ukraine/1993-06-01/case-ukrainian-nuclear-deterrent>.
31. Nuclear Energy Institute, “Nuclear Energy Around the World,” April 2017, <https://www.nei.org/Knowledge-Center/Nuclear-Statistics/World-Statistics>.
32. By one estimate, there are nearly 50 “nuclear capable” countries. Jacques E. C. Hymans, *The Psychology of Nuclear Proliferation* (New York: Cambridge University Press, 2006), 4. See also Adam N. Stulberg and Matthew Fuhrmann, eds., *The Nuclear Renaissance and International Security* (Stanford, CA: Stanford University Press, 2013).
33. Nicholas L. Miller, “Why Nuclear Energy Programs Rarely Lead to Proliferation,” *International Security* 42, no. 2 (Fall 2017): 40–77, https://doi.org/10.1162/ISEC_a_00293.
34. Those like Bracken who insist on claiming that both are new members of the nuclear club should explain how the Pakistanis could go from zero to testing in 17 days following the surprise Indian test. Nonetheless, he has made this claim repeatedly; see *The Second Nuclear Age: Strategy, Danger, and the New Power Politics* (New York: Henry Holt, 2012), 93, where he also says that Israel is “coming out of the closet” with its arsenal and other countries are considering joining the club.

35. The story is told well by George Perkovich in *India's Nuclear Bomb: The Impact on Global Proliferation* (Berkeley: University of California Press, 1999). The “peaceful nuclear device” is explained in pages 161–89.

36. The era is reviewed in Strobe Talbott, *Engaging India: Diplomacy, Democracy, and the Bomb* (Washington, DC: Brookings Institution Press, 2004).

37. David E. Sanger, “Secretary of State Rejects Talks with North Korea on Nuclear Program,” *New York Times*, 18 March 2017, A8, <https://www.nytimes.com/2017/03/17/world/asia/rex-tillerson-north-korea-nuclear.html>.

38. Ambassador John Bolton (@AmbJohnBolton), Twitter, 14 August 2017, <https://twitter.com/AmbJohnBolton>.

39. Leon V. Sigal, *Disarming Strangers: Nuclear Diplomacy with North Korea* (Princeton, NJ: Princeton University Press, 1998); Dennis Roy, “North Korea and the ‘Madman Theory,’” *Security Dialogue* 25, no. 3 (September 1994): 307–16, <https://doi.org/10.1177/0967010694025003006>; David C. Kang, “International Relations Theory and the Second Korean War,” *International Studies Quarterly* 47, no. 3 (September 2003): 301–24, <https://doi.org/10.1111/1468-2478.4703001>; Victor D. Cha, “Five Myths about North Korea,” *Washington Post*, 10 December 2010, <http://www.washingtonpost.com/wp-dyn/content/article/2010/12/10/AR2010121002488.html>; Terrence Roehrig, “North Korea’s Nuclear Weapons Program: Motivations, Strategy, and Doctrine,” in *Strategy in the Second Nuclear Age*, ed. Yoshihara and Holmes, 81–98; and Max Fisher, “North Korea, Far from Crazy, Is All Too Rational,” *New York Times*, 10 September 2016, A6, <https://www.nytimes.com/2016/09/11/world/asia/north-korea-nuclear-missile-programs-rational.html>.

40. All arms-control agreements expire after a certain period. The Non-Proliferation Treaty has been renegotiated and (so far) renewed every five years, for example, and SALT agreements only lasted eight. The JCPOA has a period of 15 years, longer than any similar agreement, and was written under the impression that it will be extended.

41. Matthew Kroenig, “Time to Attack Iran: Why a Strike Is the Least Bad Option,” *Foreign Affairs* 91, no. 1 (January/February 2012): 86, <https://www.jstor.org/stable/23217150>. See also his *A Time to Attack: The Looming Iranian Nuclear Threat* (New York: St. Martin’s Press, 2014); Norman Podhoretz, “The Case for Bombing Iran,” *Commentary* 123, no. 6 (June 2007): 17–23, <https://www.commentarymagazine.com/articles/the-case-for-bombing-iran/>; Alan J. Kuperman, “There’s Only One Way to Stop Iran,” *New York Times*, 24 December 2009, A23, <https://www.nytimes.com/2009/12/24/opinion/24kuperman.html>; and Joshua Muravchik, “War with Iran is Probably Our Best Option,” *Washington Post*, 13 March 2015, https://www.washingtonpost.com/opinions/war-with-iran-is-probably-our-best-option/2015/03/13/fb112eb0-c725-11e4-a199-6cb5e63819d2_story.html?utm_term=.fe2f2cec2390.

42. John R. Bolton, “To Stop Iran’s Bomb, Bomb Iran,” *New York Times*, 26 March 2015, A23, <https://www.nytimes.com/2015/03/26/opinion/to-stop-irans-bomb-bomb-iran.html>.

43. National Intelligence Council, “Iran: Nuclear Capabilities and Intentions,” November 2007, www.isisnucleariran.org/assets/pdf/2007_Iran_NIE.pdf.

44. On China’s nuclear program, see Jeffrey Lewis, *Paper Tigers: China’s Nuclear Posture* (London: International Institute for Strategic Studies, Adelphi Book 446, December 2014). For an analysis of Chinese nuclear behavior in the early days of the Trump regime, see Melissa Hanham, “China’s Happy to Sit Out the Nuclear Arms Race,” *Foreign Policy* blog, 30 January 2017, <http://foreignpolicy.com/2017/01/30/chinas-happy-to-sit-out-the-nuclear-arms-race/>.

45. Estimates of 1990 arsenals: Robert Norris and Hans M. Kristensen, “Global Nuclear Inventories, 1945–2010,” *Bulletin of the Atomic Scientists* 66, no. 4 (July 2010): 77–83, <https://thebulletin.org/2010/julyaugust/global-nuclear-weapons-inventories-1945%E2%80%932010>.

Most up-to-date estimates are taken from the Arms Control Association, “Nuclear Weapons: Who Has What at a Glance,” January 2017, <https://www.armscontrol.org/factsheets/Nuclearweaponswhohaswhat>.

46. Hans M. Kristensen and Robert S. Norris, “Russian Nuclear Forces, 2016,” *Bulletin of the Atomic Scientists* 72, no. 3 (16 April 2016), 125–34, <https://thebulletin.org/2016/may/russian-nuclear-forces-20169394>.

47. On the taboo, see Nina Tannenwald, *The Nuclear Taboo: The United States and Non-Use of Nuclear Weapons since 1945* (New York: Cambridge University Press, 2007); on other reasons for non-use, see Thomas M. Nichols, *No Use: Nuclear Weapons and U.S. National Security* (Philadelphia: University of Pennsylvania Press, 2013).

48. Some (primarily American) observers might give primary credit for SNA nonproliferation to the various “inhibition strategies” employed by the United States of the kind discussed by Francis J. Gavin in “Strategies of Inhibition: U.S. Grand Strategy, the Nuclear Revolution, and Nonproliferation,” *International Security* 40, no. 1 (Summer 2015): 9–46, https://doi.org/10.1162/ISEC_a_00205. It is equally possible that US actions had little effect and this belief is a result of common motivated biases, especially the “illusion of control” (see Fettweis, *Psychology of a Superpower*). Fortunately for this discussion, the exact cause of decreased proliferation is not as important as the fact that it has occurred.

49. Remarks on *Meet the Press*, 16 March 2003, transcript available on the website of the George W. Bush archives, <https://georgewbush-whitehouse.archives.gov/vicepresident/news-speeches/speeches/vp20010916.html>.

50. Philosophers and grammarians might point out that it would have been technically impossible for Hussein to “reconstitute” weapons he had not previously constituted.

51. Flynt Leverett, “Why Libya Gave Up on the Bomb,” *New York Times*, 23 January 2004, <https://www.nytimes.com/2004/01/23/opinion/why-libya-gave-up-on-the-bomb.html>; and Martin S. Indyk, “The War in Iraq Did Not Force Gadaffi’s Hand,” *Financial Times*, 9 March 2004, <https://www.brookings.edu/opinions/the-iraq-war-did-not-force-gadaffis-hand/>.

52. William R. Tobey, “A Message from Tripoli: How Libya Came to Give Up its WMD,” *Bulletin of the Atomic Scientists*, 3 December 2014, <http://thebulletin.org/message-tripoli-how-libya-gave-its-wmd7834>, which is the first of a five-part series on the issue. All other installments are linked to the first page.

53. Jacques E. C. Hymans makes the case that strong state institutions are necessary conditions for nuclear development in *Achieving Nuclear Ambitions: Scientists, Politicians, and Proliferation* (New York: Cambridge University Press, 2012). Libya is discussed on 239–48, its crated centrifuges on 242. See also Målfrid Braut-Hegghammer, *Unclear Physics: Why Iraq and Libya Failed to Get the Bomb* (Ithaca, NY: Cornell University Press, 2016).

54. Bruce W. Jentleson and Christopher A. Whytock, “Who ‘Won’ Libya? The Force-Diplomacy Debate and Its Implications for Theory and Policy,” *International Security* 30, no. 3 (Winter 2005/06): 47–86, <http://dx.doi.org/10.1162/isec.2005.30.3.47>.

55. A January 2015 report in *Der Spiegel* made waves by suggesting that the Syrian program may have restarted (Erich Follath, “Evidence Points to Syrian Push for Nuclear Weapons,” *Der Spiegel* online, 9 January 2015, <http://www.spiegel.de/international/world/evidence-points-to-syria-still-working-on-a-nuclear-weapon-a-1012209.html>). Subsequent reports have strongly disagreed. The Nuclear Threat Initiative has concluded that “it is highly unlikely that Syria currently has an active nuclear weapons program.” “Syria,” <http://www.nti.org/learn/countries/syria/nuclear/>.

56. Leonard S. Specter and Avner Cohen, "Israel's Airstrike on Syria's Reactor: Implications for the Nonproliferation Regime," *Arms Control Today* 38, no. 6 (July/August 2008): 15–21, <https://www.jstor.org/stable/23628417>.

57. Advocates of coercive diplomacy might be tempted to give US actions credit for obviating the need for preventive war; such positions are difficult to prove, since explaining non-events is not usually possible. And it is also possible that impressions of inevitable prevention from the United States would have resulted in greater imperatives to proliferate. A good discussion of coercive diplomacy can be found in Alexander L. George, *Forceful Persuasion: Coercive Diplomacy as an Alternative to War* (Washington, DC: US Institute of Peace Press, 1991).

58. John Mueller reviews the black market for fissile material in *Atomic Obsession: Nuclear Alarmism from Hiroshima to Al-Qaeda* (New York: Oxford University Press, 2009), 169–72.

59. There is a robust literature on the relationship between deterrence and nuclear terrorism. Those interested should begin with Robert Litwak, *Deterring Nuclear Terrorism* (Washington, DC: Wilson Center, 2016).

60. Quoted by Jussi M. Hanhimaki, "The (Really) Good War? Cold War Nostalgia and American Foreign Policy," *Cold War History* 14, no. 4 (November 2014): 673–74, <https://doi.org/10.1080/14682745.2014.950245>.

61. Thom Shanker, "Gates Counters Putin's Words on U.S. Power," *New York Times*, 11 February 2007, <https://www.nytimes.com/2007/02/11/us/11cnd-gates.html>.

62. Rex W. Tillerson, "Remarks to U.S. Department of State Employees," 3 May 2017, <https://www.state.gov/secretary/20172018tillerson/remarks/2017/05/270620.htm>.

63. Gideon Rose, "Notes from the Chairman: A Conversation with Martin Dempsey," *Foreign Affairs* 95, no. 5 (September/October 2016): 2, <https://www.foreignaffairs.com/interviews/2016-08-01/notes-chairman>. His long track record of nostalgia is critically addressed throughout the essays in Christopher A. Preble and John Mueller, eds., *A Dangerous World? Threat Perception and U.S. National Security* (Washington, DC: Cato Institute, 2014).

64. The most comprehensive review is Steven Pinker, *The Better Angels of Our Nature: Why Violence Has Declined* (New York: Viking, 2011); but see also John Mueller, *Retreat from Doomsday: The Obsolescence of Major War* (New York: Basic Books, 1989) and *The Remnants of War* (Ithaca, NY: Cornell University Press, 2004); Robert Jervis, "Theories of War in an Era of Leading Power Peace," *American Political Science Review* 96, no. 1 (March 2002): 1–14, <https://www.jstor.org/stable/3117806>; Christopher J. Fettweis, *Dangerous Times? The International Politics of Great Power Peace* (Washington, DC: Georgetown University Press, 2010); Richard Ned Lebow, *Why Nations Fight: Past and Future Motives for War* (New York: Cambridge University Press, 2010); Joshua Goldstein, *Winning the War on War* (New York: Dutton, 2011); and John Horgan, *The End of War* (San Francisco: McSweeney's, 2012).

65. For each of the claims, respectively: Ivan Perkins, *Vanishing Coup: The Pattern of World History Since 1310* (New York: Rowman and Littlefield, 2013); Jonathan M. Powell and Clayton L. Thyne, "Global Instances of Coups from 1950 to 2010," *Journal of Peace Research* 48, no. 2 (March 2011): 249–59, <https://doi.org/10.1177/0022343310397436>; Lotta Harbom, Stina Höglbladh, and Peter Wallensteen, "Armed Conflict and Peace Agreements," *Journal of Peace Research* 43, no. 5 (September 2006): 617–31, <https://doi.org/10.1177/0022343306067613>; Mark W. Zacher, "The Territorial Integrity Norm: International Boundaries and the Use of Force," *International Organization* 55, no. 2 (Spring 2001): 215–50, <https://www.jstor.org/stable/3078631>; Tanisha M. Fazal, *State Death: The Politics and Geography of Conquest, Occupation, and Annexation* (Princeton, NJ: Princeton University Press, 2007); Bethany Lacina, Nils Petter Gleditsch, and Bruce Russett, "The Declining Risk of Death in Battle," *International Studies Quarterly* 50, no. 3 (September 2006): 673–80, <http://dx.doi.org/10.1111/j.1468>

-2478.2006.00419.x; Victor Asal and Amy Pate, "The Decline of Ethnic Political Discrimination 1990–2003," in *Peace and Conflict 2005: A Global Survey of Armed Conflicts, Self-Determination Movements, and Democracy*, ed. Ted Robert Gurr and Monty G. Marshall (College Park, MD: Center for International Development and Conflict Management, 2005), 28–38; and Andrew Mack, "Global Political Violence: Explaining the Post–Cold War Decline," *Coping with Crisis Working Paper Series*, International Peace Academy (March 2007), <https://www.ipinst.org/2007/03/global-political-violence-explaining-the-post-cold-war-decline>.

66. Nils Petter Gleditsch, "The Liberal Moment Fifteen Years On," *International Studies Quarterly* 52, no. 4 (December 2008): 694, <http://dx.doi.org/10.1111/j.1468-2478.2008.00522.x>; and Harbom, Höglbladh, and Wallensteen, "Armed Conflict and Peace Agreements."

67. For some skepticism, see Bear F. Braumoeller, *Only the Dead: International Order and the Persistence of Conflict in the Modern Age* (working title), forthcoming, Oxford University Press; Anita Gohdes and Megan Price, "First Things First: Assessing Data Quality before Model Quality," *Journal of Conflict Resolution* 57, no. 6 (December 2013): 1090–108, <https://doi.org/10.1177/0022002712459708>; and Tanisha M. Fazal, "Dead Wrong? Battle Deaths, Military Medicine, and Exaggerated Reports of War's Demise," *International Security* 39, no. 1 (Summer 2014): 95–125, https://doi.org/10.1162/ISEC_a_00166.

68. The "New Peace" is a phrase coined by Steven Pinker in *The Better Angels of Our Nature: Why Violence Has Declined* (New York: Viking, 2011). The "Long Peace" is also occasionally used, but that phrase can also refer to the period of great power peace that followed World War II. See John Lewis Gaddis, "The Long Peace: Elements of Stability in the Postwar International System," *International Security* 10, no. 4 (Spring 1986): 99–142, <http://dx.doi.org/10.2307/2538951>.

69. Paul Kennedy makes similar points in "The Good Old Days of the Cold War," *Los Angeles Times*, 18 February 2007, <http://www.latimes.com/news/la-op-kennedy18feb18-story.html>.

70. Televisions occasionally fall on people, and cows kill more Americans than ISIS does. See Andrew Shaver, "You're More Likely to be Fatally Crushed by Furniture than Killed by a Terrorist," *Washington Post*, 23 November 2015, https://www.washingtonpost.com/news/monkey-cage/wp/2015/11/23/youre-more-likely-to-be-fatally-crushed-by-furniture-than-killed-by-a-terrorist/?utm_term=.c98af92c126d; and Christopher Ingraham, "Chart: The Animals that Are Most Likely to Kill You this Summer," *Washington Post*, 16 June 2015, https://www.washingtonpost.com/news/wonk/wp/2015/06/16/chart-the-animals-that-are-most-likely-to-kill-you-this-summer/?utm_term=.0e86c8d22f32.

71. Not everyone agrees with (or realizes the basic truth of) this statement, including Gen Michael Flynn, the disgraced first National Security Advisor of President Trump. Over and over throughout a book he co-wrote with Michael Ledeen (*Field of Fight: How We Can Win the Global War against Radical Islam and Its Allies* [New York: St. Martin's Press, 2016]), Flynn warns that the United States is losing the war on terror. How exactly the United States could possibly "lose" in any real way is left, shall we say, underexplained.

72. Richard Pipes, "Why the Soviet Union Thinks It Could Fight and Win a Nuclear War," *Commentary* 64, no. 1 (July 1977): 34, <https://www.commentarymagazine.com/articles/why-the-soviet-union-thinks-it-could-fight-win-a-nuclear-war/>.

73. For Cold War hawks, "mirror imaging" referred to the fallacy of believing that opponents think like we do. For political psychologists, the term refers to the tendency to perceive others as the opposite of oneself, as one would see in mirror. For the former usage, see Raymond L. Garthoff, "On Estimating and Imputing Intentions," *International Security* 2, no. 3 (Winter 1978): 22–33, <https://muse.jhu.edu/article/446197/pdf>; for the latter, Ralph K. White, "Images in the Context of International Conflict: Soviet Perceptions of the U.S. and the U.S.S.R.," in

International Behavior: A Social-Psychological Analysis, ed. Herbert C. Kelman (New York: Holt, Rinehart and Winston, Inc., 1965), 236–76, esp. 255–58.

74. Quoted by Lawrence S. Wittner, *Resisting the Bomb: A History of the World Nuclear Disarmament Movement, 1954–1970* (Palo Alto, CA: Stanford University Press, 1997), 161–62.

75. Francis J. Gavin, “Same as it Ever Was: Nuclear Alarmism, Proliferation, and the Cold War,” *International Security* 34, no. 3 (Winter 2009–2010): 15, <http://dx.doi.org/10.1162/isec.2010.34.3.7>.

76. William Burr and Jeffrey T. Richelson, “Whether to ‘Strangle the Baby in the Cradle’: The United States and the Chinese Nuclear Program, 1960–64,” *International Security* 25, no. 3 (Winter 2000/01): 54–99, <https://doi.org/10.1162/016228800560525>.

77. Michael Mandelbaum, “The Bomb, Dread, and Eternity,” *International Security* 5, no. 2 (Autumn 1980): 3–23, <https://www.jstor.org/stable/i323252>.

78. Contemporary research on the effect of the Cold War nuclear standoff on the psychology of young people can be found in Lisa A. Goodman, John E. Mack, William R. Beardslee, and Roberta M. Snow, “The Threat of Nuclear War and the Nuclear Arms Race: Adolescent Experience and Perceptions,” *Political Psychology* 4, no. 3 (September 1983): 501–30, <http://dx.doi.org/10.2307/3790871>; and Eric Chivian, John P. Robinson, Jonathan R. H. Tudge, Nikolai P. Popov, and Vladimir G. Andreyevkov, “American and Soviet Teenagers’ Concerns about Nuclear War and the Future,” *New England Journal of Medicine* 319, no. 7 (18 August 1988): 407–41, <http://doi.org/b29j76>.

79. For one of the earliest major works, see Frederic C. Bartlett, *Remembering: A Study in Experimental and Social Psychology* (London: Cambridge University Press, 1932). See also Elizabeth Loftus, *Memory* (Reading, MA: Addison Wesley, 1980); and Daniel L. Schacter, *Searching for Memory: The Brain, the Mind, and the Past* (New York: Basic Books, 1996).

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Conventional Arms Transfers and US Economic Security

Eugene Gholz

Abstract

This article explains the economic and practical considerations in various approaches to implementing President Trump's recent direction on conventional arms transfers (CAT) that decisions should consider economic security. CAT will require decisions about what to include in an economic security analysis, how to conduct the analysis, and who should conduct the analysis. Specifically, the analysis could focus on jobs and general economic effects or manufacturing and innovation concerns about the specific defense systems involved in the potential arms transfer. It could be based on detailed data collection specific to the proposed arms transfer or on the application of an economic model that would yield a faster but less precise result. Additionally, the analysis could be conducted by any of five plausible candidate organizations within the US government. While all options involve trade-offs, using an economic model would likely offer greater insight into the macroeconomic effects of a potential arms transfer, notably its effect on US employment. However, a targeted effort to collect and analyze transaction-specific data would offer greater insight into the effects on US defense industrial capability and the potential ability of the sale to save money in the US defense acquisition budget.

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On 19 April 2018, President Trump issued a National Security Presidential Memorandum directing revisions to the US Conventional Arms

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Transfer (CAT) policy.¹ The president has been especially interested in the economic implications of arms transfers, and they are, indeed, worth a good deal of money. The United States closed deals for \$55.6 billion in government-mediated Foreign Military Sales in fiscal year 2018, a 33 percent increase from the prior year but less than the 2012 record of \$69.1 billion.² Unlike most US trade, arms sales require specific approval from the US government, through a deliberate process involving several executive branch agencies—most notably the Departments of State (DOS) and Defense (DOD). Ultimately sales are subject to congressional approval (or disapproval) for amounts above certain threshold values.

Regulation of arms transfers by an overarching presidential policy statement dates to the Carter administration. The president set out to limit arms exports with “a strong presumption of denial,” a policy goal that did not even survive the Carter administration.³ The idea of a CAT policy did survive. Through four subsequent iterations, CAT policy made arms sales decisions depend on US diplomatic relations with the purchasing country, the national security implications of transferring particular technologies, and the human rights performance of the purchasing country. The CAT policy did not (and does not) provide an explicit prioritization of these various concerns. So each approval or disapproval of a transfer is determined on a case-by-case basis.

President Trump’s memorandum changed many parts of the process, attempting to streamline CAT and focus more upon the implications of third-party countries’ potential arms exports to the same purchasing country. Trump tasked the Departments of State and Energy with issuing detailed implementation memos. Additionally, the DOD’s Defense Security Cooperation Agency, whose job it is to oversee Foreign Military Sales, is also working on adapting its rules and procedures.

Perhaps the most significant change in President Trump’s memorandum is that it added “economic security” as a criterion to the arms transfer decision-making process.⁴ Nearly twenty-five years ago, President Clinton added a vague statement that the arms transfer policy should “consider the impact on the US arms industry when deciding whether to approve an export.”⁵ Critics worried that Clinton’s policy would draw pork-barrel political considerations into US foreign relations and that the effort to sustain the US defense industry would work against prioritizing strategic and human rights concerns.⁶ The industrial goal subsequently faded until President Trump resurrected it in his

new version of the CAT policy. Economic security interests, as defined in the memorandum, include “bolster[ing] our economy; spur[ring] research and development; enhanc[ing] the ability of the defense industrial base to create jobs; [and] increas[ing] our competitiveness in key markets. . . .”⁷ Future decisions on arms transfers will “consider . . . [t]he transfer’s financial or economic effect on United States industry and its effect on the defense industrial base, including contributions to United States manufacturing and innovation.”⁸

To be effective, the new policy must go beyond ad-hoc references to economic security as an additional rationale for approving sales that leaders desire for other reasons. The government must decide on specific criteria for measuring the economic security impact, a process for assessing proposed arms transfers, and an organization that will lead the assessments and make other participants in the arms transfer decision-making process pay attention to the economic security assessments.⁹

Giving due weight to the economic security impact analysis will require that it be completed reasonably quickly and that results be included in the same package of reports that cover foreign relations, technical, and human rights aspects of an arms transfer case. A complete data-gathering and analysis effort on the economic security impact of a proposed transfer might take longer to prepare than the other initial inputs to the decision process, potentially slowing an already slow process. Nevertheless, there are reasonable steps that could be taken—such as building the economic security analysis on existing, collected data or using an economic model to estimate the proposed transfer’s economic effects—that would prevent the new analysis from becoming the rate-limiting step in CAT decision making. Furthermore, even an ideal, streamlined process to consider foreign relations, technical, and human rights aspects of the case will always take time, allowing the potential for the economic security impact analysis to collect data without presenting an undue overall delay.

