

NMD	national missile defense
NPT	Nonproliferation Treaty
NTW	Navy theater-wide defense
PAC	Patriot Advanced Capability
RV	reentry vehicle
SBIRS	space-based infrared system
SLBM	submarine-launched ballistic missile
SDI	Strategic Defense Initiative
SRBM	short-range ballistic missile
START	Strategic Arms Reduction Treaty
THAAD	theater high-altitude area defense
TMD	theater missile defense
WMD	weapons of mass destruction

Defending America

SHOULD THE UNITED STATES build a national missile defense (NMD) to protect the American people, and possibly key allies as well, against attack by long-range ballistic missiles? President Bill Clinton's September 2000 announcement that he was deferring the decision on whether to deploy an NMD system puts this question squarely on the Bush administration's agenda. The United States currently has no nationwide defense against missile attack. Should President Bush fulfill his campaign pledge to "build effective missile defenses, based on the best available options, at the earliest possible date," the decision will have potentially seismic consequences for both American national security and international affairs.¹ Most countries, including many of America's closest allies, warn that missile defense will trigger an arms race and jeopardize three decades of arms control efforts.

Within the United States, reactions to national missile defense have broken down along well-worn lines. Opponents, most of whom are Democrats, complain that the benefits of national missile defense are uncertain and the costs steep. They argue that effective missile defenses are difficult to build—not the least because America's adversaries have every incentive to find ways to defeat them—and that the investment of billions would produce only a high-tech sieve. At the same time, deploying an NMD system would strain relations with Russia, China, and

Europe and threaten three decades of arms control. Even those who believe that formal superpower nuclear arms control has become anachronistic should worry. A hasty, ambitious NMD deployment could worsen U.S. security by impeding cooperative programs to secure Russia's nuclear weapons and materials, and by reducing the odds that Moscow and Beijing will tighten their controls over the proliferation of weapons of mass destruction. The result may well be a world with more intercontinental ballistic missiles (ICBMs) and weapons of mass destruction that would leave America less secure, not more secure.

Supporters of national missile defense, most of whom are Republicans, insist not only that the United States should build defenses but that it must. They argue that revolutionary developments in radar, laser, and data processing technology are transforming missile defense from the stuff of science fiction into a here and now reality. These technological breakthroughs come as nuclear and ballistic missile technology is spreading to states that are virulently hostile to American power and values. According to this view, a national security policy that deliberately leaves the American people vulnerable to attack when technology makes it possible to protect them is immoral and unacceptable. Not only does it fly in the face of common sense to leave the nation undefended, but it could hamstring America's role in the world. If hostile countries such as Iraq felt they could threaten the United States, and thereby deter it from defending its allies and global interests, these countries might feel less constrained about threatening or attacking their neighbors. Moreover, vulnerability to long-range ballistic missile attacks could cause America's friends and allies to doubt its willingness to stand by its security commitments, thereby weakening support for the United States around the world.

Both sides in the NMD debate make valid points. But rather than generating a serious discussion of how each side's legitimate concerns can be forged into a sensible policy for the country, the current debate has degenerated into a dialogue of the deaf. Each side repeats its claims with evangelical fervor, often exaggerating the harm or promise of missile defense. National missile defense, however, should not be an ideological issue to champion passionately or oppose resolutely. The issues are complicated, not clear cut. What is needed is not partisan or ideological cheerleading but a sober analysis of the role national missile defense can play in American national security. That is what this book seeks to provide.

Déjà Vu All Over Again?

Whether to defend the United States against ballistic missile attacks is not new to American politics. The current debate over national missile defense marks the third round in a decades-long debate over the merits of defense in the nuclear age.

Although initial research programs had begun a decade earlier, the first major missile defense debate began in 1967 when the Johnson administration proposed building the Sentinel system, which would have placed nuclear-tipped interceptor missiles at fifteen sites around the country, including ten near major metropolitan areas.² People living near the planned sites rebelled, however, because they feared that putting the missiles in their backyard would greatly increase their chances of becoming the target of an attack. The Nixon administration recognized that Sentinel was politically unsustainable and changed course. It abandoned the idea of defending American cities and proposed instead to use the same interceptor technology to defend a portion of America's land-based ICBMs. The new program, named Safeguard, proved politically controversial as well, and it barely survived congressional opposition led by a coalition of Democrats and liberal Republicans. In October 1975 the lone Safeguard site opened in Grand Forks, North Dakota. Less than two months later, however, anti-Safeguard forces prevailed on Capitol Hill, and Congress voted to close the base, effectively writing off an investment of more than \$20 billion (in 2001 dollars).³

With the passing of Safeguard, missile defense disappeared as a political issue until Ronald Reagan resurrected it in his famed 1983 "Star Wars" speech.⁴ The result was a new, high-profile program, the Strategic Defense Initiative (SDI), that sought to defend the United States with ground-based and space-based weapons. Like Sentinel and Safeguard, SDI polarized Congress, though this time largely along party lines. Proponents (mostly Republicans) argued that defending America was a moral imperative; critics (mostly Democrats) argued that it was wasteful and dangerous. Unlike Safeguard, however, SDI never left the research and development stage. The Bush administration reduced the program's political profile and focused it on long-term research. The Clinton administration initially went even further. At the behest of many in the military, it redirected spending away from national defenses and toward theater missile defenses (TMD) designed to protect U.S. troops and allies against

attacks by shorter-range missiles like the infamous Scud that played such a prominent role in the 1991 Persian Gulf War (figure 1-1). In contrast to NMD programs, TMD programs have enjoyed widespread political support during the past decade because the threat of attack on U.S. troops from shorter-range missiles has been judged considerable and because TMD systems are usually not seen as threatening the deterrents of other major nuclear powers.

The Sentinel, Safeguard, and SDI programs all foundered on two obstacles. The first was technological—none of the three programs offered the prospect of an effective defense. The Johnson administration acknowledged from the start that Sentinel could not defend the United States against a Soviet attack—the system was justified as a “thin” defense against a possible Chinese attack. (China did not deploy long-range missiles capable of reaching U.S. soil until 1980.) Even in that limited role it raised major worries because it sought to destroy incoming warheads in their terminal phase by detonating nuclear warheads in the atmosphere over the United States. The Safeguard system’s interceptor missile flunked nearly half of its flight tests. Even if the interceptor missile had worked flawlessly, the Soviet Union could easily have overwhelmed the lone Safeguard site (which is why the Ford administration acquiesced in the congressional decision to shut it down). The SDI proponents insisted that the United States was on the verge of mastering exotic technologies such as x-ray lasers. By the end of the Bush administration, however, the Pentagon had concluded that such weapons were decades away from being ready.

