



Weighing Benefits and Costs of Military Action Against Iran.



This paper offers a fact-based analysis that we hope will provide Americans sufficient understanding to weigh the balance between the benefits and costs of using military force against Iran—between the necessity and human folly of resorting to war.

From the signers of this document

This document is published by The Iran Project; the content is the collective view of the signers.

Dear Fellow Citizens,

As a group of interested former officials of the United States government and professionals in U.S. national security, we support the publication of the attached report, “Weighing the Benefits and Costs of Military Action against Iran.” We applaud the authors of this paper and their goal of contributing an objective, nonpartisan analysis to a critical national debate. While some of us made contributions to the text, we do not necessarily agree with every point in this detailed and professional report.

We do, however, believe that this report will contribute to informed public discussion of an important challenge to American interests in the world. We also believe the report is consistent with United States policy—maintaining pressure on Iran while holding open the possibility of reaching a political solution, without ruling out the use of military force.

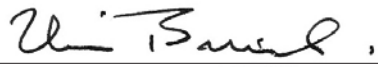
The paper draws no final conclusions and offers no recommendations. It offers an objective description of some of the prerequisites for thinking about the use of military force against Iran: the need to establish clear objectives, evaluate the capacity of the U.S. military to achieve those objectives, plan an exit strategy, and then weigh the benefits and costs of the military options.

We commend this report to the American people as a basis for open and informed discussion of a matter of crucial importance to America’s national security. As Thomas Jefferson once noted, “In a republican nation whose citizens are to be led by reason and persuasion, and not by force, the art of reasoning becomes of first importance.” This paper seeks to contribute to the democratic “art of reasoning,” as citizens across the nation debate the question of the use of force to prevent Iran from acquiring nuclear weapons.

Signed and Endorsed by:

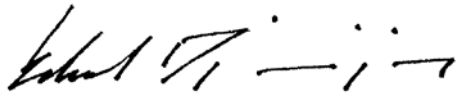
Signature Forthcoming

MORTON ABRAMOWITZ, AMB.


ZBIGNIEW BRZEZINSKI

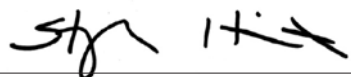
Signature Forthcoming

STEPHEN A. CHENEY BRIGGEN.


EDWARD P. DJEREJIAN, AMB.


WILLIAM J. FALLON, ADM.


CHUCK HAGEL, SEN.

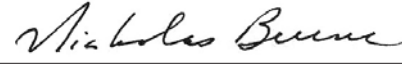

STEPHEN B. HEINTZ

Signature Forthcoming

FRANK KEARNEY, LTG.

Signature Forthcoming

RICHARD L. ARMITAGE


NICHOLAS BURNS, AMB.


JOSEPH CIRINCIONE

Signature Forthcoming

JAMES DOBBINS

Signature Forthcoming

LESLIE H. GELB


LEE H. HAMILTON

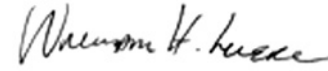
Signature Forthcoming

CARLA A. HILLS


DANIEL C. KURTZER, AMB.

DANIEL C. KURTZER, AMB.

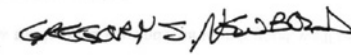
Signed and Endorsed by:


WILLIAM H. LUERS, AMB.

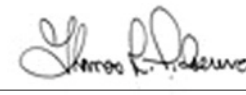
WILLIAM H. LUERS, AMB.

Signature Forthcoming

JESSICA T. MATHEWS


GREGORY S. NEWBOLD, LTGEN.

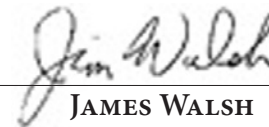
GREGORY S. NEWBOLD, LTGEN.


THOMAS R. PICKERING, AMB.

THOMAS R. PICKERING, AMB.


ANN-MARIE SLAUGHTER

ANN-MARIE SLAUGHTER


JAMES WALSH

JAMES WALSH

Signature Forthcoming

LAWRENCE B. WILKERSON, COL.


FRANK G. WISNER, AMB.

FRANK G. WISNER, AMB.

Signature Forthcoming

ELLEN LAIPSON


WILLIAM G. MILLER, AMB.

WILLIAM G. MILLER, AMB.

Signature Forthcoming

SAM NUNN, SEN.


JOE SESTAK, VICE. ADM.

JOE SESTAK, VICE. ADM.

Signature Forthcoming

PAUL VOLCKER


JOHN C. WHITEHEAD

JOHN C. WHITEHEAD

Signature Forthcoming

TIMOTHY E. WIRTH, SEN.

Signature Forthcoming

ANTHONY C. ZINNI, GEN.

“ Part of our challenge is reconciling these two seemingly irreconcilable truths—that war is sometimes necessary, and war at some level is an expression of human folly. ”

From President Obama’s Nobel Prize Speech

Table of Contents

Letter	1
Executive Summary	7
Introduction	15
Shared Understandings	16
I. Timing, Objectives, Capabilities, and Exit Strategy for Military Action Benefits & Costs of Military Strikes on Iran	21
II. Benefits of a Military Action	29
II.1 U.S. Military Action	29
II.1.1 Damage to nuclear facilities	
II.1.2 Weakened ability to rebuild nuclear facilities	
II.1.3 Damage to military capabilities	
II.1.4 Broader geopolitical benefits for the U.S.	
II.2 Israeli Air Strikes	31
III. Costs of Military Action	33
III.1 Costs of Direct Iranian Retaliation	33
III.1.1 Retaliation against the U.S.	
III.1.2 Retaliation against Israel	
III.1.3 Closing the Strait of Hormuz	
III.2 Costs of Indirect Iranian Retaliation	35
III.2.1 Indirect retaliation by Hezbollah	
III.2.2 Covert retaliation worldwide	
III.3 Escalation	37
III.4 Regional and Global Costs	37
III.4.1 A potential breakdown in global solidarity against Iran’s nuclear program	
III.4.2 Increased likelihood of Iran becoming a nuclear state	
III.4.3 Greater regional and global instability	
III.4.4 Reduced regional and global influence for the U.S.	
III.4.5 What about regime change?	
III.5 The Costs if There Is Evidence of a Decision to Weaponize	
Primer on Iran’s Nuclear Program and Other Activities	44
Endnotes	49

“ I am a firm believer in the people. If given the truth, they can be depended upon to meet any national crisis. The great point is to bring them the real facts. ”

Abraham Lincoln

EXECUTIVE SUMMARY

Weighing Benefits and Costs of Military Action against Iran

American Presidents have proclaimed for over a decade they would “take no option off the table” to stop Iran from building a nuclear bomb—leaving the door open for military action against Iran under certain circumstances.

THE PURPOSE OF THIS PAPER

At a time when debate on this critical issue is often driven by politics and based on unexamined assumptions about the ability of military action to achieve U.S. objectives, this paper seeks to provide a foundation for clear thinking about the potential use of force against Iran. The paper’s authors and signers, a bipartisan group of senior national security experts, recognize that this debate is part of a broader conversation about U.S. policy toward Iran. But **we believe that it will be impossible to make a rational assessment of the role of military force in any overall Iran strategy, without first carefully assessing the likely benefits and costs of military action.**

This paper draws from a large reservoir of informed analysis and opinion, all of it publicly available (including unclassified intelligence reports). The paper is fact-based when possible and straightforward about areas of disagreement or uncertainty. Given the quantity and richness of research on many of the issues treated in this paper, we have had to summarize some important expert discussions in the endnotes; we encourage interested readers to consult those notes for further details. Our professional judgments, when offered, are clearly identified as such. This is not an advocacy document; we hope that our balanced consideration of this highly charged issue will help readers draw their own informed conclusions as to the wisdom of a military action against Iran.

SHARED UNDERSTANDINGS

The authors of this paper brought to their task some shared understandings that provided our diverse group with a common perspective.

- We recognize that military action against Iran is being contemplated because a nuclear-armed Iran would pose dangerous challenges to U.S. interests and security, as well as to the security of Israel.
- We are mindful that Iran has twice in the past attempted to expand its nuclear program secretly—efforts that were detected and halted—and that Iran is currently in violation of United Nations Security Council Resolutions requiring it to cease enrichment activities. The International Atomic Energy Agency (IAEA), which

monitors Iran's nuclear program, continues to call for clarification of Iran's evasive responses to questions about the past record of deception. Nor has the IAEA been able to gain full access to Iran's military facilities to confirm the current status of an Iranian nuclear weapons program that intelligence officials believe was halted in 2003. In addition, Iranian leaders have repeatedly made statements that have threatened Israel and that have been interpreted as challenging the right of the State of Israel to exist.

