Nuclear First Use
Prudence or Peril?

By STEPHEN J. CIMBALA

Open discussion of the possible first use of nuclear weapons, against terrorists or other targets, is becoming more acceptable in American, North Atlantic Treaty Organization (NATO), and Russian policy circles. Presumably intended on all sides as an example of rhetorical deterrence or reassurance, declaratory policies of nuclear first use or first strike carry prospective costs and risks. These costs and risks might increase if the spread of nuclear weapons, especially in Asia, is not contained within present boundaries. In addition, the unfortunate possibility of ambiguous lines between nuclear first use and first strike, and equally indistinct lines between preemption and preventive war, has the potential to turn one state's deterrent into another's provocation. Is nuclear first use, especially as a matter of declaratory policy, a necessary option or an unacceptable risk—or both?

Overtures

In the United States and Russia, 2008 is a Presidential election year. These events were foreseen. Less anticipated has been the upsurge in open discussion by Russian and NATO military leaders about policies with respect to the first use of nuclear weapons. Although some dismiss this rhetoric as repetition of past points about Russian or NATO doctrine, the frequency of public declamation on issues normally treated as internal military matters bears scrutiny.

In a speech at Russia's Academy of Military Sciences on January 19, 2008, General Yuri Baluyevksy, chief of the general staff of the Russian armed forces, noted that Russia would use its military power to uphold its interests in a variety of situations. He emphasized that, if necessary, Russia would strike preemptively, not excluding the possible use of nuclear weapons in a first strike. According to Baluyevsky, "We are not going to attack anyone, but we want all our partners to realize that Russia will use armed force to defend its own and its allies' sovereignty and territorial integrity. It may resort to a pre-emptive nuclear strike in cases specified by its doctrine."[1]

Experts immediately cautioned that Baluyevsky was restating the "traditional" position of Russia since the end of the Cold War and that the message was consistent with the 2000 military doctrine of the Russian Federation. In contrast to the Cold War declaratory policy of the Soviet Union, Russia's military doctrine includes the option of nuclear first use or first strike in a conventional war involving attacks on Russian state territory or otherwise threatening to Russia's vital interests.

On the other hand, it was possible to interpret Baluyevsky's statement as a more assertive affirmation of the right of nuclear first use than hitherto made by Russia's military command. The question remained open with respect to the particular circumstances of an attack and how Russia would define its "interests" and "sovereignty" as having been affected. Former Russian defense minister Sergei Ivanov reportedly considers as quite defensible the carrying out of presumably preemptive or preventive nuclear strikes against terrorists. Other

Nuclear fireball from 23-kiloton test detonation, Nevada Test Site, 1953

Department of Energy

Dr. Stephen J. Cimbala is Distinguished Professor of Political Science at the Pennsylvania State University–Brandywine.

high ranking Ministry of Defense officials have also discussed this option.[2]

Similar discussions about nuclear preemptive or preventive attacks have been taking place in Western circles. In a report prepared by five prominent former U.S. and allied NATO generals calling for "root and branch" reform of the Alliance, the authors contend that NATO must be ready to resort to a preemptive nuclear attack to halt the "imminent" spread of nuclear and other weapons of mass destruction.[3] The authors—including retired General John Shalikashvili, former Chairman of the Joint Chiefs of Staff and former Supreme Allied Commander, Europe, and counterparts from Britain, France, Germany, and the Netherlands—contended that a first strike nuclear option remained an "indispensable instrument" since there was "simply no realistic prospect of a nuclear-free world."[4] In a possibly oxymoronic or fatalistic construction with regard to future NATO options, the authors noted that the "first use of nuclear weapons must remain in the quiver of escalation as the ultimate instrument to prevent the use of weapons of mass destruction."[5]

As in the case of Baluyevsky's statement about Russian doctrine, the NATO generals' manifesto about nuclear first use can be interpreted in either of two ways: as a restatement, perhaps with brio, of existing doctrine; or, to the contrary, as a slight movement of the pendulum of usable military options further away from the "nuclear taboo" and toward an explicit preference for nuclear preemption or prevention under certain conditions. The implication that either NATO or Russia might authorize the first use of nuclear weapons against nonstate actors who were planning attacks with weapons of mass destruction (WMD), and/or against states harboring such terrorists, was not unknown in military planning studies. But the public advertisement for such drastic military options has seemed to reach a higher decibel of recognition outside of professional military circles.

American, NATO, and Russian declaratory and operational policies with respect to nuclear first use are of interest not only to their respective internal audiences. Other state actors, including those with nuclear weapons and long-range delivery systems, will take note. For example, China's official policy with respect to the use of nuclear weapons is one of "no first use." On the other hand, new doctrine for the use of missiles in warfare notes that a strategy of "active defense" can include sudden "first strikes" in campaigns or battles as well as "counterattacks in self defense" into enemy territory.[6]

In addition, a vigorous debate has appeared among Chinese military and civilians about the viability of China's no first use policy—partly in the context of U.S. conventional military capabilities for long-range, precision strike against Chinese nuclear forces. According to one American expert on the Chinese military:

> *They* [People's Liberation Army military thinkers] *fear that a conventional attack on China's strategic missile forces could render China vulnerable and leave it without a deterrent. This has led to a debate in China among civilian strategic thinkers and military leaders on the viability of the announced "no-first-use" policy on nuclear weapons. Some strategists advocate departing from the "no-first-use" policy and responding to conventional attacks on strategic forces with nuclear missiles.*[7]

A further concern for U.S. military observers is the apparent mixing of nuclear, nuclear-capable, and conventionally armed missiles within the same operational and tactical units. As Larry Wortzel has noted, the decision "to put nuclear and conventional warheads on the same classes of ballistic missiles and collocate them near each other in firing units of the Second Artillery Corps also increases the risk of accidental nuclear conflict."[8] Related to this concern about accidental or inadvertent nuclear war or escalation are the doctrinal emphases in People's Liberation Army and Second Artillery thinking on the massing of decisive missile fires with surprise in a theater war; ambiguity about the kinds of warheads used in ballistic missile attacks on naval battle groups; and increasing Chinese interest in the military uses of space and in capabilities for attacking U.S. systems supporting warning, command and control, and missile defense.[9]

Russia's military doctrine includes the option of nuclear first use or first strike in a conventional war involving attacks on Russian state territory or otherwise threatening to Russia's vital interests

Caveats and Complexities

Russian and NATO interest in the possibility of preemption, and in making more explicit the existence of preemption against terrorists or other nonstate actors, is quite understandable. In the aftermath of 9/11 and other high profile terrorist attacks in the United States and Europe, the "war on terror" has carried NATO military operations into Afghanistan and realigned U.S. military thinking and planning along the lines of asymmetrical warfare. Russia, also victimized by costly terrorist attacks since 9/11 and fighting against terrorists and insurgents in Chechnya, is as concerned as the United States and NATO countries in regard to possible terrorist WMD use. Both NATO and Russian leaders recognize that nuclear weapons in the hands of terrorists create an unacceptable risk of a catastrophic attack.[10]

Acknowledgement of the peril created by terrorists with nuclear weapons or other WMD does not necessarily lead to the conclusion that *nuclear* preemption against such targets is a valid choice. There are several points to be considered. First, the United States now holds the high card with respect to long-range, conventional precision strike capabilities, supported by mastery of the information and electronics spectra. Given accurate intelligence and targeting information, the United States and therefore NATO can strike across continents or oceans and against virtually any target with near impunity and unprecedented accuracy.