The second, and in many ways more important, obstacle to missile defense was strategic. Critics argued that even if highly effective defenses could be built, they would—at least in the context of the U.S.-Soviet rivalry—produce a more dangerous world, not a less dangerous one. One problem is that they would have likely fueled a superpower arms race. Moscow would build more offensive weapons in order to be certain it could overwhelm any U.S. defense, and Washington would respond similarly to any Soviet defense. Worse yet, defenses might have made war more likely. Both countries would fear that the other side could attack first and then use its defenses to blunt a retaliatory attack. This would have created an incentive to strike first, before the adversary could attack. Moreover, the incentive to “use them or lose them” would be strongest at the worst possible time—during a crisis. Finally, given the state of technology, defenses would probably not have worked in any case—especially

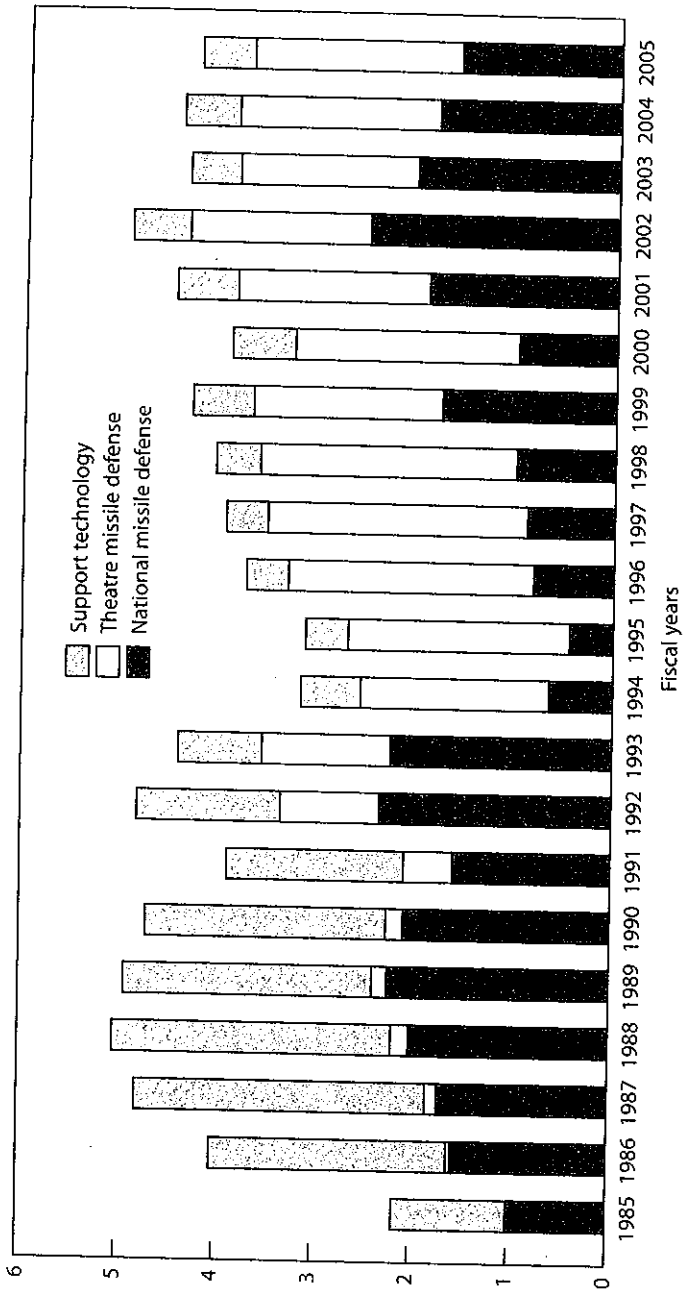
in light of the enormous strategic arsenals each side wielded against the other.

The conviction that national missile defenses fuel arms races and make crises more dangerous led the United States and the Soviet Union to sign the Anti-Ballistic Missile (ABM) Treaty in 1972. The treaty flatly banned all forms of national missile defense that could provide territorial defense for the United States or Soviet Union against long-range missile attack. It did not, however, ban defenses against strategic or long-range missiles outright. Instead, it permitted both countries to operate two small missile defense systems (like Safeguard), one around its national capital and the other around an ICBM site, each equipped with no more than one hundred interceptors designed for local defense. (In 1974 the United States and the Soviet Union agreed to cut the number of permitted sites and interceptors in half; Russia continues to maintain its site around Moscow.) The treaty permitted a certain amount of radar capability for each defense site; it also permitted early-warning radars along each country’s periphery and facing outward (and in certain overseas locations) as well as satellites for similar purposes. But to create firebreaks against any rapid or clandestine expansion of these limited defenses, the treaty barred other types of sensors, the development and testing of sea- and space-based defenses, as well as other mobile national missile defense systems. It also banned exports of long-range missile defense technologies. Both countries retained the right, however, to develop and build theater defenses, conduct basic research on virtually all missile defense technology, and develop and test fixed land-based ABM technologies as long as any deployments met the treaty’s strict guidelines.

In sum, the core motivation behind the ABM Treaty was that neither country should develop a *strategically significant* defense, that is, one that could render the adversary vulnerable to a disarming first strike, or spark an arms race. However, the letter of the treaty bans all national missile defenses—that is, any system, however limited in scale, that could defend all of a country’s territory against long-range missile attack.

In signing the ABM Treaty, Washington and Moscow formally embraced the idea that, at least in the case of their superpower rivalry, mutual vulnerability helped prevent nuclear war and dampen a wasteful arms race. (The two sides were not so enamored with vulnerability that they agreed to restrict air defenses or antisubmarine warfare capabilities.) The wisdom of this decision has been debated ever since; indeed, it was hotly debated during the 1980s, when the cold war continued. Missile

Figure 1-1. U.S. Spending on Missile Defense
Billions of constant 2001 dollars



Source: Walter Slocombe, undersecretary of defense (policy), "U.S. Limited National Missile Defense Program," presented at Harvard-CSIS Ballistic Missile Defense Conference, Cambridge, Mass., May 2000, p. 27.
Note: Spending for fiscal years 2001-05 is projected.

defense critics acknowledge that the logic of mutual assured destruction (MAD) is counterintuitive, but they insist it forms the cornerstone of strategic stability. Many NMD proponents, however, reject the idea that a MAD world has an overriding virtue. They argue that any policy that leaves the United States vulnerable to a nuclear attack, whether accidental or intentional, is immoral.⁵ What is often overlooked amid this sparring is another, more nuanced, possibility: a limited defense against small powers may have virtue even if there is no alternative to a MAD world between the great powers.

Is the Third Time a Charm?

Has anything changed since the Sentinel, Safeguard and SDI debates to warrant rethinking the idea of national missile defense? Proponents say yes. They make three points. First, U.S.-Russian relations have improved greatly with the end of the cold war, easing fears that defensive deployments will inevitably spark an offensive arms race. The warmer strategic climate also has lowered the bar for judging any missile defense worthwhile. A missile defense that would have been pointless during the cold war given the size of the Soviet threat may make sense today (table 1-1). Second, the United States faces a greater threat of attack as missile technology spreads to more countries. Many of these new ballistic missile powers are deeply hostile to American values and interests. Third, technology has improved, making it possible to build effective defenses against the smaller threats that the new ballistic missile powers pose.

There is more truth to each of these claims than critics are willing to acknowledge. The changes are not as dramatic, however, as missile defense proponents would have it.