- We agreed not to address broad questions about the United States' commitment to nuclear nonproliferation that would be raised by a U.S. decision to use force against Iran to head off a nuclear weapon, including whether the United States would continue to use force against other nations that might decide to develop nuclear weapons. Rather, we focused on questions related to the particular case of Iran.
- We believe that the use of military force should be a last resort and must be accompanied by a rigorous analysis of likely benefits and costs.
- We chose not to address alternatives to the use of force in this paper, but will make that the focus of a future paper.
- We acknowledge that the potential benefits of military action against Iran are easier to describe concisely than the costs of such action—especially the long-term costs, which are more speculative, and the costs of possible unintended consequences.
- We recognize that there is disagreement on a number of the most important questions addressed in the paper. We agreed to explain those disagreements objectively and base our own judgments on careful review of expert analyses and opinion.
- Our aim is to provide facts and analyses that could inform discussion of an urgent security challenge in an election year.

OVERVIEW

The paper is organized around **questions that U.S. leaders and citizens should ask themselves when contemplating any military action:** At what point is the use of force justified? What would be the objectives of military action? Do we have the capacity to achieve those objectives? What is our exit strategy? What are the likely benefits of using military force in this situation? What are the costs, both immediate and long-term? A primer on Iran's nuclear program concludes the paper.

The assessments highlighted below are treated in greater detail and with ample source citations in the paper.

HIGHLIGHTS

I. Timing, Objectives, Capability, and Exit Strategy. The U.S. has signaled that it is prepared to implement “all options”—including the use of military force against Iran, should sanctions and diplomacy fail—if or when there is a clear indication that Iran has decided to build a nuclear weapon. After deciding to “dash” for a bomb, Iran would need from one to four months to produce enough weapons-grade uranium for a single nuclear device. Additional time—up to two years, according to conservative estimates—would be required for Iran to build a nuclear warhead that would be reliably deliverable by a missile. Given extensive monitoring and surveillance of Iranian activities, signs of an Iranian decision to build a nuclear weapon would likely be detected, and the U.S. would have at least a month to implement a course of action.

According to official statements, the objective of U.S. military action at that point would be to prevent Iran from developing a nuclear weapon. In our judgment, that objective is unlikely to be achieved through a military action that relies on aerial strikes supplemented by cyber attacks, covert operations, and perhaps special operations forces. After reviewing many studies on this controversial question, we have come to believe that **extended military strikes by the U.S. alone or in concert with Israel could destroy or severely damage the six most important known nuclear facilities in Iran, setting back Iran's nuclear program for up to four years.** Our informed estimate is that a military strike by Israel alone could delay Iran's ability to build a bomb for up to two years. In our view, Israel could not replicate the success of its earlier surgical strikes against single reactors in Iraq and Syria, since Iran's nuclear sites are numerous and widely dispersed, with one (Fordow) buried deep underground. If no lasting resolution of tensions over Iran's nuclear program can be achieved in the aftermath of U.S. and/or Israeli attacks (as discussed below, we believe military action is more likely to reduce than enhance the prospects for such a political resolution), attacks might need to be resumed at some future point.

We note that there is a marked lack of consensus and clarity in Washington about what the U.S. should aim to achieve through any military action against Iran. Privately, some national security experts and advisors may have embraced the more modest objective of delaying Iran's ability to build a nuclear weapon, as a step toward prevention; but some others may have embraced objectives that are far broader than official statements currently suggest. Even in order to fulfill the stated

objective of ensuring that Iran never acquires a nuclear bomb, the U.S. would need to conduct a significantly expanded air and sea war over a prolonged period of time, likely several years. **If the U.S. decided to seek a more ambitious objective, such as regime change in Iran or undermining Iran's influence in the region, then an even greater commitment of force would be required to occupy all or part of the country.** Given Iran's large size and population, and the strength of Iranian nationalism, we estimate that the occupation of Iran would require a commitment of resources and personnel greater than what the U.S. has expended over the past 10 years in the Iraq and Afghanistan wars combined.

The more ambitious the objectives of military action and the longer the conflict goes on, the more difficult it would be to design an effective exit strategy.

II. Benefits. We recognize that the objectives and targets of any military action against Iran could well range from very limited to quite broad. In estimating that preventive U.S. attacks could delay for up to four years Iran's ability to build a nuclear weapon, we are assuming the deployment of American air power, drones, sea-launched missiles, and perhaps special operations forces and cyber attacks for several weeks or more, seriously damaging hundreds of targets.

Such a military action could produce the following benefits:

- **Damage or destroy Iran's declared major enrichment facilities** at Natanz; the uranium conversion facilities at Tehran and Esfahan; the nuclear research complex in Tehran; the partially completed heavy water reactor and production plant (that could be used to develop plutonium) at Arak; and some centrifuge production installations. With more difficulty, a U.S. air campaign would also damage or destroy the Fordow enrichment facility (which is buried under 200-300 feet of rock).
- **Damage Iranian military capabilities**, including its air defenses, radar, air force elements, command and control facilities, and much of Iran's direct retaliatory capability, such as the main military bases and facilities of the Iranian Revolutionary Guard Corps (IRGC) and of the Iranian Navy, Army, and Air Force. Strikes would also target non-nuclear facilities suspected of being used for weapons development, such as the Parchin site.
- **Demonstrate U.S. seriousness and credibility**, showing Iran that the U.S. is determined to prevent it from acquiring a nuclear weapon and showing other Middle Eastern governments that are concerned about Iran's regional ambitions that the United States is committed to their security. U.S. military action could

also disrupt Iranian government control, deplete the Iranian treasury, and raise internal tensions—although we do not believe it would lead to regime change, regime collapse, or capitulation.

- **Help to deter nuclear weapons proliferation.** U.S. military action against Iran's nuclear program may also reduce the odds that other countries in the region will seek nuclear weapons. If Iran's nuclear program were set back, key regional players such as Saudi Arabia, Turkey, and Egypt would feel less pressure to pursue their own nuclear programs. U.S. military action might also deter others—inside and outside the region—from pursuing their nuclear ambitions, fearing that if they do, it might invite a similar U.S. response.

We estimate that unilateral Israeli military action could set back Iran's nuclear program for up to two years, given Israel's more limited military capability. Israeli strikes could damage or destroy the Natanz enrichment facility; the conversion facilities at Esfahan and Tehran; and the suspected nuclear weapons-development facility at Parchin. **Israel could not do great damage to the deeply buried Fordow enrichment facility, without resorting to riskier ground attacks.**

III. Costs. In addition to the financial costs of conducting military attacks against Iran, which would be significant (particularly if the U.S. had to carry out thousands of sorties and if it had to return to the use of force periodically for years to come), there would likely be near-term costs associated with Iranian **retaliation, through both direct and surrogate asymmetrical attacks.** Serious costs to U.S. interests would also be felt over the longer term, we believe, with **problematic consequences for global and regional stability, including economic stability.** A dynamic of escalation, action, and counteraction could produce serious unintended consequences that would significantly increase all of these costs and lead, potentially, to all-out regional war.

Among the potential costs discussed in this paper are the following:

- **Direct Iranian retaliation against the U.S.** While some argue that Iran might hold back using force in order to avoid provoking a larger scale conflict, we believe that Iran would retaliate, costing American lives; damaging U.S. facilities in the region; and affecting U.S. interests in Iraq, Afghanistan, the Gulf, and elsewhere. Iran would draw on its extensive conventional rocket capability and IRGC anti-ship missiles, small submarines, fast attack boats, and mine warfare in the Gulf. Iran might attempt to close the Strait of Hormuz, which could rattle global markets and cause a significant spike in oil prices (as well as blocking the main artery for export of Iran's own oil).

- **Iranian strikes against Israel.** Iran would hold Israel partly responsible for any attacks, whether or not Israeli forces participated in military action. While Israel's anti-missile and civilian defense programs are strong, sustained air strikes by Iran would result in casualties and damage to facilities, perhaps including the Israeli nuclear complex at Dimona.

- **Indirect retaliation by Iran.** Attacks by well-armed proxies such as Hezbollah or Shiite militant groups in Iraq, as well as by Iran's covert forces and the IRGC Qods Force, could be even more damaging to U.S. and Israeli interests than direct Iranian retaliation. Such indirect retaliation could include the use of missiles and rockets by proxies as well as terrorist attacks and covert action, such as sabotage and assassination. If Hezbollah were to make heavy use of the missiles and rockets it has deployed in southern Lebanon, that could expand the conflict, possibly leading to a regional war in the Levant.

- **A potential breakdown of hard-won global solidarity against Iran's nuclear program.** We believe that if Iran's nuclear program is attacked by the U.S. or Israel in the absence of an international mandate or a multinational coalition, support for maintaining sanctions against Iran could be substantially weakened. Weapons sales to Iran that are now prohibited by sanctions could resume, as might the sale of materials that could be used for making a nuclear weapon.

- **Increased likelihood of Iran becoming a nuclear state.** While it is not impossible that aerial attacks could drive Iran to the negotiating table, we believe that military action probably would reduce the possibility of reaching a more permanent political resolution of concerns about Iran's nuclear program. In fact, we believe that a U.S. attack on Iran would increase Iran's motivation to build a bomb, because 1) the Iranian leadership would become more convinced than ever that regime change is the goal of U.S. policy, and 2) building a bomb would be seen as a way to inhibit future attacks and redress the humiliation of being attacked. Iran could also withdraw from the Nuclear Non-Proliferation Treaty (NPT) and end all cooperation with the International Atomic Energy Agency (IAEA), leaving the international community with greatly reduced knowledge of Iran's nuclear program.