The new emphasis on economic security will add some complexity to an already complex, judgment filled process, but there is every reason to expect that the combined decision-making process will continue to function reasonably well. Combined with President Trump’s streamlining reforms, the change may on balance make the United States, already the leading arms exporter in the world, even more competitive.

This article explains what the economic security assessment should look for in a proposed arms transfer, how the economic security as-

assessment should be conducted, and who should conduct the economic security assessment. The implementation details of economic security analysis of CATs are themselves important. Furthermore, discussing the issues in this context also offers an opportunity to consider how we might think about the relationship between defense acquisition and economic security. We can also consider the appropriate definition of economic security more broadly.

What to Look For in an Economic Security Assessment

The Presidential Memorandum regarding US CAT policy emphasizes two distinct economic security goals. The first goal is to expand the US economy. The second goal is a more fine-grained emphasis on improving *economic security*.¹⁰ General US economic performance has security implications because the economic size and wealth of the United States ultimately funds the defense budget that converts economic power to military power. However, any contribution of arms transfers to the general economic health of the United States is separate from its detailed security effects such as stimulating innovation in defense systems or preserving defense industrial capability to make specific weapon systems. In some ways, this difference is akin to the difference between macroeconomics and microeconomics. The Presidential Memorandum directs that both kinds of effects be considered in the arms transfer approval process.

At the macroeconomic level, arms transfers can be a new source of demand for American industry. The additional effort to produce goods and services for export can stimulate and expand the supply side of the US economy relative to a hypothetical world in which that export demand did not exist. If the US economy has slack inputs, notably unused labor—unemployed workers or potential workers who choose not to look for jobs—the export demand can provide a stimulus that uses those slack inputs, expands the employed population, and increases total US economic output. If, instead, the United States were already at full employment before the export demand, then the exports would require producers to outbid existing users of inputs in the US economy—meaning the exporters would offer higher wages—and the new export-oriented production would increase at the expense of other US economic activity. Presumably, that other economic activity would be lower value-added work, because the effort to bid away inputs from the other activity would succeed by offering greater compensation in the export-oriented sector.

The net effect of the exports would increase US gross domestic product (GDP) and create “higher-paying jobs” for American workers. Foreign consumers would pay the higher costs of the export-oriented production, although with arms sales the US government sometimes subsidizes the transaction with military aid, reducing or even eliminating the net economic benefit to the US economy.¹¹

We have recently seen examples in the US defense industry of the multiple possible economic effects of approved arms sales. Foreign demand for Patriot sales (both for missiles and the entire weapon system) has been brisk lately, and that has led to commitments to expand production capacity and employ new workers at both Lockheed Martin and Raytheon.¹² Both Patriot producers have also placed additional orders with their suppliers—some of whom have presumably also expanded production capacity. Many of the particular supplier companies involved are less publicly visible, as are their commitments to expanded employment.¹³ These arms sales have created “new jobs,” meeting President Trump’s commitment to “jobs, jobs, jobs.”¹⁴ However, the United States is already near economists’ estimates of “full employment,” including specifically in the regions around the Grand Prairie, Texas, operations of Lockheed Missile and Fire Control Systems and the Andover, Massachusetts, operations of Raytheon’s Integrated Defense Systems.¹⁵ Assessing the economic impact of Patriot export sales requires detailed information about the job market in the areas where the missiles are made, the skill profile of the additional workers required to build the Patriot missiles, and the production of other products that might not happen as workers are drawn into the defense sector.

Other recent high-profile arms sales cases have only “created” jobs in a relative sense by maintaining production in a facility that would otherwise have closed and enabling the workers there to remain employed. For example, Boeing’s sales of F-15s to Qatar and F-18s to Kuwait have extended the aircraft production backlog at Boeing’s St. Louis facility, keeping alive a production line that faced imminent closure.¹⁶ An economist would count those sales as “job creating” compared to a future world in which the arms sales had not happened, even though Boeing did not need to hire a new workforce the way Lockheed and Raytheon did for Patriot’s expanding foreign sales. To assess this sort of job-creating effect of arms sales requires detailed knowledge of the backlog and operations of the defense contractor producing the exported weapon.

Overall, the economic benefit of expanding exports in a particular sector is greatest when that sector has slack inputs before the export transaction and when the costs of training workers and the time required to attract sufficient skilled workers to the export-oriented production facility are relatively low. Economists have argued that shifting workers into the defense industry as a mechanism for general economic stimulus is inefficient compared to other mechanisms of government-supported economic stimulus (ranging from infrastructure spending to tax cuts to funding for education). That is, the government needs to spend more money per job created or per dollar of expanded US output. However, if a foreign government is paying that cost, the net effect on the US economy would be positive, or we could think of the expanded employment as highly “efficient” per dollar of US government spending.¹⁷

Conventional arms transfers can have separate, microeconomic effects of interest to a discussion of economic security, including effects on innovation and manufacturing highlighted in the Presidential Memorandum. The defense industry is not like a normal commercial industry, where corporations use retained earnings from their past sales—or borrowing from investors, who expect to be repaid from future sales revenue—to invest in research and development.¹⁸ Innovation in the defense industry is mostly supported by direct government research and development (R&D) contracts. That is, the DOD customer directs the trajectory of innovation and pays for specific R&D effort. Another fraction of total defense R&D comes from companies’ Independent Research and Development (IR&D) expenditures, reimbursed by the government as part of the overhead cost of other government-funded defense projects. IR&D spending is company directed, but it is also paid for by the DOD customer, not drawn from the company’s retained earnings. As a result, general increases in defense firms’ profitability—which might stem from arms sales approved under the CAT policy—do not generally have much effect on defense innovation at the systems level. However, many suppliers in the defense supply chain operate on commercial terms, and for them, the general added revenues from expanded defense sales contribute to the retained earnings that support their R&D investment.¹⁹ Thus, at the supplier level, arms sales can contribute to US innovation. However, generally, the suppliers are less visible, as are the innovations they might choose to invest in with the marginal dollar of income. Due to that lack of visibility, it would be difficult for an economic assessment, as

part of the CAT approval process, to give much weight to the potential innovation-related investments by commercial firms at lower tiers of the defense supply chain.

Arms exports still sometimes contribute directly to innovation in a way that should be considered in arms transfer decisions. Specifically, foreign buyers sometimes purchase upgraded equipment compared to what the US DOD has purchased in the past, and foreign buyers then pay the R&D cost of producing those upgrades. In some instances, as with Lockheed Martin's F-16, the US has not purchased any of the upgraded product—meaning that the particular innovations created for export sales to the United Arab Emirates and others have not contributed directly to US national security. In those cases, perhaps CAT decision makers should have considered the option value that creating those upgraded F-16s offered to the US Air Force. On other occasions, the US has directly benefited from export-supported technology upgrades—as on Patriot, Aegis, and other missile defense systems—where DOD has continued to purchase post-upgrade weapons from US contractors after export sales funded technology investments. Considering this pathway to innovation in an assessment of the economic effects of a potential arms sale requires detailed knowledge of the likely trajectory of future US defense procurement spending. In general, the more recently the exported system has joined the US weapons inventory, the more likely that this pathway could contribute some economic security (innovation) benefit to the United States through approval of an arms transfer. This is because it would be more likely that the US military would still be building its inventory of the newly upgraded system.

CATs have a clearer, direct effect on economic security via their effect on US defense manufacturing. Because weapon systems tend to stay in the US military inventory for so long, they often require spare parts for maintenance years after the initial production run is complete. DOD needs to pay the overhead cost of maintaining the production capacity for those spare parts, even when the production rate for spares is much slower than the initial production rate during original manufacture of the defense system. That slower rate tends to drive the unit cost of spare parts dramatically upward. In some cases, demand for spare parts drops below the minimum technical sustaining rate, meaning that the workers lose the ability to maintain quality standards even when the buyer is willing to pay very high unit costs. In other cases, the government

does not realize how much the cost of production has risen over time and does not invest enough to keep the supplier interested or able to produce the part profitably, so production drops below the minimum economic sustaining rate. These situations create potentially very costly Diminishing Manufacturing Sources or Material Shortage (DMSMS) problems.²⁰ Arms exports and the expanded demand for future spare parts business that they create can help reduce the unit cost of spares production by keeping up production rates, maintaining workers' skills, and ameliorating the risk of DMSMS by bolstering revenue for critical and fragile niches in the supply chain. These effects have been observed in recent years in export sales of M-1 Abrams tanks and M-2 Bradley infantry fighting vehicles, among others. Assessing these manufacturing effects of arms sales requires detailed knowledge of the defense supply chain, including the technical characteristics of the components that suppliers make, the financial status of each of those suppliers, and the business strategy of the executives at each supplier—knowledge that is not often available to the government or defense industry prime contractors.

Finally, CATs can contribute economic benefits to the United States through the economies of scale that are often available in defense systems production. If foreign sales are figured into the cost estimates from the start of a project, and foreign buyers contribute to development and capital investment spending, the cost of a project to the US defense budget will be proportionately reduced, benefiting US economic security. For example, the F-35 program claims to have benefited from this dynamic, although the higher overhead cost of managing a multinational development program and the redundancies of building extra final assembly and sustainment facilities overseas cut against the economies of scale benefits.²¹ In some European multinational aircraft development programs, governments have presumed that programs would gain very large benefits from economies of scale that have not materialized. This is due to technical and management challenges in the programs or the countries' failure to follow through on their initial purchase commitments. The result in those cases was that including projected economy of scale benefits of foreign sales in a program's management baseline added to rather than reduced program instability and hurt economic security.²² Estimating the net economic effect of expected economies of scale as part of a CAT decision would require sophisticated, reliable understanding of program

dynamics that might be beyond what the US government should reasonably count on in its decision making.

Overall, the new economic assessment in the CAT policy could meaningfully consider two separate types of economic benefits that might derive from arms sales: first, macroeconomic effects, especially via effects on employment, and second, microeconomic effects on specific firms and products, such as funding for component upgrades and prevention of DMSMS challenges. The methods for assessing these two types of effects would likely differ, and each would present its own challenges to the data collection and analysis process.

Conducting the Economic Security Assessment

The two main methods for assessing economic and economic security impacts are: 1) collecting actual data on companies' planned reactions to a potential arms transfer, and 2) using an economic model to estimate the plausible effects of the potential arms transfer. Neither method can be expected to produce an exact answer, and both methods involve trade-offs. On the one hand, the first method (using real data) might perform somewhat better at assessing the microeconomic or economic security effects of the potential arms transfer. Only fine-grained data collection can find the critical niches in the defense supply chain that are on the brink of failure but that could be sustained by an arms export deal. An economic model cannot yield answers about specific companies, their labor forces, and their investment plans. On the other hand, the second method (using a model) might do better with the macroeconomic or generalized employment effects of the potential arms transfer. This is because a macroeconomic model can take into account general equilibrium effects (e.g., whether the economy is already at full employment) in a way that data collection from specific companies cannot (because the specific companies do not know what other companies they would potentially be poaching workers from, in their arms export-led growth scenario). Using a model would also be a more practical solution for real-world decision making. The model could rapidly yield an estimate about the effects of a particular CAT case without extensive fresh data collection. However, it would certainly sacrifice accuracy and ignore or neglect the most important economic security impacts of a potential arms transfer that President Trump highlighted in the Presidential Memorandum.

Collecting actual data about the effects of a potential arms transfer would be both slow and difficult. In the modern defense industry, the prime contractors still often employ the largest group of workers on a project at the site of final assembly, but many more workers are employed across hundreds of supplier companies. Moreover, the prime contractor often does not make many of the critical components that give the defense system its edge. As a result, collecting data just about the prime contractor would be insufficient to inform the economic security aspects of the CAT decision-making process.²³

Unfortunately, the government does not generally know the list of even the most critical companies in the supply chain for defense systems because prime contractors consider that information to be proprietary. The result is that the government would probably not know whom to contact regarding the economic security effects of a potential arms transfer. Furthermore, the process of developing the list of companies to contact, soliciting responses, and analyzing the data generally would take months—even if there were a substantial staff working on the project.²⁴ Adding a government data collection process to CAT decision making would slow down the process further and would be inconsistent with one of the other primary goals of the new Presidential Memorandum, streamlining CAT reviews.

The US could, as part of its renewed commitment to protecting American industry, invest substantial effort in better understanding the defense industrial base in a way that is not tied to a particular decision about a potential arms export deal. A routine data collection policy could be applied throughout the contracting process. For example, the US could require prime contractors to provide supply chain lists as part of normal language on all Major Defense Acquisition Program contracts and flow that requirement down to lower-tier suppliers.²⁵ A process along these lines is already used in the nuclear Navy.²⁶ Alternatively, the government could collect data on the supply chain separately from the contracting process through independent surveys, as it attempted to do briefly in the early part of this decade through the sector-by-sector, tier-by-tier (S2T2) project.²⁷ Such general knowledge about the defense supply chain could be applied as part of the CAT decision-making process. However, even the Trump administration shied away from such a massive data collection effort as part of its implementation of the July 2017

*Presidential Executive Order on Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States.*²⁸

The defense industry has also generally resisted such government data collection efforts. As an alternative, the prime contractors could take the lead in actual data collection by voluntarily providing information on critical niches, DMSMS problems that could be addressed through arms sales, and prospective hiring by themselves and their subcontractors to meet production requirements for the arms sale, etc. However, in many cases, the prime contractors also do not know who their critical suppliers are because the first-tier subcontractors consider their lists of suppliers to be proprietary. Furthermore, there is an obvious incentive for prime contractors and their suppliers to exaggerate the potential benefits of the arms sale in their data collection efforts—not by committing fraud, but rather by taking an optimistic view every time they consider a range of possible outcomes. Optimistic assessments would likely compound through the supply chain—as each level of respondent reported an assessment at the high-end of the range reported at the lower level. That kind of bias was one of the fundamental problems faced by the economic planning ministry in the Soviet Union.²⁹

If the economic analysis of the potential arms transfer were to focus only on employment effects, many of the small suppliers—even those that make critical components—could be ignored in the assessment. Large suppliers that employ the bulk of the workers on a project tend to be more visible to the prime contractor and the government.³⁰ It is plausible that the government could survey the relevant major suppliers to get a rough estimate of the overall employment and investment status of the system being considered for sale. The government could also draw an arbitrary line at the third- or fourth-tier of the defense supply chain, limiting the scope of any data collection effort. It could further focus on only the largest facilities within its tier limit, because they would be most likely to react to a particular arms sale with substantial hiring or new capital or R&D investment. That would make the survey effort more practical and would still capture most of the relevant effects. However, it would certainly be imperfect and would also require considerable time for data collection and analysis, even without a commitment to chase down information about small suppliers that would not significantly affect the overall number of jobs involved in the project.

If the government decided to focus on employment and macroeconomic effects rather than looking for fine-grained economic security information about R&D and diminished sources or shortage issues, it likely could achieve most of what it wants in the CAT decision-making process through the use of an economic model. This effort would still require data collection that is not part of the current government routine—for purposes of calibrating the model and keeping it updated—but it would be a much smaller and less time-sensitive data collection effort than the alternative of trying to collect actual data on each specific arms transfer case.

The challenge for economic models is that few are specifically attuned to the defense industry. Most macroeconomic models have been developed for other analytical purposes, and they include assumptions about competitive and investment dynamics that do not mirror the reality of the defense industry. However, a model that is useful for assessing the economic effects of arms sales must build on a model of the entire economy, not just because the defense industry competes with other sectors for skilled labor but also because the dedicated defense industry's supply chain includes companies that identify almost every North American Industry Classification System code as their primary area of effort.³¹ Perturbations induced by CAT will propagate into the rest of the economy, and the effects on every sector of the US economy can be estimated by using economic input-output tables. The modeling requirement is for a general model of the US economy that has been fine-tuned to focus on the defense sector by experience, calibration efforts, and modified assumptions. Unfortunately, the economic models themselves are often proprietary. This means that their usefulness is linked not just to the general tendencies of economic modeling but also to the specific issue of who owns the particular economic model and which organization performs the analysis. However, several reasonable options do exist for models that could contribute to the CAT decision-making process.

Organizing the Economic Security Assessment

There are five principal options for the organization that might lead the economic security analysis as part of the CAT decision-making process: the DOS's Office of Regional Security and Arms Transfers, the Department of Commerce's (DOC) Bureau of Industry and Security (BIS), the DOD's program office for the system under consideration, DOD's Office of Cost Assessment and Program Evaluation (CAPE), and a

Federally Funded Research and Development Center (FFRDC). None of the organizations mentioned is a perfect fit. However, some organizations fit better than others.

The State Department will always play an important role in arms transfer decisions because arms sales are an important tool for US diplomacy. The DOS will lead most discussions of the effect of an arms transfer on US foreign policy and human rights protections in foreign countries—the traditional considerations in arms transfer decision making. However, the State Department does not have background expertise in economic analysis, especially of the defense industry, even though US diplomacy plays an important role in export promotion. Economic statecraft is a recognized tool of the DOS, and many Foreign Service Officers choose “economic officer” for their career track. Although the Foreign Service may have largely overcome its historical legacy of dominance by political officers, yielding a more balanced Foreign Service, the DOS does not specialize in the economy.³² Moreover, Congress has persistently questioned the State Department’s commitment to the US economy. For example, Congress created and empowered the Office of the US Trade Representative to lead trade negotiations when previously trade negotiations were led by the State Department. Even if State were to develop the required expertise in defense economics, it would lack institutional commitment and organizational power to advocate on behalf of the results of the economic security analysis at the pinnacle of CAT decision making.

By contrast, the DOC is widely judged to have an organizational culture that is committed to the promotion of US industry. The DOC is not institutionally powerful in the US interagency decision-making process—a stark contrast to the position of many other countries’ ministries of industry or economy—but it is likely to use what power it has to advocate on behalf of economic security interests.³³ Furthermore, the DOC holds the authority to conduct mandatory surveys of industry under the Defense Production Act (DPA).³⁴ If the implementation of the economic security mandate under the CAT policy chooses to go the route of collecting actual data to pursue fine-grained microeconomic analysis, the DOC is likely to play a leading role. The Office of Technology Evaluation (OTE) within the Commerce Department has repeatedly used its DPA authority to conduct industrial base assessments of specific sectors of the US economy, notably including defense industrial base assessments.

OTE knows the particulars of industrial base impact well and is in a position, if augmented by additional data collection and analytical staff, to conduct the microeconomic DMSMS and innovation-oriented analysis to support decision making about arms sales.³⁵

Even more relevant, the Commerce Department's BIS already collects economic effects data related to arms transfers for its annual report on *Offsets in Defense Trade*, and BIS has built up defense-specific economic expertise as a result. The offsets report makes simplifying assumptions that would not be appropriate for a fine-grained assessment of the economic security impact of arms sales. Examples include assuming that all work that contributes to arms exports takes place within the United States (despite global participation in the defense supply chain) and assuming that all offset work takes place in foreign countries but would have taken place within the United States without the offset agreement.³⁶ These assumptions mean that the BIS offset report almost certainly gives a substantially inaccurate picture of the net employment effects of offset agreements, but perhaps BIS gets the order of magnitude right, which is a start. Additionally, BIS uses an established methodology for analysis of offsets that is based on the *Benchmark Input-Output Table* that the DOC maintains as a model of the US economy.³⁷ That input-output table is used as the basis for many non-DOC economic models and appears the best source for economic analysis based on that modeling methodology. Moreover, the DOC also conducts the *Census of Manufactures* of the United States, a comprehensive survey that takes place every five years, supplemented by a smaller *Annual Survey of Manufactures*. Those two sources provide vital contextual data for assessing the economic security impact of potential arms transfers.³⁸

Just because the Commerce Department collects routine economic data and creates a benchmark economic model does not mean that it is best equipped analytically to apply that model to specific circumstances, notably including potential arms transfer decisions. Even a government decision to apply the survey methodology as its mechanism to implement economic security analysis does not mean that the DOC should necessarily take the lead on economic security analysis for conventional arms transfer decisions. The DOC often conducts surveys on behalf of other government agencies, which can then analyze the resulting data themselves. However, the survey data collection mechanism might work

more smoothly and quickly if the DOC had the lead for economic security analysis of proposed arms sales.

The third candidate for leading the economic security analysis of potential arms sales is the relevant DOD program office. Because the program office is in routine touch with the companies involved in the program and is directed as part of the *Defense Acquisition Guidebook* to monitor the manufacturability of the components and the overall system the DOD is acquiring, the program office has the best sense of critical and fragile niches in the supply chain that could be aided through an arms sale.³⁹ The program office, in cooperation with the Defense Contract Management Agency, also has actual (reported) cost data for the weapon system and has a sense of how production rates and economies of scale might affect production costs. Yet program office knowledge of the industrial side of its program is quite imperfect. After all, the program office often has an adversarial bargaining relationship with the companies that produce the defense system (over price, performance, and schedule), and it only receives data from the companies on topics that are covered by contractual language. Furthermore, the main source of the program office's data is the companies that build the system. These companies have a vested interest that leads them to be more willing to provide some kinds of data than others. Thus, program office data is likely to be biased in a way that might exaggerate the economic security impact of an arms transfer that the company wants to see approved. The program office itself may also have a reason for bias in considering the range of possible outcomes of an arms sale. Program managers are prone to optimism about their program's success to such an extent that DOD has established rules about managing programs to Independent Cost Estimates (ICE) performed outside the program office (either by or under the supervision of DOD CAPE) rather than to the Program Office Estimate. Program office staff may also lack the advanced analytical skills that would enable them to conduct credible economic analysis. Furthermore, there are many program offices, and most program office employees necessarily will not have a background in economics. As a result, program office analysis of the economic security impacts of potential arms sales may be considered suspect and could be downplayed in CAT decision making.

The fourth option for the economic security assessment would be to use the DOD Office of Cost Assessment and Program Evaluation.

It provides the Independent Cost Estimates for program management and has a set of well-established (yet imperfect) models for projecting programs' costs and economic impact. The Secretary of Defense has also designated CAPE as the lead advisor on defense economics. As a result, CAPE maintains several analytical models of the US economy that are fine-tuned to the needs of defense analysis. Specifically, CAPE has worked for many years with Interindustry Forecasting at the University of Maryland (INFORUM) to create an economic model called Defense Employment and Purchases Projection System (DEPPS).⁴⁰ If the economic security assessment process chooses to focus on aggregate employment impacts of arms sales, it would be natural to work on an evolution of DEPPS to estimate those impacts.

As it stands today, DEPPS incorporates a fine-grained model of the impact of defense expenditure regionally within the United States and on various categories of skilled labor. Even though the model makes imperfect assumptions about the location of actual outlays, at least DEPPS incorporates a rigorous input-output table, using a proprietary modified version of the DOC's benchmark table to make connections throughout the economy.⁴¹ DEPPS is designed to assess the employment impact of the entire defense budget proposal. However, one could also imagine CAPE working with the INFORUM experts to create a more fine-tuned version that could assess the impact of a particular arms sale. INFORUM engages in similar project-level work for other clients.⁴² The output of such a model would provide a general sense of the impact upon skilled labor in the US; however, it would not yield information about specific DMSMS challenges or innovation opportunities that program office-level analysis or detailed data collection could offer the CAT decision-making process. Using CAPE would exchange practicality and ease of estimation for the detail and accuracy that could be offered by another organization—assuming that potential bias could be overcome in the analysis by that other agency.