Better Relations with Russia (Though Don't Forget about China)

With the end of the cold war, the United States and Russia are no longer enemies and have begun to take important steps to reduce the threat they pose to each other. They no longer deploy huge land armies against each other. They have negotiated the Strategic Arms Reduction agreements (START I and START II), which if implemented will bring the number of strategic nuclear warheads on each side down to 3,000-3,500. They are committed to using the START III negotiations to cut their arsenals to no more than 2,000-2,500 strategic warheads apiece. Under the

Table 1-1. Evolution of U.S. National Missile Defense Programs

Item	Mission	Threat size	Space-based laser	Space-based interceptors	Ground-based interceptors
Strategic Defense Initiative (1980s)	Counter massive Soviet ballistic missile strike	1,000s	10s	4,000	1,500
GPALS (early 1990s)	Defeat accidental or unauthorized ballistic missile launch	200	No	1,000	750
Limited national missile defense (2000)	Defend against very small rogue state threat	A few to a few 10s	No	No	100 to 250

Source: Walter Slocombe, undersecretary of defense (policy), "U.S. Limited National Missile Defense Program," presented at Harvard-CSIS Ballistic Missile Defense Conference, Cambridge, Mass., May 2000.

Department of Defense (DoD) Nunn-Lugar cooperative threat reduction initiative and related Department of Energy (DOE) programs, American scientists visit Russian nuclear weapons labs and vice versa, U.S. technology helps protect Russian weapons and nuclear materials from theft and diversion, and American dollars pay for the partial dismantlement of an aging Russian nuclear arsenal.⁶

The fundamental transformation in U.S.-Russian relations clearly creates the opportunity for new discussions on missile defense, as Moscow itself acknowledges. In 1997, then-Russian president Boris Yeltsin agreed to consider Bill Clinton's request to negotiate changes to the ABM Treaty to permit the deployment of a limited national missile defense. In 2000, the new Russian president, Vladimir Putin, acknowledged that missile defenses have a role to play in the post-cold war world and proposed that Russia and NATO work jointly to develop them.

But claims about a new strategic climate are easily pushed too far. Although Russia and the United States have better relations, they are not allies. Substantial suspicion still marks the relationship—witness the tensions over NATO's 1999 war against Serbia and Russia's ongoing war against Chechen rebels. The distrust is especially strong in Moscow. It understandably fears defenses that theoretically could some day render its nuclear deterrent obsolete and further diminish its already sinking international status. So Washington should not be surprised that Moscow does not enthusiastically embrace its missile defense proposals.

The focus on how much warmer U.S.-Russian relations are than U.S.-Soviet relations also overlooks another key player in the missile defense debate: China. Unlike Russia, China is not a declining power but a rising one; and again, unlike Russia, China has specific territorial issues (notably Taiwan) over which it could conceivably wage a war with the United States. How does the missile defense debate look in Beijing, then?

China is not a signatory to the ABM Treaty, but missile defense clearly affects its interests. With only about twenty ICBMs in its arsenal, China has never had a robust second-strike capability against the United States. Deployment of even a "limited" NMD system could, depending on the specific architecture chosen, make the value of its nuclear deterrent even more questionable. Missile defense looks especially threatening to Beijing coming as it does on the heels of a decade of seemingly closer U.S. support for Taiwan—a rogue, breakaway province in China's eyes—as well as a 1997 White House decision to add Chinese political and military installations back into U.S. strategic nuclear targeting plans after a twenty-year

absence.⁷ No one should be surprised, then, that Beijing looks skeptically on President George W. Bush's claim that "America's development of defenses is a search for security, not a search for advantage."⁸

It is tempting to dismiss Russia's and China's complaints as their problem. But that view is too simplistic, even from the perspective of enhancing U.S. security. At a minimum, deploying defenses over Russia's objections could jeopardize President Bush's hopes to make deep cuts in offensive nuclear weapons. Until the day that Russia sees the United States as entirely unthreatening—an outcome to be hoped for but not one on the immediate horizon—it will continue to link its offensive deployments to U.S. decisions on missile defense. Fiscal constraints will hamper its ability to do so, but Moscow will still retain some low-cost options for deploying a sizable nuclear arsenal—such as retaining the multiple-warhead ICBMs it is supposed to destroy under START II. Chances are, then, that the more robust the U.S. defense, the larger the Russian nuclear arsenal. The same goes for China.

Some may say, so what? After all, with the cold war over, superpower arms balances no longer have the importance they once did. And if China builds up its offensive strategic forces to counter a U.S. defense, at least it will have fewer resources to spend on other military instruments—such as the amphibious forces that would be needed to seize Taiwan.

But the fallout from a push for missile defenses would probably rebound to America's disadvantage. Both Russia and China would probably improve their existing countermeasure technologies—particularly against so-called midcourse defenses that attempt to destroy enemy warheads in space—a step that any country with the resources to test missiles repeatedly can probably take with considerable success. If Moscow and Beijing feel threatened by a U.S. missile defense, they might also respond by deploying their nuclear forces on states of hair-trigger alert. (Russia already does so, but future arms control efforts could change that.) This would substantially increase the risk of accidental war, hardly the desired outcome of missile defense.

Russia might also curtail its cooperation with the United States to secure its nuclear arsenal. Cooperative programs have consolidated and secured most of Russia's nuclear weapons to date, but challenges remain. Surplus nuclear materials that are not inside actual nuclear warheads remain widely dispersed and vulnerable to theft. In addition, large numbers of Russian weapons scientists, many of whom are now working on temporary contracts that reduce their incentives to emigrate to radical

states seeking their expertise, do not yet have self-sustaining civilian jobs within Russia.

Finally, Russia and China might stop cooperating on issues that matter to Washington, particularly nuclear proliferation. Indeed, pursuing national missile defense over Russian and Chinese objections might encourage them to sell technology for developing weapons of mass destruction, building missiles, and defeating defenses to countries such as North Korea, Iran, and Iraq, creating a situation in which the cure aggravates the disease. And China might reduce its efforts to moderate North Korea's behavior, and raise the temperature in its dealings with Taiwan, to complicate U.S. foreign policy and make Washington pay a price for ignoring China's strategic interests.

To be sure, at this point these worries are hypothetical. No one knows for certain how Russia or China would react to a U.S. NMD deployment that trampled on its interests. However, the vociferousness of Moscow's and Beijing's objections to NMD suggests that their responses would not be benign. So do the normal competitive security dynamics between countries that view each other as rivals. The U.S. National Intelligence Council shares our concerns, concluding, among other things, that Moscow and Beijing may sell countermeasures to other countries if the United States deploys an NMD system.⁹ And domestic political pressures may also push Russia and China to react. For example, many Russians view the Nunn-Lugar cooperative threat reduction program as a sophisticated and well-camouflaged U.S. espionage effort. This sentiment has been fueled by a growing irritation with the United States, first because of NATO expansion and then because of the Kosovo war and frequent Western criticisms of the Chechnya conflict. Coupled with an NMD deployment, this irritation could greatly complicate U.S.-Russian relations, possibly undermining cooperation on the Nunn-Lugar or nonproliferation fronts.¹⁰

None of this is to gainsay then-governor Bush's claim during the 2000 presidential campaign that "it is possible to build a missile defense, and defuse confrontation with Russia."¹¹ Both can be done. But it will not be easy. And defenses are not all created equal. Some types will likely intensify confrontation between Moscow and Washington, as well as Beijing and Washington.