- **Global political and economic instability, including disruptions in energy supply and security.** A U.S. and/or Israeli attack on Iran could introduce destabilizing political and economic forces in a region already experiencing major transformations. In addition to costing the U.S. economy hundreds of billions of dollars yearly, a sustained conflict would boost the price of oil and further disrupt an already fragile world economy.

- **Damage to the United States' global reputation and increased credibility for anti-American extremist groups.** U.S. military action, especially if unilateral, could further alienate Muslims and others worldwide, reinforcing the view that the United States resorts too often to military force. An attack on a Muslim nation could enhance the recruiting ability of radical Islamist groups, including Al Qaeda. Even though some Sunni Muslims might be pleased to see attacks on Shiite Iran, the likely impact on U.S. stature in the Muslim world would be negative.

On the contested issue of whether military action would weaken or strengthen Iranian public support for the current regime, we conclude that U.S. and/or Israeli strikes are **more likely to unify the population behind the government than to generate resistance.**

Some of these costs would be mitigated if a U.S. strike were to occur in response to Iranian actions that clearly revealed an intention to develop a nuclear weapon. Such actions might include the expulsion of IAEA inspectors and withdrawal from the NPT, or the launch of a crash program to raise existing supplies of low- and medium-enriched uranium to a weapons-grade level of enrichment. Given the time required for Iran to progress from the decision to weaponize to possession of a reliable, deliverable weapon, the United States would have an opportunity to develop international support for multilateral action against Iran, including further sanctions, additional negotiations, and the use of military force. **While the costs associated with Iranian retaliation would not significantly be altered if other nations approved or joined in a U.S. military strike, the longer-term costs to U.S. interests would be somewhat lessened.**



This Executive Summary cannot do justice to the extended debates and months of study that have gone into preparing the paper that follows, or to the rigor of the research and analysis that buttress its findings. Our aim throughout this effort has been to present the best possible assessments—based on a large body of expert analysis and opinion—of how the use of military force against Iran might contribute to or detract from resolving one of the most critical security challenges now facing the United States. We hope the facts and professional judgments we have assembled will stimulate informed debate and reflection among citizens and leaders alike.

“Democracy cannot succeed unless those who express their choice are prepared to choose wisely. The real safeguard of democracy, therefore, is education.”

Franklin D. Roosevelt

Weighing Benefits and Costs of Military Action Against Iran

INTRODUCTION

American presidents have proclaimed for over a decade that they would take “no option off the table” to stop Iran from building a nuclear bomb—leaving the door open for military action against Iran under certain circumstances. A decision to attack Iran would have profound implications for U.S. interests. Yet debate on this critical issue is often driven by politics and based on unexamined assumptions about the ability of military action to achieve U.S. objectives with acceptable costs.

This paper provides a foundation for clear thinking about the potential use of military force against Iran. It is not an advocacy document. Its authors and signers, a bipartisan group of senior national security and foreign policy experts, aim to serve the cause of rational analysis and dispassionate policymaking in the national interest. Nor is this paper a comprehensive treatment of options for dealing with the Iranian nuclear program. Our hope is to encourage more informed and objective discussion of the military option by policymakers, the public, and the press. We realize that this discussion is part of a larger conversation that includes consideration of the relative costs and benefits of various options. But we also believe that it will be impossible to make a rational assessment of the role of military force in any overall Iran strategy without first carefully assessing the likely benefits and costs of military action.

This paper draws from a large reservoir of informed analysis and opinion, all of it publicly available; none of the authors or signers of the paper drew on classified intelligence or confidential strategy documents that were available to them while serving in government. The paper is fact-based when possible and straightforward about areas of disagreement or uncertainty. Given the quantity and richness of research on many of the issues treated in this paper, we have had to summarize some important expert discussions in the endnotes; we encourage interested readers to consult those notes for further details. We recognize that the prolonged lack of contact between the U.S. and Iran makes it difficult to predict consequences and outcomes with confidence. Our professional judgments on such questions are clearly identified.

This paper is organized around questions that U.S. leaders and citizens should ask themselves when contemplating any military action: At what point is the use of force justified? What would be the objectives of military action? Do we have the capacity to achieve those objectives? What is our exit strategy? What are the likely benefits of using military force in this situation? What are the costs, both immediate and long-term? A primer on Iran’s nuclear program and other activities concludes the paper.

We hope that our balanced consideration of this highly charged issue will help readers draw their own informed conclusions as to the wisdom of military action against Iran.

SHARED UNDERSTANDINGS

The authors of this paper brought to their task some shared understandings that provided our diverse group with a common perspective.

- We recognize that military action against Iran is being contemplated because a nuclear-armed Iran would pose complex and dangerous challenges to U.S. interests and security, as well as to the security of Israel and possibly to stability in the Middle East.
- We are mindful that Iran has twice in the past attempted to expand its nuclear program secretly—efforts that were detected and halted—and that Iran is currently in violation of United Nations Security Council Resolutions requiring it to cease enrichment activities. The International Atomic Energy Agency (IAEA), which monitors Iran’s nuclear program, continues to call for clarification of Iran’s evasive responses to questions about the past record of deception. Nor has the IAEA been able to gain full access to Iran’s military facilities to confirm the current status of an Iranian nuclear weapons program that intelligence officials believe was halted in 2003. In addition, Iranian leaders have repeatedly made statements that have threatened Israel and that have been interpreted as challenging the right of the State of Israel to exist.
- We agreed that in this paper, we would focus on the particular case of Iran, and not on broad questions about the United States’ commitment to nuclear nonproliferation that would be raised by attacking Iran to head off a nuclear weapon. But we recognize the fundamental importance of such questions as: Will the U.S. continue to use force, as a general policy, in support of its commitment to stopping the spread of nuclear weapons, taking military action against North Korea and any other nations (such as Saudi Arabia, Egypt, or Turkey) that might decide to develop a nuclear weapon? What criteria would govern decisions about the use of force to avert development of a nuclear weapon? Would those criteria apply in the case of Iran, or does the U.S. believe that special conditions are in play in this case?
- We believe that the use of military force should be a last resort and must be accompanied by a rigorous analysis of what the use of force might achieve, and at what cost.
- We have chosen not to address alternatives to the use of force in this paper, in order that we might focus more intently on analyzing the benefits and costs of military action. Assessing the alternatives to military force is vitally important, and we plan to undertake such an assessment in a separate paper.
- It quickly became clear to us that articulating the potential benefits of military action against Iran is an inherently different task from that of articulating potential costs. Some important

benefits can be described fairly concisely, in terms of targets destroyed and objectives achieved. The costs of military action against Iran, on the other hand (and in particular, the long-term costs), are more difficult to describe concisely or precisely—especially given the need to consider unintended consequences, and the impossibility of anticipating with certainty how Iran and others would respond to actions. This reality is reflected in the relative lengths of the “Benefits” and “Costs” sections of the paper.

- The paper necessarily grapples with a number of key strategic questions on which there is disagreement—including how long a military strike might delay Iran’s capacity to build a nuclear weapon; how and when the United States would know if Iran was carrying out a decision to build a nuclear weapon; the probable impact of military strikes on the stability of the Iranian regime; and the potential scope of Iranian retaliation. In all cases, the professional judgments presented in this paper are based on careful review of a wide range of expert analyses and opinion.
- In offering this rigorous and objective assessment by a bipartisan group of national security professionals, we aim to help de-politicize discussion of an urgent security challenge in this election year.

Iran's Nuclear Program: Overview

While the Iranian nuclear program is large and encompasses many different dimensions, the facilities and activities of greatest concern are those involved in the enrichment of uranium.

Natural uranium contains less than 1% of the isotope (or form) of uranium useful for a nuclear weapon; it must be enriched to a much higher level (the U.S. standard is 90%) for use in a bomb. Without highly enriched uranium (HEU), any Iranian nuclear weapons design would remain impracticable. Iran currently has a stockpile of low enriched uranium, or LEU (3.5%), which is suitable for nuclear reactor fuel, and a modest supply of medium enriched uranium, or MEU (20%), which Iran claims would fuel a reactor that creates medical isotopes. Due to the characteristics of enrichment, uranium that has been enriched to 20% is relatively easier to enrich further and could potentially be used as the basis for rapidly producing weapons-grade uranium (WGU).

Iran has four declared sites that are central to the enrichment process. Two of them, Esfahan and Tehran, are used for conversion of uranium, with Esfahan much larger and therefore more critical than Tehran. Two others, Natanz and Fordow, are facilities for enrichment. Natanz is the larger of the two facilities and can enrich uranium more quickly than Fordow. Both are underground, providing protection from bombing, but Fordow is buried much deeper and therefore is much better protected.