Second, nuclear weapons cause collateral damage that may be unacceptable to the user. The first use of nuclear weapons in anger since Nagasaki would bring international inquiries, and possibly recrimination, for the perpetrator. Even tactical or "mini" nuclear weapons would cause civilian casualties in unknown numbers. And if, in the aftermath of a nuclear preemption for the sake of counterterrorism, the target were misidentified or the intelligence were flawed, the damage to the credibility of the attacker, in political and in moral terms, would be inestimable. For example, a preemptive *nuclear* attack on the pharmaceutical plant in Sudan in 1998, whose operators were allegedly in cahoots with al Qaeda and engaged in making or storing biological weapons, would have been worse than an embarrassment given the ultimately ambiguous and widely disputed intelligence in support of that strike.

Some contend that more precisely delivered nuclear weapons with reduced yields are ideal for "bunker busting" against terrorist or rogue state actor storage facilities for WMD. Nuclear weapons would offer the advantage of burning up the residue of any chemical or biological weapons stored at the suspect site. However, the collateral damage to surrounding communities and facilities might still be extensive, and the distribution of radioactivity across the region would be subject to a number of uncertainties, including weather and seasonal variations in climate. The collateral damage from reduced yield nuclear weapons might well exceed the expectations of optimists and, in the process, also bring into question American or NATO motives and ethics.

The objection might be raised here that Russia, lacking the conventional military capabilities of the United States and NATO, has a stronger case for nuclear preemption against anticipated WMD attacks by terrorists. However, in carrying out a nuclear preemption, Russia faces some of the same decisionmaking tradeoffs as NATO does, and possibly others.

If Russia were to fire the first nuclear weapon since 1945 against terrorists, its neighbors and trading partners would hold their breath. They would worry whether this was a sign of Russian willingness to repeat the exercise under conditions of similar, or lesser, provocation. The United States and NATO would be discussing whether to increase their own preparedness for nuclear war and the adequacy of their current forces for nuclear deterrence. Russia's economic relations with Western Europe could be destabilized, and the Kremlin's program for building an entirely more prosperous economy based on energy sales might be disrupted. In addition, Russia's inclusion among the Group of Eight as an interlocutor rests not only on its raw economic or military power, but also on its perceived legitimacy and commitment to world order.

Finally, in any nuclear first use, there are the important particulars of *against whom* and *where*. If Russia were to employ tactical or smaller nuclear weapons against terrorists on its own state territory, and if evidence proved that a terrorist WMD attack was indeed imminent, then the world would take notice, but the matter would be widely regarded as a justified self-defense of Russia's homeland. A more complicated situation would occur if Russia struck preemptively with nuclear weapons against alleged terrorists in its "near abroad," especially in states that are in contention with Russia over various issues or being considered for membership in NATO. A preemptive nuclear attack outside of Russia's own territory against terrorists, however threatening they are perceived to be, raises issues of violation of state sovereignty and sets the dangerous precedent that others can cross state boundaries in nuclear preemption of suspected terrorists.

Neither NATO nor Russia faces easy issues, therefore, in deciding whether and when to use nuclear preemption—whether first use or first strike. Indeed, the distinction between first use and first strike is itself a problematic aspect of the case for nuclear preemption. This conceptual problem exists alongside another: the relationship between preemption and preventive war.

Preemption and Prevention

The distinction between preemptive and preventive attacks lies in the attribution of motive (by the defender against the attacker), in the reliability of the intelligence (relative to the plans of the attacker), and in the time available for making decisions (whether an attack is in progress or being considered in good time). If a defender has actionable intelligence that an attack has already been set in motion or is imminent, then preemption is a means of avoiding the worst effects of being surprised. Of course, people can quibble about what "actionable intelligence" means, but for the present discussion it means that there is verifiable information from human or technical (or both) sources that an attack is in progress or is about to be launched. For example, the U.S. nuclear attack warning system during the Cold War required confirmation by "dual phenomenology" (satellites and ground stations) before authoritative interpretation of an attack in progress was validated.

In addition to the reliability of the defender's intelligence about the attacker's capabilities and plans, the matter of time is also important in the justification for preemption. Preemptive attacks occur under the assumption that the option of forestalling the attack by diplomacy or deterrence no longer exists. The attacker has taken an irrevocable political decision for war. The defender's options are either to await the first blow or, alternatively, to act first to minimize damage or to preemptively destroy the enemy's strike capabilities if possible. The time pressure for making these judgments creates a compression factor that can destabilize rational or even sensible decisionmaking. Even when nuclear weapons are not involved, crisis management often brings out the worst in decisionmaking pathologies by individuals and organizations.

For instance, the months of July and August 1914 present a rich tableau of leaders who made mistaken assumptions about other states' intentions, capabilities, arts of war, and politico-military staying power. Some heads of state and foreign ministers were unfamiliar with their own country's war plans and their implications for crisis management. In lieu of intelligence, stereotypical thinking about national character and military dispositions was available to take up the slack ("the Frenchman cannot be a very effective fighter; his voice is too high"). Added to this was the uncertainty about alliance cohesion on the part of the Triple Alliance and the Triple Entente: each state or empire had its own priorities, in policy and in strategy, and these priorities could

the United States holds the high card with respect to long-range, conventional precision strike capabilities, supported by mastery of the information and electronics spectra

Indian Prithvi short-range ballistic missile launches from seaborne platform

India Today

not be synchronized under the time pressure between Sarajevo and the guns of August.

In a crisis involving two nuclear armed states with the capability for second strike retaliation, time pressure becomes nerve shattering. The evidence from studies of the Cuban missile crisis of 1962 shows that American and Soviet leaders operated under high stress and strained group decisionmaking throughout the 13 days that were required for the crisis to run its course. U.S. officials at one point wondered whether Soviet Premier Nikita Khrushchev had actually been the victim of a coup and replaced by a hard-line Politburo coalition more determined for war. And the "known unknowns," as Donald Rumsfeld might have said, are, in retrospect, equally discouraging for optimists about nuclear crisis management.