The Spreading Threat

Missile defense proponents argue that the United States faces a growing ballistic missile threat. Missile defense critics respond by arguing that

the long-range ballistic missile threat facing the United States has decreased during the past decade. By some measures the critics are right. During the 1980s, the Soviet Union possessed 2,318 long-range missiles. Today Russia has roughly 1,100, a decline of more than 50 percent. That number will fall further if Washington and Moscow make good on their START III pledge. Meanwhile, no other potential adversaries besides China have built ICBMs, and Beijing's arsenal remains small. And countries such as Argentina, Brazil, Egypt, and South Africa that sought to develop long-range missile technology in the 1980s abandoned their programs in the 1990s.¹²

These measures, however, ignore the more important trend for the future of American national security: the number of states hostile to the United States and possessing long-range missile technology is likely to grow during the coming decades. The U.S. intelligence community believes that by 2015 the United States will face ICBM threats not just from Russia and China but also from "North Korea, probably from Iran, and possibly from Iraq."¹³ Even more troubling, the intelligence community warns that any of these countries may be able to flight test a functioning "ICBM with a reentry vehicle (RV) with little or no warning."¹⁴ So the United States may not have the luxury of waiting for evidence of a clear and present danger before taking steps to counter the missile threat.

The threat that spreading ballistic missile technology poses, while real, should be kept in perspective. North Korea, Iran, and Iraq may succeed in building ICBMs, but they will not recreate the Soviet missile arsenal. All three countries operate under substantial financial and technological constraints, and according to the U.S. intelligence community, will be able to produce only "a few to tens [of missiles], constrained to smaller payloads, and less reliable than their Russian and Chinese counterparts."¹⁵ Their accuracies may also be poor, and their warheads may or may not survive the descent to earth given the difficulty of building heat-resistant reentry vehicles. All three countries will be even harder pressed to build more than a few nuclear warheads. North Korea has the most advanced nuclear program of the three, and the U.S. intelligence community estimates that it has enough nuclear material for two warheads at most.¹⁶ Any such warheads may not be small enough to place atop a missile. Of course, North Korea, Iran, or Iraq could use chemical and biological warheads instead, but doing so would, most probably, diminish significantly the lethality of any attack (while still risking nuclear retaliation). Consider the situation with

a biological agent like anthrax. Not only is it difficult to deliver anthrax effectively by high-speed warhead, but if a missile were fired at the United States, Americans would know they had been attacked, possibly giving them valuable time to take cover and in any case providing an opportunity to seek prompt medical treatment against infection.

The threat facing the United States also is not immediate. Although the U.S. intelligence community contends that North Korea, Iran, and Iraq "could" deploy long-range missiles, considerable disagreement exists over whether they will anytime soon.¹⁷ Moreover, recent political trends give reason to be optimistic that ballistic missile technology may not spread as rapidly as feared. North Korea agreed to freeze its missile flight-test program in 1999, in June 2000 the leaders of the two Koreas held a historic summit meeting in Pyongyang, and in October 2000 Secretary of State Madeleine Albright became the first senior U.S. official to visit the hermit kingdom. Iranian voters elected a more moderate Parliament in February 2000, and relations between Teheran and Washington may be slowly warming. Positive political trends do not extend to Iraq, however. Sanctions remain in place on Baghdad, slowing Saddam Hussein's pursuit of missiles and weapons of mass destruction, but international support for maintaining the embargo has frayed.¹⁸ If the sanctions regime ends, or if countries further ignore it, all signs indicate that Iraq will move rapidly to rebuild its arsenal.

That some political trends are now working against missile proliferation and sanctions remain in place against Iraq weaken claims that the United States must launch a crash course to build missile defenses. Washington probably has time to do missile defense right and not just fast. Put differently, the risks of rushing outweigh the risks of being a bit more patient. By the same token, however, encouraging political trends are no reason to shelve the idea of missile defense or to adopt a casual and relaxed attitude toward missile-defense research. Political trends can reverse themselves overnight; North Korea may resume flight testing at a moment's notice, reformers may not gain control of Iran's military, and Iraq may succeed in acquiring a long-range missile capability. Indeed, continued vigorous U.S. missile defense efforts will keep the pressure on the international community to take nonproliferation more seriously; both China and Russia have pushed Pyongyang to moderate its behavior in a bid to show the world that the U.S. fear of North Korea is exaggerated. And in the long run, with the advent of a networked world and easy access

to information, it may prove impossible to stem the proliferation of missile technology.

Better Technology

For decades, effective defenses against long-range ballistic missiles were derided as fantasy. Now many NMD critics agree that some kinds of defenses are becoming feasible. But considerable disagreement exists over which missile defense architectures make sense and how effective they are likely to be.

The missile defense architecture that has attracted the most attention is the Clinton administration's proposal to build a midcourse interceptor system using "hit-to-kill" technology. Under this plan, the United States would eventually be able to launch interceptor missiles from bases in Alaska and North Dakota. Upon reaching space, these defensive rockets would launch "exo-atmospheric kill vehicles" that would try to destroy the attacker's warheads by ramming into them. In October 1999 the Pentagon demonstrated the basic feasibility of "hitting a bullet with a bullet" in a controlled test in which a kill vehicle destroyed a warhead 140 miles above the Pacific Ocean. Equipment malfunctions disrupted the next two tests, however, and the interceptors failed to hit their targets.

These flight-test problems highlight the difficulties that plague the development of any major weapons system, especially one as complex as missile defense. Programs seldom proceed as smoothly, rapidly, or inexpensively as their strongest supporters contend. And while the Pentagon may eventually solve the engineering problems that have beset the NMD system that the Clinton administration proposed building, it remains questionable how well any midcourse interceptor can be made to work under operational conditions. Critics contend that because midcourse interceptors operate in the weightless vacuum of space, where there is no air resistance to help separate heavier warheads from lighter decoys, they are inherently vulnerable to simple countermeasures.¹⁹ Pentagon officials acknowledge that early versions of its midcourse interceptor would be vulnerable to "sophisticated countermeasures" but insist that its capabilities will be upgraded over time.²⁰ It will be years before the tests needed to settle the issue can be conducted, but basic physics suggests that the Pentagon faces serious and innate disadvantages in trying to make a midcourse NMD system work against anything but a crude attack.

The vulnerability of the Clinton administration's proposed system to countermeasures has prompted considerable interest in boost-phase tech-

nology.²¹ These defenses would shoot down missiles shortly after launch, before they reached space, and most important, before they could deploy warheads or decoys. In theory, boost-phase intercepts should be easier than midcourse intercepts. When a warhead reaches space, it is small, cold, and fast, making it difficult to locate and hit. By contrast, during boost phase an ICBM is moving relatively slowly and its rocket plume makes it easy to locate. The operative words, however, are "in theory." Serious work on boost-phase defense is only just beginning, and perhaps its leading proponent, physicist Richard Garwin, acknowledges that making it work will be "technologically challenging."²² No one knows yet how long it would take to build an operational system or how effective it would be under real world conditions.

Even when the Pentagon solves these technological challenges, boost-phase defenses based on land or sea or in the air—the variants that have drawn the most political support thus far—are inherently limited: because missiles remain in their boost phases for only a few minutes, these defenses can work only if the defensive weapon is based within a few hundred miles of the launch site of the offensive missile. In many instances, therefore, boost-phase defenses would need to be based on foreign territory. This raises serious questions about such a defense's reliability in wartime. Moreover, earth-based boost-phase defenses cannot be used to protect the United States against Chinese or Russian missile attack—deliberate, accidental, unauthorized, or erroneous—because both countries are too large. That fact is seen as a virtue by some (including us), because it should ease the effort of gaining Russian or Chinese support for the system, but it is seen as a weakness by others. The geographical limitations inherent in earth-based boost-phase defenses lead many missile defense proponents to champion space-based boost-phase defense. But deploying boost-phase interceptors in space, and keeping them in good operational condition there, would be a monumental technological and logistical challenge that makes the idea a rather distant prospect.