However, being part of DOD might hold back CAPE's usefulness for economic security analysis. While DOD has a strong interest in addressing DMSMS issues and in finding ways to share the fixed cost of its acquisitions with foreign partners, the organizational culture of DOD has long resisted paying serious attention to economic security issues. DOD believes that acquisition and arms transfer decisions are made exclusively through considerations of the national (military) interest.⁴³

Manufacturing and industrial base analysis are included in DOD's milestone decision-making framework for program management, but they are often perfunctory analyses. For example, Manufacturing Readiness Levels have not been incorporated as part of DOD programs' milestone reviews, nor has the DOD Industrial Policy office participated directly in milestone reviews in recent years.⁴⁴ Moreover, if DOD paid serious attention to DMSMS and critical and fragile niches in the industrial base, presumably DOD would face fewer surprises and desperate last-minute rescue efforts as critical suppliers go out of business because they are not paid enough to cover their fixed costs. Due to DOD's inattention regarding economic and industry issues, it is not likely that a DOD organization such as CAPE, even if it took the lead on the CAT economic security analysis, would present a strong case for ultimate decision makers to emphasize economic security in their reasoning. DOD would likely favor traditional national security concerns such as alliance relationships in CAT decision making.

Finally, FFRDCs might be tasked with conducting economic security reviews of potential arms sales. DOD calls on FFRDCs, notably including the RAND Corporation, the Institute for Defense Analyses (IDA), and the Center for Naval Analyses (CNA), to provide independent, high-quality industrial analysis for decisions.⁴⁵ FFRDCs employ high-end economists who have the requisite skills for the kind of economic security analysis suggested by the Presidential Memorandum on CAT policy. FFRDCs are also designed to maintain their analytical independence, and they generally have the historical track record to support their claims of maintaining independence.⁴⁶ Their analysts could also shift from program to program, as potential arms sales arise, which would make their employment at an FFRDC more efficient than trying to scatter economic analytical skills throughout DOD program offices.

FFRDCs have many other important commitments: they do not have slack resources, as each faces a congressionally imposed cap on the amount of work it can do for the federal government under its FFRDC contract each year.⁴⁷ Contracting with FFRDCs to conduct an economic security impact analysis of potential arms sales would likely come at the expense of established analytical efforts. Moreover, their analyses are relatively expensive, because the government must pay for very high-end skilled labor (Ph.D. economists, physical scientists, and political scientists) with security clearances. FFRDCs cannot compel sources to

reveal proprietary data. They mostly analyze data collected by the government or request data through voluntary surveys or interviews with companies and acquisition officials. That process may be slow, unreliable, and potentially biased—as discussed above concerning program offices requesting data from interested parties. Finally, FFRDCs also need a client for their analysis. In the end, FFRDCs might best fit into economic security analysis for CAT decision making by providing analytical support to CAPE (in the case of IDA, RAND, or CNA) or the DOC (which would require a new FFRDC arrangement, since the DOC does not currently have an FFRDC contract).

Conclusion

Even if it did not face time and resource constraints, the US government would not likely receive access to the data and analytics required for an ideal CAT decision-making process. Any practical process will be imperfect, but there are two reasonable approaches available that would better inform decision makers than the previous system, which did not significantly consider economic security impacts of potential arms transfers. A fine-grained analysis that would directly examine economic security effects—identifying critical and fragile niches that would benefit from arms transfers and opportunities to ameliorate DMSMS problems or to fund upgrades and innovations—would be slower than a model-based alternative that could emphasize general employment effects of arms transfers. Each of these approaches would reflect a different emphasis in the definition of economic security. Is economic security about particular technologies and industrial capabilities? Or is it about latent economic power in general, represented by overall industrial activity measured by employment levels and GDP?

On balance, a fine-grained analysis seems best undertaken either by the DOC's Bureau of Industry and Security or by DOD program offices. The independent expertise of FFRDCs would ideally support each organization. Alternatively, a model-based analysis that would emphasize general-equilibrium effects on overall employment in the United States would suit the analytical experience and capabilities of DOD's Office of Cost Assessment and Program Evaluation, again perhaps supported by one or more FFRDCs.

If resources and time were made available, the fine-grained solution would be more desirable than the model-based solution, especially if the

goal is to take economic security concerns seriously in the CAT process. Of course, the United States could ultimately decide to both collect specific data and use an economic model, if it were willing to make a major resource commitment to economic security analysis. This would provide insight into both macroeconomic considerations like the potential creation of high-quality jobs and also microeconomic considerations like ameliorating DMSMS problems. The Trump administration is already hiring additional staff to support the federal government's efforts on conventional arms transfers, but the additional resources may primarily seek to speed processing rather than to expand the analytical effort to engage economic security substantively.⁴⁸ It would be asking a great deal to hope that the new process might incorporate the full range of micro- and macroeconomic analysis.

There is not a perfect answer for how the economic security impact assessment should be conducted or who should conduct it. Ultimately, deciding whether to approve or reject a proposed arms transfer will require top decision makers to compare economic security effects to traditional concerns like national security and human rights effects.⁴⁹ There can be no formula for deciding how many dollars of economic impact would outweigh a likely human rights abuse or a tendency for an arms transfer to undermine rather than increase regional stability. However, the political judgment behind the final decision must weigh the full spectrum of factors and should be informed about all aspects of a potential arms transfer's effects, including its economic security effects, to the extent practical.

It is difficult to say whether arms sales have the potential to increase US economic security significantly. Critics are already questioning whether arms sales generate many good quality jobs, while advocates are confident arms sales can make a very substantial contribution.⁵⁰ Realistically, we do not yet have the data and evaluation process in place to judge effects. President Trump's memorandum offers the opportunity to create a process to resolve the question during future conventional arms transfer deliberations—and to allow future political leaders to weigh those economic benefits against other considerations in making arms transfer decisions. **SSQ**

Notes

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4. White House, Presidential Memorandum.

5. Lora Lumpe, “Clinton’s Conventional Arms Export Policy: So Little Change,” *Arms Control Today* 25, no. 4 (May 1995): 9–15.

6. Lumpe, “Clinton’s Conventional Arms Export Policy.”

7. White House, Presidential Memorandum.

8. White House.

9. Even if the White House leadership actually intends to make decisions in an ad hoc manner or, more cynically, intends simply to use the rhetoric of economic security as a public justification for decisions that it makes on other grounds, it is quite likely that the executive branch departments involved—primarily State, Defense, and Commerce—will develop some sort of analytical process to support the economic security component of the CAT policy. Bureaucracies have good reasons to focus on standardized rules and processes, whether those reasons are rational-legal reasons designed to yield an optimal decision or are political reasons designed to protect bureaucrats from allegations of shirking and malfeasance. James Q. Wilson, *Bureaucracy: What Government Agencies Do and Why They Do It* (New York: Basic Books, 1989), 315–45; and Stephen P. Rosen, “Systems Analysis and the Quest for Rational Defense,” *Public Interest* 76 (Summer 1984): 3–17.

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12. Jen Judson, “Lockheed to Double Patriot Missile Production as Orders Explode,” *Defense News*, 11 July 2018, <https://www.defensenews.com/land/2018/07/11/lockheed-to-double-patriot-missile-production-as-orders-explode/>.

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18. William P. Rogerson, “Economic Incentives and the Defense Procurement Process,” *Journal of Economic Perspectives* 8, no. 4 (Autumn 1994): 65–90.

19. Eugene Gholz, Andrew James, and Thomas Speller, “The Second Face of Systems Integration: An Empirical Analysis of Supply Chains to Complex Product Systems,” *Research Policy*, 47, no. 8 (October 2018): 1478–94, <https://doi.org/10.1016/j.respol.2018.05.001>.

20. DOD defines DMSMS as “the loss or impending loss of the last known manufacturer or supplier of raw material, production parts, or spare parts.” See Defense Logistic Agency’s “Diminishing Manufacturing Sources and Material Shortages (DMSMS),” Department of Defense, <http://www.dsp.dla.mil/Programs/DMSMS/>; see also DOD’s, *Diminishing Manufacturing Support and Material Shortage Guidebook* (Washington, DC: Department of Defense, 2016), [https://www.dau.mil/guidebooks/Shared%20Documents%20HTML/DMSMS%20Guidebook%20\(SD-22\).aspx](https://www.dau.mil/guidebooks/Shared%20Documents%20HTML/DMSMS%20Guidebook%20(SD-22).aspx). Program offices establish plans to try to proactively prevent DMSMS problems from disrupting systems development, production, and sustainment, but those plans do not always work, and program offices often scramble to maintain schedule and performance in the face of DMSMS problems, often at significant cost.

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23. Gholz et al., *Second Face of Systems Integration*.

24. As demonstrated by the government’s aborted 2010–2013 sector-by-sector, tier-by-tier (S2T2) assessment of the industrial base and its other, smaller, more targeted industrial base surveys. For criticism of the expense and time required to use surveys, see Nancy Y. Moore, Clifford A. Grammich, and Judith D. Mele, *Findings from Existing Data on the Department of Defense Industrial Base* (Santa Monica, CA: RAND Corporation, 2014), 1–2, https://www.rand.org/content/dam/rand/pubs/research_reports/RR600/RR614/RAND_RR614.pdf.

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31. Gholz et al., *The Second Face of Systems Integration*, 1486, 1488–91.

32. Stephen D. Cohen, *The Making of United States International Economic Policy: Principles, Problems, and Proposals for Reform*, 5th ed. (Westport, CT: Praeger, 2000), 52–55.

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34. Department of Commerce, Bureau of Industry and Security, 15 CFR Part 702 [Docket No. 140501396-5463-02], US Industrial Base Surveys Pursuant to the Defense Production Act of 1950, Final Rule, *Federal Register* 80, no. 135 (10 July 2015): 41426–32.

35. For access to past reports and explanation of the survey authority, see US Department of Commerce, Bureau of Industry and Security's "Industrial Base Assessments." <https://www.bis.doc.gov/index.php/other-areas/office-of-technology-evaluation-ote/industrial-base-assessments>.

36. US Department of Commerce, Bureau of Industry and Security, *Offsets in Defense Trade: 21st Study*, (Washington, DC: US Department of Commerce, December, 2016), <https://www.bis.doc.gov/index.php/documents/pdfs/1620-twenty-first-report-to-congress-12-16/file>.

37. The DOC's Bureau of Economic Analysis (BEA) maintain data that "offer a comprehensive picture of the inner workings of the US economy, showing production relationships among industries and commodities." The idea is that the tables show the effects of a change in output in a particular industry on other industries in the U.S. economy. As the BEA goes on to state, "Businesses can use input-output data to develop economic projections and forecasting models. Economists can use the data to examine the role of information technology on structural change, productivity, and the sources of economic growth. Researchers can use the data to analyze the economic effects of specific events. Input-output data are updated each year and provide information on 65 industry categories. Detailed benchmark input-output statistics, produced roughly every five years, are further subdivided into 425 industries." See Bureau of Economic Analysis, "Input-Output Accounts." <https://www.bea.gov/data/industries/input-output-accounts-data>.

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41. OSD, CAPE, *Projected Defense Purchases*.” Appendix A. As an example of the imperfections in the DEPPS model, consider that it “hold[s] the spending distribution by state constant across all years for each industry and major category, based on the most recent three years’ average of prime contract award data,” as if prime contract award location matches the actual production location for the prime contractor (quote from p. 160).

42. “Inforum.” <http://inforumweb.umd.edu>.

43. Sapolsky et al., *U.S. Defense Politics*, 171–72.

44. Manufacturing Readiness Levels (MRLs) are a standardized scale for assessing manufacturing risk as an aid to program management. The Department of Defense has debated using MRLs as part of its acquisition process for more than a decade, but they are not currently required by policy. The DOD’s Manufacturing Technology Program maintains and regularly updates a “Body of Knowledge” on MRLs as “best practice,” but its uptake across the DOD is uncertain at best. See OSD Manufacturing Technology Program and Joint Service/Industry MRL Working Group, *Manufacturing Readiness Level (MRL) Deskbook*, (Washington, DC: Office of the Secretary of Defense, 2017) http://www.dodmrl.com/MRL_Deskbook_2017.pdf; for some of the historical debate about MRLs, see US Government Accountability Office, *DOD Can Achieve Better Outcomes by Standardizing the Way Manufacturing Risks Are Managed*, GAO-10-439 (Washington, DC: United States Government Accountability Office, April 2010), <https://www.gao.gov/assets/310/303512.pdf>.

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The Changing Dynamics of Twenty-First-Century Space Power

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Abstract

Many recent assessments of space power have posited a US decline and predicted a gloomy future in comparison to China and Russia. However, such analyses—based almost exclusively on state-run activities—present only part of the picture. In the twenty-first century, a new form of bottom-up, net-centric, commercially led space innovation is emerging that promises cheaper and more timely technological developments to those nations that can effectively tap into them, thus reshaping traditional definitions of space power. This study first sets a baseline by focusing on Cold War space power determinants, next analyzes recent changes among the three leading spacefaring nations, and then looks into the future, factoring in the expanded role of commercial space startups and military space alliances. The article concludes that new forms of networked space power could put the United States in a more favorable position than countries relying on state-controlled innovation and development.



Traditional measures of space power have focused on the activities of a nation's military and civil space programs. This common emphasis comes from the Cold War when the United States and the Soviet Union created well-funded, government-run, and largely military-led (and sometimes secret) space programs to “show the flag,” support their operational forces and intelligence needs, and prevent surprise nuclear attacks. Since

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the early 2000s, China has entered this club with a large-scale space program run by its military while also conducting civil human spaceflight and a range of scientific and quasi-commercial activities. After a decade of severe decline in the 1990s, Russia's space program has rebounded under President Vladimir Putin and, according to some accounts, is set to surpass Soviet achievements, especially regarding new military capabilities, including counterspace.²

According to some popular and expert reports, the United States is falling behind in comparison to these rising and revanchist space powers.³ As Vice President Michael Pence stated at the first meeting of the newly revived National Space Council in the fall of 2017: "America seems to have lost our edge in space."⁴

US military leaders are legitimately concerned. US intelligence officials recently released an assessment stating that Russia will likely deploy new antisatellite weapons within the next few years for use against US space assets.⁵ US Strategic Command's Gen John Hyten also stated recently, "From a defense perspective, the isolation [as a result of Western sanctions] has not slowed the Russian modernization program . . . on the space side."⁶ Russia also remains the only country currently delivering US astronauts to the *International Space Station* and continues to produce the main engine used in the United States' Atlas V rocket, setting up uncomfortable dependencies for the United States.

Regarding China, Air Force Lt Gen Steven Kwast has argued that Beijing has a relative advantage in its preparedness for space conflict, stating, "In my best military judgment, China is on a 10-year journey to operationalize space. We're on a 50-year journey."⁷ In civil space, a major US news magazine recently concluded that, in contrast to currently vague US goals, "China is boldly moving ahead with its own space exploration efforts, and with little ambiguity about its mission,"⁸ given its continuing manned spaceflights, new Hainan Island launch site, and plans for larger boosters.

Finally, military analyst Brian Chow says that the United States is facing "a new game-changing threat under development in China and Russia" in the form of spacecraft with robotic arms that might quickly disable US military satellites in a conflict.⁹ Such negative assessments of US space power are based on traditional determinants, which presume that capabilities emerge almost exclusively from top-down, government funded, and largely military-led efforts, where centralization, national

autonomy, and secrecy play key roles. Aspects of these trends are indeed worrisome. However, do they tell the whole story? Or are there other factors that need to be considered in evaluating comparative twenty-first-century space power?

Traditional, state-run approaches to space security have led authors to three assumptions: (1) that war in space is inevitable, (2) that nations will have to rely exclusively on their assets for fighting in space, and (3) that space wars will be dominated by offensive strategies, as opposed to space-based defensive or deterrent approaches. One of the leading realist scholars on space power, Everett Dolman, makes this case, “if some state or organization should desire to contest or control space, denying the fruits thereof to another state, there is simply no defense against such action—there is only deterrence through the threat of asymmetric, Earth-centered retaliation.”¹⁰

However, new conditions may facilitate other options, such as space-based deterrence by denial. A state may, over time, create a resilient constellation of hundreds of networked satellites (national, commercial, and allied) that may be able to convince an adversary that its forces will not be able to accomplish their objective of denying space-derived information. In 2016, Deputy Assistant Secretary of Defense Douglas Loverro stated in congressional testimony, “we must remove the likelihood that attacks in space will succeed. Strangely enough, there are those who believe that we cannot do this... That conclusion would be untrue.”¹¹

In the modern world, technological, economic, social, scientific, and even military dimensions of power have begun to shift from the national to the international context. This point suggests that space power will also be affected by globalization and interdependence, where networks and success in innovation are becoming at least as important as national government capabilities in creating power and influence. Indeed, the highly nationalistic and state-focused strategies of Russia and China may in the future represent anachronisms rather than cutting-edge approaches to space security. At the same time, new forms of networked space power could offer the United States a distinct advantage. If this is true, then assessments of comparative future power in space must be reexamined and, possibly, recalculated based on new measures. As Loverro argues regarding the proper response to the threats posed by Russia and China in space, “the US response is clear—we must leverage our two natural and sustained space advantages: the US commercial/

entrepreneurial space sector, and our ability to form coalitions with our space-faring allies.”¹²

If such comparative advantages can be exploited to supplement national assets and eventually transform narrow, national defensive capabilities into more robust architectures, then the autonomous, highly centralized, military-led, nationalistic, and secretive space programs that dominated the Cold War period could face new challenges of their own against more resilient, networked space coalitions. A key variable affecting these trends is the future nature of space innovation. Will traditional state-run programs lead it or instead will it be led by commercial actors, who may move more quickly in responding to market conditions and in developing new technologies? These dynamics merit particular attention, as effective innovation will be the main driver of future space transformation and, consequently, changes in space power.

This article first presents a brief history of the Cold War and the “technocratic” approach to space power. It then assesses how the United States—after riding high in the 1990s—suffered relative declines in the military and civil space sectors after 2000 compared to Russia and China. Next, it reconsiders emerging trends in space activity and the increasing (and often discounted) role of the commercial space sector, especially start-up innovators. It also considers the potential contributions of military space allies, proposing a new concept for space power via networked capabilities. Finally, the article assesses future US, Chinese, and Russian prospects in space. It concludes that the United States—thanks to its vibrant commercial space sector and its emerging partnerships with space-proficient allies—has greater potential than its rivals to retain (and even expand) its future space power and influence. However, this will require continued US national commitment to space and favorable policies in regard to the commercial sector and US allies.

A Brief History of Cold War Space Power

Looking back at Cold War trends in space power assessments, the popular metrics for success were the number and size of launches, accomplishments by astronauts (first in orbit, first spacewalk, and first on the moon), the fielding of military support technologies, and discoveries in space science. These areas depended almost completely on state-run and state-funded programs throughout the Cold War. It was a period dominated by the two superpowers who together conducted well over

95 percent of space launches up through 1991.¹³ As historian Walter McDougall argued in his 1985 Pulitzer prize-winning book, space activity embodied the post–World War II concept of “technocracy,” which he defined as “the institutionalization of technological change for state purposes, that is, the state-funded and -managed R&D explosion of our time.”¹⁴ Without state sponsorship and military interest, McDougall observed, the US-Soviet “space race” and its many technological developments would not have taken place.

In building space power, the Soviet Union benefited from its larger rockets and ability to put significant payloads—instruments, canines, and humans—into space. With the Soviet Union’s accomplishments piling up, from *Sputnik I*’s launch in 1957 through Yuri Gagarin’s spaceflight in 1961 and then other flashy Soviet “firsts” (two people in space, then three, and then a spacewalk), the United States was seen as woefully lagging behind Moscow in perceived space power. However, public perception was only part of the story. In the secretive world of national security space, the Soviet Union knew the United States was creating advantages. The first reconnaissance satellites (*Grab* and *Corona*) achieved success in 1961, years before their Soviet counterparts, but the Eisenhower and Kennedy administrations chose to keep their existence secret. During the 1960s, US technological advantages in reliable electronics, computers, and miniaturization combined to move the United States even further ahead in national security space. Furthermore, it helped to facilitate the highly successful and well-publicized Mercury, Gemini, and Apollo programs, which culminated in the 1969 moon landing. This event finally ended the notion of the Soviets leading the way in space power, at least until the late 1970s.¹⁵

Meanwhile, China lagged even further behind, conducting its first space launch in 1970. The influence of Communist Party politics plagued China’s space program—and overall “technocratic” power—during the 1960s and 1970s. This came as a result of the anti-Western Cultural Revolution (which sent thousands of engineers into the countryside for reeducation) and an unlucky association with General Lin Biao, whose alleged coup attempt against Mao Zedong in 1971 and subsequent death in a suspicious airplane crash in Mongolia set back the space program for nearly a decade.¹⁶ Only in the 1980s did China begin to emerge as a fledgling space power under Deng Xiaoping, by building a space launch infrastructure and a cadre of space-trained personnel.¹⁷

The failure of the United States to launch any astronauts during the Carter administration in the late 1970s began to raise concerns of a US space power decline. Critics of the US program began pointing to Soviet long-duration flights on a series of *Salyut* stations and to counterspace capabilities from the resumption of Soviet antisatellite testing. Popular fears of a relative US nuclear and space power “gap” helped elect Ronald Reagan.¹⁸ The *Challenger* disaster in 1986 and coincidental problems with the US Air Force’s satellite launch program led to renewed assessments—including the cover story of *Time* magazine in October 1987—of a dangerous advance in Soviet space capabilities.¹⁹ However, the United States again resumed its stature as the leader in space with a series of successful shuttle flights and new constellations of military satellites, including the groundbreaking capabilities introduced by the Global Positioning System (GPS). The Soviet Union’s collapse led to the selling off of many Russian space technologies, which later contributed to China’s emergence in space.

Space Power Dynamics in the 1990s: US Hegemony

The early post–Cold War period was characterized by US technocratic dominance in space. US space accomplishments included the successful operation of the space shuttle, leadership in organizing the construction of the *International Space Station (ISS)*, commercialization of the military GPS system (a vast windfall for US companies), and the reestablishment of military space launch reliability under the Evolved Expendable Launch Vehicle program.

Meanwhile, Russia experienced its sharpest decline in space power—in both relative and absolute terms—since 1957. Although a legacy fleet of launchers allowed it to maintain a significant role in the newly internationalized, post–Cold War commercial launch sector, its constellations deteriorated significantly, its spending on civil space dropped precipitously, and its military space program developed wide gaps in capability, suffering dangerous “blackout” periods in space-based reconnaissance and early warning. With post-Soviet Russia on the brink of economic collapse, NASA opted to extend a helping hand to the Russian Space Agency in the form of contracts for astronaut flights to the Russian *Mir* station and cooperative work on the *ISS*. US goals in this cooperative effort included lowering overall costs for the station and

preventing former Soviet missile scientists from taking jobs in countries of proliferation concern.²⁰

Nevertheless, Russian space employment dropped precipitously due to long periods of unpaid wages, as the Yeltsin government struggled financially. By 1996, the Russian Space Agency's budget had declined to a mere \$700 million.²¹ As Brian Harvey describes, despite efforts by the Energiya enterprise to keep up with its commitments to the *ISS* in the late 1990s in the face of on-again, off-again support from the Yeltsin administration, "new [state] funding turned out to be a complex set of bank loans rather than on-the-spot cash. Dates again slipped and slipped. The situation worsened with inflation and the slide of the ruble on foreign exchanges."²² US funding helped salvage some of the work, and the Russians met their commitments, albeit late. The de-orbiting of Russia's *Mir* space station in early 2000, due to lack of funding, marked the symbolic end to this humiliating period of relative decline for Russia. The subsequent launch of the *Zvezda* module for the *ISS* marked a new start, as did Russia's success in marketing the Proton booster, which had 17 commercial launches by the end of the decade.²³

China in the 1990s was still emerging slowly as a "technocratic" space power. It began pursuing a state-led, import substitution strategy by acquiring foreign technology and learning to build copies. With Russian enterprises struggling to survive, China benefited greatly from fire-sale prices for major space technologies, especially for its own future human spaceflight operations. The Chinese government also invested heavily in the development of space manufacturing infrastructure and personnel, making only small advances in near-term capability but setting the foundation for later growth. In the commercial sector, it benefited in part from the Reagan administration's cooperative agreements, which eventually allowed 26 US commercial satellites to be launched on Chinese Long March boosters by the end of the next decade. However, this program—under the state-created Great Wall Industry Corporation—came to a halt in 1999 after the House report, *U.S. National Security and Military/Commercial Concerns with the People's Republic of China* ("Cox Report"), alleged the transfer of sensitive information by two US space companies during investigations after failed Chinese launches.²⁴ The cessation of this cooperation cut Chinese commercial space revenues dramatically in the initial years of US sanctions and heightened export controls.²⁵

In the military sector, this period saw significant Chinese investments in research and development, but few tests. Little hint of the military direction of China's space program in the coming decade would be found at the time. However, China had witnessed the United States' use of space-supported warfare in the Persian Gulf in 1991 and the Balkans in the late 1990s. This convinced Beijing of its dangerous inferiority and the need to be prepared to challenge and defeat US space assets in a crisis. The Chinese military's new goal of being able to fight "local wars under modern, high-tech conditions" meant that disruption of US space-supported command, control, communications, and intelligence would take on a new level of importance in the future.²⁶

Shifts in Space Power from 2000 to 2017: Russia's Resurgence, China's Rise

The twenty-first century began with an all-consuming terrorist strike against the US homeland in the form of the 9/11 attacks. In this environment, space became a secondary priority for Washington, and the two main elements of US space power—civil and military space—both struggled, allowing China and Russia to make relative gains. The United States remained the world leader in civil and military space, but its reigning position diminished. The commercial sector continued to grow steadily but did not yield revolutionary, sector-changing products in launch, communications, human spaceflight, space manufacturing, or imagery. Relative US space power suffered under both the Bush and Obama administrations, which witnessed tight budgets and the untimely cancellation of the US space shuttle program without a replacement.