One of these "known unknowns" was whether the Soviets had deployed any nuclear capable delivery systems in Cuba in addition to the medium- and intermediate-range ballistic missile launchers that provoked the crisis. U.S. officials at the time assumed not, but later historians determined otherwise. Nuclear capable surface-to-surface short-range missiles were deployed with Soviet ground forces in Cuba, unknown to U.S. intelligence at the time. And Soviet ground force commanders, in the event of a U.S. military invasion, were presumably authorized to use nuclear capable missiles in self-defense. The result of this "known unknown" could have been World War III, as a U.S. nuclear retaliation against Soviet nuclear first use in, or near, Cuba led to further escalation.

if a defender has actionable intelligence that an attack has been set in motion or is imminent, preemption is a means of avoiding the worst effects of being surprised

Preventive war or attack differs from preemption, nuclear or otherwise. Preventive war is anticipatory of a possible, but not an inevitable, future attack. Israel's attack on Iraq's nuclear reactor at Osirak in 1981 was motivated by Tel Aviv's concerns about what Saddam Hussein might do, should he acquire nuclear weapons at a future time. On the other hand, George W. Bush's attack on Iraq in 2003 was, if we take the President at his word, preemptive. Iraq was thought to have chemical and biological weapons by U.S. and other intelligence services, and its continuing interest in developing nuclear weapons was assumed on the basis of Saddam's prior stiffing of United Nations international inspectors.

Russian General Yuri Baluyevsky indicated Russia would use preemptive nuclear strike in certain cases

U.S. Air Force (D. Myles Cullen)

Case studies of military decisionmaking lend themselves to conflicting interpretations. Two kinds of interpretations overlap: those of the policymakers and advisors who participated in the decision, and those of academic or other observers of those decisions. Observers have the advantage of hindsight and distance from the actual events; insiders appreciate the feel for the pressures experienced by those who had to act with incomplete information. The Bush administration decision to invade Iraq in 2003, for instance, appears unwise in retrospect on account of the failure to find any weapons of mass destruction. In addition, the botched occupation following the end of the active combat phase on May 1, 2003, casts additional retrospective doubt on the validity of the entire U.S. strategy and policy.

On the other hand, Bush policymakers were leaning forward into the decision, not backward against the harsh verdict of history. They did interpret some intelligence with a preconceived bias, for which they paid a significant cost in public credibility. However, all administrations do this; separating the "facts" of intelligence collection and analysis from the "interpretations" placed upon it by policymakers and military advisors is virtually impossible. An interesting aspect of the Bush administration view of Iraq was that it was conditioned by the retrospective appraisal of the events of 9/11. Iraq was one front on the war on terror, and Saddam might slip chemical or biological (or nuclear, once he had them) weapons to terrorists. Thus, by wrapping Iraq around the war on terror like a double helix, President Bush, Vice President Dick Cheney, and their advisors misperceived a pattern of strategic cooperation between Iraq and al Qaeda.

In reaction to the preceding critique, the Bush administration might respond that its war against Iraq was not preemptive, but preventive. It was to prevent Saddam from acquiring nuclear weapons in the future that he might use against Israel or give to terrorists. This justification might have merit if the Bush administration had not insisted that the danger posed by Iraq's WMD was *imminent*: that justification requires a case for preemptive, not preventive, war. The same problem applies to the Bush National Security Strategy that defends preemption as a necessary tool for policymakers and commanders under some circumstances. Few experienced policy planners or military analysts would argue the point, but the Bush usage of "preemption" often elides into "preventive" war and vice versa.

First Use and First Strike

The Cuban missile crisis provides an interesting overture for the second part of the problem of terminology related to nuclear first use: the distinction between nuclear *first use* and *first strike*. Canonical Cold War usage referred to a nuclear first strike as an attack involving missiles or bombers of intercontinental range. Theater or shorter range attacks were usually described as first use. However, this distinction was somewhat muddied by the overlap between geography, Alliance membership, and technology. An example is provided by the Soviet and then NATO deployment of Intermediate Nuclear Forces (INF) during the 1970s and 1980s before they were disarmed by treaty in 1987.

NATO ground-launched ballistic missiles and ground- and sea-launched cruise missiles deployed in Europe were capable of striking targets not only within Eastern Europe but also within Russia itself. Therefore, whereas NATO viewed its "572" deployments (464 ground-launched cruise missiles and 108 Pershing II missiles deployed in NATO countries beginning in December 1983) as offsetting capabilities in response to the Soviets' SS–20 ground-launched ballistic missiles, Soviet military planners saw the NATO deployments as an escalation going beyond a symmetrical response to the Soviet initiative. One reason for this Soviet perception of NATO's intentions was the capability of U.S. Pershing II ballistic missiles to reach sensitive military and command targets in the western Soviet Union within minutes. Pessimistic Soviet military analysts might have interpreted the Pershing II as a first strike weapon, intended to neutralize or obviate a Soviet retaliation following a NATO nuclear first use.

Further complicating the situation with respect to INF deployments was the two-way connection between INF and the ladder of escalation. Looking downward, intermediate nuclear forces were connected to the conventional forces deployed in Europe by both NATO and the Warsaw Pact. Looking upward, they were connected to the strategic nuclear deterrents of both the Americans and Soviets (and, with more uncertainty, to the British and French national nuclear forces, the latter conditionally available to NATO but solely under French determination). Thus, the "intermediate" character of INF rested only on the technical dimensions of their range and probable destructive power. But the political "range" of INF capabilities was more problematic.

For the Soviets, INF threatened to create a seamless preemptive theater warfighting capability in Europe that would, if put into effect, impose a military defeat or stalemate on NATO while simultaneously deterring U.S. escalation of the conflict into a global nuclear war. INF for the Americans, from the Soviet perspective, threatened to undo this Soviet plan for "decoupling" NATO theater from American "strategic" nuclear forces by raising the stakes and risks of any "theater" nuclear first use. However, the U.S. and NATO 572 deployments could also raise risks for NATO. Soviet war planners might decide that they had to attack the NATO INF immediately upon the outbreak of any large scale war, conventional or nuclear. So instead of contributing to a separation of conventional from nuclear war in Europe, or creating a firebreak between theater and strategic nuclear war, INF could expedite the leap from nuclear first use into total war.

In short, both the Soviets and NATO soon realized that INF deployments created a zone of uncertainty with respect to deterrence and the control of escalation that was unacceptable. The walk from first use to first strike was too quick and too ambiguous for diplomats and war planners to sort out in the fog of war. It was problematic enough to maintain any clear firebreak between tactical and strategic weapons once the nuclear threshold had been crossed—a distinction that the Soviets as a matter of practice disavowed, although they were well prepared for tactical nuclear first use apart from ordering a nuclear first strike by their long-range forces.