Technological optimists may turn out to be right, and missile defense technology may move ahead rapidly. Even then, however, Americans will remain vulnerable to chemical, biological, and nuclear attack. Neither the Clinton administration's proposed midcourse system nor a system using boost-phase interceptors is designed to shoot down cruise missiles or short-range missiles launched from ships, which are easier for any attacker to build than long-range ballistic missiles because the basic components are more readily available and the engineering challenges are less

severe. Hostile states (or terrorists) may also resort to nonconventional means of attack.²³ This is especially true for weak states that cannot conduct rigorous missile flight tests because of financial or political constraints. And in the case of biological weapons, a nonconventional attack probably would be more deadly than a ballistic missile because Americans might not learn of the attack until it was too late to take cover or seek early medical treatment.

The recognition that America will remain vulnerable to attack even with national missile defense does not mean that defense is pointless. The fact that the United States cannot defend itself perfectly against every threat is no reason to give up the effort. Taking steps to defend the country against long-range missile threats is especially worthwhile because missile threats differ fundamentally from "suitcase bombs"—which are much bigger and less easily concealed than that phrase suggests, especially in the key case of nuclear weapons. Missiles deliver warheads very quickly—making them especially dangerous during a crisis or in a war. They are also inherently more useful than suitcase bombs as instruments of coercive diplomacy because the attacker does not have to issue a threat; the fact that a potential assailant possesses missiles may be sufficient to deter. Finally, it is not true that Americans are defenseless against suitcase bombs or terrorist attacks. The United States spends billions of dollars every year on intelligence and law enforcement activities that attempt to track terrorists, monitor borders, and foil bomb plots. As for cruise missiles, several TMD programs have the capability to address this emerging threat.

But even if a limited NMD system is feasible and desirable, one does not have to be a Luddite to be skeptical about claims that robust national missile defenses capable of defeating large-scale attacks are within reach—or wise, even if possible. The Pentagon has made important strides in recent years, but it has only established that it might be able to build a limited national missile defense. Much work remains to be done to build an operational system. That will take time, and the ultimate effectiveness of any defense remains to be seen. What is clearly not in the cards any time soon is a technological magic bullet that erases the threat of nuclear annihilation. For that reason, talk of moving toward a "defense dominant" world or substituting mutual assured security for mutual assured destruction is wildly premature. Ronald Reagan's dream of rendering nuclear weapons "impotent and obsolete" remains just that.

Why Not Prevention, Preemption, and Deterrence?

The strategic climate may have changed, the threat may be potentially more widespread, and technology may be better, but does national missile defense fill a niche not met by traditional policy tools? Critics say no. They argue that the United States should deal with ballistic missile threats as it has for forty years, through a combination of prevention, preemption, and deterrence. The problem, however, is that all these policy tools have shortcomings.

Consider prevention. The United States has long controlled the export of high-technology goods, and it has pressed other advanced industrialized countries, including Russia and China, to follow suit. It has imposed sanctions on states judged to be proliferators. It has pioneered arms control agreements such as the Nonproliferation Treaty (NPT) and the Comprehensive Test Ban Treaty (CTBT), though the Senate has refused to consent to the latter. It has created the Missile Technology Control Regime (MTCR), a supplier cartel composed of more than three dozen countries that seeks to deny missile technology to missile-seeking states. And it has used military force (against Iraq) and implicitly threatened to use force (against North Korea) to launch preventive attacks designed to disrupt other countries' proliferation efforts before they could produce operational weapons. Despite these efforts, nuclear and missile technology continues to spread, though at rates that vary from weapon to weapon and decade to decade.

If proliferation does occur, the United States could resort to a preemptive attack if it received reliable information that a country was preparing to launch a ballistic missile attack.²⁴ But preemption is easier to urge than to carry out. For a preemptive attack to succeed, the United States would need to know where enemy missiles were located. Although ICBMs are larger than Scuds, the abject failure of the U.S.-led coalition to find Iraqi Scuds during the Gulf War underscores the difficulty of this strategy. If a country such as North Korea or Iraq put ICBM silos inside large buildings or even under tents, the United States might not know where they were. Worse yet, a preemptive attack may trigger what it sought to avoid: an attack on the United States or one of its allies. Should U.S. forces lose the element of surprise or should they fail to destroy all the adversary's missiles, the opposing country would be able to launch its own attack.

The difficulties inherent in preventing proliferation and preempting attackers explain why the United States has also relied on deterrence in dealing with missile threats. This reliance will continue even if more states acquire long-range missiles. Despite claims to the contrary, no good reason exists to believe that the leaders of countries such as North Korea, Iran, or Iraq are inherently undeterrable. To the contrary, the behavior of all three countries suggests that they respond to incentives and punishments in a rational manner. For example, Pyongyang has refrained for nearly a half century from attacking its more powerful neighbor to the south. (It also showed it could respond to incentives and punishments by suspending its nuclear program after Washington, Seoul, Tokyo, and other capitals offered compensation, and the United States threatened to use military force.) Iraq refrained from using weapons of mass destruction against U.S.-led coalition forces in the Gulf War, quite possibly because it was warned that any such attack would be met with a devastating response.

The problem with deterrence is that, while generally reliable, it can fail. No one seriously contends that North Korea or Iraq will attack out of the blue or even under most conceivable circumstances. Missiles come stamped with a return address, which is one reason deterrence works. But in a few situations a missile attack might become thinkable. Perhaps the likeliest scenario is a regime on the verge of collapse. The Soviet Union's peaceful demise does not mean that other dictatorial regimes will go quietly as well. A government in its death throes might care little about the calculus of deterrence, either because it has nothing to lose by lashing out or because it loses control over its arsenal. Indeed, should a regime in Pyongyang or Baghdad find itself losing a civil war, it could conceivably attempt to blackmail Washington into coming to its rescue. Alternatively, in a more traditional interstate war, a foreign leader may rationally threaten missile attack if U.S.-led forces try to overthrow his regime.

This scenario points to a broader problem: weak nations want long-range missiles not only because they can serve as operational weapons of war, and help assure regime survival in such a war, but also because their very presence makes them useful for coercive diplomacy. Missile defense proponents rightly ask whether the United States would have been willing to liberate Kuwait in 1991 if Iraq had possessed a nuclear missile capable of hitting American soil. Even if the answer had been yes for the Bush administration, it might not be for a future president in a similar situation—or for a future Congress. (After all, Congress just barely ap-

proved Operation Desert Storm.) Perceptions of American vulnerability could have equally important consequences for U.S. alliance relations. Friends and allies could come to doubt whether the United States would make good on its security guarantees, thereby undermining America's interests around the world.