NASA faced considerable problems in the early 2000s, beginning with the 2003 *Columbia* disaster, which killed all the astronauts aboard during a breakup as the shuttle reentered the atmosphere. The stand-down of shuttle operations forced the United States to rely on Russia for access to the *ISS*. This was the first such period of dependency, but not the last. Pres. George W. Bush's Vision for Space Exploration speech in 2004 attempted to rally NASA for a cooperative return to the moon as a jumping-off point to Mars.²⁷ However, in the midst of the wars in Afghanistan and Iraq, the US administration could not offer any real funding. President Obama's attempt to continue elements of that program with the Asteroid Redirect Mission failed to garner either congressional or public support. With the end of shuttle flights in 2011, NASA

entered into its second and longest period of dependence on Russia for human spaceflight. While the completion and operation of the *ISS* marked major accomplishments and the Mars Rover program captured the public's attention, an inherited budget deficit forced the Obama administration to cut NASA's budget and its planned return to the moon. US civil space leadership suffered globally as a result.²⁸

In the face of rising threats to US space assets, however, the Obama administration developed new concepts in its 2010 US National Space Policy and the 2011 National Security Space Strategy. These documents set a course away from traditional US nationalism in space toward international engagement, including operational cooperation with allies. By 2016, the United States had signed over a dozen space situational awareness sharing agreements with foreign countries and 50 companies and commercial organizations.²⁹ Also, in 2015, the US military began work toward a Joint Interagency Combined Space Operations Center (JICSpOC) to begin the process of operationalizing space cooperation with allies and the commercial sector. Secretary of Defense Ash Carter established the Defense Innovation Unit Experimental (DIUx) in Mountain View, California. The goal was to increase the pace of adopting innovations from Silicon Valley's commercial start-up companies into the realm of military deployment to boost effectiveness and save money. However, this effort had limited initial results and had to be reorganized. The JICSpOC also failed to achieve its intended mission. In the face of emerging Russian and Chinese threats, the outgoing Obama administration approved funding for \$5 billion aimed at increasing "space protection" capabilities. Overall, however, under both Bush and Obama, the United States failed to address a series of problems in civil and military space enterprises in a context where promising commercial technologies had not yet yielded significant security benefits.

Meanwhile, Russia under Vladimir Putin took a very different activist course to reconstitute its space program in the early 2000s. Recognizing the military vulnerability Russia faced and the fact that the nation's space program represented one of the few remaining elements of Russia's international prestige, he pursued several actions. Putin plugged the gaps in his military constellations, restored the Russian GLONASS GPS system, and upgraded the military launch site at Plesetsk. Most worrisome, Putin restarted work on several counterspace programs, dormant since the Cold War, citing new threats from US missile defenses

and the X-37B experimental space plane. Russia began testing its Nudol direct-ascent antisatellite system and undertook a series of on-orbit experiments in proximity operations, including near some Western communications satellites in geostationary orbit.³⁰

Drawing on revenues from newly renationalized oil and gas companies, Putin also restored the civil space budget. Due to Russia's average annual economic growth of 7 percent from 2003 to 2007, the Russian space program underwent a remarkable "resurgence," in the words of French space expert Bertrand de Montluc.³¹ He specifically cited Russia's leadership in commercial space launch. But Montluc cautioned that Russia's long-term strategy remained unclear, noting, "Reusable launchers will not be on the cards for another 30 years."³² Nevertheless, Russia's possession of the Soyuz launcher eventually made it the sole point of access to the *ISS*, putting it into a de facto leadership role. Not surprisingly, President Putin used his leverage to increase the price for foreign astronauts of a round-trip ride to the *ISS* to \$70 million. Under President Dmitri Medvedev (2008–12), Russia also began an effort to stimulate a start-up sector by creating the Skolkovo Innovation Center near Moscow. With state funding and a favorable "incubator" environment, several small firms emerged, mostly in the launch components sector.³³ However, their activities remained minor, due in part to opposition from the state sector, indicating a Russian preference for traditional technocracy.

Efforts to reconstitute Russia's former space science glory proved unsuccessful. The much-ballyhooed flight of the *Phobos-Grunt* spacecraft to a moon of Mars in November 2011 (with a range of Russian and foreign, including Chinese, scientific payloads) ended in a disastrous failure. When faulty computer chips caused the spacecraft to become unresponsive shortly after launch, it became stranded in a low, uncontrolled orbit around Earth. The reentry and breakup of this expensive and much-anticipated mission in early 2012 met with finger-pointing about failures of quality control within Roscosmos and political pressures to launch. However, flush with cash, the Russian government doubled down on a major plan for lunar and planetary exploration. The development of a series of new launchers, plus the construction of a major new launch site in the Russian Far East (Vostochny) was intended to remove Russia's dependence on—and \$115 million in yearly rent payments for—the former Soviet launch facility at Baikonur in Kazakhstan.

Russia's space resurgence reached a high-water mark in 2014 when Roscosmos's annual budget totaled a healthy \$4.2 billion, and Russia conducted 35 successful launches, far surpassing both the United States and China.³⁴ However, the combined effects of corruption, Western sanctions after Russia's seizure of Crimea and intervention in eastern Ukraine, and falling state oil and gas revenues eventually began to put pressure on Roscosmos. President Putin's prized project—the Vostochny Far Eastern launch site—failed to meet its operational goal of a 2015 launch due to rampant corruption, which resulted in politically embarrassing hunger strikes by unpaid workers, the loss of hundreds of millions of dollars, and the firing of two successive managers.³⁵ Putin eventually took the unusual step of putting the project directly under the control of Deputy Prime Minister Dmitri Rogozin. In late 2015, to eradicate corruption and raise quality control after a series of Roscosmos launch failures, President Putin abolished the space agency altogether and established the eponymous “State Space Corporation Roscosmos” in early 2016. It was described as a commercial unit of the Russian government intended to reduce corruption and run the consolidated space industry according to best business practices. However, Roscosmos remained much more like a state enterprise than a commercial one. Vostochny finally conducted its first launch in April 2016. However, after a failed launch in November 2017, even Russian analysts began to downplay previously rosy prospects for the facility, discounting the possibility of any near-term cosmonaut launches.

Meanwhile, China's major state-led investments in space advancement began to bear fruit in the early 2000s. Fearful of US military space advantages, eager to rally public support for the communist leadership through high prestige space missions, and hopeful of spurring developments in high technology to benefit the Chinese economy, Beijing began to make deliberate efforts to advance its place in the space community. After several unmanned tests, the Chinese military launched *Shenzhou V* with its first *taikonaut* (Chinese astronaut) aboard in October 2003, shocking the world by becoming the third country to launch and return a human from Earth orbit. A slow but steady series of successes in human spaceflight, including a small station (*Tiangong 1*) visited by taikonauts in 2012 put other countries on alert that China was making a long-term commitment to civil space activity, even if it was managed by the military. With an unmanned mission to the lunar surface with

its *Jade Rabbit* rover, the establishment of a substantial space science program, and cosponsorship (with Russia) of a UN initiative to prevent the weaponization of space, China sought to burnish its credentials as a responsible space player. In 2008, China attempted to establish itself as an international space leader by founding the Asia Pacific Space Cooperation Organization (APSCO). The Beijing-based APSCO was modeled on the European Space Agency, but the limited space capability of its other members—including Iran, Mongolia, Pakistan, and Peru—reduced the likelihood of any real technological synergies emerging from this cooperation.

China's kinetic antisatellite test in January 2007 showed another, more troubling side of its military-led space program. By flaunting international norms on debris mitigation and then continuing to develop a range of counterspace capabilities over the next decade, China showed a commitment to developing an offensive military space capability aimed at possible use against the United States in a future regional conflict. From being a virtually nonexistent military actor in 2000, China emerged by 2017 as a potent military competitor, albeit one with considerably less operational experience.

Only in the commercial sector did China's space capabilities seem to lag behind world space leaders. While China's Great Wall Industry Corporation expanded its sales of on-orbit satellites and low-cost launches—to countries such as Nigeria, Venezuela, Bolivia, and Laos—the highly subsidized nature of most of these deals suggested that the criteria for sales were based more on politics than economics. In the launch sector, after its loss of launch rights for satellites with any US components after 1999, China slowly gained a niche commercial market thanks to European efforts in developing satellites without US components. However, this market remained modest.

More significantly, China successfully bypassed its former European partners in the Galileo GPS network by developing and launching its own system called BeiDou.³⁶ With 23 satellites by 2016, the constellation entered into regional operation, with additional satellites and global functionality promised by 2020. China began to force domestic enterprises to purchase BeiDou receivers while enticing foreign countries to buy into the network on favorable terms. Overall, Chinese developments during the 2000 to 2017 period marked major accomplishments relative to both Russia and the United States, although the US space program continued to lead the world in terms of its absolute space capabilities.

Emerging Changes in Space Power Dynamics

Until recently, the source of space power has relied heavily on state funding and innovation. However, over the past several years, the increasing share of commercial space in the total arena of space activity merits reevaluating traditional measures. Christopher Kirchhoff, a former official at DIUx, observes that “most innovation today—unlike that of two generations ago—takes place in the commercial sector, not government labs.”³⁷ Accordingly, where state spending dominated space revenues well into the 2000s, today the commercial sector accounts for over three-quarters of the \$323 billion spent yearly across the globe on space activity.³⁸ These new trends in space spending, activity, and the nexus of innovation suggest the need to consider a revised model of space power as we look toward the future. While the earlier space race period could be accurately characterized as dominated by rival, state-led “technocracies,” a more flexible, disaggregated, and resilient “netocracy” is now emerging as a rival model of space organization (see Fig. 1.) It may soon prove to be a superior model for the challenges facing countries in establishing twenty-first-century space power. We can define space-related *netocracy* as a new form of organization based on public-private partnerships, distributed architectures, rapid innovation, and the use of multiple commercial and allied partnerships.

Cold War Space Power Model ("Technocracy")	21st Century Space Power Model ("Netocracy")
<ul style="list-style-type: none">• National• Secret• Military led• Independent• Few, large platforms (vulnerable)• Slow, top-down innovation	<ul style="list-style-type: none">• International• Transparent• Commercially led• Networked• Many, small platforms (resilient)• Rapid, bottom-up innovation

Fig. 1. Comparison of space power models

Conditions for the creation of net-centric space power are emerging from the so-called “NewSpace” revolution, where venture capital, dynamic entrepreneurs, scientific innovators, and a supportive political and legal infrastructure are combining to bring a whole range of new space technologies to the marketplace. Critical in this process is an environment that supports the free flow of ideas and people and protects intellectual property. Otherwise, innovators may develop to a certain stage and then move elsewhere for a more favorable business climate. Notably, such innovation “hubs” are present in some areas of the United States, due to a combination of technological factors, human capital, and political/legal mechanisms that have made rapid start-up formation possible and have assured investors that successful companies will be allowed to keep profits and expand their businesses. Such conditions do not exist in Russia today and are only partly present in China, creating significant potential advantages for the United States.

Another set of changing factors relates to the role of international cooperation in military space. In the past, the disparities in capabilities between the superpowers and other spacefaring countries were so stark that neither the United States nor the Soviet Union would have derived any substantive benefits from sharing constellations and engaging in extensive data-sharing or operational cooperation with allies.³⁹ Until 2010, US National Space Policy had not made any mention of possible benefits to the United States from integrating aspects of the US military space program with those of its allies. However, those conditions have changed as a number of US friends and allies have now developed sophisticated space capabilities—including India, Israel, Italy, France, Germany, Japan, and the United Kingdom. Moreover, a number of these countries in Europe and Asia have the financial capability to contribute to advanced military space architectures, some of which are too expensive for even the United States to field alone. These space capabilities have raised the attractiveness of military space alliances for those countries that are willing to engage foreign space powers.

In light of these new dynamics, how are the three leading space powers likely to fare going forward? Are the gloomy assessments of certain US experts and officials merited?

US Trends

The United States has begun to address its relative decline in space, although only in part due to government efforts. NASA's budget remains flat, and the Department of Defense projects aimed at addressing the resilience of space assets are largely continuations of policies begun late in the Obama administration. However, these projects are now coming to fruition. General Hyten's focus on space as a war-fighting realm has brought a new tone of seriousness to the US approach to military space protection, as has the standing up of the National Space Defense Center at Schriever Air Force Base, Colorado. The reestablishment of the National Space Council has raised the importance of space activity within the national defense enterprise, while also highlighting the importance of public-private partnerships. Former Defense Secretary James Mattis's decision to reform and reinvigorate the DIUx organization set up by his predecessor (and change the name to the Defense Innovation Unit-DIU), by increasing funding and expanding its reach, marked another positive sign. DIU can now fund projects directly and operates in Mountain View, Boston, Austin, and Washington, DC.⁴⁰

However, the most dynamic recent change in US space capabilities is coming from the commercial sector itself, especially among start-ups. Already, the space marketplace is being flooded with new products and services from these emerging US space ventures. These include revolutionary, low-cost services now being offered by US companies in the fields of Earth observation, space situational awareness, satellite tracking, space launch, and space manufacturing. After many years of promising change, NewSpace companies are now bringing revolutionary products to the marketplace, which is shifting space power leadership back toward the United States.⁴¹

In Earth observation, the San Francisco-based company Planet now operates 150 satellites, the largest constellation of satellites ever launched by a private company or a government, providing daily revisits of all areas of the globe.⁴² In the field of space situational awareness, Menlo Park, California-based start-up LeoLabs is operating its own phased-array radar (constructed in Texas) and developing the largest catalog of low Earth orbital objects outside the US government.⁴³ It plans to expand this network with three additional radars, supported by a growing commercial and governmental client base. In space manufacturing, another Mountain View-based start-up, Made in Space, now operates

the only 3-D printer on the *ISS* and is working toward the capability to build and robotically assemble large structures in orbit, thus drastically reducing construction costs.⁴⁴ Each of these companies is helping the United States build new elements for future space power and resilience.

In the launch field, 2017 marked the first time the United States has led global launches since 2003, with 29 successful orbital missions, compared to 20 for Russia and 16 for China.⁴⁵ Even more remarkable is the fact that Elon Musk's Space Exploration Technologies (SpaceX) company conducted 18 successful launches. SpaceX has the prospect to launch more in the future if the company can perfect its ability to return boosters to the ground and reuse them safely. SpaceX's Falcon 9 rocket also surpassed Russia's Soyuz as the most successful launcher for the first time. Other US companies, including the United Launch Alliance and Orbital ATK, add to the US tally, while start-ups like Blue Origin and Rocket Lab provide further capability to the US launch stable. Indeed, the commercial launch sector seems to be entering a period of United States dominance.

In the intelligence area, the National Reconnaissance Office (NRO) and the National Geospatial-Intelligence Agency are aggressively pursuing benefits from the commercial sector, including from start-ups with small satellites. Growing capabilities and the availability of persistent observation of points of interest have changed the previously skeptical attitude of US intelligence providers regarding the commercial sector. As NRO director Betty Sapp said recently about the US government's former development of its own buses and systems, "Those days are long gone."⁴⁶ Today, with purchases from companies like Planet, DigitalGlobe, and others, the real problem facing the US intelligence community is how to handle the vastly increased flow of data. The NRO, according to Sapp, is using this commercial bonanza to plan for a future involving "integrated architectures that meet user needs with far more affordability, resiliency, and tolerance for failure."⁴⁷

Another area where the United States has begun to show leadership is in the area of military space alliances. The underlying concept of military space cooperation begun during the Obama years has continued thus far under the Trump administration, providing benefits in terms of reduced cost, increased deterrence, and expanded resiliency, despite the recent emergence of new counterspace threats. Again, the prospects for space cooperation are greater for countries with existing military

alliances, such as the United States. For the first time, the concept of a military space “network” is realistic. The Wideband Global SATCOM system now funded by the United States and eight of its close allies, who receive bandwidth in return for their financial contributions to this constellation of communications satellites, demonstrates this concept.

In the area of space situational awareness agreements, US Strategic Command has now established 83 international data-sharing agreements to expand its network of satellite and debris information to improve space safety and the effectiveness of US operations.⁴⁸ Also, the Air Force announced the opening of the Combined Space Operations Center in the summer of 2018 at Vandenberg Air Force Base, California, completing a multiyear process of consultations and exercises that eventually led to the center.⁴⁹ The initial foreign military partners will include Australia, Canada, and the United Kingdom. The point of this effort is to allow more rapid sharing of information among countries and the actual conduct of joint missions involving the commercial sector and the intelligence community. A supporting process—the Multinational Space Collaboration (MSC) initiative—is working with additional countries toward future cooperation in space situational awareness and operations, including Germany and France, with future participation expected from Italy, Japan, New Zealand, South Korea, and Spain.⁵⁰ Another example of emerging military space cooperation is the Enhanced Polar System recapitalization, in which US military communications payloads are being hosted on Norwegian polar-orbiting satellites, saving the United States some \$900 million.⁵¹ US military space war games now also regularly include US allies. Notably, such military space partnerships have not yet emerged in either Russian or Chinese space policies or architectures. Neither country has significant military allies that are space-capable, and the two sides, despite other forms of military cooperation, have thus far exhibited inadequate trust for real cooperation in military space.

The one area of space power where the United States’ commitment and plans remain somewhat vague is in civil space. Although President Trump’s one-page Space Policy Directive of December 2017 outlined a general goal of returning to the moon and moving on to Mars, it did not offer details on how to organize or fund such missions.⁵² The administration’s second directive on space in March 2018 provided more information on commercial and military space but almost nothing about NASA.⁵³ The currently flat NASA budget does not seem to offer enough

flexibility to support major manned missions—absent new funding—and more recent discussion of trying to free up funds by privatizing the *ISS* do not seem realistic. The absence of a NASA administrator or a White House science advisor for over a year set back the organization's planning process. It remains to be seen if the Trump administration will be able to make up for lost time in getting NASA back on track as a global civil space leader, as the commercial sector cannot be expected to carry out US scientific missions.

Russian Trends

Russia's course under Putin regarding space organizations and innovation has followed political dictates rather than global economic best practices. The Putin administration has steadily reversed the significant integration of the Russian space sector into the international marketplace, with mixed (and sometimes negative) results. In sharp contrast to US and other Western trends—where small start-ups are driving a continuous process of innovation—the Russian situation has moved toward extreme centralization. Since forming the State Space Corporation Roscosmos, President Putin fired director Igor Komarov, who had come out of the commercial sector, and instead appointed his former deputy prime minister Rogozin to take over the agency in May 2018, suggesting the primacy of political loyalty over business experience.

The problems Roscosmos faces today have much to do with the disconnect between its nationalist agenda and its growing isolation from the rest of the space community. Ironically, the very success of the Russian space industry in integrating into global supply chains in the 1990s has now made it dependent on foreign components for construction of satellites. A recent study indicated that up to 75 percent of electronic parts on certain current-generation satellites come from the United States.⁵⁴ With the advent of Western sanctions after Russia's 2014 seizure of Crimea and intervention in eastern Ukraine, Russia has been forced to substitute substandard and often ill-fitting Russian or other foreign components from countries that do not adhere to UN sanctions. Russia may develop renewed capabilities, but it will take time and steady budgetary support for such efforts to succeed.

A second problem facing Roscosmos relates to changes in the international marketplace. In the 1990s, Russia was able to enter into the commercial marketplace successfully due to a combination of factors

including low costs, avid buyers (from the West and China), and the existence of large stockpiles of “legacy” Soviet space products, especially launchers. However, as that legacy of rockets and other technology has gradually dwindled and Russian manufacturers have been spoiled by two decades of high Western prices for space products, the NewSpace revolution in the United States has created serious new challenges. Put simply, prices are dropping, especially in the launch sector, and a variety of new products are now available from commercial start-ups that Roscosmos cannot produce or cannot offer with comparable quality and price. Russia had only one commercial launch in 2017; the rest were paid for by the state. Similarly, there is not a market for Russian communications satellites. As one recent Russian article observed regarding the quality of satellites produced under Roscosmos, “a significant portion of its satellites lack commercial potential” compared to their foreign, especially US, counterparts.⁵⁵ The main niche Roscosmos fills today is human spaceflight—it is the only provider for astronaut transportation to and from the *ISS*. However, when NASA’s commercial crew program begins service (now planned for 2019), Russia will lose much of that business and the associated income.

Russia’s uncertain and highly oil-dependent state budget is another problem facing the now re-centralized space industry. The long-term Russian space budget for the 2016 to 2025 period, originally planned for \$70 billion, has now been reduced drastically to \$20 billion.⁵⁶ Looking ahead, Russia’s decision to put the bulk of its space investments into the military sector over the past few years has created a serious decline of planned state investments in civil and commercial space. One of the main enterprises within Roscosmos, the Khrunichev State Research and Production Space Center—builder of the workhorse Proton booster and new Angara rocket—has had to resort to selling some of its property and buildings to recoup costs not covered by existing funds from Roscosmos.⁵⁷ The problem stems, in part, from a drop in state orders from seven rockets to only three.⁵⁸ This overall situation poses a serious threat to the long-term competitiveness of the Russian space industry. State orders are falling, and Russia does not have marketable products for the increasingly competitive and innovation-driven commercial market.

Regarding innovation, Russia has become one of the least friendly countries for start-ups since the business-friendly Medvedev finished his one-term presidency in 2012. According to a recent report by experts at

the Moscow-based Center for Strategic Assessments and Forecasts, the business and legal environments for space start-ups in Russia today are highly unfavorable.⁵⁹ One Russian analyst describes a series of structural problems that have reduced its ability to organize itself for modern space operations (compared to during the Cold War), such that its share of the international space market has now declined to between 1 and 3 percent.⁶⁰ Despite its declining budget, or perhaps because of it, Roscosmos itself has worked actively to block the emergence of commercial start-ups, supported by Russian regulators who have made it extremely difficult for entrepreneurs to obtain licenses to operate private space companies. As the Center for Strategic Assessments and Forecasts notes, even the list of requirements for establishing a space start-up is “classified,” adding that “to access it you need the permission of the FSB (Federal Security Service).”⁶¹ Despite these obstacles, several Russian start-ups do exist, some from Medvedev’s Skolkovo initiative. In the launch sector, for example, a small number of fledgling rocket builders have been able to find sponsors among Russia’s oligarchs and state-favored businesses. Nevertheless, the hurdles facing Russian space start-ups are formidable, making the kind of commercial space “innovation hubs” present in the United States unlikely to be developed or duplicated any time soon.