The United States and the International Atomic Energy Agency (IAEA, an independent monitoring organization that reports to the United Nations) have extensive knowledge of these sites and Iran's other declared nuclear facilities, including a partially completed heavy water reactor at Arak which could potentially

be used to produce plutonium—an alternative route to the development of a nuclear weapon. The IAEA used to have access, and has recently sought renewed access, to Parchin, a military site suspected of past involvement in undeclared Iranian research potentially related to the construction of nuclear weapons. Based on quarterly IAEA reports, as well as on intelligence data and reports from dissident groups in Iran, U.S. intelligence officials have expressed confidence that Iran has not yet built any new, undeclared nuclear facilities and that there is a good—but not perfect—chance that new clandestine enrichment facilities could be detected on a timely basis. Intelligence officials also judge that an Iranian nuclear weapons development program begun prior to 2003 was halted; the IAEA continues to seek clarification regarding the current status. In light of Iran's past weapons-related work and the IAEA's relatively limited access to military facilities, the United States and other nations remain watchful for any signs that Iran might be engaged in non-nuclear research and development activities that could contribute to the development of a nuclear weapon.

Having enriched uranium is not the same as having a bomb—but it is not possible to make a bomb without HEU (or plutonium). Given Iran's current centrifuge capacity and stockpiles of enriched uranium, and the technical challenges entailed in fashioning even a crude, testable nuclear device, conservative estimates suggest that it would take Iran a year or more to build a military grade weapon, once the decision was made to do so. At least two years or more would be required to create a nuclear warhead that is reliably deliverable by a missile. United States intelligence officials believe that no decision to develop a nuclear weapon has been made by Iran's Supreme Leader.

For additional background and source citations, see the Primer on Iran's Nuclear Program and Other Activities at the end of the paper.

“Let us not seek the Republican answer or the Democratic answer, but the right answer. Let us not seek to fix the blame for the past. Let us accept our own responsibility for the future.”

John F. Kennedy

I.

TIMING, OBJECTIVES, CAPABILITIES, AND EXIT STRATEGY FOR MILITARY ACTION

I.1. Timing. The United States has indicated that it would consider taking military action against Iran if or when there is a clear indication that Iran has decided to build a nuclear weapon. The Israeli government, led by Prime Minister Netanyahu, describes a nuclear-capable Iran as an “existential threat” and has threatened to use military force to prevent Iran from having the capability of producing a nuclear weapon. Many members of the U.S. Congress and other political leaders support the Israeli position, and U.S. intelligence analysts believe that Iran is already “capable” of eventually producing a nuclear weapon, if it should decide to do so. But intelligence experts also judge, with a high degree of confidence, that no such decision has been taken by Iran’s Supreme Leader.¹ The Obama administration has held that Iran should be stopped from having a nuclear weapon.²

How would the United States know when such an Iranian decision is made—especially if there is no public statement of intent or reliable intelligence regarding a secret statement of intent by the Supreme Leader? While a stated intention may be hard to come by, we believe that the United States and the international community are very well equipped to detect and assess Iranian actions that would signal the implementation of a nuclear weapons decision. For example, International Atomic Energy Agency (IAEA) inspections would almost certainly reveal any Iranian efforts to begin enriching uranium beyond 20% at declared sites; such activity would be an important signal, even if it were explained by Iran as having some non-weapons purpose—construction of a naval reactor for example, which some recent reports indicate Iran may be contemplating.³ Of course, if Iran were to expel IAEA inspectors who are currently monitoring Iran’s declared nuclear facilities, that would be a different kind of signal. The United States also has excellent capabilities for detecting any Iranian efforts to build clandestine weapons-development facilities. The science of satellite surveillance has made significant advances in recent years, and American signals and electronic intelligence has improved as well. In addition, Iran today is probably the most “watched” country in the world—not just by the United States and the IAEA, but by other nations as well. To carry out a secret, parallel nuclear weapons program, Iran would need to divert both safeguarded material and some of the country’s relatively small network of well-qualified experts in centrifuge enrichment⁴; such diversions would almost certainly be detected. While there are differences of opinion on this issue, we believe it would be extremely difficult for Iran to hide a nuclear program devoted to weapons development. No monitoring and detection system is

failure-proof, but Iran has little reason to be confident that it could get away with creating a secret program to produce fissile material for a weapon.⁵

Were Iran to attempt to produce a single bomb's worth of highly enriched uranium (HEU), it would take at least one month (although some experts believe the timeline could be as long as four months or more).⁶ It is important to note that while the ability to build a single bomb is a somewhat useful theoretical construct, it has little or no correspondence to how nuclear weapons programs function in the real world. Historically, no country in the nuclear age has sought as its goal to build one nuclear weapon; nor has any country adopted a strategy of building one weapon knowing that as a consequence, its program would be exposed. The timeline for producing a single bomb's worth of HEU is subject to change, depending on the number and type of operational centrifuges available as well as the size of Iran's stockpile of already enriched uranium, particularly 20% enriched uranium.⁷ Conservatively, it would take Iran a year or more to build a military-grade weapon, with at least two years or more required to create a nuclear warhead that would be reliably deliverable by a missile.⁸

In short, it is likely that the United States would receive some warning and have at least a month to make a decision on action—military or other. Understanding the difference between the one-month timeline of producing sufficient fissile material in order to produce a weapon, and the two-year timeline of creating a nuclear warhead, is critical when considering the likely success of military action. After a month, the weapons-grade uranium (WGU) could be reduced significantly in size (25 kilograms); if properly encased, it could be easily hidden and would be highly mobile. This would be a very hard target to detect and destroy. While it would take some additional time for Iran to translate the WGU into a meaningful military capability, the ability for the United States or others to launch preventive military strikes would be reduced. In contrast, the facility used to enrich the WGU is immobile and large and therefore an easier and somewhat vulnerable target (unless deeply buried).

The more telling the indications that Iran has decided to make a weapon, the more persuasive the justification for military action would be to the international community, including the United Nations Security Council. If the Iranians were to withdraw from the Nuclear Non-proliferation Treaty (NPT), disconnect the IAEA monitoring devices, and permit no further on-site inspections, the international community itself might consider military action or some other form of engagement. In this case, the U.S. would still be in a position to exercise a military option and might even be able to

assemble a coalition for attacking Iran. The more apparent the decision to make a weapon, the more persuasive the justification for military action would be to the international community, including the United Nations Security Council. While Israel's more limited military capabilities and earlier "red line" create a closing window of opportunity to take military action, the U.S. could afford to wait for its red line to be crossed—Iran undertaking a dedicated weapons program—before deciding whether to take preventive military action.

Realistically, though, any near-term military action against Iran is likely to be undertaken in the absence of incontrovertible evidence or an open statement by Iranian leaders about their intention to pursue development of a nuclear weapon. Given the deepening mutual distrust between the U.S. and Iran; congressional sympathy for Israel's perspective on a nuclear-capable Iran; and the conviction among some parties that Iran has already secretly decided to build a nuclear weapon, we believe the most likely military scenario is one in which preemptive, unilateral action against Iran is initiated by the U.S. and/or Israel, under conditions of some uncertainty about Iran's real intentions. That scenario is the primary focus of our paper.

I.2. Objectives. U.S. policy statements indicate that the objective of military action against Iran would be to prevent Iran from developing a nuclear weapon.⁹

Are we capable of achieving this objective through a brief or even an extended military campaign, whether conducted by the U.S. alone or in concert with others? As described in more detail below, a military action involving aerial strikes, cyber attacks, covert operations, and special operations forces would destroy or severely damage many of Iran's physical facilities and stockpiles. But in our judgment, complete destruction of Iran's nuclear program is unlikely; and Iran would still retain the scientific capacity and the experience to start its nuclear program again if it chose to do so.

We believe that extended military strikes by the U.S. alone or in concert with Israel could delay Iran's ability to build a bomb by up to four years—if the military operation is carried out to near perfection, with all aircraft, missiles, and bombs working to maximum effect.¹⁰ A military strike by Israel alone, with its more limited military capacity, could delay Iran's ability to build a bomb for up to two years.¹¹

The distinction between preventing and delaying Iran's ability to build a nuclear weapon would be a critical one, when considering the objectives of war.¹² Although there are strategic reasons for not being specific about redlines and military objectives, official and unofficial statements reveal a marked lack of consensus and clarity within government circles about what the United States should aim to achieve through any military

action against Iran. Privately, some in Washington may have embraced the more modest short-term objective of delaying Iran's ability to build a nuclear weapon, as a step toward prevention; but others may well have embraced objectives that are far broader than official statements currently suggest. Examples of broader objectives that are embraced by some parties include: 1) to bring about regime change; 2) to damage Iran's military and economic power so that it would be unable to pursue an aggressive policy in the region, particularly with regard to Israel; or 3) to force Iran to capitulate to U.S. demands regarding not only the nuclear program, but also Iran's hostility toward Israel; its support for Hezbollah and Hamas; and the regime's treatment of the Iranian people.