National missile defense, then, could help the United States remain a global superpower, reducing the odds that it would be dissuaded from projecting decisive power in a future crisis or conflict out of fear that its own territory might then be attacked by weapons of mass destruction. As a practical matter, the United States would not be able to act with impunity just because it had a shield for its homeland against missile attack. It would not be sure that shield would work perfectly; it would have to worry that other, clandestine means of attack could be undertaken against U.S. territory (even if such attacks are hardly guaranteed to succeed, as argued above); it would have to worry that its friends and allies, particularly those in immediate proximity to the enemy, could be attacked with weapons of mass destruction as well. There is no doubt that, as a general principle, the United States needs to be especially careful about fighting countries with weapons of mass destruction, and NMD would not change that fact. However, taking account of all constraints and dangers, once Washington and its allies had settled on a policy choice, even an imperfect national missile defense might save tens or even hundreds of thousands of American or allied lives in a given conflict.

National missile defense could also affect the perceptions and incentives of U.S. enemies. Whether the system was perfect or not, potential adversaries might assume that it would help steel the resolve of the United States in a crisis or conflict, and make it more likely to intervene militarily to oppose acts of aggression. If that were the case, NMD would already have aided American national security policy—quite possibly by deterring conflict (or even deterring a potential enemy's desire to develop long-range missiles in the first place).

Missile defense, then, has a role to play in U.S. national security policy because the unthinkable could happen and that prospect will shape the behavior of the United States, its friends, and its foes. If defenses can be made to work, they can provide the United States with a measure of insurance against an unlikely but potentially catastrophic event, preserve America's freedom of maneuver abroad, and reassure others of America's security guarantee. And, it is important to note, in the case of small missile attacks, a defense does not need to be perfect to be useful. Assuming

that the attacker targeted several cities rather than concentrating its attack on just one, a system that could strike down one in two incoming warheads could still save hundreds of thousands of Americans from nuclear annihilation. And even a porous missile defense could enhance deterrence by forcing an attacker with limited capability to contemplate the possibility that any attack would be futile and fatal.

But even if the Pentagon succeeds in building highly effective defenses—and that remains a big if—defense will not provide a substitute for other tools in dealing with proliferation. Just as buying personal life insurance is no reason to start smoking, eat poorly, or behave foolishly, the United States will need to continue policies of prevention, preemption, and deterrence. All four tools should be part of an integrated strategy for dealing with ballistic missile threats.

Sensible Defense Means Limited Defense

If missile defense can provide insurance in the event other policy tools fail, how much defense should the United States seek given what we know about the strategic climate, threat, and technology? Should America limit its efforts to defend against small attacks, as the Clinton administration proposed with its NMD system? Should it seek to defend itself “against any missile launch,” as President Bush proposed at one point during the 2000 presidential campaign?²⁵ Or should it seek to develop something in between? These questions go to the heart of the debate over missile defense.

Many missile defense enthusiasts argue that the United States should build ambitious defenses. While most recognize that an impermeable peace shield remains decades off, they favor building defenses that could defeat any attack up to and including a large-scale unauthorized Russian launch. Such a system has immediate appeal. Who would not want to be protected against an accidental missile launch if it could be done at an acceptable cost? If Russia’s command and control system fails, it might fail big, possibly leading to the launch of many dozens of missiles. That would mean the end of American society as we know it.

Proposals for ambitious defenses, however, suffer from two fatal flaws. First, we are decades away from developing missile defenses capable of blunting a large and technologically sophisticated attack. A defense against a large-scale accidental launch—unlike one against a small attack—needs to operate close to perfection to be worthwhile. Faced with

200 incoming warheads, even a system with an 80 percent kill rate—which would be a daunting technological achievement—would still allow 40 warheads to reach American soil.

Second, ambitious defenses come with strategic and diplomatic costs that are unacceptably high. Any system capable of defeating a large-scale unauthorized launch could also give the United States a first-strike capability against Russia. Moscow would be faced with a choice between basing its nation’s security on assurances of American goodwill or finding a way to defeat the U.S. system. Given the current state of U.S.-Russian relations, there is little doubt that it would choose the latter. That would mean keeping missiles on high states of alert (to avoid a surprise attack), maintaining large stockpiles of nuclear weapons (to increase the chances of overwhelming the defense), and developing better countermeasure technologies (to penetrate the defense). The first is relatively easy to do, and the second two steps can be taken, despite Moscow’s budgetary woes, if Russia disregards START II’s ban on land-based missiles with multiple warheads and puts some of its excellent rocket scientists back on the job of developing countermeasures. The United States would almost surely be safer with just a limited defense, combined with deep cuts in offensive nuclear arsenals, lower states of weapons alert, enhanced efforts in the Nunn-Lugar cooperative threat reduction program and related activities in Russia, and possibly accidental-destruct technologies that either side could use to destroy an unapproved attack by its own forces.

What about building a less ambitious defense that could defeat China’s much smaller nuclear arsenal? This proposal also has considerable surface appeal. Chinese officials have on at least two occasions issued veiled threats to use nuclear weapons against the United States to keep it from coming to the aid of Taiwan in a possible future war.²⁶ Whether China really would threaten nuclear attack or not under such auspices, it is only natural that the United States would want to have some protection against the possibility, if it could be had at an acceptable cost. Having a defense against such a possible attack could also dissuade China from issuing threats in the first place—or from thinking that it had the upper hand over Washington in any crisis concerning Taiwan. That in turn could reduce the odds of dangerous conflict.

However, such a U.S. defense capability against China is almost certainly unattainable. The problem is not, as is often alleged, that the United States will end up in an arms race with China. The United States can afford an arms race far more easily than can Beijing. Some would

even argue that such an arms race would be desirable for the simple fact that it could deprive China of resources needed to improve its conventional military capabilities to seize Taiwan. The problem instead is that there is no reason to believe that when the race ends, the United States will have a defense that can defeat a modernized Chinese arsenal. Mid-course interceptors are vulnerable to countermeasures—technologies the Chinese have developed and no doubt could improve; earth-based boost-phase systems cannot reach China's long-range missiles, except for those deployed near its eastern coast; and space-based defenses will not be ready for perhaps two decades. At best, any attempt to render China's nuclear deterrent obsolete will become an expensive version of tic-tac-toe; the United States is likely to end up where it started—vulnerable to Chinese attack. At worst, it will poison U.S.-Chinese relations and aggravate the missile threat the United States faces—not only from China, but other countries to which Beijing might transfer technology—while also consuming large sums of money that might do much more for U.S. armed forces, and U.S. national security, if spent in other ways. Nor is it clear that China would spend less on its conventional military forces during a nuclear buildup; it might simply elect to spend more on its military if persuaded it was engaged in a major competition with the United States.²⁷

In the end, efforts to build anything other than limited defenses will prove a fool's errand. Technology may some day allow the United States to build ambitious defenses, and U.S. relations with China and Russia may some day improve to the point that neither will see such defenses as threatening. But neither is true today. Americans can insist that they mean no harm with national missile defense, but that will not stop China and Russia from taking steps to protect their interests. And because these steps would probably diminish U.S. security, any effort to develop robust national missile defenses would likely be counterproductive and dangerous.