The case of INF in Europe shows how the line between first strike and first use is as much a matter of arbitrary definition as it is a reliable guide to military effectiveness or deterrence credibility. If nuclear weapons of shorter range and lesser yields were capable of being used with the surgical precision of conventional weapons, then shorter range and lower yield nuclear weapons would be stronger candidates for preemption and first use or first strike missions. However, the advent of sanitized nuclear weapons, comparable in their collateral damage to conventional means, is not imminent and, ironically, is not judged to be desirable by politicians or military planners. Nuclear weapons derive their deterrent effects from their "awfulness": their capability to destroy not only military targets, but also societies and economies on a large scale in a historically unprecedented short period of time. Even the most obtuse politician is thus pushed backward from candidate scenarios of "victory" on offer from briefers on first use or first strike.

The ambiguous space between first use and first strike becomes even more evident if nuclear weapons are used not to "strategic" effect but rather across borders within a region, and covering ranges that NATO and Russia would consider as tactical or operational-tactical. Indian strikes on Pakistani or Chinese territory, or strikes by Pakistan or China against India, could be accomplished with short- or medium-range missiles or aircraft with similar reaches. If these delivery systems were nuclear armed, their effects on the targeted state might create strategic dysfunctions requiring a proportionate response or worse.

by wrapping Iraq around the war on terror like a double helix, the Bush administration misperceived a pattern of strategic cooperation between Iraq and al Qaeda

Thus, one of the major dangers of nuclear proliferation is the possibility of lowering the threshold of decisive attacks against a state's armed forces, political leadership, command and control system, or economy without requiring weapons of intercontinental or even intermediate range. In addition, contiguous nuclear wars, as opposed to nuclear exchanges between distant powers such as the United States and Russia or the United States and China, allow comparatively shorter times for the defender for launch detection, processing of information, and decisionmaking prior to the impact of a first strike. Realizing this, contiguous states fearing the opponent's prompt launch or preemption might be driven toward hair triggers that biased their options toward preemption in first use or first strike.

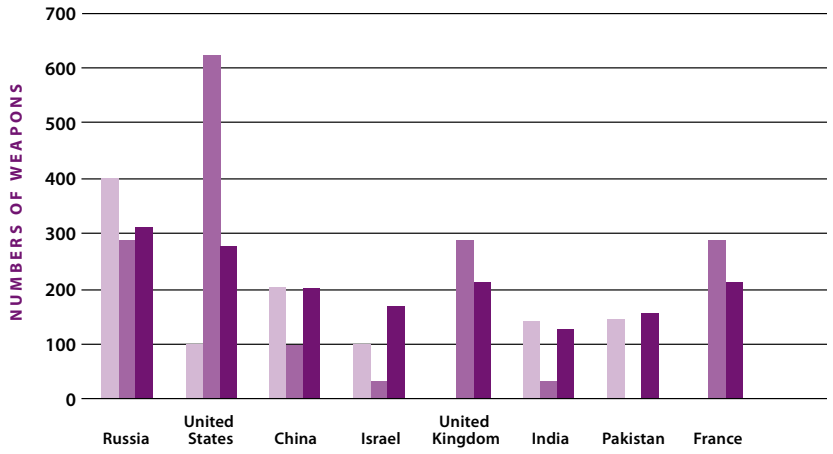
Methodology

The following develops a methodology for analyzing some aspects of the first use/first strike and preemption/prevention problems as they might appear in various future nuclear "worlds," which are set up as analytical reference points. Neither world is predicted to realize itself in actuality—at least not in detail. They are hypothetical constructs projected roughly to the time period 2015–2020. The first

world is the optimist's outcome. In this international system, the number of nuclear weapons states is limited to the presently declared and widely acknowledged eight: Britain, China, France, India, Israel, Pakistan, Russia, and the United States. The case of North Korean nuclear proliferation is reversed according to the protocols of the Six-Party agreement reached in 2007 among North Korea, South Korea, the United States, Russia, China, and Japan. Iran is persuaded by diplomacy and/or economic sanctions to stop short of a nuclear weapons capability, although its nuclear infrastructure for peaceful purposes places Iran within about 6 months of weaponization—after a political decision to do so.

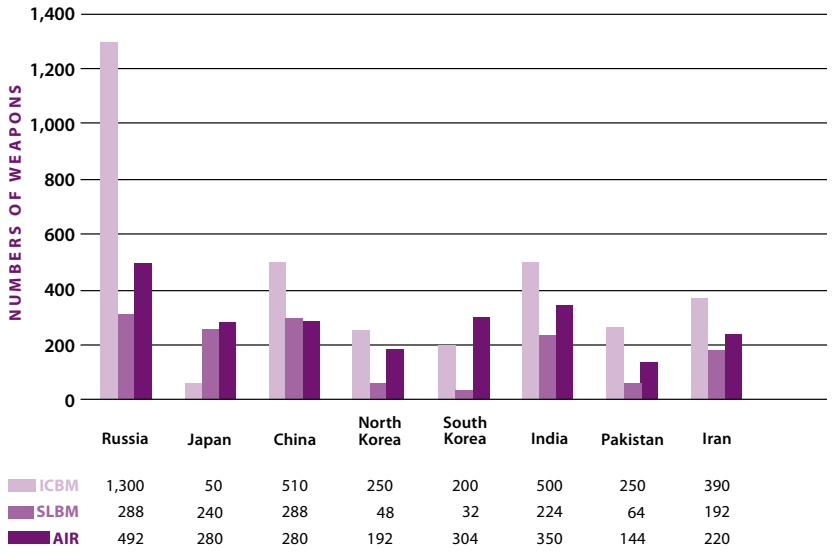
The second world is the pessimist's predicament: nuclear weapons spread in Asia and in the Middle East with strategic reach into Asia. In this scenario, nuclear weapons states in Asia include China, India, Iran, Japan, North Korea, Pakistan, Russia, and South Korea. The reason for labeling this world as pessimistic is not to *assume* that nuclear war or nuclear terrorism is more likely in the second world than the first. Some highly regarded academic opinion argues that the spreading of nuclear weapons does not necessarily lead to greater danger of nuclear war in world politics. The second world is more pessimistic on the basis of its indeterminacy: a larger variety of regimes, with a greater mix of force structures and command systems, will be operating nuclear weapons for the purpose of deterrence (at least).