In order to fulfill the stated objective of preventing Iran from ever acquiring a nuclear bomb, the U.S. would need to conduct a significantly expanded air and sea war over a prolonged period of time, likely several years. In order to fulfill any of the more ambitious objectives suggested above, an even greater commitment of force, including troops on the ground, would be required to occupy all or part of the country.¹³ As far as we can judge from publicly available documents, no government official has suggested undertaking a land war or occupying Iran. Were the objectives of military action to expand during conflict, making such a campaign necessary, we estimate that Iran would require a commitment of resources and personnel would be greater than what the United States has expended over the past ten years in the Iraq and Afghanistan wars combined (due both to Iran's large size and population and to the strength of Iranian nationalism, as demonstrated during Iran's long and brutal war with Iraq, which invaded Iran in 1980).¹⁴

I.3. Capabilities. We have asserted that standoff attacks alone—by the U.S. or Israel or both—would not suffice to eliminate the possibility of Iran ever acquiring a nuclear bomb, but could produce a delay of two to four years in Iran's ability to develop a nuclear weapon. In reaching these judgments, we are assuming that the U.S. would deploy a full array of aircraft and conventional weapons against Iran, in standoff strikes that could last for several days or weeks, or longer. (For the purposes of this paper, we do not consider the conduct of certain small-scale asymmetrical operations using non-traditional military capabilities, especially in a pre-conflict mode, to constitute the use of "military force." We also do not attempt to evaluate the likely impacts of covert action or cyber attacks—even as part of a formal military action—because of the limited availability of open-source materials on that subject and the difficulty of predicting the success of such efforts.)

Such an action would include first destroying Iranian air defense and command and control facilities, which are generally regarded as relatively old and unsophisticated, in order to assure accurate and effective attacks on intended targets with low American casualties. For attacking deeply buried targets, like Iran's Fordow enrichment facility (which is 200–300 feet underground), the U.S. would use its B-2A stealth bomber armed with the GBU-57 Massive Ordnance Penetrator (MOP), a 30,000-lb "bunker-busting" bomb. Experts disagree about whether or not a bomb of this sort is capable of destroying or merely damaging the Fordow facility.¹⁵ The United States would also have the option of using missiles, drones, and special operation forces to reach some high-value targets.¹⁶ The U.S. would need to rely on its own intelligence to determine the accuracy of completed strikes and the degree of damage to key targets, since Iran would almost certainly move quickly to expel inspectors from the IAEA. (The United States might also issue an advance warning of aerial attacks, so IAEA inspectors could get out of harm's way.) If initial U.S. actions fail to produce the desired damage or if the list of targets grows once strikes begin, more sorties and multiple waves of attack would be necessary, extending the duration of the campaign.

An Israeli aerial strike would be based mainly on the long-range strike capability of the Israeli Air Force, but could include submarine-launched cruise missiles and the medium range 'Jericho' missile based on Israeli territory. The Israeli aerial strike capability consists of F-15I and F-16I long-range fighter-bombers armed with 2,000-lb and 5,000-lb bunker-buster bombs; KC 707 aerial refueling tankers; and electronic warfare support aircraft (manned and unmanned).¹⁷ The Israelis have been developing this capability since the mid-1990s and have continued to modernize and exercise it even over recent months.¹⁸ Israel most likely would plan to cross Jordanian and Iraqi airspace to attack Iran, not only because that is the shortest route to Iran, but also because the Iraqi Air Force is not capable of impeding such an incursion.¹⁹ Israel would hope to take advantage of its sophisticated electronic warfare capability and Iran's long border with Iraq in order to surprise Iran. An Israeli attack would likely be rapid (not longer than one night or at most two days of bombing) and well prepared, but certainly more limited in scope than a larger and more extensive U.S. military campaign.²⁰

In particular, an Israeli air strike is unlikely to succeed in destroying or even seriously damaging the Fordow enrichment facility and the stockpile of 20% enriched uranium that is stored there.²¹ The lack of a high-confidence military option against Fordow is a key reason why Israeli government officials believe they must take action to

destroy Iran's supply of low enriched uranium (LEU) and damage Iran's ability to produce more centrifuges, before Fordow becomes fully operational.²²

I.4. Exit Strategy. Questions about exit strategy are obviously closely related to questions about the objectives of military action. Given the lack of clarity about the objectives of military strikes against Iran, different parties could evaluate the success or failure of military action in very different ways. Military objectives also tend to broaden or change over time, especially in response to retaliation.

If stand-off air strikes achieved the limited objective of delaying Iran's nuclear program—and if no broader objective was adopted, including in response to retaliation—an exit strategy might not be needed. Of course, after the attacks ended, it would be necessary to continue applying diplomatic and economic pressure (including through the sustained imposition of sanctions) in order to produce a lasting solution. Whether resorting to force would enhance or reduce the prospects for success in this endeavor is a legitimate question for debate, which we consider in the “Benefits” and “Costs” sections that follow. If there is no lasting resolution of concerns about Iran's nuclear intentions and if Iran seeks to rebuild its nuclear program, the U.S. and/or Israel may need to consider renewing military operations again at some later point or points.

On the other hand, if the U.S. objective were to broaden to regime change or eliminating Iran's ability to play an aggressive role in the region—or if an escalating spiral of retaliation and counter-retaliation caused the conflict to spread—then planners would be challenged to develop an effective exit strategy. As the U.S. experience in Iraq suggests, it is not easy to devise an exit from deep and prolonged military engagement in a conflict that ultimately requires the crafting of a political solution.

“Things seem to be hurrying to an alarming crisis, and demand the speedy, united councils of all those who have regard for the common cause.”

Thomas Jefferson

II.

Benefits of a Military Action

In this section we make separate estimates of what can be achieved by U.S. military and Israeli military action, since the benefits differ significantly in these two scenarios.

II.1. U.S. Military Action. We estimate that a preemptive U.S. military action could delay for up to four years Iran’s ability to build a nuclear weapon.²³ Such a delay would be the result of damage to Iran’s existing nuclear facilities, the weakening of Iran’s ability to rebuild such facilities, and damage to Iran’s military capabilities. In addition to these impacts on Iran’s nuclear program, the decision to take military action could have broader geopolitical benefits for the United States.

II.1.1 Damage to nuclear facilities. Sustained U.S. attacks could damage or destroy Iran’s major enrichment facility at Natanz, plus the conversion facilities in Esfahan and Tehran (where the potential for civilian casualties would exist); the still incomplete heavy water reactor and production plant in Arak; and some centrifuge production installations. While there is some debate about the capacity of a single large bunker-buster bomb to destroy Fordow, repeated sorties could result in significant damage to the facility and to the portion of Iran’s stockpile of 20% enriched uranium that is stored there—without taking the site permanently out of commission.²⁴ The Iranian nuclear program would have to re-excavate the site to recover enriched material (if such recovery is even possible) or build new enrichment facilities. This would be time consuming under the best of circumstances. Iran’s work at Fordow was first detected in 2007,²⁵ but it was not until two years later that the facility was advanced enough to be identified as an enrichment facility. Another two years passed before Iran began installing centrifuges at Fordow, suggesting a timeline for recovery of up to four years. While this may not represent the maximum speed with which Iran could build an enrichment facility, it does indicate that the process cannot be completed in a few months.²⁶

II.1.2 Weakened ability to rebuild nuclear facilities. Iran’s ability to reconstruct its nuclear program could be impaired by attacks on sites where centrifuge components are produced or stored. One assessment notes that, since some critical components cannot be produced domestically and current sanctions severely restrict Iran’s ability to import those components, Iran would only be able to replace 2,000 of the centrifuges that are likely to be destroyed or damaged through attacks on the Fordow and Natanz enrichment

facilities (which currently house 10,000–11,000 centrifuges).²⁷ Other assessments indicate that Iran's supplies may be less constrained and that Iran might have the capability to begin producing significant numbers of centrifuges again within a few months of an attack. Thus, while destroying some critical components might delay recovery for a very substantial period, the delay could potentially be shorter. This uncertainty is one reason it is difficult to predict the impact of an attack.²⁸ If Iran were to decide to replace a severely damaged or destroyed Fordow facility, it would have to build again deeper underground and perhaps place smaller facilities in more remote areas, all of which would be time consuming.

II.1.3 Damage to military capabilities. The U.S. would also be able to destroy or damage many of Iran's air defenses, its air force, its military communications networks and command and control centers, and some of Iran's retaliatory capabilities such as the main military bases and missile and rocket-launching sites. In addition, damage could be done to the facilities of the Iranian Revolutionary Guard Corps (IRGC); as well as those of Iran's air force, army, and navy. The U.S. could also damage some sites suspected to be involved in work on nuclear weapons, such as Parchin.²⁹

II.1.4 Deterrence of nuclear weapons proliferation. U.S. military action against Iran's nuclear program may also reduce the odds that other countries in the region will seek nuclear weapons. First, it might provide assurance to regional allies, who would see that the United States will act to protect their security and that Washington's promises to its friends are credible. Moreover, if Iran's nuclear program were set back, key regional players such as Saudi Arabia, Turkey, and Egypt would feel less pressure to pursue their own nuclear programs. Second, a U.S. military action might also deter others—inside and outside the region—from pursuing their nuclear ambitions, fearing that if they do, it might invite a similar U.S. response.