A Modest Proposal

The fundamental purpose of any American NMD effort at this point should be to build a system that can defend the United States and its allies against attack by hostile emerging ballistic missile states, which in practical terms means small attacks of no more than a couple dozen missiles lacking sophisticated countermeasures. This is the extent of the clearly identifiable missile threat that North Korea and, possibly, Iran or Iraq could pose over the next ten to fifteen years. It is also the realistic extent

of what defense technology will permit over that same period. Above all, the system should be designed to minimize the threat it poses to the Chinese and Russian nuclear deterrents, keeping only a capability against a small, accidental or unauthorized launch from their arsenals. And the United States should continue a vigorous missile defense research program, to keep open the possibility of deploying a more ambitious NMD system if the evolution of the threat warrants it and the advance of technology permits it.

Contrary to the claims of both the Clinton administration and the more zealous missile defense proponents, there is no need to rush to build an NMD system by mid-decade. Neither the evolution of the threat, the state of technological development, nor the status of missile defense diplomacy warrants haste. It is far more important that missile defense be done right, in technical and political terms, than done quickly. Moreover, taking the time to do national missile defense right would enable the United States to coordinate NMD deployment with the deployment of advanced TMD systems, now currently scheduled for no earlier than 2007. Until these TMD systems are ready, America's major allies, and the American troops and citizens they host, will be vulnerable to attack and the United States still vulnerable to blackmail, even if a U.S. NMD system is deployed.

But can the United States design a defense against missile attacks from North Korea, Iran, and Iraq that Beijing and Moscow could live with? There are solid grounds to believe that the answer is yes. The key is to develop a limited, two-tier defense system, with a total number of interceptors constrained by treaty—or, failing that, unilateral U.S. statement—not to exceed 200. Considerably fewer numbers of interceptors would probably need to be deployed in the near to medium-term future, so adopting a ceiling of 200 interceptors—the original limit in the 1972 ABM Treaty—should provide ample room for adequate deployments.

The first layer of defense should consist of a modest number of boost-phase interceptor missiles, based either at sea or on land near the threatening countries. The exact number of interceptor missiles and their placement would depend on which states acquired the ability to threaten the United States. A boost-phase capability has the advantage of reassuring European capitals, which fear that any defense that protects the United States alone would make them tempting targets for longer-range attack. (U.S. friends and allies in the Middle East and East Asia do not have the same concerns; they face a more immediate short- and medium-range missile threat that is more easily addressed by U.S. TMD systems.)

Boost-phase interceptors could hit almost any long-range missile that a country launched, regardless of its ultimate destination—provided the country was sufficiently small and geographically accessible. Fortunately for the United States, most likely new ballistic missile powers meet these criteria.

A scaled-down version of the midcourse interceptor architecture that the Clinton administration favored should also be built to back up the boost-phase layer. There are several reasons for a backup: earth-based boost-phase interceptors (or lasers) require the cooperation of other countries to deal with most threats; the time window for shooting down a missile in boost phase is quite short; and boost-phase interceptors only work if deployed near the country that ultimately poses a threat to the United States. The midcourse system should be small, consisting of no more than fifty interceptors and quite possibly only twenty-five or so for the foreseeable future, given the plausible magnitude of any possible threat. It should be based in Grand Forks, North Dakota, instead of Alaska as the Clinton administration proposed. Depending on the speed of the interceptors and their response time, deploying the defense in North Dakota may still permit coverage of all fifty states, with the possible exception of a few, sparsely populated islands at the westernmost end of the Aleutian and Hawaiian island chains. Those areas would still be covered by the boost-phase layer.²⁸ By contrast, relying on the Alaska site alone would leave most of the northeastern United States poorly protected against missiles fired from the Middle East. The North Dakota system would have limited effectiveness because of its vulnerability to countermeasures, but it could still provide some capability against relatively simple limited threats. Moreover, because the construction season is much longer in North Dakota than Alaska, there is less reason to rush a decision on beginning work there in 2001 or even 2002. The extra time would allow more opportunity for all-important diplomacy in the interim, without postponing the date by which the NMD system could be operational.

Would China and Russia accept such a limited, two-tier defense? China would be the harder sell. Boost-phase interceptors would have no capability against its long-range missiles, except any located near its eastern coast, because they could not be placed close enough to most Chinese launch sites. That China is developing a mobile ICBM force should prevent the United States from obtaining even a modest boost-phase capability against Chinese long-range missiles. The hit-to-kill interceptor would be more problematic for Beijing. Although the Pentagon would

probably fire multiple interceptors at every possible target to maximize the chances of a kill and though the system would be vulnerable to sophisticated countermeasures, Chinese military planners might nonetheless conclude that in theory it threatened their nuclear deterrent.

However, this problem should be solvable. Beijing could ensure its ability to retaliate by modestly increasing the size of its long-range missile force and using countermeasures. It probably plans the former step already, even in the absence of a U.S. missile defense. No one can applaud having more Chinese missiles aimed at the United States, but even a three- or five-fold increase in the size of the Chinese ICBM force would not fundamentally alter the strategic balance between the two countries. Moreover, as long as China does not place its missiles on hair-trigger alert, a larger Chinese missile force would not imply a higher risk of accidental launch.

Moscow's response to a limited, two-tier missile defense should be more positive. Earth-based boost-phase interceptors pose no threat to Russian ICBMs, and even under the most pessimistic Russian budgetary projections, Moscow will retain more than enough survivable ICBMs to overwhelm the North Dakota defense we propose even in a second strike. President Putin has endorsed boost-phase defenses, and the commander of Russia's Strategic Rocket Forces has suggested it might be possible to live with a U.S. missile defense if the number of U.S. offensive missiles is cut.²⁹ Moreover, basing twenty-five to fifty interceptors in North Dakota is not only consistent with the ABM Treaty's core principle of banning strategically significant defenses, the treaty already gives the United States the right to deploy one hundred interceptor missiles in Grand Forks (even if not for the purposes of national missile defense). It is true that President Putin has consistently voiced strong skepticism about permitting national missile defense, but in a November 2000 speech and on other occasions he has also expressed a willingness to keep talking to the United States about possible modifications to the ABM Treaty. This may be just the type of proposal that would tap into his limited, but apparently real, willingness to consider treaty modifications provided that they not threaten strategic stability or the Russian deterrent.³⁰

The United States should seek Moscow's agreement to modify the ABM Treaty—or to negotiate a successor agreement—to permit the deployment of this limited, two-tier defense (box 1-1). This means lifting the treaty's general ban against a nationwide defense as well as its specific bans on defenses based at sea or on foreign soil.

Box 1-1. Is the ABM Treaty Still in Effect?

When the United States and the Soviet Union signed the Anti-Ballistic Missile (ABM) Treaty in 1972, Russia was but one of fifteen Soviet republics. Many Soviet nuclear weapons and some other nuclear-related facilities such as early-warning radars were located on non-Russian soil. As such, when the Soviet Union dissolved in 1991, one of the two signatories to the ABM Treaty was replaced by fifteen countries with varying degrees of responsibility for what had been Soviet nuclear forces. So is the ABM Treaty still in effect? And if so, what former Soviet countries does it obligate?