Figure 1. Total Strategic Weapons: Holding Model



Key: ICBM: Intercontinental ballistic missile, SLBM: Submarine-launched ballistic missile, AIR: Aircraft

Figure 2. Total Strategic Weapons: Folding Model



Key: ICBM: Intercontinental ballistic missile, SLBM: Submarine-launched ballistic missile, AIR: Aircraft

Analysis

For purposes of simplification and analysis, each of the two nuclear worlds is set up as follows. The first, or optimist, world is a three-tier system based on agreement: the United States and Russia have a maximum of 1,000 operationally deployed nuclear weapons on intercontinental launchers; Britain, China, and France, a maximum of 500; and India, Pakistan, and Israel, a limit of 300. In the second, or pessimist, world, the Asian nuclear balance of power has established no consensual ladder of capability. Notional nuclear forces are assigned based on possible future capabilities, perceived threats, and decisionmaking proclivities. Continuation of the regimes in North Korea and Iran, more or less, is presumed. Pakistan is anybody's guess, but its geostrategic setting dictates certain continuities in policy and planning.

The initial force structures of each world prior to any use of nuclear weapons are depicted in figures 1 and 2, which summarize the total strategic weapons for, respectively, the optimist world (or *holding* model) and the pessimist international system (or *folding* model).

Figures 3 and 4 summarize the results of nuclear force exchanges for the states in each of the preceding two systems. Figure 3 shows the outcomes of first strikes against the deployed nuclear weapons of each state in the optimist world/holding model by summarizing their numbers of second strike surviving and retaliating weapons that would arrive on enemy targets. Figure 4 provides equivalent information for each state in the pessimist world/folding model.

In view of the more disparate force structures in the pessimists' predicament world, compared to the optimists' outcome world, the task of comparing performances and indicators from one world to another is challenging. Two measures of assessment are proposed to help us: generation stability and launch on warning stability. *Generation stability* is the difference between the number of second strike surviving and retaliating warheads for each state on generated alert, compared to day-to-day alert. *Launch on warning stability*, in turn, is

the difference between the number of second strike surviving and retaliating warheads when *launched on warning*, compared to *riding out the attack* and retaliating.

Figure 5 summarizes the data on generation stability for the optimist world/holding model. Each country's numbers of surviving and retaliating weapons are represented by two vertical bars. The left bar for each state shows the number of arriving retaliatory weapons on *day-to-day alert* as a percentage of the number of arriving weapons on generated alert—for the condition of launch on warning. The right bar shows the number of arriving retaliatory weapons on day-to-day alert as a percentage of the number of arriving weapons on generated alert—for the condition of riding out the attack. The difference between the size of each state's left and right bars is one measure of the stability or instability of its deterrent force.

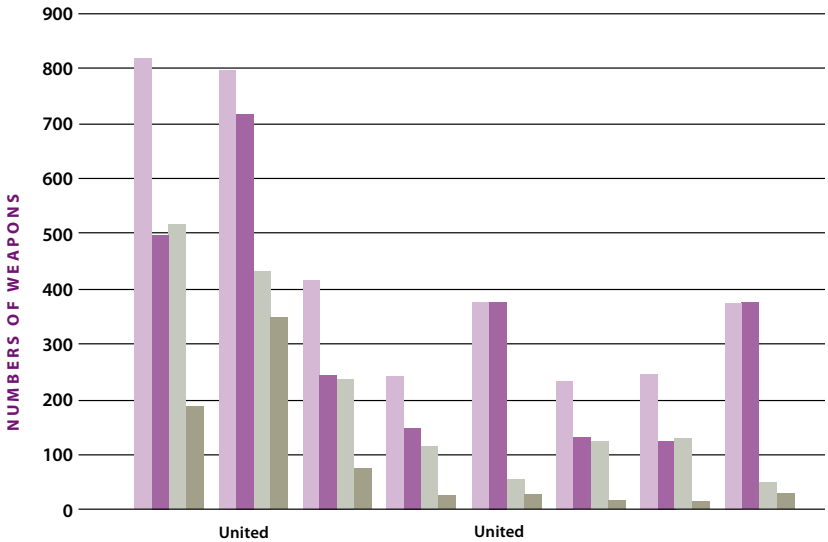
In figure 6, the data on generation stability are summarized for each country in the pessimist world/folding model. The left and right bars for each state show, respectively, the number of arriving retaliatory weapons on day-to-day alert as a percentage of the number of arriving weapons on generated alert—under conditions of launch on warning; and the number of arriving retaliatory weapons on day-to-day alert as a percentage of the number of arriving retaliatory weapons on generated alert—when a state chooses to ride out the attack.

nuclear weapons derive their deterrent effects from their capability to destroy not only military targets, but also societies and economies on a large scale

In figure 7, the nuclear force exchange data are summarized for launch on warning stability in the optimist world/holding model. The left bar shows the number of arriving retaliatory weapons for each state when riding out the attack as a percentage of its number of arriving retaliatory weapons when launched on warning—under conditions of generated alert. The right bar shows the number of arriving retaliatory weapons for each state when riding out the attack as a percentage of its number of arriving retaliatory weapons when launched on warning—under conditions of day-to-day alert. The larger the difference between the left and right bar for a given state, the higher the apparent degree of instability on this measure.

In figure 8, the findings on launch on warning stability are summarized for the pessimist world/folding model. The left bar shows the number of arriving retaliatory weapons when riding out the attack as a percentage of the number of arriving weapons under a condition of launch on warning—when forces are on generated alert. The right bar shows the number of arriving weapons when riding out

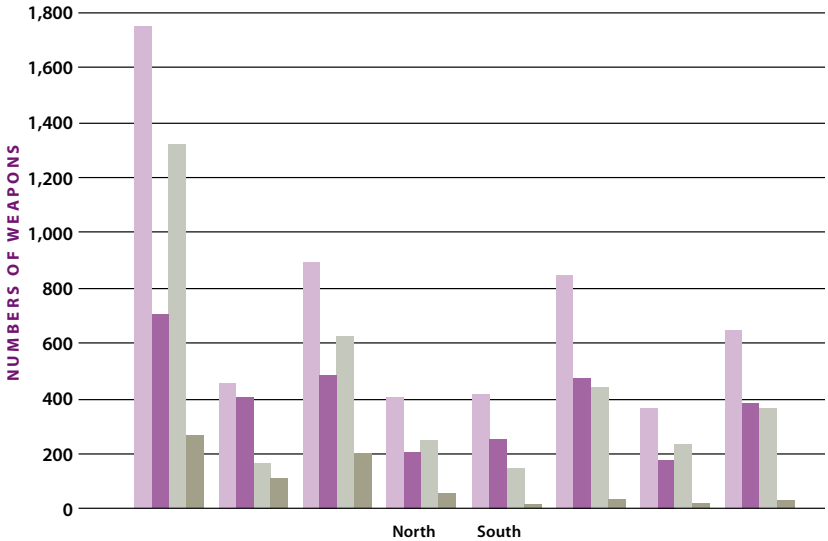
Figure 3. Arriving Retaliatory Weapons: Holding Model