II.1.5 Broader geopolitical benefits for the U.S. U.S. military action would demonstrate to the Iranian government America's determination to prevent Iran from acquiring a nuclear weapon. It could disrupt government control, deplete the Iran treasury, raise internal tensions, and, some maintain, weaken the regime.³⁰ This last is a highly contested assumption, and we join other experts in believing that an attack would strengthen the Iranian regime instead of weakening it (as mentioned in the consideration of "Costs," below). The use of force would also reassure those American allies and potential allies in the greater Middle East that are concerned about Iran's regional ambitions.

II.2. Israeli Air Strikes. Given the extensive, concealed, and protected nature of Iran's nuclear sites, and the scope of Israel's military capabilities, we estimate that an Israeli attack could delay Iran's ability to build a nuclear weapon by up to two years.³¹ In our view, Israel could not replicate the success of its earlier surgical strikes against single reactors in Iraq and Syria, since Iran's nuclear sites are numerous and widely dispersed, with one (Fordow) buried deep underground.

Israeli military action would likely do serious damage to the enrichment facility in Natanz, and the conversion facilities around Esfahan and Tehran. It would also likely destroy a portion of Iran's 3.5% enriched uranium stockpile. Successful strikes against centrifuge production facilities would contribute to postponing Iran's ability to build a nuclear weapon. Should Israel also attack portions of Iran's air defenses and some suspected weapons development locations such as Parchin, Iran's overall military capabilities would be at least somewhat damaged.

“Facts are Stubborn Things.”

Ronald Reagan

III.

Costs of Military Action

The initiation of preventive military action against Iran, even with limited objectives, could be the beginning of a war entailing all of the uncertainties and unanticipated consequences so familiar to those who have experienced or studied military conflicts. Obviously, any substantial U.S. commitment to military action against Iran would create a highly unstable and combustible relationship with one of the largest and most powerful nations in the region.

Some of the costs of an Israeli and/or American military action would be realized immediately. (We are talking here about the costs of Iranian retaliation, not the financial costs of conducting an offensive military campaign, which would be significant, particularly if the U.S. were to carry out thousands of sorties and decide it had to return to the use of force periodically for years to come.)³² Attacking Iran would also have important longer-term regional and global consequences for the United States. The long-term and even the near-term costs of military action are difficult to estimate, because of uncertainties about Iran's reactions and the reactions of other nations, and because of the high likelihood of unanticipated and unintended consequences.

In this section of our paper, we start by providing estimates of the costs of direct and indirect Iranian retaliation, and then offer some more speculative assessments of the very critical regional and global implications of attacking Iran.

III.1. Costs of Direct Iranian Retaliation. Some argue that Iran would be inclined to hold back in its response to an attack, so as not to provoke an even larger conflict with the United States.³³ We believe, however, that Iran would retaliate, costing lives and causing damage to U.S. property and assets in the region. Iran could engage in at least token missile/rocket strikes against the attacker, targeting sites in Israel or U.S. facilities in the region. Iran's ballistic missile program has developed in parallel to its nuclear program, with both making substantial progress in the past several years (although sanctions have slowed development in both programs).³⁴ According to unclassified estimates, Iran probably has at least two dozen and possibly more than 100 conventionally armed ballistic missiles capable of striking most of the region, including Israel³⁵—although this capability may be blunted by ballistic missile defense systems that the United States is reportedly in the process of deploying in the region.³⁶

We do think it possible that the Iranians might limit the scope of their retaliation, in order to develop support and sympathy from key regional states and the broader international community, gauging that they would gain politically from being perceived as the victim.³⁷

III.1.1 Retaliation against the United States. In response to a U.S. military campaign, Iran would have less incentive to exercise restraint in retaliation than if the attack came just from Israel (in which case Iran might wish to avoid triggering U.S. involvement); but Iran would still be mindful of America's power and readiness to respond. Retaliation would most likely involve Iran's asymmetrical conventional force capability. Iran would want to avoid direct military confrontation, to the extent possible, so targets would include U.S. facilities in the region, Israeli facilities (since Iran would view Israel as partly responsible for a U.S. attack), or some combination thereof. While Iran's ability to retaliate in this way is likely to have been degraded by American attacks on Iran's arsenal of ballistic missiles, Iranian strikes over time could still potentially kill American and Israeli citizens, as well as citizens of those countries where the U.S. has allies and bases. Iran could also use its naval or other assets to attack U.S. ships, both civilian and military, in the region.³⁸ Iran has built up its naval capabilities over the past two decades, particularly in the Persian Gulf. While Iran's asymmetrical naval capability—consisting of anti-ship missiles, small submarines, fast attack boats, and mines—would ultimately be overmatched by the U.S. Navy, Iran could take advantage of the constrained geography of the Persian Gulf to inflict meaningful damage on U.S. or allied ships.³⁹ The IRGC Navy would carry the burden of attacks inside the Gulf. The regular Navy operates generally outside the Gulf and has larger vessels that are more easily targeted.⁴⁰

In addition to retaliation involving conventional forces, Iran could kidnap U.S. military personnel, businessmen, and/or civilians and leverage hostages for political bargaining.

III.1.2 Retaliation against Israel. In response to an Israeli strike, Iran could launch missiles at Israeli cities. While Iran's missiles are highly inaccurate and Israel's missile defenses (which would likely be supported by U.S. systems) could intercept many of these weapons, some could get through. Although Israel could anticipate some of Iran's likely targets and direct most of the affected civilians to bomb shelters,⁴¹ there would inevitably be casualties and property damage.

Some Israelis and others have suggested that since earlier Israeli surprise attacks on Iraq's Osirak and Syria's Deir ez-Zor reactors provoked no retaliation from either country, Iran also might not retaliate. This seems unlikely to us. While retaliation against Israel would risk drawing the United States into the conflict, it might be necessary for domestic Iranian political reasons, and it would be understandable to many in the international community who would condemn the Israeli military action. Iran could target Israeli airbases where aircraft used in the strike are located, or the Israeli nuclear complex at

Dimona. Iran might even estimate that such a proportional response might not draw the U.S. into the conflict.

III.1.3 Closing the Strait of Hormuz. Iran could attempt to close the Strait of Hormuz in retaliation for an attack. Nearly 20% of world exports of petroleum—including Iran's own exports—pass through the Strait of Hormuz.⁴² Any effort to block the Strait could disrupt the global oil and natural gas markets (in addition to blocking the main artery for export of Iran's own oil), resulting in a large increase in petroleum prices and potentially alienating important nations, such as China, which otherwise would likely be sympathetic to an Iran that has been attacked seemingly without clear provocation. Nonetheless, Iran might calculate that threats to close the Strait could galvanize international pressure on the U.S. to de-escalate.

Despite the overmatch enjoyed by the U.S. Navy and possible coalition partners, Iran might succeed in closing the Strait for days or even weeks by deploying a substantial number of mines and then using its naval forces and land-based anti-ship missiles to hinder efforts at clearance.⁴³ Such an outcome obviously would drive oil prices higher.⁴⁴

Even if Iran did not seek to close the Strait, an attack on Iran would likely produce an anticipatory spike in oil prices—in fact, mounting tensions with Iran have already contributed to a price increase. Escalating tensions and naval skirmishes could further rattle markets and produce additional price spikes. There is also the possibility that defensive measures taken by the Iranians could be misinterpreted, or that rogue actions by elements of the IRGC Navy could create incidents in the Persian Gulf, creating an inadvertent naval escalation in the Strait.

III.2. Costs of Indirect Iranian Retaliation. Indirect retaliation by Iranian-backed proxies such as Hezbollah, or by Iran's covert action assets—such as the Revolutionary Guards' Qods Force—could include the use of missiles and rockets by proxies as well as terrorist attacks and covert action, such as sabotage and assassination.

III.2.1 Indirect retaliation by Hezbollah. It is an open question as to what Hezbollah would do if Israel or the United States attacked Iran. Hezbollah has fought against Israel and is well aware of the price it would pay for attacking Israel. Hezbollah might conclude that an Israeli strike against Iran would bring international condemnation, thereby resulting in increased sympathy and support for Hezbollah's own use of military force. (Hamas might conceivably make the same calculation, although its more narrow

focus on the Palestinian–Israeli arena makes that somewhat less likely.) Yet events in Syria have introduced uncertainties for Hezbollah, which has depended heavily on the Assad regime for support. A seriously weakened Assad or a completely new Syrian government would change the calculus for Hezbollah; depending on who succeeded Assad, Hezbollah might find it much more difficult to sustain a war with Israel.⁴⁵

If Hezbollah (and perhaps Hamas) were to decide to take action, they could inflict significant damage on Israel with their extensive rocket and missile arsenals. Hezbollah's military capability is now significantly greater than during the 2006 war; the group currently has thousands of longer-range rockets and missiles (Israel estimates 50,000) capable of hitting central Israel.⁴⁶ Again, Israel's Iron Dome anti-rocket and missile defenses—significantly enhanced over the past year, with U.S. assistance—would blunt the attack, as would Israeli retaliation against the Hezbollah arsenals. But the resulting conflict could kill civilians, inflict property damage, and set back the Israeli economy. Hezbollah could also launch terrorist attacks against Israelis and Israeli interests.