Chinese Trends

China has risen the fastest and farthest among major spacefaring countries over the past two decades and seems likely to continue on this trajectory. However, despite recent Chinese efforts to stimulate technology incubators with government-provided seed money, the bulk of Chinese space activities continue to be state-run and militarily controlled. As one Russian space analyst observed recently, “The Chinese model is really the Soviet model.”⁶² The point here is that state direction and state funding have gotten China to where it is today in space, an impressive accomplishment. However, defense analyst Richard Bitzinger notes that “critical weaknesses remain” within China’s military industry and that it has played the role of a “fast-follower” rather than that of an innovator.⁶³ The question is, can this path continue?

Tai Ming Cheung from the University of California–San Diego has studied China’s military-industrial complex for more than two decades. He has documented China’s keen ability to acquire and reverse-engineer foreign technologies in the service of state programs, especially in the

defense sector. However, he raises doubts about whether China can take the next step into innovation. Given the structure of Chinese industry, he observes, “Having the state define and pick winners and losers is not how long-term sustainable innovation happens.”⁶⁴ He notes the increasing pressure on Chinese companies to comply with government directions and controls, thus slowing innovation.

China’s typical processes over the past few decades of developing new military technologies, as described by Cheung, “range from spending heavily on importing large amounts of [foreign] technology and engaging in collaboration to the use of more nefarious means, such as industrial and cyber espionage.”⁶⁵ The question going forward is whether China can develop its own pathways to sustainable innovation rather than copying existing technologies. In a startling realization after the Chinese company Zhongxing Telecommunication Equipment faced sanctions from the United States in the spring of 2018, Chinese leaders had to admit that the country still has a 90 percent dependence on foreign (mainly US) components for its semiconductor products.⁶⁶ Regarding space launch, a recent article in the state-run newspaper *Global Times* lamented SpaceX’s accomplishments, “we are almost 10 years behind; more importantly, what our country has to desperately catch up with is actually a private US enterprise.”⁶⁷

Reforms, however, are being attempted. The problem, as Cheung notes, is that “the People’s Liberation Army and defense industrial regulatory authorities are seeking to replace this outdated top-down administrative management model with a more competitive and indirect regulatory regime, but there are strong vested interests that do not want to see any major changes.”⁶⁸ Nevertheless, in 2014 China instituted new laws lowering financial thresholds and bureaucratic red tape in the establishment of private businesses. China hoped to stimulate the employment of new college graduates, spur the slowing economy, and accelerate technological innovation. It followed with more specific actions in 2015 aimed at fostering space start-ups.⁶⁹ Overall, these actions succeeded in boosting the number of technology start-up companies in China, many facilitated by the establishment of government-funded start-up “incubators” located around major universities, such as Beijing’s Tsinghua. Thus far, some 60 fledgling space companies have been registered, but the results have been somewhat disappointing.⁷⁰ OneSpace Technologies conducted China’s first private launch in May 2018, but it is a solid-fuel

rocket that only reached an altitude of 25 miles and lacked orbital velocity, thus putting it behind German rockets of the 1940s, which used more sophisticated and scalable liquid-fuel technology. Shanghai-based SpaceOK plans to build a constellation of 40 satellites aimed at supporting the government's "One Belt, One Road" investment initiative across Asia.⁷¹ LandSpace hopes to begin solid-fuel rocket tests in 2018 using former military rockets, while ExPace will use former military air defense missiles to attempt to enter the launch market.⁷² These dynamics, thus far, suggest that conditions mirroring those in the US marketplace are still lacking in China and may require more political reforms to stimulate truly bottom-up innovation.

Despite the existence of obstacles to innovation, China will continue to advance rapidly in space capability. Through its state institutions and its military, China is moving to fulfill ambitious plans to establish a presence on the moon, launch a large space station, develop space-based solar power, and harness the ability to mine asteroids.⁷³ It will also seek to improve upon its already significant counterspace capabilities. However, if China's economy wavers, that raises questions related to the pace and the sustainability of these efforts and leads to doubts about this state-led path in space. Thus far, there are few signs that game-changing commercial technologies will be developed in China. Moreover, if US commercial companies and allies can render attacks on US national space assets more of an inconvenience than an existential threat, China's heavy investments into military space may simply be wasted. Former Deputy Assistant Secretary of Defense Loverro noted in 2016 that US reconnaissance satellite cooperation involved "nearly 200 satellites and likely 20 ground infrastructures" and that the number of networked satellites would rise to "over 600" by 2020.⁷⁴ As he concluded, "Using this lever to increase assurance of US imaging capacity presents an extremely complex problem to our adversaries, with little increase in our own costs."⁷⁵

Conclusion

The future of space power may not look like the past if current trends in the commercial space sector continue. As US Space Command's Gen Howell Estes predicted in 1997 as he looked ahead in terms of space power, "It is not the future of military space that is critical to the United States—it is the continued commercial development of space that will provide continued strength for our great country in the decades ahead."⁷⁶

Similarly, trying to determine the likely relationship between the US military and commercial space sector back in 2002, Lt Col Peter Hays commented, “It is currently unclear that military means are the best way to protect commercial satellites or that the military will be called upon to build a more robust space infrastructure based on perceived threats to commercial systems.”⁷⁷ Since Hays wrote that passage, the Cold War assumption that US military assets would be needed to “protect” commercial assets in space has been challenged even more, to the extent that it is now more common to discuss the concept of using commercial infrastructure or allied assets to provide resilience to what are seen as more vulnerable US military assets. If this trend continues, it may well be that commercial capabilities and allies will prove to be essential to sustainable space power by providing the mission assurance needed in various areas of space activity necessary for effective deterrence.

Just because the United States has a vibrant, emerging commercial space start-up sector and strong friends and allies, however, does not mean it can assume future US power relative to its adversaries. As Gen Jay Raymond stated recently, “Space superiority is not a birthright; it must be earned.”⁷⁸ Indeed, a lack of investment in either dimension of national space capability (civil or military) or ineffective policies to engage (and draw upon) the commercial sector and allies could cause overall US space power to fail to reach its potential. However, unlike some of the gloomy assessments of relative power trends frequently heard today within the US space community, there are also considerable grounds for believing that the United States has comparative advantages over Russia and even China thanks to emerging innovation in the commercial space start-up sector and the presence of increasingly space-capable allies. The problem facing both Russia and China in the twenty-first century is that their model for space development posits a dominant role for their governments, thanks in part to their leaderships’ insistence on absolute political control over the process and results of innovation. Reforming their state-centric model to favor start-ups and bottom-up innovation or sharing of assets with foreign governments would require loosening political controls. Such actions are feared by current Russian and Chinese leaders, making them unlikely to occur. State control over investment can successfully develop national space activities in periods of strong budgetary support and under conditions where technological innovation need only occur slowly. It is a less effective organizing principle in

a fast-growing, globalized, information-based economy where market-based solutions can respond more quickly than state-led initiatives and where private capital is more readily available than government sources. Under these conditions, state-led strategies are more likely to fail.

These points, however, should not make US policymakers overly confident. Continued slowness in US military acquisition and in establishing more resilient constellations, challenges posed by excessive government secrecy and export controls, and recent underfunding of space science and civil space could all cause the United States to miss the benefits from these favorable trends. To ensure that the US advantage in NewSpace comes to fruition regarding future space power, the US government and the US military must develop and follow through on initiatives aimed at institutionalizing strong US public-private and allied links in space. Also, the US should focus on moving from Cold War “technocracy” to twenty-first-century “netocracy.” Some of these actions items should include:

- continuing to create favorable rules for the US commercial space sector that emphasize responsible behavior but allow for entrepreneurship;
- fostering international discussions and interpretations of the Outer Space Treaty that support commercial outcomes with proper national licensing procedures;
- engaging in sensible export control policies, allowing sharing of technologies that are already widely available from other foreign suppliers but preventing the export of cutting-edge technologies and purchases of US commercial space companies by non-allies;
- shaping the space security environment by building more binding international norms and rules against the creation of orbital debris (to include kinetic weapons testing) and interference with satellites, while emphasizing the rights of companies to prosecute foreign violators through existing international liability law;
- developing public-private partnerships to support US civil space activity, and continuing to invest in a robust space science and exploration agenda to build US leadership;
- supporting military space resilience and sustainability, as well as enhancing the military’s ability to work with the commercial sector,

especially start-ups, through expanded use of rapid acquisitions under “other transactional authorities” allowed under US law; and

- promoting policies that institutionalize cooperation with US allies in space, including joint space training, exercises, and operations.

Overall, the United States remains the world’s leading space power and has the tools—national, commercial, and allied—to retain its comparative advantage in space. The challenge will be how to create flexible yet effective mechanisms to build a new, “netocracy” framework for US space power. Given emerging threats, this effort should focus on creating a shared deterrent posture based on resilience, superior numbers, continuous innovation, and cooperative resolve to deny adversaries any belief that they will benefit from starting a future conflict in space. In this way, the United States should be able to develop a robust commercial infrastructure and sustainable defenses to continue US space power under changing twenty-first-century conditions. ■■■

Notes

1. The author thanks an anonymous reviewer for providing a useful set of points to consider. The views in this article are those of the author alone and do not represent statements of the official policy of the US Navy or the US Department of Defense. It draws upon interviews conducted by the author at commercial space start-up companies in Silicon Valley, southern California, Seattle, and Denver from May to September 2017. The author is grateful to Dan Rasky, Bruce Pittman, and Tina Panontin of the NASA Ames Research Center for their advice and assistance during this process.

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Horizontal Escalation: An Asymmetric Approach to Russian Aggression?

Michael Fitzsimmons

Abstract¹

This article examines whether horizontal escalation strategies—threats to geographically expand a conflict—can help deter Russian aggression or manage escalation in a US/NATO-Russia crisis. After summarizing the current pitfalls of conventional and nuclear deterrence strategies in Eastern Europe, the article highlights horizontal escalation’s brief prominence in US Cold War strategy. It then develops and applies a simple analytic framework to four examples of horizontal escalation options in the context of a crisis over Russian aggression in the Baltic region: strikes on Russian forces deployed in Syria; interdiction of Russian ships and seaborne commerce; strikes on bases in Russia’s Far East; and an invasion of Crimea. The analysis ultimately yields a skeptical view of horizontal escalation, yet finds a limited role for it in the US/NATO strategic toolkit. Under most circumstances, its costs and risks appear likely to outweigh its benefits. Its promise of coercing or distracting Russian leaders in a Baltic crisis is highly constrained. However, horizontal escalation’s potential benefits for deterrence before a crisis and signaling during a crisis justify greater attention and planning than they have received to date.

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The frontiers of Eastern Europe are again the subject of military planning in the capitals of NATO allies, spurred by Russia’s military modernization and its demonstrably renewed willingness to employ military tools of coercion and aggression. While direct conflict between US and Russian

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militaries remains improbable, grave concerns familiar to Cold Warriors regarding deterrence and escalation management have returned to national security strategy debates.

Planners and scholars, alike, have revived earlier work on strategies for deterrence in Europe, concerning both conventional and nuclear military operations. As in previous generations, however, deterrence is fraught with difficulty.² Tools of denial face significant obstacles, from open terrain, to advanced weapon range and precision, to political and budgetary pressures in NATO governments. Tools of punishment and cost imposition risk being too ineffectual to affect Russian behavior on the one hand, or too provocative to avoid Russian nuclear employment on the other.

While existing literature is rich on traditional tools of deterrence and escalation management, relatively little attention has been given to “asymmetric” approaches. During the Cold War, historian John Lewis Gaddis defined US asymmetric approaches to its containment strategy as those involving “shifting the location or nature of one’s reaction onto terrain better suited to the application of one’s strength against adversary weakness.”³ At the level of grand strategy, asymmetric approaches can take a wide variety of forms spanning political, military, economic, and other tools.

At the level of military strategy, one asymmetric approach to deterrence came to be known as horizontal escalation. Strategists have defined horizontal escalation as widening the geographic scope of a conflict, and contrast it with vertical escalation, an expansion of a conflict’s intensity through the amount of force or the types of weapons or targets involved.⁴ Its logic is principally coercive, designed to convince an adversary to abandon a course of action by imposing costs or threatening interests not previously imperiled by the conflict. In the contemporary context of a confrontation with Russia, this could involve constructing NATO threats to military or economic targets on Russia’s Pacific, Southern, or Northern periphery, or even holding at risk Russian assets and interests outside Russian territory.

During the Cold War, horizontal escalation was the subject of considerable contemplation and planning at senior levels of the US government. It became a particular focus in the late Carter and early Reagan administrations as a possible means for deterring or responding to a Soviet invasion of Iran or aggression elsewhere in the Persian Gulf. It also

played an important role in the development of the US Navy's Maritime Strategy in the 1980s.

Such strategies suffered from significant shortcomings in their Cold War incarnations, and many would suffer still today. At the same time, however, traditional conventional and nuclear tools of deterrence and escalation management face daunting challenges and risks of their own. US policymakers and planners would benefit from a more comprehensive understanding of the strengths and weaknesses of all the possible deterrence tools.

Horizontal escalation is not the only asymmetric approach deserving of further study in this context. Tools of economic coercion, offensive cyber operations, counterspace operations, information and political warfare, and even unconventional warfare are highly relevant to US-Russia competition. Indeed, some of these tools are already prominent elements of the US and NATO strategy for confronting Russian aggression. However, horizontal escalation strategies are distinct in their military character, their geographic separation from the area of conventional aggression, and the scarcity of their analytic treatment in security policy literature.

This article attempts to address this analytic gap by considering the question: can horizontal escalation strategies help deter Russian aggression or manage escalation in a US/NATO-Russia conflict? The article first examines asymmetric approaches to deterrence and escalation management by summarizing the current pitfalls of conventional and nuclear deterrence of Russia. Second, it reviews the Cold War history and logic of horizontal escalation as a means to build a simple analytic framework for assessing horizontal escalation options. Next, it applies that framework to four examples of US/NATO horizontal escalation options in the context of a crisis over Russian aggression in the Baltic region.

The analysis ultimately yields a skeptical view of horizontal escalation, yet finds a limited role for it in the US/NATO strategic toolkit. There are three core challenges with horizontal escalation. First, the options most capable of affecting Russian strategic decisions are at least as likely to prompt further escalation as to induce restraint. Second, in the high stakes scenarios where horizontal escalation is most needed, Moscow's resolve to endure high costs is at its strongest. Third, horizontal escalation options can carry significant costs and risks beyond unwanted further escalation.

Another difficulty with a horizontal escalation strategy is the uncertainty inherent in identifying and manipulating an adversary's values and escalation thresholds. However, horizontal escalation can help the US and NATO use this uncertainty to their deterrent advantage, complicating Moscow's decision-making. And if deterrence fails, horizontal escalation options can offer potentially effective means for signaling US and NATO resolve to incur costs, take risks, and ultimately see their collective defense mission succeed.

Pitfalls of Deterring Russia

Both conventional and nuclear military strategies are demonstrably problematic for deterring or managing a crisis with Russia. To set this discussion into the proper context, it is important to acknowledge the limited ambit of deterrence and escalation management in the overall US and allied strategies. As with the Soviet Union in the Cold War, Russia's threats to US and NATO interests extend well beyond the military realm.⁵ Indeed, as news headlines regularly attest, Russia finds ready avenues of influence and disruption in cyber operations, information operations, political manipulation, and economic coercion, which it can pursue at lower cost and risk than military aggression.⁶

Nevertheless, the potentially dramatic stakes of a military confrontation in Europe guarantee an evergreen relevance for military deterrence and escalation management. Such scenarios are worth close analysis and careful planning, particularly those that might ensnare NATO treaty allies. This premise is widely shared among Western governments⁷ and is based largely on four straightforward observations. First, Russia has demonstrated its willingness to challenge the norms of territorial sovereignty. Its 2014 annexation of Crimea and its thinly veiled operations in the Donbas region of Eastern Ukraine are the main exhibits in this case. However, its military presence in Moldova's Transdniestria region, its 2008 war with Georgia and its 2007 cyber attacks on Estonia are also relevant. These operations coexist with a pattern of military exercise behavior, including provocations by tactical aircraft buzzing US ships and aircraft, that seems designed to signal Moscow's readiness to engage in military conflict to protect its interests in its "near abroad."⁸

Second, Russia has been engaged for the past decade in a major military modernization program for both nuclear and conventional forces. While these modernization efforts have faced and will continue to face

serious constraints, their achievements are significant. Improvements in technology, training, readiness, manpower, and logistics have created a military force far superior to the one that stumbled through its war with Georgia a decade ago.⁹

Third, Russia's stated policy and military doctrine single out the US and NATO as the pre-eminent threats to Russian security.¹⁰ While experts can and do debate how defensive or escalatory Russian doctrine is or how closely crisis behavior might adhere to declaratory policy, there can be little doubt that war on NATO's Eastern flank is a core preoccupation of Russian strategists and planners.

Also, deterrence and escalation outcomes in a regional crisis with Russia are critically important to the US beyond the direct local consequences of any conflict, grave as they may be. The US commitment to NATO's collective defense is the lynchpin of American alliance commitments globally. Hence, even otherwise minor crises are likely to have long-term effects for US power and global security, in terms of demonstrating strengths, weaknesses, and levels of resolve in American defense of its stated commitments abroad.¹¹

These factors have prompted a fresh focus in Western capitals on the low-likelihood but high consequence scenario of a NATO-Russia war. As military analyst Michael Kofman wrote in 2015, "Perchance the broadest and most vexing question for US decision-makers and experts today is this: How do we deter Russia? It is as vague as it is recurrent."¹² Taking up this challenge, a group of US and European experts framed the problem this way:

Basic deterrence principles apply here. Deterring Russia from escalating a conflict will require convincing Moscow that either the costs of escalation will be too high, the benefits will be too low, or that there will be significant payoff from demonstrating restraint in terms of achieving an acceptable outcome or avoiding an unacceptable one.¹³

This formulation reflects one of the classic frameworks for thinking about deterrence, which distinguishes deterrence by punishment from deterrence by denial.¹⁴ The former seeks to induce restraint by promising to inflict prohibitive costs on an adversary in response to its aggression. The latter seeks to directly prevent the adversary from attaining its goals or realizing the benefits of its aggression.

In principle, as noted strategist Lawrence Freedman points out, "denial is a more reliable strategy than punishment because, if the threats have

to be implemented, it offers control rather than continuing coercion. With punishment, the [adversary] is left to decide how much more to take. With denial, the choice is removed.”¹⁵

However, denial can be difficult, demanding substantial capabilities to be deployed and ready at or near prospective points of attack. For the US, with its global security interests and robust capabilities to project military power, deterrence by punishment holds considerable appeal by promising deterrence without large formations of forward-stationed forces. For this reason, US extended deterrence over the years has relied heavily on deterrence by punishment.¹⁶ Importantly, the credibility of denial usually depends on conventional force capabilities, while punishment may incorporate threats of both conventional and nuclear strikes. Consider now both conventional and nuclear deterrence in contemporary Europe.

Conventional Deterrence of Russia

The central problem of NATO’s conventional deterrence of Russia is the difficulty of denial, given local force balances. Local balances are particularly important in conventional deterrence since an adversary may believe a quick victory in a limited area would be sufficient to deter major intervention by an outside power, even one that had superior capabilities overall.¹⁷ While US forces, not to mention NATO forces together, are superior to Russian forces in aggregate, Russia can much more easily bring to bear superior force quickly in areas immediately adjacent to its borders. This includes moving large numbers of ground forces forward relatively quickly. It also includes robust capabilities to thwart NATO counterattacks, in the form of what is often called anti-access and area denial (A2/AD). These capabilities include advanced integrated air defense systems and diverse offensive missile systems that can accurately target bases, infrastructure, and shipping throughout most of Europe. Particularly important to this latter capability is Russia’s Kaliningrad Oblast, a Russian “exclave” between NATO members Poland and Lithuania, stocked with advanced missile capabilities.¹⁸

Prospects for a conventional NATO-Russia match-up have generated a sizable literature in the national security policy community in the past few years.¹⁹ The majority view from that body of analysis is that Russia would very likely succeed in seizing any territory on its borders if it chose to do so. Thus NATO would face a choice between a costly, risky

counterattack and accepting a *fait accompli* while attempting to negotiate a Russian withdrawal.²⁰ In light of this kind of prevailing analysis, it is no wonder that US military leaders have been candid in worrying about the strength and credibility of US and NATO deterrence in the region.²¹

In theory, significant improvements in NATO's capabilities to deter by denial are within reach. Many analysts have recommended substantially increasing forward deployed ground and air forces in Eastern Europe²² even beyond the four rotationally-based battalions sent to Poland and each Baltic state as the "Enhanced Forward Presence" (EFP) following the NATO-Warsaw Summit in July 2016.

However, further bolstering conventional force presence in the Baltic region comes with significant drawbacks. One concern is the potential for such deployments to exacerbate existing tensions and thereby make conflict more likely. In this regard, more deployments certainly play into President Vladimir Putin's strategic narrative of pervasive Western aggression and encirclement. More concretely, the forces could potentially undermine so-called "crisis stability," by generating incentives in a crisis for preemptive reinforcement (by NATO) or attack (by Russia). As analyst Martin Zapfe points out, NATO's Baltic EFP also presents Russia with opportunities for subversion of NATO cohesion, if NATO troops were seen to cause local civilian casualties, became focal points for protests by local Russian minorities, or even become terrorist targets.²³ Additional deployments would also be expensive, potentially controversial within NATO, and could raise concerns about NATO's commitment in the 1997 NATO-Russia Founding Act to forswear permanent basing of "substantial combat forces" in the territories of new NATO members.²⁴ Finally, and most fundamentally, it is not clear that deploying additional conventional forces to the Baltic would achieve the basic goal of deterrence by denial. Even a force considerably larger than the EFP would be vulnerable to a concerted Russian offensive.²⁵

Whatever forward conventional deterrent posture NATO chooses, there remains the acute problem of reinforcement if deterrence fails. Deploying additional ground forces from the US, or even from elsewhere in Europe, faces considerable logistical challenges and would take many weeks even in the most favorable circumstances. Moreover, many of the missile and air defense forces integral to Russia's operations in such a scenario would be located in Russian territory. As a result, US air and missile forces seeking to halt or roll back Russian advances would be

forced to attack Russian territory in substantial numbers. The escalatory dynamics of such a move are hard to predict, but cannot be considered without explicit reference to nuclear weapons.

Nuclear Deterrence and Escalation

The other “traditional” tools for deterrence and escalation management in the US-Russian context are nuclear weapons. The prospect of nuclear strikes in response to aggression has for several decades been the pinnacle of deterrence by punishment. However, as with conventional deterrence, though for different reasons, US and NATO nuclear deterrent capabilities are strong but far from ironclad. Moreover, should deterrence fail, escalation challenges are myriad, and the prospects for managing escalation highly uncertain.

One concern is that the very power of nuclear weapons gives rise to serious questions about their credibility as a deterrent in the context of limited conflicts when limited interests are at stake.²⁶ Many analysts also fear that the dynamics of nuclear escalation in a US-Russia conflict might currently favor Russia for two key reasons.²⁷ First is the potential asymmetry of interests between the two powers in an Eastern European crisis. If the US sees the credibility of alliance commitments at stake, but Russia sees the survival of its current regime potentially threatened, then Russia may ultimately be willing to run greater escalation risks. So if Thomas Schelling’s canonical analysis was correct, that nuclear crises are “competitions in risk-taking,” then Russia may gain the upper hand.²⁸ As in the Cold War, extended deterrence on behalf of allies is inherently harder to make credible than direct, bilateral deterrence.

The second concern is Russia’s large arsenal of non-strategic nuclear weapons, which affords diverse and unique opportunities for limited, targeted escalatory steps.²⁹ Russia’s recent policies and behavior offer some evidence that they aim to exploit these potential advantages. New patrols by nuclear bombers and heightened exercise tempo for strategic forces have been accompanied by considerable rhetorical saber rattling from Russian leaders, with generals, ministers, ambassadors and President Putin, himself, levying nuclear threats against various NATO allies.³⁰

However, what would Russia actually do in a crisis? There is ample debate among Western analysts about doctrinal interpretation and Russia’s real proclivity to use nuclear weapons.³¹ The often-cited shorthand for Russia’s policy of “escalate to deescalate” obscures more than it reveals.