	Russia	United States	China	Israel	United Kingdom	India	Pakistan	France
GEN, LOW	821	797	407	238	388	233	243	388
GEN, ROA	497	716	242	157	388	129	127	388
DAY, LOW	516	429	236	107	47	120	130	47
DAY, ROA	192	348	70	26	23	14	13	23

Key: GEN: Generation stability, LOW: Launched on warning, ROA: Riding out the attack, DAY: Day-to-day alert

Figure 4. Arriving Retaliatory Weapons: Folding Model



	Russia	Japan	China	North Korea	South Korea	India	Pakistan	Iran
GEN, LOW	1,762	444	896	404	410	842	382	667
GEN, ROA	709	403	483	201	264	477	179	392
DAY, LOW	1,326	175	615	251	167	441	235	382
DAY, ROA	273	135	202	49	19	59	28	51

Key: GEN: Generation stability, LOW: Launched on warning, ROA: Riding out the attack, DAY: Day-to-day alert

the attack as a percentage of the number of arriving weapons under launch on warning—when forces are on day-to-day alert.

Insights

These figures require interpretation with trepidation. The analysis deliberately posits hypothetical worlds with generic force structures instead of attempting to make "micro" predictions as to who will actually deploy what. It is an analytical exercise, not a crystal ball. However, some conclusions suggest themselves for reasons of theory and policy when the data analysis is applied to what we already know, or think we know, about this subject.

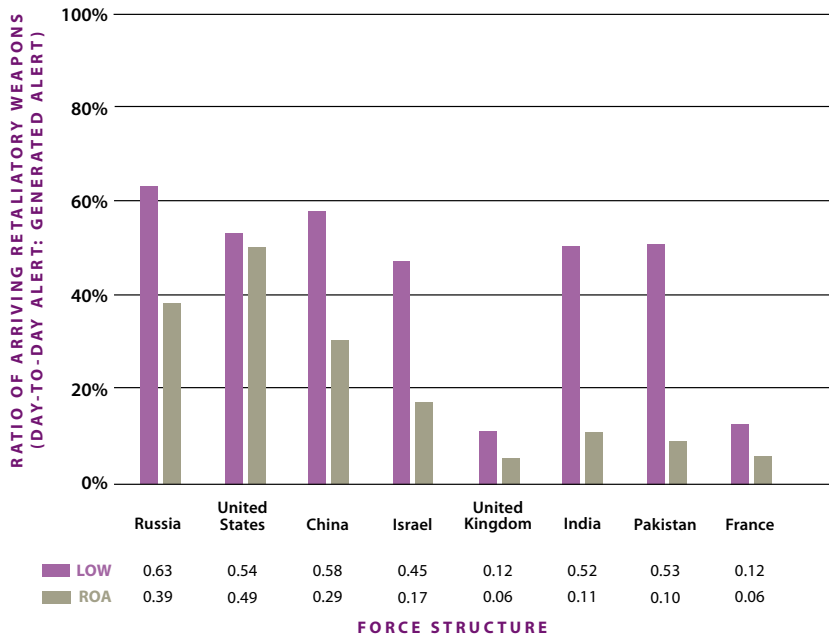
First, force structures matter. It is true that U.S.-Soviet arms control negotiations coughed up a great deal of phlegm in order to reach accords that were based, ultimately, on a conditional commitment to autolimitation. However labored the birthing process for various cycles of the Strategic Arms Limitations Talks and Strategic Arms Reduction Treaty, the Americans and Soviets were forced to confront the implications of deploying land-based compared to seabased ballistic missiles, or missiles compared to aircraft. These realities are apparent in the figures. For example, forces most dependent on land-based ballistic missiles, compared to submarine-launched ballistic missiles or bombers, are relatively vulnerable to first strike and encourage higher levels of instability. Although this finding is not new, its implications in a world of greater Asian and Middle Eastern nuclear proliferation are not obvious.

forces most dependent on land-based missiles are relatively vulnerable to first strike and encourage higher levels of instability

Critics might retort that contiguous states with land-based missiles on mobile launchers (transporter-erector-launchers, or other kinds of movable platforms) would have a higher rate of prelaunch survivability, compared to missiles based in silos or otherwise not really mobile. This might be true, but there are differences between missiles that are *truly* mobile and those that are *merely* movable. The latter are not always purpose-built for prompt relocation during a crisis or after an enemy attack has presumably begun. Some of the American and Soviet Cold War plans for movable or mobile intercontinental ballistic missiles (ICBMs) provided fodder for scientific skepticism and even political incredulity.

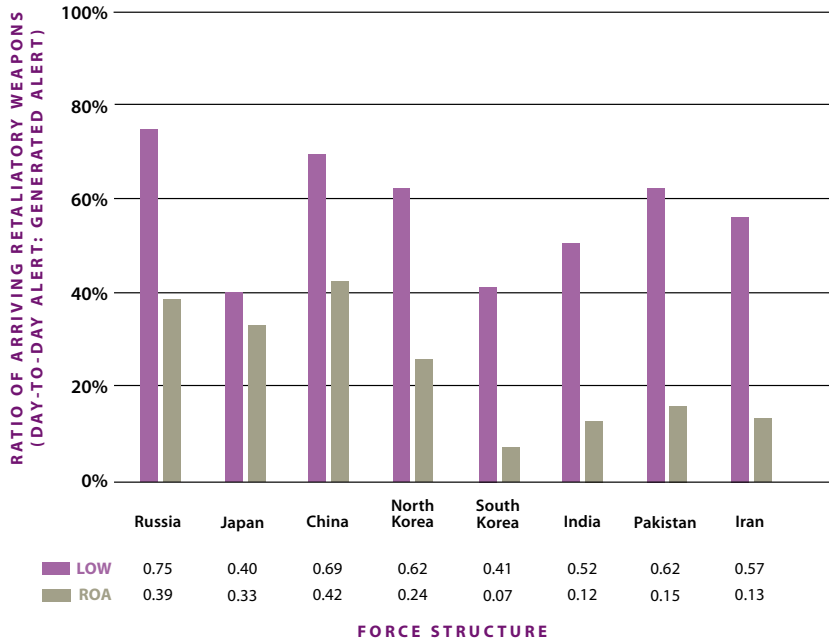
For example, the Reagan "Dense Pack" plan for clustering ICBMs together for greater survivability and the Carter administration "racetrack" scheme for mobile ICBM basing in the American Southwest were both eventually judged to be infeasible from a technical, military, and/or political standpoint. An American plan for "deep underground basing" of land-based missiles for retaliation after riding out the attack had *Dr. Strangelove* overtones as did the Soviets' alleged "dead hand" postattack nuclear command and control system, providing for some dedicated ICBMs that would then trigger follow-on launches by other retaliatory forces in the event that Soviet nuclear

Figure 5. Generation Stability: Holding Model



Key: LOW: Launched on warning, ROA: Riding out the attack

Figure 6. Generation Stability: Folding Model



Key: LOW: Launched on warning, ROA: Riding out the attack

command, control, and communications were decapitated by enemy attacks.