Since the 2006 war, both Hezbollah and Israel have been preparing, in some sense, for their next conflict. Combine the possibility of a retaliatory cycle after attacks on Iran with these simmering regional tensions and the threat of a Third Intifada developing among a frustrated Palestine population, and we believe there are at least the preconditions for a major escalation and a bloody conflict in the Levant.⁴⁷

III.2.2 Covert retaliation worldwide. Iran could also use its own and controlled covert action capabilities to attack Israel or the United States or their interests outside of the greater Middle East. This would offer Iran the advantage of deniability, with a view to limiting the potential for escalation. The Qods Force was implicated in a failed 2011 plot to kill the Saudi ambassador to the United States; the involvement of Qods in such a clumsy yet audacious attempt was regarded by many in the intelligence community and law enforcement as surprising but credible.⁴⁸ Likewise, Iranian intelligence services or their proxies have been implicated in recent bombings or attempted bombings in Bulgaria, India, Thailand, and Georgia (possibly in retaliation for the assassination of Iranian nuclear scientists by Israelis).⁴⁹ The extent of Iran's ability to conduct such a covert campaign is unclear, given some recent failures and missteps, though the success of the bombing in Bulgaria does indicate some ability to attack soft targets well outside the Middle East. Even one or two successful terrorist attacks could kill many and inflict substantial psychological, physical, and economic damage. Moreover, it seems likely that with more experience and greater determination, Iran could improve its performance significantly.

III.3. Escalation. Any Iranian retaliation could lead to Israeli or U.S. responses that in turn might provoke additional Iranian responses. The consequences are uncertain, but an escalation spiral certainly could result, with either or both sides taking actions that neither side contemplated before an initial strike—particularly since what one side sees as a completely justified retaliation may very well be perceived by the other side as a deliberate escalation. Given the “fog of war,” high levels of mutual distrust, the absence of communication among regional combatants, and the ability of events to overtake even the most careful planning, miscalculation and uncontrollable escalation to full scale combat cannot be discounted.⁵⁰

III.4. Regional and Global Costs. The long-term and global costs to U.S. interests are even more difficult to estimate. Recognizing that these may be speculations and that there is disagreement on these points, we offer the following assessments of possible global costs.

III.4.1 A breakdown in global solidarity against Iran's nuclear program. The United States would likely seek some kind of international mandate for military action against Iran, and attempt to put together a large multinational coalition. But if the U.S. and/or Israel end up attacking Iran's nuclear program without such a mandate, hard-won international support for maintaining sanctions against Iran could be substantially weakened. China and Russia would loudly condemn military actions against Iran, and some European nations might pull back from a sanctions regime after such attacks.⁵¹ Iran would be seen by many around the world, Muslims and non-Muslims alike, as the victim of unjustified American and/or Israeli military action. Sanctions are at present one of the main coercive levers against Iran; the heaviest sanctions on Iranian oil sales and access to worldwide banking have just come online. The weakening of the sanctions regime as a result of a military action would represent a significant break in the global solidarity against the Iranian nuclear program.⁵²

With the breakdown of cooperative international efforts to isolate Iran, there is the possibility that Iran might receive new support for its military capacity. For example, Russia might be willing to sell Iran advanced surface-to-air missiles (SAMs) that would make future attacks on Iran more costly and difficult. Russia is currently withholding sales of these systems because they fall under U.N. sanctions, but this decision and others could be revisited after strikes on Iran.⁵³ Also, Iran now faces severe limits on its ability to acquire from abroad a variety of dual-purpose materials and components for its centrifuges and other nuclear technology. States that see Iran as the victim of an unjustified

attack might become more willing to share information and material with Iran. This could potentially enable Iran to produce more advanced centrifuges than the country is currently able to produce, given material and technical shortages.⁵⁴

III.4.2 Increased likelihood of Iran becoming a nuclear state. Any sort of military action that could lead to outright war would have a significant impact on the possibility of reaching a more permanent political resolution of concerns about Iran's nuclear program (as well as concerns about Iran's regional role and many other issues that are central to U.S. security interests in the greater Middle East). Of course, there is a chance that punishing aerial attacks might drive Iran to the negotiating table—although we know of very few historical cases in which air strikes combined with other forms of pressure (but without the use of ground troops) produced such a result. Rather, once negotiations are abandoned for military action, it would become extremely difficult to pursue diplomatic discussions unless and until the Iranian regime surrenders or capitulates—which seems unlikely, although not impossible. As asserted above, in order to achieve Iran's capitulation or to bring down the regime, the United States would probably have to use ground forces and wage a long-term war.

In fact, we believe that a U.S. attack on Iran would increase significantly Iran's motivation to build a bomb.⁵⁵ According to one senior military official, this was the conclusion reached by many in the Bush administration.⁵⁶ While there is no evidence that Iran's Supreme Leader has decided the country should develop a nuclear weapon, many observers believe that Iran's leaders want the country to be capable of making a bomb if they perceive one to be needed. After an attack or repeated attacks, Iran's leadership could become more convinced than ever that regime change is really the goal of U.S. policy. The decision to build a bomb would be taken for national security reasons, with the assumption that a nuclear weapon would help to head off any future or sustained U.S. military action. But building a bomb would also redress the humiliation of being attacked and restore national pride, which has been a major driver of Iran's nuclear program for a decade.

In connection with a decision to go rapidly for a nuclear weapon, or perhaps even in advance of actually making such a decision, Iran could also withdraw from the NPT and end all cooperation with the IAEA. Such actions would have a significant impact on U.S. policy objectives by eliminating international inspections and monitoring of declared sites, which have been a crucial source of data on the Iranian nuclear

program. Losing the IAEA presence in Iran would not make it impossible to monitor a reconstituted Iranian nuclear program, but the task would become far more difficult and the resulting conclusions would be more uncertain.

III.4.3. Greater regional and global instability, including the possibility of increased terrorist recruitment. A U.S. and/or Israeli preventive military action against Iran could combine with rising populism and the uncertain political developments associated with the "Arab awakening" and the Syrian civil war to create a toxic mixture, perhaps contributing to increased sectarian conflict and regional war. It is particularly difficult to anticipate how a U.S. attack on Iran would interact with the dynamics of conflict in Syria, given the close nexus between the Iranian regime, the Assad regime in Syria, and Hezbollah, and the United States' vocal support for the Syrian rebel forces. While a United States-led military action against Iran could temporarily improve official U.S. relations with the governments of Saudi Arabia and some of the Gulf States, the impact on the broader Arab public is likely to be negative for U.S. interests and leverage in the region, particularly in Egypt. An attack on Iran would most certainly provoke increased hostility toward Israel, which could escalate into a regional conflict or, at the very least, undermine prospects for progress on the Israeli Palestinian peace process, which would have a direct effect on U.S. security interests. Much of the impact on the region would depend on the nature and extent of the initial military actions, whether it is only Israel or the U.S. and Israel, the nature of Iranian retaliation, and the subsequent Israeli and/or U.S. responses. Large-scale Iranian retaliation would add significantly to the likelihood of opening up a broader conflict in the region, through the escalation spiral described above.

In addition, we believe that an attack on Iran would enhance the ability of radical Islamist groups, including Al Qaeda, to recruit in the region. It is hard to quantify the scale of this effect, but if Iraq and Afghanistan are models, one could anticipate that an attack on Iran will boost the popularity of groups and leaders who claim that the U.S. is the enemy of Islam. Even though Al Qaeda's Sunni leaders might be pleased by attacks against the Shiite Iran, they would nonetheless welcome the resulting international Muslim outrage, which would create fertile ground for expanding their ranks.

Iran might also use its connections to Shiite groups in Iraq to encourage attacks on U.S. interests there, in the region at large, and globally. While U.S. combat forces have departed from Iraq, thousands of U.S. military support personnel, diplomats, civilian contractors, and business people remain. Retaliation in Iraq could take the form of

large-scale rocket attacks against U.S. diplomatic and military facilities or attacks on convoys; or it could be disguised as criminal activity, such as kidnapping U.S. citizens. Iran might also increase its behind-the-scenes support for sympathetic groups in Afghanistan as well, where there is an even larger U.S. presence.⁵⁷

Globally, in addition to rattling global markets and increasing the price of oil in the short term,⁵⁸ a new conflict in the Middle East would be a major disruptive factor in a world economy that is struggling to regain its footing. While this paper does not attempt to estimate the global economic costs of a single or a series of preemptive strikes against Iran, we gauge that the resulting instability could bring even more uncertainty to global markets, currencies, and recovery.