It does appear evident that Russia is increasingly exploring non-nuclear tools of escalation management, enabled not only by its conventional force modernization but also by a growing set of offensive cyber and counterspace capabilities.³² Still, the basic fact remains that Russia maintains an arsenal of thousands of deployed non-strategic nuclear warheads. Overall, the potential for deliberate nuclear escalation is not trivial.

A related concern is that of inadvertent escalation. The main problem here is that the most likely NATO response to a military crisis with Russia would include a major US conventional air operation involving capabilities and operations that may appear indistinguishable from an attempted disarming first strike against Russian strategic capabilities. This does not need to be remotely close to NATO's intent for it to raise fears among Russian leaders.³³

Collectively, these concerns have moved from the periphery of US defense policy to its center, as signaled in particular by the most recent *Nuclear Posture Review's* declared intent to supplement the US arsenal of non-strategic nuclear weapons.³⁴

The obstacles and risks of traditional deterrence on NATO's Eastern flank, then, are formidable. Such challenges are not NATO's alone, of course; they burden Russian strategy as well. In no small part, this accounts for Russia's vigorous exploitation of asymmetric tools, such as proxy forces, cyber weapons, and disinformation campaigns in its pursuit of security objectives in recent years. Indeed, asymmetry has become a hallmark of Russian strategy, hailed variously (and contentiously) as the "Gerasimov doctrine," "gray zone conflict," "new generation warfare," or "hybrid warfare."³⁵

A broad but important question for US and NATO is, what promise do asymmetric approaches have in shoring up conventional and nuclear deterrence and escalation management? It is into this strategic context if anywhere, that horizontal escalation options should fit. At least a few experts have seen some potential value in such approaches. Former NATO official Fabrice Pothier, for example, has recommended building "options to escalate horizontally, allowing allies to respond to a crisis in the Baltic by exerting pressure on Russia in other regions, such as the Black Sea or the Northern Atlantic."³⁶ Michael Kofman argues that NATO's best approach "is to shore up deterrence by punishment, . . . leveraging US air power and the Navy as a global force able to horizontally expand the

theater of conflict and inflict colossal military and economic punishment on Russia should it aggress against a NATO member state.”³⁷

These ideas echo debates of an earlier generation of policymakers grappling with an analogous strategic challenge. The next section uses those Cold War debates to develop a simple framework to analyze the promise or peril of horizontal escalation today.

Horizontal Escalation: An Analytic Framework

The origin of horizontal escalation as a formal concept is often traced to renowned strategist Herman Kahn, whose 1965 book *On Escalation: Metaphors and Scenarios* contrasts escalation by “increasing the intensity” of a conflict with escalation by “widening the local area of conflict.” These came to be known as “vertical” and “horizontal” escalation, respectively.³⁸

Senior US policymakers began explicitly contemplating horizontal escalation as a key tool of military strategy prompted mainly by a pair of geopolitical shocks in 1979: The Iranian revolution, and the Soviet invasion of Afghanistan. These setbacks exacerbated concerns among President Carter’s national security team about the threat of Soviet attacks in the Persian Gulf.

In a top secret 1980 paper, Pentagon staffers set about examining the potential for “Horizontal Escalation as a Response to Soviet Aggression.”³⁹ Ten specific options—such as supporting insurgent groups in Soviet client states, striking Cuba, or conducting naval blockades—were assessed for their potential to “convey to the USSR that the US has both the will and the capability to oppose any Soviet incursion into Iran and that the US military response will not be limited to Iran or even to Southwest Asia.”⁴⁰ The paper argued that to be beneficial, horizontal escalation options would need to: affect Soviet cost-benefit calculations of continued aggression; acquire bargaining chips to be used in settling the conflict; and/or force the Soviets to divert forces from its main effort. Also, benefits would need to be weighed against potential Soviet counterattacks in kind and the heightened risk of general war.⁴¹

However, the analysis ultimately produced divergent perspectives among its participants. Some, assuming the direct territorial defense of Iran itself to be infeasible, saw horizontal escalation as a risky but acceptable “alternative to acquiescence in Soviet control of Iran or to escalating to nuclear warfare.”⁴² Others, looking at the options as adjuncts to a direct defense of Iran were more skeptical. As senior policy official Walter

Slocombe wrote, horizontal options “that are feasible (like striking at Cuba) aren’t significant enough to affect Soviet capabilities or incentives in Iran, and those that would be significant (like a Chinese attack on the USSR) aren’t sufficiently feasible to be reliable.”⁴³

This ambivalence in the Pentagon and President Carter’s electoral defeat temporarily deferred further planning for horizontal escalation options. However, President Reagan’s national security team soon began thinking about the concept in more strategic terms, and horizontal escalation—often referred to as “counteroffensives”—featured in many discussions and policy statements in the first few years of the Reagan administration.⁴⁴ This new emphasis was codified in 1982, when the Department of Defense (DOD) *Annual Report to Congress* noted that with respect to the potential for Soviet regional aggression, “. . . our strategy is based on the concept that the prospect of combat with the US and other friendly forces, coupled with the prospect that we might carry the war to other arenas, is the most effective deterrent to Soviet aggression. . . .”⁴⁵ In that vein, administration officials argued that in response to a Soviet attack in the Persian Gulf, “the US should have the capability to hit back there or in Cuba, Libya, Vietnam, or the Asian land mass of the Soviet Union itself.”⁴⁶

The policy area where horizontal escalation probably gained the most traction during this period was in developing the US Navy’s maritime strategy. One advantage of the potent global US naval force envisioned in that strategy was the ability to attack simultaneously Soviet naval and land targets from the sea around the world, regardless of where Soviet aggression was initiated. This vision became one, though by no means the only, rationale for the significant buildup of naval capabilities initiated by the new maritime strategy.⁴⁷

While Reagan’s national security leaders never publicly repudiated their interest in horizontal escalation, references to the strategy dissipated after the administration’s first few years and never reappeared. Of course, the occasion to implement any horizontal escalation options never arose, and by the end of the decade, the concept’s relevance had been overtaken by history.

In its relatively brief moment in the spotlight, horizontal escalation had raised both interest and skepticism among policymakers. The skepticism was also reflected in the few analytic reviews the strategy received at the time.

In a 1983 article in the journal *International Security* titled “Horizontal Escalation: Sour Notes of a Recurrent Theme,”⁴⁸ scholar Joshua Epstein postulated four potential operational goals that horizontal escalation might serve: deterrence by punishment; “hostage taking” for the purposes of a bargained settlement to a conflict; “compensatory acquisition” of some valuable asset or territory; and fixing, diverting, or otherwise distracting an adversary’s forces and leaders.

An assumption at the heart of the strategy, Epstein argued, is that “the compelling effectiveness of the horizontal action will surely depend upon the value placed by the Soviets upon its target.”⁴⁹ In this regard, he uncovered some of the same challenges that the 1980 Pentagon analysis did. In particular, he echoed the conclusion that the most feasible targets would be unlikely to have much coercive value, while the most valuable targets would entail the highest risk of further escalation. He also flagged the potential downside of diverting critical US military resources toward execution of peripheral operations, a point which Reagan’s classified 1982 *National Security Strategy* acknowledged as well.⁵⁰ Based in part on these problems, he concluded that a horizontal escalation strategy to deter or defeat Soviet aggression was neither clear nor credible.

Epstein’s argument emphasized the great uncertainty involved in predicting Soviet reactions to various “horizontal” targets: “[E]ven with clear goals for horizontal escalation in mind, the selection of an appropriate target seems to require knowledge of the *Kremlin’s* valuations. An uncertain affair even in peacetime, the problem would be compounded in war when, among other things, values change.”⁵¹

Uncertainty is also a prominent theme in the only other major published analysis of horizontal escalation. “Second-Area Operations: A Strategy Option” was the product of a study conducted for the Office of the Secretary of Defense by the RAND Corporation in 1984.⁵² Their framing of the problem could serve almost equally well today as it did then:

A fundamental question is to what extent fairly small-scale, multi-front campaigns can effectively be substituted for and influence the balance in central theater confrontations . . . Sidestepping the risks of central war by undertaking a series of second-area operations may require making commitments that involve greater (if different) uncertainties than those arising in classic deterrent strategies or central front wars.⁵³

The authors identified a similar set of theoretical goals for horizontal escalation as the other analyses, including “coercion, acquiring bargaining chips, diverting enemy forces, and imposing attrition on an opponent . . .”⁵⁴ They also enumerated a similar set of risks of such a strategy, including unintended escalation, counter horizontal escalation by the adversary, and diverting resources that would be better employed more directly.⁵⁵ Overall, like Epstein, the RAND authors ultimately arrived at a skeptical view of horizontal escalation.

Criteria for Evaluating Approaches

The Cold War analyses discussed here generally had convergent views on the relevant criteria for evaluating potential US horizontal escalation strategies against the Soviet Union. The most important considerations for an option can be addressed under three headings: its potential value; its escalation risk; and its costs to other priorities.

The principal source of potential value is coercion, where an option’s promise to punish Russian aggression and impose costs on its behavior is intended to deter or alter its behavior. Another related source of leverage could be to establish new bargaining chips for use in a negotiated end to a crisis. Finally, a horizontal option may have a more direct operational benefit by forcing a diversion of adversary resources, capabilities, or leadership attention.

At the same time, an option may increase the risk of further escalating a conflict. Unwanted escalation could take the form of vertical escalation, with Russia increasing the intensity of its aggression. With sufficient provocation or misinterpretation, this escalation could include Russian initiation of nuclear attacks in some form. Alternatively, Russia could respond “in-kind” through counter horizontal escalation on vulnerable US/NATO assets or interests in locations outside Europe or the US. It is important to note that escalation risk for each option must be considered not relative to inaction, but rather to the considerable escalation risk of more direct responses to aggression.

Finally, an option may entail costs to other US or NATO priorities. These costs could include the diversion of forces needed to support deterrence or counteroffensives in Europe or Asia, political costs in persuading or defying allies and partners, and risks of losses to allied military forces.

Scenarios of Interest: Deter or Manage What?

As is often the case in analysis of military strategy, some of the most consequential scenarios are also the least likely. As noted in the first section of this article, the scenario that has garnered the most attention of US and NATO military planners and analysts is a conventional confrontation between NATO and Russian forces in the Baltic region. While less likely than more surreptitious means of aggression,⁵⁶ a conventional invasion there would threaten not only regional security but also the credibility of NATO's collective defense and American extended deterrence commitments worldwide. Immediately at stake would be prospects for nuclear war and the viability of the NATO alliance.

As a result, the US military began focusing significant attention on plans for conventional warfare with Russia beginning fairly soon after Russia's aggression in Crimea and Donbas.⁵⁷ Of course, the Baltic states cannot afford to be sanguine about Russian restraint in a crisis. As the Estonian Foreign Intelligence Services' 2018 threat assessment summarized it, "the threat of a direct Russian military attack on NATO member states in 2018 is low," but "the only existential threat to the sovereignty of Estonia and other Baltic Sea states emanates from Russia."⁵⁸

Thus, a low-probability, high consequence Baltic invasion is the scenario best suited for analyzing the prospects for US/NATO horizontal escalation options. It is in this scenario where the shortcomings of other conventional and nuclear options are most acute, and where the stakes of the crisis would be most likely to prompt US leaders to give serious consideration to running the risks inherent in horizontal escalation.

A Russian invasion in the Baltic region could take several different forms. For purposes of this analysis two features are key. First, the attack must be of sufficient scale to seize Baltic territory and hold it against a concerted counterattack. This condition unambiguously confirms the implication of NATO's Article V requirement for a significant collective response. Second, Russia's initial aggression must not be accompanied by the use of nuclear weapons or any other major attack on US soil, since these developments would most likely render moot any plans for horizontal escalation.

Russia could have many strategic objectives in launching an attack, but the most likely one would be preventively shoring up defenses against a Western attack, especially in establishing a direct territorial link to Kaliningrad through Belarus and Lithuania. Naturally, such a course

of action would entail great risks for Moscow but is also consistent with some pre-emptive strains of thinking in contemporary Russian strategy.⁵⁹

Horizontal Escalation Options

There is a wide range of options for horizontal escalation against Russia in a crisis. In theory, Russian assets and interests anywhere in the world could be candidates for holding at risk, from its settlements in the Kuril Islands (disputed by Japan)⁶⁰ to economic interests in Latin America.⁶¹ While a comprehensive assessment is beyond the scope of this article, this section briefly analyzes four military options the US and its allies could pursue outside Northeastern Europe in the context of Russian aggression against a Baltic neighbor: 1) strikes on deployed Russian military forces in Syria; 2) global interdiction of Russian ships and seaborne commerce; 3) strikes on military bases in Russia's Eastern Military District; and 4) an invasion of Crimea to expel Russian forces and restore Ukrainian sovereignty.

As a set, these options represent a spectrum regarding both their geography and the scale of operation likely required to execute them. They comprise some of the most significant available options, and also serve to illustrate the advantages and disadvantages of a wider set of potential options. The focus here is principally on conventional military operations. Cyber, counterspace, financial, information, and other tools should be profitably analyzed in the context of asymmetric deterrence and escalation management. However, they would likely be employed in any response to Russian aggression and do not fit comfortably in the framework of horizontal escalation. Thus they are not addressed here.

For ease of comparison, each option is presented in a standard format. A general description is followed by assessments of each of the three criteria defined in the previous section: the option's potential value; its risk for unwanted escalation; and its potential costs for other US priorities. Finally, a summary evaluation is presented for each option.

Strike Russian Forces in Syria

Option description. As of this writing, Russia maintains a significant deployed military force in Syria supporting the regime of embattled President Bashar al-Assad in its civil war. The size and shape of this force have varied since its initial deployment in 2015, and its details have been

partly shielded from public reporting. However, there are likely a few thousand Russians in Syria attached to various air, naval, and ground force units.⁶²

These forces would be relatively vulnerable to US attack in a crisis. They operate out of fixed locations in Syria, such as the naval base at Tartus and the Hmeimim air base near Latakia, which are close to air and sea approaches open to NATO forces. The deployed forces are accompanied by some sophisticated defense systems, including S-400 long-range surface-to-air missiles⁶³ and Syrian operated anti-ship cruise missiles.⁶⁴ In combination with Russian naval forces in the Mediterranean and Black Seas, these capabilities have given rise to concerns over the establishment of a major Russian A2/AD complex in the Eastern Mediterranean region.⁶⁵ However, it seems unlikely, barring significant changes in posture, that these defensive capabilities would be sufficiently robust to defeat the sort of multi-axis air- and sea-launched cruise missile attack US forces would be able to muster on relatively short notice.⁶⁶

Potential value. The Syrian option does not hold many prospects of seizing Russian forces as bargaining chips or prompting diversion of significant Russian resources away from Northern Europe. The former would be prohibitively difficult and expensive for a relatively minor benefit, while the latter would simply be unlikely to materialize. The vulnerability of Russian forces in Syria to stand-off attack would be well understood in Moscow before its initiation of hostilities. Russia could choose to reinforce their Syrian defenses in advance of an attack in the Baltics; however, they would be highly unlikely to do so in any way they thought would compromise operations in the Baltics. The size of the Syrian deployment simply would not justify such a gamble.

Instead, the intended benefit from this option for the US would depend on the coercive efficacy of the costs imposed on Russia for its aggression. These costs could include dozens or even hundreds of casualties, loss of aircraft, ships, and equipment, plus the crippling of its expeditionary capability in Syria and the greater Mediterranean. Additionally, the strikes would highlight the potential for additional strikes in other locations. If successful, this option could also serve to disabuse elite and popular opinion in Russia of any expectation that its course of action in the Baltics would be an easy victory or could be sustained at low cost.

Escalation risk. A principal attraction of the Syrian deployment as a horizontal target is that it is clearly separated from Russian territory. This is one of the most important factors in mitigating the risk of vertical escalation. The strikes would not challenge Russian sovereignty and would be very hard to mistake for a prelude to attacks on nuclear forces or regime leadership. However, if Russia wished to respond to this option proportionately, it could probably do so, targeting US forces in deployed locations.

Costs to other priorities. A US strike on Russian forces in Syria could be conducted at a relatively low cost and risk to US forces. The principal opportunity cost of this option for operations in the Baltic region would be the munitions expended. Most or all of the strikes could be launched from ships and aircraft operating at or near locations also useful to support the central effort. This option entails attacking the territory of a state not a party to the European conflict, which could carry some political price for the US. Some US allies may not be supportive of this option for this reason. However, under the circumstances, Syria under the Assad regime would be perhaps the least problematic external state imaginable for such expansion of US combat operations against Russian interests.

Summary. Striking Russian forces in Syria is feasible, probably at a relatively low cost to the US and NATO. The option's escalatory risks are modest. However, this option's coercive value is sharply limited by the relatively small stakes involved in Russia's Syrian deployments as compared to the major gamble of a hypothetical Baltic invasion.

Interdict Russian Ships and Seaborne Commerce

Option description. The US and NATO could exploit their significant naval advantages over Russia to sweep the oceans of Russian ships and interdict Russian seaborne commerce. Russian naval deployments beyond its near seas are typically modest, and Moscow would likely be conservative about leaving its surface vessels far from home, and therefore vulnerable, in the event of a planned assault in the Baltics. Even so, in a crisis, a handful of Russian surface combatants operating in the Atlantic, Pacific, or Indian oceans may well be vulnerable to capture or attack.⁶⁷ Besides, at least some small fraction of Russia's 2,500 flagged merchant ships⁶⁸ would be at sea and largely defenseless against military interdiction.

More broadly, this option could include something akin to a distant naval blockade of Russia.⁶⁹ The large majority of Russia's commercial shipping transits the major port terminals around St. Petersburg in the Baltic Sea, Novorossiysk in the Black Sea, and Vladivostok on the Pacific coast. More than half of Russia's containerized seaborne trade and more than a third of its seaborne crude oil exports transit Baltic ports.⁷⁰ This traffic would likely be curtailed or stopped by a war in the Baltic regardless of any horizontal escalation strategies. Operationally, a coercive blockade would focus on interdicting Russian trade in the Pacific and possibly in the Mediterranean, if Turkey allowed Russian traffic to continue transiting the Bosphorus Strait. While mining of ports and other direct close-in attacks could be considered in this context, the principal concept here focuses on diversion, capture, or destruction if necessary, of ships bound to or from Russia by the US and allied naval forces positioned beyond the range of Russian land-based defenses.

Potential value. Analysts have explored a naval blockade as a coercive tool and an indirect alternative to attacking sophisticated A2/AD systems in Chinese scenarios extensively.⁷¹ However, no similar body of analysis exists for Russian scenarios. In theory, a blockade holds coercive promise distinct from strikes on limited military targets, in that it can limit the loss of life while exerting a growing effect over time. The costs accumulate, as opposed to being "sunk" as soon as the military option is executed. Moreover, seaborne trade is important to Russia's economy. Russia exports most of its crude oil and condensate production and relies on shipping for more than 80 percent of those exports.⁷² In turn, more than a third of the federal budget revenue comes from sources related to oil and gas activities.⁷³ Apart from denying Russia the financial returns on exports, the reduction in imports resulting from a blockade could create hardships for Russian consumers and some sectors of the economy.

However, there is a reason to doubt that the costs of a blockade would provide much coercive leverage in a Baltic crisis. One challenge with economic coercion is that it takes time to have any effect, time that Russia would use to consolidate and reinforce its tactical and diplomatic positions. There is some potential for a blockade, in concert with financial and cyber tools, to generate an economic shock in a short timeframe.⁷⁴ However, Russia enjoys substantial resilience against such measures. It is less dependent on seaborne trade than, for example, China or the US. It

is largely self-sufficient for energy and has extensive overland trade with China (among others), whose participation in any US or NATO-led blockade would be unreliable at best.

A related challenge is that the economic hardship likely to be imposed by maritime interdiction would be of relatively modest scale (given the factors noted above) and relatively diffused across Russian society. Unlike, for example, financial sanctions targeted at individual Russian elites, the hardships from a blockade would be spread across most of the economy and population, undermining its political potency. Russia is not historically known, after all, for wartime capitulation under economic hardships.

Escalation risk. An important but manageable escalation consideration for a maritime interdiction option is avoidance of any Russian perception that NATO naval operations were targeting its nuclear weapons-carrying submarines (SSBNs). A key mission for Russia's attack submarines and the surface fleet is the defense of a few "bastion" operating areas for the SSBNs.⁷⁵ Certainly, in the context of horizontal escalation strategy, the US and NATO would exercise caution not to target any ships associated with the defense of those bastions.

Global maritime interdiction, like the Syrian option, avoids attacks on Russian territory. It also holds out the possibility of imposing costs with military means, but without significant violence. This is a benefit for escalation risk. At the same time, the option introduces explicitly civilian targets in the form of both commercial shipping and economic hardship, which could serve to legitimize reciprocal Russian actions.⁷⁶ Such actions could—though need not—take the form of mirrored maritime interdiction responses. Russia's submarine forces would likely be fairly busy defending SSBN bastions and approaches to Russian waters and focusing limited offensive operations on military targets. Nevertheless, Russian attacks on US and NATO commercial shipping nominally unrelated to the NATO-Russia conflict should not be ruled out.

Costs to other priorities. On the one hand, blockading Russian commerce could provoke opposition from US allies, such as Germany and the Netherlands, who have major trading relationships with Russia, both as importers of Russian oil and gas, and as exporters to Russia's domestic market.⁷⁷ On the other hand, the extreme scenario of Russian aggression in the Baltics would probably have disrupted these relationships already, especially with NATO members. This would limit the salience

of objections from US allies to a blockade. However, at the same time, this also demonstrates that Russian leaders would have factored these potential effects into their plans for aggression from the outset, perhaps implying that they were prepared to endure the burdens of economic disruption.

Though detailed operational assessments are beyond the scope of this analysis, achieving a significant effect on Russian commerce appears plausible, but challenging. Enforcement of even a distant naval blockade would be resource intensive for US and NATO navies. Commercial shipping fleets are very large, and identifying Russian-flagged ships, much less Russian cargo on foreign-flagged ships, could be difficult. Large numbers of ships and aircraft would need to be dedicated to patrols, identification, boarding, escorting, and quarantining potential targets, not to mention disabling or sinking blockade runners. For the most part, these ships would not be available for other naval missions.⁷⁸

Maritime chokepoints on the approaches to Russia's main ports would facilitate blockade operations, though cooperation by countries abutting those chokepoints would be vital. In most cases, those countries are members of NATO, but blockading Vladivostok would depend on Japanese and South Korean support, two nations perhaps unenthusiastic about inviting Russian retaliation for a somewhat distant cause.

Summary. Interdicting Russian ships and seaborne commerce promises potentially meaningful cost imposition paired with reasonably good escalation management. In this way, it does offer some measure of deterrent value. However, barring an unexpected cascade of economic shocks, even successful execution of this option seems unlikely to levy sufficient punishment on Russia to effect a reversal of their aggression, especially given that much of the trade that would otherwise be subject to blockade may already be disrupted by the initial onset of the war. Moreover, the successful execution of this option would require extensive cooperation from allies and partners as well as the diversion of naval and air assets that could hamper operations in Northeastern Europe.

Strike Eastern Military District Forces

Option description. Russia's Eastern Military District spans a major portion of Asian Russia East of the Ural Mountains. Compared to the Western and Southern Military Districts, the Eastern District's dedicated military capabilities are sparse, reflecting not only the relative scarcity of

assets to protect in the Far East but also a generally more benign threat environment.⁷⁹ That said, Russia's military modernization efforts in the past decade have included augmentation of capabilities in the Far East. These include new deployments to the Kuril Islands, the creation of a variety of new units in the region, and modernization of old equipment. Especially important is the enhancement of air defenses aimed at bolstering a defensive perimeter around the Bering Strait, the SSBN bastion in the Sea of Okhotsk and more southerly maritime approaches to the Russian Pacific coast.⁸⁰

Potential US targets in this option would include the surface ships of the Pacific Fleet and various Air Force and Army bases located within the range of stand-off strike platforms. This might include roughly a few dozen ships, over 200 combat aircraft, nine maneuver brigades and a variety of other support units, many located in the coastal Primorski Krai.⁸¹ Russian defenses against US attacks on these targets would be far stronger than defenses in the Syrian option. Nevertheless, US naval and land-based air forces could readily project sufficient strike capabilities to inflict substantial damage if such deployments were prioritized. To minimize the risk of ship and aircraft losses, the US would likely favor long-range cruise missiles such as the Tomahawk Land Attack Missiles (TLAM) and Joint Air-to-Surface Standoff Missile–Extended Range (JASSM-ER) for these strikes.