The Clinton administration maintained that the ABM Treaty remains binding on the United States, a view that was widely shared, including by Governor George W. Bush during the 2000 presidential campaign. But some Americans, most (though not all) of them conservative Republicans, argue that the ABM Treaty is no longer in force because the Soviet Union left no obvious heir. For example, former CIA director R. James Woolsey argues:

According to longstanding principles of international law, when one country has a bilateral treaty with another and is then "succeeded" by a different state (as Russia has succeeded to the rights and duties of the Soviet Union under a number of treaties), the bilateral treaty remains in effect only if both states so affirm—the new state and its predecessor's treaty partner. The only exception to what international lawyers call this "clean slate" rule is "dispositive" treaties—such as those that dispose of territory. In only these cases is the succession automatic. . . . But the administration does not assert that the 1972 U.S.-Soviet ABM Treaty is "dispositive."¹

So far as it goes, this argument is correct. But it begs three other issues, the first two primarily legal and the third political. First, who in the U.S. system of government is constitutionally authorized to designate a successor state? Second, ten years after the Soviet Union's demise, has the United States already designated Russia as its successor? Third, is it realistic for the United States to expect to make one decision on the ABM Treaty and a different one on other U.S.-Soviet treaties?

In our judgment, the answers to all three questions affirm that the ABM Treaty remains binding. First, although the Constitution says nothing about whether presidents can designate a successor state on their own authority, and the case law on the matter is not settled, the Supreme Court's rulings in similar cases suggest that they can. In *Goldwater v. Carter* (1979) the Court rejected the argument that Jimmy Carter could not unilaterally terminate a mutual defense treaty with Taiwan because treaties require the Senate's advice and consent. If presidents are free to terminate treaties, they are presumably also free to decide which successor states inherit a treaty's obligations.

The power of presidents to designate successor states is important, because the Bush administration stated in 1992 that the ABM Treaty remained in force, with Russia as the natural successor to the Soviet Union under its terms. The administration even went so far as to propose amending the treaty to permit construction of missile defenses in formal talks with Russian officials. The Clinton administration also

took the view that the treaty remains in force and that Russia is bound by its provisions. (The Clinton administration contended that the treaty's obligations extended to Belarus, Kazakhstan, and Ukraine—though not to all of the states that emerged from the Soviet Union—because all three had significant ABM assets. The administration negotiated a 1997 agreement formally designating all four countries successor states to the Soviet Union for the purposes of the ABM Treaty. Clinton never made good on his pledge to submit the succession agreement to the Senate for approval, and the obligations of Belarus, Kazakhstan, and Ukraine remain unsettled.)

Things do not change even if one believes that the Constitution requires some form of congressional approval. As law professor Michael Glennon points out, Congress acknowledged the continued standing of the ABM Treaty in 1996. At that point, the Republican-controlled Senate put restrictions on the president's ability to modify the ABM Treaty, something that logically and legally implied that legislators recognized the continued existence and relevance of the treaty.² And as Justice Robert Jackson wrote in the famed *Steel Seizure Case*, "When the president acts pursuant to an express or implied authorization of Congress his authority is at its maximum."³

These legal arguments form the core of the matter. But the broader political issue should not be trivialized. It would be bizarre, and transparently self-serving, for the United States to insist that the ABM Treaty no longer exists when the nation recognized it for a decade after the Soviet Union dissolved. Furthermore, it would run directly contrary to the position the United States has taken on who inherited the Soviet Union's obligations under other treaties. The United States agreed that Russia would inherit the Soviet seat on the UN Security Council, and it expects Russia to pay Soviet debts and abide by agreements on conventional forces in Europe, nuclear nonproliferation, offensive nuclear arms control, and many other matters. If the United States suddenly declares the ABM Treaty null and void, could it really expect Moscow to go along? Or would Russia also become highly selective about which treaties and obligations it would assume—and which it would not?

Washington could still calculate that the benefits of declaring the ABM Treaty void outweighed the likely consequences of Russian retaliation. But in this event, it would face the same types of calculations that it would face when considering outright withdrawal from the ABM Treaty. Deciding now to ignore the ABM Treaty would be tantamount to withdrawing from it. In our view, if the United States wants to abandon the treaty it would be better served by invoking its withdrawal provision than by fabricating a weak legal argument that few in the world would take seriously.

1. R. James Woolsey, "What ABM Treaty?" *Washington Post*, August 15, 2000, p. 23. See also Douglas J. Feith and George Miron, "Memorandum of Law: Did the ABM Treaty of 1972 Remain in Force after the USSR Ceased to Exist in December 1991 and Did It Become a Treaty between the United States and the Russian Federation?" Washington, Center for Security Policy, February 24, 1999.

2. Michael J. Glennon, "Yes, There Is an ABM Treaty," *Washington Post*, September 4, 2000, p. A25.

3. *Youngstown Sheet and Tube Co. v. Sawyer* (The Steel Seizure Case), 343 U.S. 579, 637 (1952).

The reason for pursuing negotiations with Moscow is not that the ABM Treaty is sacred but that a formal agreement on defenses would serve U.S. interests. It would reassure Moscow about American intentions. That would greatly increase the odds of agreeing on deep cuts in offensive nuclear weapons as well as other measures designed to reduce nuclear risk, substantially reduce the diplomatic costs of an NMD deployment, improve the prospects for a strong Nunn-Lugar cooperative threat reduction program, and reduce the chances that Russia would seek to undermine the U.S. defense system, for example, by selling counter-measure technologies to countries such as Iran, Iraq, and North Korea. Most U.S. allies are unlikely to object strongly to a U.S. missile defense if Moscow decides to accept it. A modified ABM Treaty may need to be further revised a decade or two from now should the evolution of the ballistic missile threat warrant it. But the United States should cross that bridge only when (and if) it comes to it.

Moscow may prove intransigent on missile defense and leave the United States with no choice but to withdraw from the ABM Treaty. But in doing so, Washington should still seek to allay Russian concerns. At a minimum, it should pursue a tacit arms control policy that keeps Moscow informed of its plans and unilaterally accept intrusive verification procedures on the size and nature of its NMD program. Because China can also make the costs of an NMD deployment exceed the benefits, Washington should pursue a similar policy of transparency toward Beijing.

No one should be under any illusion, however, that tacit arms control will be easy to establish. Not only is treaty withdrawal an inauspicious foundation on which to build a new relationship with Moscow, domestic political support for tacit arms control could prove elusive. Critics will ask why the United States is sharing sensitive information with Russia and China when both countries target American cities. The net result might be no arms control at all. Both Washington and Moscow should keep this in mind as they discuss the future of the ABM Treaty. It would be much more preferable to modify the treaty than to abandon it.

Missile Defense: Concepts and Systems

THE BASIC IDEAS BEHIND how missile defense systems operate are not particularly complex. But it is important to have a clear mental picture of how ballistic missiles, and technologies designed to counter them, function. This chapter provides that background information, with a number of graphics, illustrating the main concepts.

Basic Elements of Ballistic Missiles

Ballistic missiles are rockets designed to accelerate to fast enough speeds so that they can fly relatively long distances before falling back to earth. They are first accelerated by the combustion of some type of fuel, after which they simply follow an unpowered—or ballistic—trajectory. They consist, most basically, of rocket engines, fuel chambers, guidance systems, and warheads, though the specifics vary a great deal depending on the range and sophistication of the missile.

Missile Parts and Types

For shorter-range missiles, the entire weapons system is generally simple. The missile usually consists of a single stage rocket, which fires until its fuel is exhausted or shut off by a flight-control computer and then ceases functioning for the duration of the flight. The missile body and