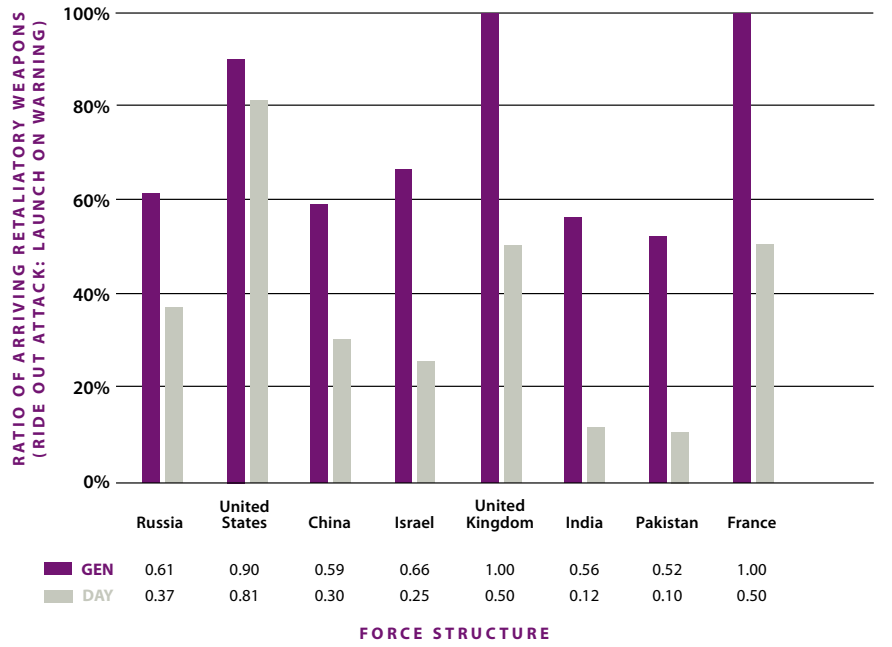
Short- and medium-range land-based missiles might be easier to move and hide than their larger counterparts with multitheater or intercontinental ranges. On the other hand, the race between military "hiders" from reconnaissance and "seekers" appears to be moving in favor of the latter. Global space-based, airborne, and other sensors for collecting enemy order of battle and communications information are steadily improving, relative to the stealth and seclusion of the targets that they are attacking—at least on land. This may suggest to states that they move more of their missile forces out to sea, on surface ships, or submarines. Not only does seabasing, compared to land-basing, add to uncertainty about the locations of missiles, but it also provides survivability in two ways: by waterborne movement, and by uncertainty as to which ships are armed with nuclear, as opposed to conventional, munitions (or both).

In addition, smaller nuclear powers might be tempted to base more of their nuclear charges on aircraft compared to missiles. Aircraft are "slow flyers" compared to "fast flyers" (land- and seabased ballistic missiles) and thus reduce the risk of accidental or inadvertent war because they can be recalled if launched by mistake. In addition, aircraft are poor tools for preemption given the pervasiveness of modern air defense systems. Unhappily for pilots, the same characteristic of airpower makes it more vulnerable in retaliation. An enemy who has already struck first with missiles or bombers would have its air defenses at maximum readiness for counterstrikes. On balance, aircraft and air delivered weapons are a stability-plus launch platform, although their efficiency in destroying targets relative to ballistic missiles is smaller (missile defense technology lags air defense technology relative to the platforms opposing it).

Medium-size nuclear powers, in either the optimist or the pessimist world, might try to deploy more of their nuclear capable launchers at sea. This seaborne deployment might be easier to accomplish for cruise missiles, compared to ballistic missiles. The operation of long-range, nuclear armed ballistic missile submarines requires considerable funding, expert crews, and highly expensive and nuanced command and control. Even now, post-Soviet Russia is challenged to maintain even a fraction of the fleet ballistic missile submarines deployed by the Soviet Union during the 1980s. The sinking of the Russian submarine *Kursk* in 2000 due to an accidental torpedo explosion (although the *Kursk* was a cruise missile and not a ballistic missile submarine) shows how dangerous advanced subsurface operations can be—even without an opponent—when technology or personnel are insufficiently "fault tolerant."

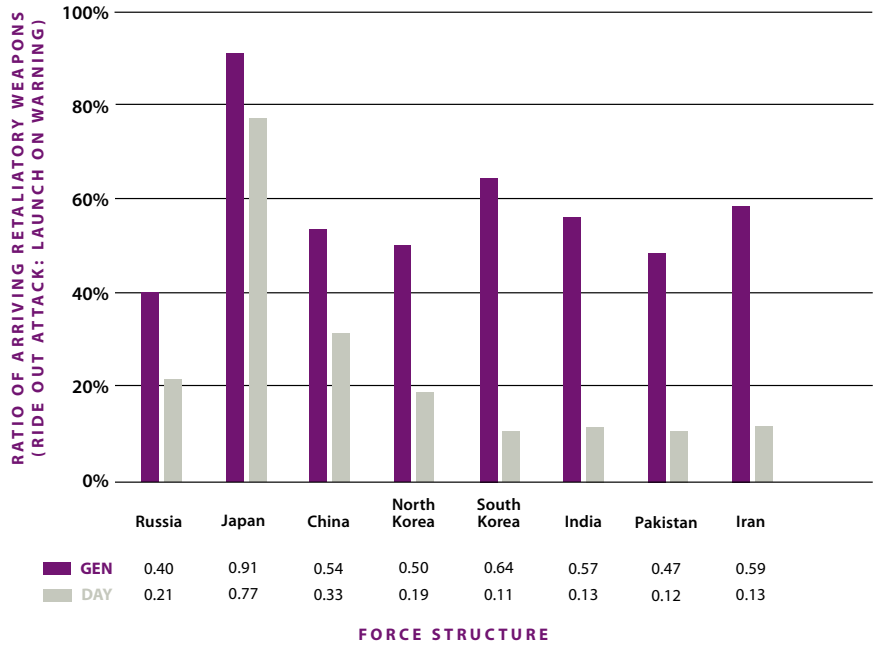
A second general finding or implication of the analysis is that the degrees of instability accepted by the states in this model are barely acceptable in the optimist world—and verging on intolerable in the pessimist system. As the figures indicate, some states even in the "bull market" system for stability have large gaps between their arriving retaliatory weapons on generated, compared to day, alert and between

Figure 7. Launch on Warning Stability: Holding Model



Key: GEN: Generation stability, DAY: Day-to-day alert

Figure 8. Launch on Warning Stability: Folding Model



Key: GEN: Generation stability, DAY: Day-to-day alert

retaliating weapons on prompt, compared to delayed, launch. Hair triggers are a nuisance in the optimist world/holding model; they are the gateways to hell in the pessimist world on account of the fact that in the folding model, more states with historical or present political grievances share geographical proximity. Forces that depend on prompt launch or high generation in time of crisis can provoke the very war that they are intended to deter, especially if states' decisionmakers are aware of their limitations on day alert or when riding out an attack and then retaliating.