Potential value. Like the Syrian strikes, attacks on Far East military targets would be aimed principally at imposing costs on the Russian regime for its Baltic aggression, and either implicitly or explicitly signaling the ability and willingness to expand those attacks. The symbolism of direct attacks on Russian territory would certainly be significant, especially if no such attacks had occurred yet in Europe. Moreover, the military losses incurred, especially in the Pacific Fleet, would represent painful setbacks to Russia's capability and self-image as an Asian power.

The option also offers a chance of prompting a diversion of Russian forces and resources, albeit only a small one. Most likely, Moscow would avoid drawing down any significant capabilities in its Western or Southern Military Districts in response to the attacks and probably would have consciously accepted the risk of some losses in the East before embarking on its aggression.

Indeed, partly, for this reason, it is unclear that strikes on the Eastern Military District would translate into major coercive leverage for the US

and its allies. If losses in the Far East were already factored into Russia's calculations over its Baltic plans, then this option would be unlikely to alter their course of action fundamentally.

Escalation risk. This option's escalatory risk is contingent on whether it was pursued before or after initiation of NATO combat operations in Europe. The escalatory dynamic would be substantially mitigated if NATO strikes had already begun on Russian territory in the vicinity of the Baltics. If they had not, this option could conceivably cross a threshold for Russia's leaders and prompt a limited nuclear strike or some other non-nuclear strategic strike on US or allied homelands. If they had, this option would only constitute an incremental escalation. Though Russian leaders might still have to reconsider their assessment of the scope of US/NATO goals in light of the expanded campaign, there is evidence that Moscow would be thinking about the conflict in a holistic geographic context from the beginning of the engagement.⁸²

Whatever the timing may be, there is the potential for Russian misinterpretation of strikes in the East to be seen as a precursor to a disarming strategic strike. This would be the case for any attacks on Russian targets close to nuclear facilities or forces. Care would need to be taken to ensure that no strikes were seen as targeting Russia's strategic forces in the region, including SSBNs based at Petropavlovsk-Kamchatskiy and long-range aviation bombers at Ukraine Air Base near Belogorsk.⁸³ Another tactical consideration in this regard is that the American B-2 bomber (or its future B-21 successor) would theoretically be a plausible platform for performing these strikes and would allow for the use of shorter range munitions. However, since these US penetrating bombers are nuclear capable, there would be value from the escalation management standpoint of avoiding their use in this context.

Costs to other priorities. While Russian forces in the Far East would be hard-pressed to defeat a concerted US and allied effort, executing this operation would still involve considerable operational risk and demand dedication of substantial combat power. In addition to attack submarines, one or more carrier strike groups would likely be dedicated to the operation to provide more strike platforms and defenses. Guam could be used to generate land-based strike sorties from US territory. However, the operation would likely depend on Japanese support to provide basing for support aircraft for missions such as refueling, intelligence and surveillance, command and control, electronic warfare, and anti-submarine warfare.

The long-range cruise missiles that would be the primary tools for striking targets in Russia's Far East would also be heavily demanded for deterrence and combat operations in Northeast Europe in this scenario. Moreover, these weapons are a crucial element of US deterrence against Chinese aggression, so emptying US inventories of those weapons nominally apportioned to the Pacific theater would come with significant risk.

Summary. This option could succeed in damaging and signaling further harm to Russian interests of real value to leaders in Moscow. However, executing the option could entail significant escalation risks and trade-offs in the resources available for operations in Europe and would pose some risk to the forces involved. And, since the attacks would not be completely unexpected and would imperil interests ultimately smaller than those at stake in a Baltic crisis, they would be unlikely to result in either major operational benefits or decisive coercive effects.

Seize Crimea

Option description. Among the most extreme horizontal escalation options, US and NATO leaders might consider an invasion of Crimea. Since 2014, Russia has occupied Crimea, the peninsular province of Ukraine with unique Russian historical ties. While Russia's rule in Crimea enjoys some measure of local support, few countries recognize its legitimacy.⁸⁴ So a US/NATO offensive there would at least maintain the *de jure* features of avoiding placement of troops on Russian territory and could be justified by restoring Ukraine's rightful sovereign boundaries. The Kremlin, naturally, would not share this interpretation of these actions.

Strategically, such an offensive would require a major diplomatic effort to garner support within NATO. Operationally, it would require an allied combined arms effort rivaling the scale of that required for a counteroffensive in the Baltics. As noted below, Russian air and coastal defenses in Crimea are strong and growing. Accordingly, the first step of a NATO attempt to seize Crimea would be a major campaign of strikes to neutralize Russian defenses. This might require attacks on Russian air defenses deployed in Syria as well. The primary ground assault force would probably need to maneuver into and through Ukraine. Airborne and amphibious forces could play a role, but they would remain fairly vulnerable even after substantial suppression of Russian defenses. Implementing this option would depend on support from, at a minimum,

Ukraine and NATO allies adjoining the Black Sea. Besides Romania and Bulgaria, Turkey's support would be especially vital, given its unique influence over maritime and overflight access to the Black Sea.

Potential value. By threatening Russia's control over territory with an ethnic Russian majority population, which it has reclaimed as its own, this option imperils Russian interests of potentially commensurate value as those at stake in a Baltic crisis. Moreover, given the difficulty and risk for NATO in mounting the operation, Moscow may well discount the odds of such an attack in its own initial risk calculations. Together with Crimea's inherent importance to Russia, this factor makes this option more likely than the others assessed here to prompt Russia to reassess the costs and benefits of its Baltic aggression fundamentally. In this context, the prospect of NATO seizing Crimea could serve as a strong incentive for Russian leaders to seek a negotiated return to the status quo.

Operationally, this option would present a dilemma for Russia's prioritization of its force deployments. Uniquely among the options assessed here, a significant diversion of Russia's conventional forces is a plausible response. Crimea's relative proximity to the Baltics would make some timely reallocation of ground and air units feasible.⁸⁵ And the importance of defending Crimea would make this a real consideration in Moscow.

Escalation risk. For the same reasons that this option has the most coercive potential of those considered here, it is also the option most likely to prompt an escalatory Russian response. Many Russians never accepted the legitimacy of Ukrainian sovereignty in Crimea and saw it as part of the Russian homeland. And Moscow would be concerned not only about losing control of Crimea, itself, but about the potential for additional incursions in the region if NATO forces were to gain a secure foothold in Ukraine. These could include NATO movement into Eastern Ukraine, Moldova, contested territories in Georgia, or even into Southern Russia, itself.

As with any US/NATO strategy, limited Russian nuclear use is one plausible escalatory response.⁸⁶ Non-nuclear escalation responses specific to this option might include widespread targeting of military and infrastructure targets in Southeastern Europe, which Russian missile attacks might otherwise have de-prioritized.

Costs to other priorities. Seizing Crimea is clearly the most dangerous and costly of the horizontal escalation options. Since annexing Crimea, Russia has conducted a major buildup of military capabilities

there, creating what some analysts see as a Black Sea A2/AD “bubble.”⁸⁷ The port city of Sevastopol was already home to Russia’s Black Sea fleet. It recently added substantial capability, including naval infantry, air, and coastal defense missiles, and new frigates and corvettes equipped with highly capable KALIBR anti-ship and land attack cruise missiles. The fleet has also expanded its diesel-electric submarine force from one boat to seven.⁸⁸ Russia is completing a major bridge complex over the Kerch Strait to link Russian territory directly to Crimea, a move motivated in significant part by military considerations and accompanied by the development of defensive plans and capabilities.⁸⁹ While the bridges could be neutralized early in a conflict, Russia would still maintain the capability to reinforce Crimean defenses through the air, across the Sea of Azov,⁹⁰ or even overland through Eastern Ukraine.

So given Russia’s current and planned posture in the Black Sea region, an assault on Crimea would pose many similar challenges to the hazardous Baltic counteroffensive that it would aim to obviate. And, recent augmentations of NATO Black Sea capabilities notwithstanding,⁹¹ mounting such an operation would certainly impose trade-offs on NATO’s prioritization of force deployments, perhaps even to the extent of precluding a credible simultaneous counteroffensive threat in the Baltic.

Politically, the option’s feasibility is far from assured. NATO consensus, difficult under any circumstances, may prove particularly elusive on such an ambitious yet indirect strategy. Even if the US was willing to proceed in the absence of NATO consensus, Turkey’s willingness to play such a central role in military operations against Russia is highly uncertain, given recent trends in Russian-Turkish rapprochement.⁹² Another political concern that this option would raise relates to the longer-term durability of US extended deterrence. The Baltic states and perhaps other US allies may see the choice inherent in this option of avoiding a confrontation of Russia’s territorial aggression as undermining American commitments to NATO defense particularly or its treaty commitments more broadly.

Summary. Among the horizontal escalation strategies assessed here, seizing Crimea is the most formidable option with the best chance of changing Moscow’s calculus regarding Baltic aggression. However, the option is also the most likely to prompt unwanted Russian escalation, including nuclear use. The option also faces significant operational and

political obstacles to implementation, to a degree comparable to a direct counterattack on Russia's Baltic encroachment.

Conclusions and Implications

The question posed at the beginning of this article was: Can horizontal escalation strategies help deter Russian aggression or manage escalation in a US/NATO-Russia conflict? The preceding analysis suggests an answer of "yes," but only with significant caveats.

In important respects, the problems that plagued the strategy of horizontal escalation in the Cold War remain relevant in confronting Russian aggression today. Just as analysts and Pentagon planners found in the early 1980s, contemporary horizontal escalation options that are feasible are not significant enough to change Russian incentives in a major crisis. And options that are significant enough to promise strategic effects are fraught with operational challenges, escalatory risk, or both. All the same, the threat of horizontal escalation could help deter Russian initiation of aggression and help signal resolve in a crisis.

Four basic conclusions emerge about horizontal escalation as a tool for deterring and managing escalation with Russia.

1. Horizontal Escalation's Potential Value and Its Escalatory Risk Are Correlated

This point is perhaps obvious, but central to the strategic problem. US and NATO leaders contemplating horizontal escalation strategies face an inescapable dilemma. Threatening—or even seeming to threaten—those interests of greatest value to Russian leaders, such as territorial control, strategic weapons, or regime stability, could just as easily provoke escalation as induce restraint. By contrast, the Syrian and maritime interdiction examples above illustrate how threatening less vital but still important interests, such as deployed military forces and trade, can help manage escalation risk. Even then, however, some risk remains. The Pentagon's 1980 analysis highlighted this general problem as well, finding that:

The only category of ripostes which has the possibility of raising Soviet costs to a level commensurate with the gains of occupying Iran involves a major escalation of the conflict . . . Such actions, however, carry heavy risks of rapidly expanding the conflict to a worldwide NATO-Warsaw Pact war with the attendant risk of nuclear escalation.⁹³

2. In High Stakes Scenarios, Coercing with Punishment Is Difficult

Because of horizontal escalation's inherent risk of provoking further escalation, US and NATO leaders would most likely only consider such options in scenarios where relatively high stakes were involved, such as the hypothetical Baltic crisis. Running high risks for lesser stakes would be hard to justify. However, it is precisely this kind of scenario where Russian resolve would be greatest and therefore most difficult to break with threats or imposition of punishment.

If Moscow were to invade a NATO ally, it would undoubtedly be prepared to incur costs and accept risks along the way. The kinds of costs involved in the options analyzed in this article—such as economic hardships from interdicted trade or military losses in Syria or the Eastern Military District—would likely have already been factored into the original decision to attack the Baltics. This problem was also evident to the Pentagon planners in 1980, who noted: “There is no US and allied riposte against Soviet interests . . . that would clearly equal or exceed in value the political, military, and economic gains the Soviet Union could be expected to achieve. . . .”⁹⁴

This point harkens back to Schelling's distinction alluded to earlier between deterrence and compellence.⁹⁵ Horizontal escalation, it turns out, presents a special case of the general rule that compellence is harder to achieve than deterrence. What about deterrence? Might the prospect of facing such US/NATO attacks make an unlikely scenario even more remote? The next point focuses on this conundrum.

3. Uncertainty About the Effects of Horizontal Escalation Is Both a Liability and an Asset

Evaluation of any horizontal escalation option is subject to considerable uncertainty, especially regarding adversary perceptions, values, and escalation thresholds. Understanding how adversaries would perceive their own (much less their adversaries') stakes and risk tolerance and expected outcomes is inherently difficult. In Richard Smoke's classic examination of escalation, his historical case studies show that escalation failures most often occur because of a fundamental failure on the part of policymakers to comprehend how the world looked to others and understand basic assumptions, goals, and options of decision makers in other capitals.⁹⁶ As noted earlier, uncertainty was also a prominent

theme in the two cited non-government studies of horizontal escalation in the 1980s.

This uncertainty has strategic value to Russia, to be sure, and it is in their interest to remain somewhat opaque regarding intentions and escalation thresholds. However, such uncertainty can cut both ways, and it is here that horizontal escalation's deterrent value gains a foothold. Russia's leaders may share the general conclusions of this analysis, and the others cited here, that horizontal escalation options are probably either too modest to be effectual or too costly and risky to be attractive. But the merits of the case are not so stark as to inspire great confidence that the US and NATO would reject horizontal escalation. Accordingly, if US and NATO forces gave Russia indications, either explicit or implicit, that they were planning for execution of such contingencies, this could influence Moscow's cost-benefit analysis before launching overt aggression.

4. Horizontal Escalation Could Be Valuable as a Signal of Resolve

Previous analyses of horizontal escalation identified its potential benefits as coercive punishment, seizing bargaining chips, and diverting valuable adversary resources. But there is another plausible benefit that does not appear to have been part of the discussions of horizontal escalation in the Cold War: shaping Russia's perceptions of the stakes that the US and NATO see in a crisis and its expectations about what they might do next. In other words, horizontal escalation could help signal resolve.

If Russia did seize control of some portion of the Baltic States, one of its chief objectives would then be to deter a NATO counteroffensive to regain the territory. To achieve this deterrence, it would be counting on its initial local military advantages, divisions within NATO over the importance of specific territorial stakes, and the shadow of nuclear war. On the other side, NATO's goal would be to force a Russian withdrawal without having to execute a counteroffensive. NATO could only hope to achieve that by making the counteroffensive appear highly credible. Effective mobilization and resilience of the military capabilities for that attack would be the principal means of demonstrating that credibility.

However, this is also where means of signaling resolve could play an effective supporting role. If a horizontal escalation option (or options) were executed in the midst of a Baltic crisis—after a successful Russian *fait accompli*, but before a counterattack—this could signal US/NATO's

willingness to accept significant costs and risks to achieve its goals. This could in turn help convince Moscow that its deterrence strategy was destined to fail, a seemingly necessary pre-condition for achieving a negotiated Russian withdrawal. This point does nothing to eliminate horizontal escalation's drawbacks, but it does add an important new dimension to US and NATO's deliberations on developing horizontal escalation strategies to confront Russian aggression.

In sum, horizontal escalation strategies are worth examining for US and NATO strategists, but should only be considered for employment with great caution. Under most circumstances, their costs and risks appear likely to outweigh their benefits. Their promise of coercing or distracting Russian leaders in a Baltic crisis is highly constrained. However, horizontal escalation's potential benefits for deterrence before a crisis and signaling during a crisis justify greater attention and planning than it has received to date.

Greater attention to horizontal escalation would require reviews of plans and capabilities in US and NATO organizations. Expanding planning for horizontal escalation would be valuable for two reasons. First, none of the options for responding to Russian aggression is particularly attractive, so it is natural to develop and test a wide portfolio of options, even ones that are unlikely to be executed. Costs and benefits of any course of action are highly contingent, and leaders can benefit from a rich menu of options in a crisis. Second, planning offers the opportunity—without making any commitments or costly investments—to expose Russian leaders to the notion that aggression against NATO or the US might put its interests everywhere in the world at risk. Whether this message is conveyed overtly or covertly, it exploits the inherent uncertainty of a prospective crisis in the service of deterrence.

Concerning capabilities, if horizontal escalation is to be credible for signaling resolve, specific options would need to be operationally plausible. From a political standpoint, this would require some diplomatic spade-work both inside and outside NATO, to determine which options would garner which kinds of support, and to coordinate planning and signaling. From a military standpoint, many horizontal escalation options are already fairly credible without greater marginal investment in military capabilities. On the other hand, operational feasibility of some options may be constrained by capacity rather than capability; that is to say, by quantity, not quality.

Given the importance of a standoff strike to both a Baltic counteroffensive and horizontal escalation options (not to mention deterrence of other adversaries), long-range cruise missile inventories may be the most logical candidate for expansion in this context. Some options could also buttress arguments for expanding major elements of force structure; a robust maritime interdiction option would benefit from larger NATO navies, for example. Or, a Crimean invasion conducted in conjunction with mounting a Baltic counterattack might benefit from larger NATO armies. However, given the extraordinary expense of such capability enhancements, it is hard to imagine horizontal escalation strategies having a force planning influence on this scale. In expanding its asymmetric options, the US and NATO must take care not to impose costs on the wrong side of the competition inadvertently.

Finally, it is critical to reiterate that horizontal escalation should be thought of as a niche element in an integrated set of asymmetric tools for deterrence and escalation management. These tools span the full range of elements of power and thus underscore the importance of greater integration between conventional and nuclear operational planning, across geographic, functional, and national military headquarters, and between military and non-military tools and organizations.⁹⁷ Ultimately, it is a holistic, coordinated strategic campaign—not a “silver bullet”—which offers the best hope of navigating the daunting challenges of any military confrontation in Europe. ■■■

Notes

1. The author is grateful for input and feedback from James Blackwell, Stephen Blank, Robert Bovey, William Chambers, Susan Clark-Sestak, John Deni, Christopher Hickey, Daniel Rosenfield, Michael Wheeler, Heather Williams, and an anonymous reviewer.

2. For an argument emphasizing the continuity between Cold War and contemporary deterrence problems, see Austin Long, “Deterrence: The State of the Field,” *NYU Journal of International Law and Politics* 47, no. 2 (Winter 2015): 357-377, <http://nyujilp.org/wp-content/uploads/2015/11/NYI204.pdf>.

3. John Lewis Gaddis, “Containment: Its Past and Future,” *International Security* 5, no. 4 (Spring 1981): 80, <https://doi.org/10.2307/2538714>.

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Deterring Terrorists Abroad: The Implausibility of Indirect Deterrence

Ann Mezzell

Abstract

This article offers reasons for significant pessimism about the prospects for success in adopting an indirect approach to deterring terrorist threats in fragile and civil war-prone states. Individual case studies and comprehensive statistical analyses suggest US security force assistance (SFA) correlates with deterrence failures—the onset of civil wars in partner states, which allow for inroads and safe havens for terrorist organizations—and increased partner-state repression of targeted population groups. In short, SFA is an ineffective means of shoring up partner stability, inhibiting civil war, and deterring terrorists. Worse yet, SFA risks leaving partner states more susceptible to intrastate war, and the US more susceptible to terrorist threats to its interests abroad, than they would have if the US had done nothing at all.

The *2018 National Defense Strategy (NDS)* identifies “interstate strategic competition, not terrorism” as the overriding US national security concern.¹ Even as senior leaders focus on “deterring or defeating long-term strategic competitors” like China and Russia, the US still needs to counter the “persistent condition” of terrorism.² Indeed, the *NDS* notes the Joint Force will “sustainably compete to: deter aggression in three regions—the Indo-Pacific, Europe, and the Middle East.”³ Addressing both sets of challenges—rebalancing capabilities to account for emerging strategic competition, yet maintaining capabilities to account for enduring terrorist threats—requires a significant strategic reset. How is the US adapting to meet these twin challenges? Is it adapting to account for the changing

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character of the terrorist threat, which has emerged in concurrence with the changing strategic environment?

Beginning with the 2001 invasion of Afghanistan, the US employed largely direct means of countering terrorists; in Afghanistan and Iraq, it conducted substantial military interventions, engaging in counterterrorism operations, population-centric counterinsurgency warfare, and sizable nation-building projects. Military operations, in particular, aimed to deter terrorists from re-establishing footholds in these politically unstable and conflict-prone states. Recognizing that terrorists and other violent non-state actors (VNSA) had become adept at exploiting security gaps in fragile states, the US committed enormous resources to counter their influence in Afghanistan and Iraq, hoping to stave off civil wars and state collapse.⁴ However, with the return of great power competition, the US cannot afford to maintain such a cost-intensive strategic and operational approach to combating VNSAs. Instead, the new strategic approach calls for more agile deterrence options. To this end, the US has shifted to a strategy of deterrence by denial, employing indirect means to deny terrorists and other VNSA inroads, safe havens, and bases of operation in fragile states.⁵

Deterrence by denial hinges on the “capability of denying an aggressor his battlefield objectives with conventional forces.”⁶ The *2017 National Security Strategy (NSS)*, the *2018 NDS*, and related theater strategy documents suggest the US will increasingly rely on indirect means to conventionally deter VNSAs—especially in fragile states at risk of armed rebellion—from civil violence in US partner states. The cornerstone of this indirect approach to deterrence is security force assistance (SFA), in which the US assists partner states with shoring up their security forces against terrorist threats, as a way to deter civil violence (that threatens partner state and US interests).⁷ SFA refers to the provision of military aid, training, equipment, and support to partner states.⁸ Some depict military assistance as crucial to US aims in the Middle East and Central Asia. For example, Gen Joseph Votel, commander, US Central Command, contends US support to Afghan forces is key to deterring Taliban resurgence in Afghanistan.⁹ Whether SFA yields deterrence successes—denying VNSA options for building inroads, generating instability, and waging war in partner states—is an open question. Indeed, the empirical record for SFA outcomes is notably mixed.¹⁰ While SFA’s effects on partner states and US national security interests are increasingly

subject to interest from the academic and policy communities, its effects on deterring terrorism remain largely understudied.

There are several reasons for pessimism about the prospects for success in adopting an indirect approach to deterring terrorist threats in fragile and civil war-prone states. Individual case studies and comprehensive statistical analyses suggest US military assistance correlates with deterrence failures—the onset of civil wars in partner states, which allow for inroads and safe havens for terrorist organizations—and increased partner state repression of targeted population groups. In short, SFA is an ineffective means of shoring up partner stability, inhibiting civil war, and deterring terrorists. Worse yet, SFA risks leaving partner states more susceptible to intrastate war, and the US more susceptible to terrorist threats to its interests abroad, than they would have been if the US had done nothing at all.

This article addresses the logic behind the US's growing reliance on the indirect approach to conventional deterrence as well as the limitations of that approach. It examines failures to deter al-Qaeda's influence and activities during the onset and spread of the Yemeni Civil War. Finally, it presents considerations for US foreign policy decision makers regarding future counterterrorism pursuits.

The Logic of Indirect Deterrence

Given the need to secure US interests against strategic competitors and VNSA alike, and the risks of either broadly engaging or broadly ignoring “real but limited” terrorist threats—decision makers are primed for seeking alternatives to direct and cost-intensive uses of force.¹¹ As Elbridge Colby, deputy assistant secretary of defense for Strategy and Force Development, says of the *2018 NDS*, “One of the things the strategy is trying to do is say that we know we are going to be dealing with terrorism in one way or another for the long haul—so let's figure out ways of doing it that are more cost-effective, that are more tailored.”¹²

Defensive posturing and offensive counterterrorism operations require significant resources: the former for “detecting and deflecting” threats as they arise, and the latter for defeating threats at their sources.¹³ Direct conventional deterrence and traditional extended deterrence (in the form of retaliatory strikes, military interventions, or proxy wars against threats to protégés) are also costly, and largely inapplicable to the risks of intrastate instability and civil war onset. The indirect approach to deterrence,

though, presents a seemingly limited and resource-sustainable means of serving extended deterrence aims—it affords the US options for managing conflict in regions of interest without having to overtly commit to defending protégé states against threats of aggression. By “sponsoring” other states’ security forces, the US can limit expenditures to the provision of military aid, training, and equipment; the burden of employing those resources falls largely on the partner states.