A third implication of the results in the preceding analysis has to do with the issue of "no first use" as a declaratory or operational policy for American or other nuclear forces. No first use of nuclear weapons is an ethically admirable, and politically desirable, declaratory policy. However, it is highly conditional on circumstances, and its effectiveness is scenario dependent. NATO found it inexpedient during the Cold War on account of the presumed inferiority of its conventional forces compared to those of the Soviet Union and Warsaw Pact deployed in Europe. Russia now finds a no first use declaratory policy unpropitious for the same reason: the decrepit character of its conventional forces compared to those of the United States and NATO, or to Soviet forces of the late Cold War.[11]

It is argued that no first use doctrines are sometimes dysfunctional for deterrence, especially for the deterrent umbrella that the United States might want to extend to allies. As a case in point, the United States might want some states in the Middle East or Asia to be deterred from attacking regional American allies (Taiwan, Japan, Israel, and Iraq) with conventional forces or with weapons of mass destruction other than nuclear. The credible threat of nuclear first use against such adventurism might give pause to aggressors who would otherwise be willing to gamble on U.S. restraint. For example, U.S. negotiators apparently informed Saddam in 1991, prior to the outbreak of Operation *Desert Storm*, that any Iraqi use of chemical or biological weapons would put all American options on the table, including the possible first use of nuclear weapons. On the other hand, this case might be interpreted not as one of deterrence but as an instance of escalation control for the management of a conflict that U.S. officials and Iraqis knew was inevitable.

Extended deterrence does have the value of providing a U.S. nuclear umbrella over states in Europe or Asia that might have deployed their own nuclear weapons in lieu of American protection. On the other hand, demonstrating that extended deterrence has worked because of American nuclear weapons, as opposed to other assets, is a more difficult argument now than it would have been during the Cold War. In conventional warfare, the United States, in the first decade of the 21st century, was unarguably superior to any other state as a military power with global reach.[12] The case that nuclear umbrellas, as opposed to conventional raincoats, are necessary for the protection of allies against threats *other than nuclear coercion or attack* is weaker now than hitherto.

As an alternative to a declaratory policy of nuclear first use, the nuclear powers might consider the doctrine of "defensive last resort," which is one step less rigid than nuclear first use. A doctrine of last resort (presumably defensive in intent) was adopted by NATO in 1991, and as a declaratory policy, it is more suited to the realities of operational policy and military practice. Under a doctrine of defensive last resort, the first use of nuclear weapons is not precluded, but it is also not encouraged as an early step on the ladder of escalation. As explained by the authors of an important study on nuclear arms control:

> *To recognize the possibility that in some future defense against aggression the use of the nuclear weapon could unexpectedly become the only alternative to an even worse disaster is not to encourage reliance by planners on any such action, nor does it support any doctrine of early use. A doctrine of defensive last resort is fully consistent with a continuing American effort to sustain the worldwide tradition of nonuse.*[13]

The preceding point is reinforced by the blurred line between nuclear first use and first strike already noted in this discussion, and by the unhealthy dependency of current and possible future nuclear states on prompt launch and high alert (that is, hair triggers) in order to guarantee the survivability and retaliatory credibility of their nuclear forces.

American, NATO, or even Russian declaratory policies, let alone extensive debates, about nuclear first use or first strike are unhelpful as matters of public diplomacy. As matters of military credibility or deterrence stability, they are even worse. There is little to be gained, and much potentially to be lost, by front-ending nuclear weapons onto undisciplined "what if" policy discussions. In an exceptional case that requires serious consideration of nuclear first use, or the threat of same, leaders can rise to the occasion without having already mortgaged their reputation for seriousness and sanity.

The threat of nuclear first use against terrorists with WMD or states that harbor them is hardly likely to dissuade terrorists, although it may inhibit other states from providing comparable support to dangerous malcontents. However, terrorists might actually welcome a preventive nuclear attack on their headquarters and storage sites, providing them with martyrdom and inflaming much of the rest of the world against American ideals and policies. Nuclear weapons are neither the obvious first choice for suppression of nonstate actors by preemptive military attacks nor the expedient solution to a problem that is best resolved by improved intelligence, better international cooperation in counterterror operations, and lethal nonnuclear munitions. **JFQ**

NOTES

[1] Andrei Kislyakov, "Russian Army Prepares for Nuclear Onslaught," *RIA Novosti*, January 29, 2008.

[2] Vladimir Ivanov, "Comparison of Russian, U.S., and NATO Policies toward Preemptive Nuclear Strikes," *Nezavisimoye Voyennoye Obozreniye*, February 4, 2008.

[3] Ian Traynor, "Pre-emptive nuclear strike a key option, NATO told," *Guardian Unlimited*, January 22, 2008, available at <www.guardian.co.uk/nato/story/0,,2244782,00.html>.

[4] Ibid.

[5] Ibid.

[6] Larry M. Wortzel, *China's Nuclear Forces: Operations, Training, Doctrine, Command, Control, and Campaign Planning* (Carlisle Barracks, PA: U.S. Army War College, May 2007), 9.

[7] Ibid., viii–ix.

[8] Ibid., 31.

[9] Ibid., 31–33 and *passim*.

[10] Graham Allison, *Nuclear Terrorism: The Ultimate Preventable Catastrophe* (New York: Henry Holt–Times Books, 2004).

[11] Dale R. Herspring, "Putin and Military Reform," in *Putin's Russia: Past Imperfect, Future Uncertain*, 3d ed., ed. Dale R. Herspring (Lanham, MD: Rowman and Littlefield, 2007), 173–194.

[12] Stephen M. Walt, *Taming American Power: The Global Response to U.S. Primacy* (New York: Norton, 2005), 33–36.

[13] McGeorge Bundy, William J. Crowe, Jr., and Sidney D. Drell, *Reducing Nuclear Danger: The Road Away from the Brink* (New York: Council on Foreign Relations, 1993), 85.