In theory, the indirect approach to deterrence should allow US decision makers to balance capabilities for serving priority interests in Europe and the Asia–Pacific as well as lingering concerns in the Middle East, Central Asia, and Africa. Moreover, it should provide options for deflecting strategic competitors’ and VNSAs’ growing facility for exploiting intrastate crises to their advantage. Both Russia and the Islamic State (IS), for example, took advantage of Syria’s descent into instability, violence, and civil war: Russia gained a foothold in the Levant, and IS gained territory in support of its declared caliphate.

The indirect approach to deterrence should also allow for a measure of political cover. Unlike directly coercive threats or uses of force, SFA is relatively low-profile; it tends to draw little risk of oversight–interference or public scrutiny. The US humanitarian wars of the 1990s and state-building efforts in Afghanistan and Iraq generated considerable political debate. SFA, though, is structured to minimize the US military footprint in the partner state. It tends to go unnoticed by the US public and sometimes, by administration officials and members of Congress. This helps ensure that SFA shortcomings incur limited reputational costs for the US; the US rarely “loses face” as a result of a state descending into civil war, regardless of US security force assistance.

Finally, the employment of indirect approaches in states prone to civil war is not new to the US. The US maintains a long record of employing military assistance and small-scale interventionism to secure partner states (or US-aligned groups operating inside hostile states) against threats of aggression. Indeed, these “small footprint” efforts constituted the plurality of US twentieth-century military operations. Military assistance-and-support operations were key to the pursuit of US post–WWII containment aims; it functioned as the primary non-nuclear military pillar against communist threats to the liberal international order.¹⁴ The US breadth of experience with the indirect approach should prove useful to contemporary SFA strategists.

The Limitations of Indirect Deterrence

Despite the many reasons SFA should enhance partner state deterrence of VNSA challenges to stability (and by extension, US deterrence), evidence suggests that the indirect approach to deterrence may be inherently ineffective. Statistical analyses of US presence abroad—specifically, in the form of military assistance—reveal SFA can have substantially destabilizing effects on partner states. Military assistance correlates with an increased likelihood of recipient state civil war during the Cold War era; in the post-Cold War era, it correlates with an increased likelihood of recipient-state repression.¹⁵ Likewise, case-specific data indicate both small-scale and expansive SFA efforts are associated with deterrence failures.¹⁶

Several factors account for the previously mentioned statistical and case study findings. First, under conditions of armed resistance, rebels are disincentivized from settling with states rather than going to war; given the informational uncertainties that typify the onset of insurgency and civil war, third-party behaviors are unlikely to deter rebel aggression. Second, third-party threats are particularly susceptible to problems of credibility signaling, and “cheap” signals are apt to magnify (rather than minimize) existing informational uncertainties. Finally, third-party involvements in intrastate crises are prone to conditions of moral hazard.¹⁷ Each of the factors mentioned above is apt to raise the risk of deterrence failures. Rationalist accounts of war and conflict shed light on these barriers to indirect deterrence successes.

Intrastate Conflict: Effects of Informational Uncertainties

SFA does little to counteract informational uncertainties that typify the onset of civil disputes. Due to informational uncertainties, rebel actors (such as VNSAs) can be particularly impervious to deterrent threats or uses of force. Whether the state at risk (such as a partner state) of aggression—or a third-party (such as the US) acting in defense of that state—adopts coercive behaviors, rebels are unlikely to interpret those behaviors as causes for turning to a negotiated settlement rather than war. The war-as-bargaining literature suggests that rational actors should prefer negotiated settlement over war, given the high costs of war relative to the costs of settlement. It acknowledges, though, that even rational parties may opt for war over settlement. This is because they are likely to face: 1) uncertain information about the adversary’s strength or resolve, 2) questions about the adversary’s commitment to upholding a negotiated

settlement, or 3) stakes that cannot be easily divided (one or both parties may seek sole control of the government or a piece of territory).¹⁸ All three conditions typify periods of domestic political dispute and risk of conflict onset and escalation;¹⁹ consequently, the effects of deterrent threats and uses of force against rebels are apt to be muted.²⁰

Rebels are apt to pursue war when they question the state's commitment to upholding settlement terms or when they suspect their security can only be assured by gaining control of the state in its entirety. Rather than risking post hoc settlement abuses, insurgents may seek decisive military victory, hoping to gain control of the state's government and territory.²¹ Uncertain information is perhaps most influential on the behaviors of rebel-aggressors and state-defenders. In most cases, rebels will appreciate the likely superiority of the state's armed forces. However, they will exaggerate their strength in hopes of compelling the state to grant concessions. The state, similarly, will likely recognize the limited military capacity of the rebel group(s) but will exaggerate its resolve in hopes of deterring further rebel aggression. The state may have difficulty assessing rebel strength (given the costs of monitoring rebel capabilities); rebels may have difficulty assessing state resolve. Under such conditions—when either the defender or the aggressor lacks adequate “proof” of the other's strength/resolve—civil war onset is the more probable outcome than a negotiated settlement.²²

Even when backed by a third-party actor, the state's deterrent threats or demonstrations of force may ring hollow with rebels, holding little influence on their calculations about the expected costs of war. This seems to be particularly true of US assistance to Nigeria, which plays a role in the state's preferred “carrot-and-stick” approach to Boko Haram. Consisting of conventional military campaigns as well as efforts to entice (likely) members away from the organization, the approach has prompted critics to question its potentially “muddying” effect on Boko Haram's calculations about the state's intentions and capabilities.²³ The US began augmenting SFA to Nigeria in 2010 in the wake of the 2009 emergence of the Boko Haram insurgency; following limited short-term improvements to the state's security apparatus in 2010–2011, Boko Haram's continued attacks strained state resources, eventually degrading its security force capacity.²⁴ Though Nigeria announced its “technical defeat” of Boko Haram in late 2015, the group's attacks have been “just as frequent and deadly” in 2017–2018 as in previous years.²⁵

Insurgent Perceptions: Signaling Credibility

Third-party support for partner states is frequently complicated by signaling problems, which undercut the deterrent effects of SFA. When a third-party actor signals support for its partner, it must do so credibly. Credible signals convey a willingness to assume sunk costs (to allocate the resources needed to act on a deterrent threat in the future) or audience costs (to risk losing face for failing to act on a deterrent threat).²⁶ High cost signals, like threats of military intervention, bring clarity to deterrent bargaining scenarios. Low-cost signals, like diplomatic shaming, yield uncertainty.²⁷ High cost third-party signals are linked to the decreased probability of civil war, while low cost third-party signals are linked to increased odds of civil war.²⁸

Credible signals provide state defenders and dissident aggressors with actionable information about whether and how to adjust their behaviors, while low cost threats do not. When a third-party commits to militarily intervening on behalf of another government, the partner state and the rebel group have clear bases for adjusting their bargaining positions, though they might be otherwise disinclined to bargain.²⁹ When a third-party commits to militarily assisting another government, the partner state and rebel group have questionable bases for adjusting their bargaining positions, though they might be otherwise inclined to bargain. In the first case, the threat is overt; it signals that the external actor will assume potentially great costs on behalf of its partner. In the second case, the threat is implied; it signals that the external actor will assume potentially limited costs on behalf of its partner. Most US security force assistance operations carried out in the US Africa Command's (USAF-RICOM) area of responsibility adhere to this low-profile, implied threat model of SFA.

The distinction between the two scenario types is critical. Assistance commitments convey a willingness to assume some costs, but not necessarily great costs; the signal is neither clearly costly nor cheap. Even sizable, high-visibility assistance programs call for comparatively modest cost sinking (unlike direct coercive action) and rarely place the US at risk of losing face. However, modest and low-profile assistance programs still require a willingness to accept losses. Unlike overt threats of direct military action, implied "threats" of SFA leave potential insurgents with uncertain information about US effects on the partner's capability and

resolve. Uncertainty, in turn, increases the likelihood of civil war onset and escalation.³⁰

The question of credible signaling can be applied to USAFRICOM activities in East and West Africa, largely designed to assist African states in countering terrorist threats. Despite the counterterrorism impetus for the Command's activities, US messaging could raise doubts about the extent to which the US is committed to assisting African states in deterring terrorists. In 2012, for example, Principal Deputy Assistant Secretary of State for African Affairs Don Yamamoto argued before a US House Foreign Affairs Committee meeting that the US expected "African countries affected by groups such as al-Shabaab, Boko Haram, al-Qaeda in the Islamic Maghreb (AQIM) and the Lord's Resistance Army" to "lead the response to terrorism" themselves. Despite US support for partner activities, he stated, the US could not risk allowing terrorist organizations to legitimize their efforts by "attempting to draw us into the conflict."³¹ Though the statements were directed at a US government audience, they also ran the risk of reinforcing others' perceptions of the low cost (and perhaps limited commitment) US approach to deterring terrorists abroad.

Partner State Interests: Moral Hazard

Third-party efforts to shape the strategic dynamics of intrastate hostility are further complicated by the possibility that the partner state may seek to "capture" the external actor's presence or resources for the pursuit of its interests; this can remove the SFA from its intended deterrent aims.³² In the case of impending military intervention, for instance, the partner state may exploit the defensive cover provided by the third-party actor. Rather than maintaining its defensive options, it may instead go on the offensive, employing force in hopes of achieving a decisive victory. Unless the rebels agree to settlement options—if they go to war, or "wait out" the third-party's presence and then go to war—the partner state has cause to request further resources or longer-term support from its external patron.³³ (Moral hazard also applies to rebels, who may exploit signs of third-party presence to drum up popular support for aggression against the partner state.)³⁴

The dynamics mentioned above characterize direct US military interventions (they played a role in the 2009 Afghan surge) as well as indirect US partner support missions (such as the once substantial US military

assistance to Pakistan).³⁵ The states in greatest need of SFA support often have limited means for upholding their end of the partnership arrangement. Further, a partner's interests in receiving SFA may differ greatly from the US's interest in providing it. While the US may hope to bolster the partner's ability to counter potential terrorist insurgents, the state may find other domestic dissidents or insurgents to be more concerning.

Even if the partner redirects efforts to aims unaligned with those of the US, the US may be beholden to the partnership; withdrawal of support could tempt terrorist actors to exploit the state's loss of backing.³⁶ Monitoring partner compliance with SFA terms carries material costs, and ending partnerships absent clear evidence of SFA abuse entails political and strategic costs. Consequently, the US can become "obligated" to sustaining support operations that have little chance of deterring threats to the partner state's security and may entail counterproductive outcomes.³⁷ Just as direct intervention can result in conflict escalation rather than deterrence, indirect support efforts can yield disruption rather than stabilization.³⁸

In the wake of the 2001 US invasion of Afghanistan, the US increased military assistance to Pakistan by considerable degrees, hoping to shore up its counter al-Qaeda and counter Taliban efforts. Indeed, the assistance was regarded as a vital means of deterring the groups' resurgent influence in Afghanistan, and their efforts to secure inroads and safe havens in Pakistan.³⁹ US officials, though, came to question Pakistan's employment of SFA; some went so far as to suggest that Pakistan had not only "abused" US assistance for its ends, but accommodated the presence of Taliban actors.⁴⁰ Nonetheless, the US remained largely dependent on Pakistan as an access and resupply point for its efforts in Afghanistan. In essence, the US ran risks by continuing to provide SFA to Pakistan; it also ran risks by threatening to cut SFA to Pakistan. The Trump administration's 2018 decision to suspend key military assistance to Pakistan elicited renewed debates about the moral hazard implications of SFA.⁴¹

The Case of Yemen⁴²

The onset and escalation of the Yemeni Civil War illustrate the influence of each limitation of SFA's deterrent effectiveness: informational uncertainties, signaling challenges, and conditions of moral hazard. Troublingly, they also reveal that indirect deterrence—in the form of

SFA—helped undercut US counterterrorism aims in Yemen. The US began increasing security assistance to Yemen in 2007, and then substantially disbursed SFA funding and equipment in 2008–2009. Wary of the rise of al-Qaeda in the Arabian Peninsula (AQAP), and the group's efforts to secure inroads in Yemen, the US allocated more than \$500 million in SFA between 2007 and 2012.⁴³ While then president Ali Abdullah Saleh siphoned off much of the aid for himself, AQAP's growing presence in Yemen ensured US security force assistance to Yemen continued uninterrupted. Houthi dissidents, who sought expanded rights for the Zaidi–Shia sect, exploited the situation to their advantage, decrying Saleh's alignment with the US, and shoring up popular support for the Houthi movement.

When the 2011 Arab Spring protests reached Yemen, power jockeying yielded a near collapse of the state. AQAP affiliated militias moved to fill the power vacuum, seizing territory in the south. The US and Saudi Arabia discreetly worked to broker options for political transition; Saleh agreed to transfer power to the former vice president, Abdu Rabbu Masour Hadi. Assuming office in 2012, Hadi faced challenges from AQAP, southern separatists, Saleh's loyalists (including some military units, which split away from the new Hadi government), and increasingly powerful Houthi movement. Despite backing from the US, Saudi Arabia, and the UN Security Council, his government struggled to build support for a new political framework. By January 2014, the various factions involved in the constitution building process had come to a stalemate. Houthi leaders saw an opportunity for armed resistance.

The US continued to back Yemen against AQAP; but, it did little to shore up the state against Houthi aggression. In fact, counter AQAP pursuits may have had the inadvertent effect of strengthening the Houthis against the better trained and equipped AQAP fighters. Seizing on Hadi's moment of weakness— his vulnerability to challengers, and near-total reliance on US–Saudi support— the Houthis pushed to solidify their control of the northern Saada province. Bolstered by success in Saada, growing influence over Yemen's population, and a coalition-of-convenience with former rival Saleh, the Houthis seized the capital city of Sana'a in September 2014. Hadi shortly escaped to the south, reestablished Yemen's government in the port city of Aden, and sought support from loyalists among the police, armed forces, and the Popular Resistance Committees (militia groups).

Once civil war was underway, the US substantially dialed back SFA to Yemen; Hadi barely clung to power, and wartime conditions posed obstacles to the disbursement and employment of aid. The US voiced rhetorical support for settlement options, and the UN proposed terms for peace talks. Faced with the prospect of long-term war, competing regional tribal groups weighed plans for restructuring the government and Yemen's provinces. The resulting draft constitution—that proposed dividing the state into six federally administered regions met with Houthi rejection. The constitutionally delineated regions, they claimed, left them with inadequate resources and without access to the sea. Fearing their designated region would leave them weakened and exposed to rivals, the rebels opted to push for control of the entire state.

As Houthi insurgents advanced to the south, Hadi sought support from Sunni tribes. Foreign minister Riad Yassin called for external support, and a Saudi-led coalition of Sunni-Arab Gulf states prepared to intervene on Hadi's behalf. Despite the noted possibility of Gulf coalition action (Saudi Arabia had previously struck against Houthi sites in 2009, hoping to undercut Iran's "proxy" in Yemen), Houthi rebels did not acquiesce. Rather than accepting the slim odds of claiming Yemen against local and external challengers, they expanded the conflict. Neither coalition air strikes nor the deployment of ground forces to Aden—initiated in March and August 2015, respectively—deterred the spread of Houthi resistance. Western support for the Saudi-led efforts held little effect on their calculations, as the Houthis benefited from Iranian backing. The Gulf coalition ultimately secured Aden, but the rebels sustained combat for four months; they also initiated a campaign to seize the nearby city of Taiz and shored up their control of Sana'a.

After civil war broke out in 2015, factions solidified along pro-government, Houthi, and AQAP lines. Combatants made few attempts at negotiation, remaining suspicious of each other's motives, capabilities, and resolve (uncertainties that were magnified by the roles of external actors). AQAP waged attacks with increased frequency, seeking to build influence beyond its initial footholds in Yemen. SFA did little to deter the Houthi uprising, the onset of armed resistance, or the spread of conflict across the country. By extension, it did little to deny AQAP access to or territorial gains in Yemen.

Over the 2000–2018 period, the US disbursed an estimated \$841 million in security assistance to Yemen (though estimates vary).⁴⁴ Each

point of increased commitment was followed by the onset of further instability or hostility: anti-government protests in 2011, multi-front challenges to state power in 2013, and the onset of civil war in 2015. US military assistance to Yemen, particularly during the 2007–2015 period, reveals how the strategic dynamics of civil war can be particularly resistant to indirect deterrence. Exploitation and cheap signaling, in conjunction with informational and commitment uncertainties, combined to ensure that indirect deterrence (in the form of SFA) was all but guaranteed to fail.

Informational Uncertainties and the Outbreak of Civil War

Informational and commitment uncertainties played a clear role in Houthi decision-making. The Hadi government's initial failure to show resolve in the face of initial Houthi challenges gave way to further claims on key Yemeni cities and provincial territories. Hadi's subsequent efforts to reassert government power left Houthi rebels with little sense of the need to pull back from war. When Hadi assumed office in 2012, Yemeni military capacity had been degraded by Saleh's exit; his loyalists in the military opted to back him regardless of his fall from power. Regardless, Yemen's security capacity likely outmatched Houthi capabilities.

The upsurge in Hadi's array of challengers, and his ostensible dependence on US–Saudi support provided Houthi leaders the basis for calculating that their potentially slim chance of victory in war merited the likely costs of going to war. With the extent of Yemen's weakness—and the scope and likely duration of US–Saudi support for Hadi—up for question, the Houthis saw an opportunity for action. Because the constitutionally proposed territorial divisions placed the Houthis at risk of post-settlement abuses (given Houthi leaders' stated concerns about resource accessibility and exposure to rivals), they also saw a cause for action. Thus, the Houthis opted to seize the capital city and strategically significant regions of the state.

Informational uncertainties were most influential on the 2014–2015 phase of the Houthi insurgency. Unconvinced by Hadi's indications that he would maintain resolve and act on deterrent threats, and troubled by indications that they might “lose out” on constitutionally designated territorial divisions of Yemen, they opted to go to war. Though critical to Houthi calculations during the lead up to the civil war, informational

uncertainties continued to shape rebel-actor decision-making as the civil war evolved to encompass the broader Yemeni state.

Commitment Signaling—Assistance vs. Intervention

US signaling via SFA reinforced the effects of informational and commitment uncertainty. The US's deliberately limited but supportive SFA presence left Hadi in a tenuous position. Hadi likely calculated that his government could rely on Saudi Arabia for support, given Houthi ties to Iran. Yet, the US began reducing its already modest and AQAP-centric SFA to Yemen once civil war broke out. As government actors worked to build on US–Saudi rhetorical support for Hadi, the Houthis calculated that Western states—and particularly the US—were unlikely to pursue direct military intervention on Hadi's behalf. They had already secured backing from Iran; they were willing to accept the risk of a potential Saudi Arabian intervention. Given the US's questionable commitment to acting on Hadi's behalf and the absence of immediate external defensive cover, the Houthis recognized an ideal opportunity for advancing the insurgency.

Aware of Hadi's vulnerability to competing claims to state power, and the limited probability of Western support beyond counter AQAP efforts (which held inadvertent benefits for the Houthis, given AQAP's threats to Houthi territorial interests), the rebels acted before Hadi secured clear commitments from Saudi Arabia and other Sunni-majority Gulf states. By the time the Saudi-led coalition had initiated strikes on Houthi-held cities, the Houthis had already gained further ground and shored up support from broader segments of Yemen's population.

Though the US provided logistical, intelligence, and refueling support for Saudi Arabia's efforts in Yemen, its officials also worked to distance the US from immediate ties to coalition attacks; the coalition strikes posed clear threats to civilian populations, while its efforts to block access to Yemen's ports compounded the growing humanitarian crisis in Yemen. This shift in the rhetorical US support for the Saudi-led efforts to restore Hadi's government, coupled with its modest SFA support to Yemen, further solidified perceptions of cheap commitment signaling. Despite persistent coalition strikes against Houthi strongholds, and recent indicators of support from the Trump administration, the civil war in Yemen continues unabated.⁴⁵

Moral Hazard—The Counter AQAP Trap?

Moral hazard conditions, finally, amplified the effects of both informational uncertainty and the US's cheap commitment signaling in Yemen. During the lead up to the Yemeni Civil War, the US continued to focus SFA spending on counter AQAP aims, despite indications that the Houthi movement had been slowly gaining ground since its emergence in 2004. US assistance to Yemen's security forces peaked at \$177 million in 2010; Saleh's (self) interest in SFA had little to do with denying AQAP its desired foothold in Yemen.⁴⁶ Despite signs of Saleh's misappropriation of SFA funding and equipment, the US was hesitant to risk letting Yemen "fall" to AQAP and sustained the SFA partnership despite the diversion of counter AQAP resources.

Hadi's interest in regaining SFA support—which declined significantly in 2011, but then reached \$150 million in 2012 and \$136 million in 2014—was likely rooted in concerns for shoring up state stability.⁴⁷ Yet, the US continued to concentrate SFA on AQAP specific efforts. The Yemeni government was far less preoccupied with AQAP attempts to secure influence in Yemen than by Houthi attempts to assume control of Yemeni territories and the capital city of Sana'a. Nonetheless, US officials failed to draw connections between Hadi's potential loss of power to Houthi rebels, and the likelihood of AQAP territorial and influence entrenchment in Yemen.

Because Hadi could not risk the loss of US SFA support, and the US could not risk leaving an opening for further AQAP gains in Yemen, both remained committed to a partnership in which their interests were fundamentally misaligned. When the Houthi insurgency gave way to outright civil war, AQAP moved to secure its existing areas of influence and began looking to expand beyond its traditionally recognized territorial holdings. In effect, the specificity of US security force assistance to Yemen—with its emphasis on counterterrorism, and namely counter AQAP programs—left Yemen crippled by intrastate war. More problematically for the US, it left AQAP (now recognized as one of the most lethal al-Qaeda franchises) poised to fill the power vacuums in the ungoverned territories of Yemen.

Implications: Policy and Strategic Considerations

The case of the civil war in Yemen sheds light on the degree to which deterrence based SFA represents a weak form of indirect deterrence. Though the examination of a single case falls short of offering definitive proof of the inherent limitations of indirect deterrence via SFA, it does illustrate some of the inherent challenges and pitfalls of employing SFA for terrorist denial ends. These challenges and pitfalls have been the subject of informal debate since the 2007 institution of USAFRICOM, which was largely established for partnership building in service of counterterrorism ends.⁴⁸ Given SFA's growing centrality to US counterterrorism policy—in Central Asia, the Levant and broader Middle East, as well as the Sahel and Horn of Africa—its questionable deterrent effects require a review of both the specifics of its strategic design and its general fitness for policy ends.⁴⁹

Security force assistance has been broadly employed in various forms; it seems plausible that certain forms of SFA (variations on its general strategic design) might be better suited to conventional deterrence than others. Yet, the turn to strategic redesign—absent a discussion of the fundamental barriers to SFA effectiveness—seems shortsighted. The inherent limitations of indirect deterrence, this analysis of SFA, and the Yemeni Civil War, suggest that US national security decision makers should consider restricting the provision of SFA. More specifically, they suggest those decision makers should consider limiting the provision of SFA to those states in which it is least likely to generate or amplify: informational uncertainties between disputants, disputant perceptions of limitations on US support to the partner state (cheap signaling), and conditions of moral hazard. This will require decision makers to make far more careful decisions about how and where to employ SFA for deterrent ends. At the very least, it calls for weighing SFA partnership considerations according to more rigorous standards.

Indirect deterrence (via SFA) represents a questionable alternative to countering terrorist and other VNSA threats by more direct and expansive means. The US currently employs SFA in so many states—and typically, in such limited forms—that it is not only an ineffective means of achieving counterterrorism ends, but also it often runs counter to those ends. This signals the need for strategic restraint; it calls for policy makers and strategists to exercise prudence, and commit to making tough decisions, about when and where to intervene abroad.

Decision makers would do well to recognize that limited commitment interventions can only be expected to yield limited effects; worse yet, they threaten to drain the US of resources that could be more meaningfully employed elsewhere.

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