III.4.4 Reduced regional and global influence for the U.S. One of the most serious but most difficult to quantify costs of military action against Iran could be damage to U.S. reputation and standing in the world.⁵⁹ Such damage could occur whether it is Israel or the U.S. that takes military action. If Israel takes military action over official U.S. objections, the perception will be that the U.S. has tacitly approved the attack. If the U.S. attacks, especially without a very clear and widely convincing indication of a decision by Iran to build a nuclear weapon, the perception will be that once again the U.S. has taken preventive military action in a unilateral fashion. Moreover, if either Israel or the U.S. were to attack the Islamic Republic of Iran, Muslims around the world would have even more reason to believe that the U.S. and Israel are at war with Islam. Even though some Arab leaders would be privately relieved, Muslim world leaders in general would condemn the attack. We believe that U.S. stature and influence in the region would suffer.

To be sure, some policy analysts contend that after years of declaring that an Iranian nuclear weapon is unacceptable, the failure to take military action would undermine America's global credibility. These two differing judgments highlight the dilemma faced by the United States as it weighs various policy options toward Iran. We acknowledge a third possibility as well—that the failure to attack and the decision to attack *both* could have some negative reputational consequences for the United States. The challenge then would be to determine which of those consequences are most probable, important, and lasting.

III.4.5 What about regime change? We cannot know for certain how the initiation of military action against Iran would affect the regime's grasp on power. But history and recent experience hold some clues. We note that military attacks by other nations have

seldom led to regime change, absent the use of ground forces to occupy territory.⁶⁰ Indeed, the 2011 air campaign in Libya suggests that, even with local rebel forces active on the ground, air strikes would need to be sustained for an extended period and supplemented by on the ground support from other nations' professional militaries in order to produce a change in leadership. Of course, there is always the possibility that an effective attack on Iran's nuclear and military facilities would demonstrate the impotence and confirm the failed policies of the Iranian regime. Such a demonstration could hearten resistance and perhaps signal the beginning of a change of leadership in Iran.⁶¹ But in our view, air strikes alone are not likely to lead to regime change, regime collapse, or capitulation.⁶²

Would military action against Iran increase or undermine support for the regime among Iran's population? The former seems more likely, judging by the strong support showed by the Iranian public for their leaders after the Iraqi attack in 1982 and throughout the grueling, eight-year war that followed.⁶³

Even if regime collapse could be produced by a prolonged campaign of air attacks combined with covert and cyber attacks, and drone activity (an outcome that we view as unlikely), it is not necessarily the case that Iran or the region would be more stable as a result.

III.5. The Costs If There Is Evidence of a Decision to Weaponize. As noted previously in section I, there are several developments that could indicate to the U.S. and the international community that Iran has decided to go for a nuclear weapon. These include a withdrawal from the NPT, the expelling of IAEA inspectors, and intelligence indicating that Iran has begun to enrich uranium beyond 20%. Such warning signals would allow the U.S. to consult first with allies and other members of the United Nations Security Council (UNSC) and with the neighbors of Iran over what next steps would be effective and required. Indeed, if the evidence of Iran's decision to pursue a bomb were credible, the U.S. could seek authorization to use force from the UNSC. It is highly unlikely that the UNSC would approve the use of force, if for no other reason than the anticipation of vetoes by China and Russian. But an effort to work through the UNSC could help the U.S. develop moral, financial, and perhaps even military support from some European and regional states that do not want Iran to have a nuclear weapon.

Military action, even if undertaken unilaterally, would be less costly under these circumstances, in terms of its impact on U.S. influence and objectives. Support for sanctions would not be so likely to weaken, and some of the specific limits on Iranian acquisition of SAMs and centrifuge components would be more likely to hold firm. America's reputation also would suffer less, in the region and globally.

All this said, a unilateral attack by the United States would still come under heavy international criticism. And the potential for costly retaliation by Iran—direct and indirect—would not be significantly reduced under circumstances of greater certainty about whether Iran is actually building a bomb.



In Conclusion...

Our aim in this paper has been to stimulate informed debate and reflection on one of the most critical security challenges now facing this country. We have grappled here with a number of key strategic questions on which there is disagreement—including how long a military strike might delay Iran’s capacity to build a nuclear weapon; how and when the United States would know if Iran was executing a decision to build a nuclear weapon; the probable impact of military strikes on the stability of the Iranian regime; and the potential scope of Iranian retaliation. In addressing these and other questions, we have offered fact-based analyses and professional judgments based on careful review of a wide range of expert opinion.

We offer this rigorous assessment by a bipartisan group of national security professionals in an election year in order to help de-politicize discussion of a highly charged issue. We hope the facts and professional judgments arrayed in this paper will help citizens and leaders alike weigh the benefits and costs—both immediate and long-term—of using military force against Iran.

A Primer on Iran's Nuclear Program and Other Activities

The Iranian nuclear program became an issue of concern to the United States and the international community nearly two decades ago. The concern became more pronounced in 2002, when intelligence revealed that the Iranians had failed to declare a buried facility for uranium enrichment at Natanz. In the decade since, the Iranian program has made substantial progress on enrichment, despite a United Nations Security Council (UNSC) resolution (#1696) demanding that Iran suspend its uranium enrichment and reprocessing activities, and a subsequent UNSC resolution (#1737), imposing sanctions on Iran for failure to comply with the demands of the international community. These resolutions were followed by four other UNSC resolutions, implementing harsher sanctions to pressure Iran. In response, Iran's U.N. ambassador has accused the Security Council of attempting to force Iran to abandon its rights as a signatory of the Nuclear Non-Proliferation Treaty (which allows non-nuclear-armed countries to enrich uranium for peaceful purposes, at declared facilities).⁶⁴

There is bipartisan consensus in the United States that Iran should not have nuclear weapons. Both the Bush and Obama administrations have maintained that, at least as a last resort, military action to prevent Iranian acquisition of nuclear weapons is an option. At the same time, the Israeli government, led by Prime Minister Netanyahu, describes a nuclear capable Iran as an “existential threat” and has threatened to use military force to prevent Iran from having a nuclear weapons capability. Many members of the U.S. Congress and other political leaders support the Israeli position, and U.S. intelligence analysts believe that Iran is already “capable” of eventually producing a nuclear weapon, if it should decide to do so. But intelligence experts also judge that no decision has been taken by Iran's Supreme Leader to use that “capability” to make a weapon. The Obama administration has held that Iran should be stopped from having a nuclear weapon, should it become apparent that Iran had decided to build one.⁶⁵

The United States and the International Atomic Energy Agency (IAEA) have extensive knowledge of declared nuclear facilities in Iran. (The IAEA is an independent organization that reports to the United Nations and that has as part of its purpose the inspection of existing nuclear facilities in order to ensure their peaceful use). The U.S. had intelligence about the existence of the Natanz and Fordow enrichment facilities before the Iranians declared them and before they went into operation. Although Iran has stated its intention to construct as many as 20 nuclear power reactors and additional enrichment sites in the coming years, current and former U.S. intelligence officials have expressed confidence that Iran has not yet built any new, undeclared nuclear facilities and that there is a good—but not perfect—chance that new clandestine facilities could be detected on a timely basis. In addition to seeking information about Iran's nuclear facilities, the United States and other nations are concerned to detect any signs that Iran might be engaged in non-nuclear research and development activities that might contribute to the development of a nuclear weapon.

1. Declared versus undeclared sites and inspections. The Iranian nuclear program includes 24 declared facilities that are subject to IAEA inspection, though many of these do not pose any risk of nuclear weapons proliferation (nine, for example, are hospitals that use small quantities of nuclear material). The four major facilities are the uranium enrichment sites at Natanz and Fordow, the uranium conversion facility at Esfahan, and the nuclear research complex in Tehran. The partially completed heavy water reactor at Arak, which could potentially be used to produce plutonium for a weapon, is also under inspection. In addition to these inspected sites, there are other declared sites that are not currently under inspection, such as the heavy water production plant associated with the Arak reactor. Other sites are associated with the production of components for the nuclear program, such as gas centrifuges, and others, such as Parchin, are suspected of involvement in undeclared Iranian research potentially related to the construction of nuclear weapons. The IAEA used to have and has recently sought renewed access to Parchin.

2. Understanding different levels of enrichment. The chief concern of the United States and international community about the Iranian nuclear program focuses on Iran's future capability to produce highly enriched uranium (HEU or weapons-grade uranium). The fissile material required for nuclear weapons is generally considered to be uranium enriched to the level of around 90% in the isotope U-235. One of the key aspects of this concern is that Iran has been assembling a quantity (145 kgs) of medium enriched uranium (MEU) at 19.75% for the Tehran Research Reactor. MEU can be used to fuel a reactor that creates medical isotopes, although there is little evidence that Iran has the capacity to use it for this purpose. Uranium that has been enriched to 20% is relatively easier to enrich further to HEU and could be used as the basis for rapidly producing weapons-grade uranium. Iran also has a much larger stockpile (about four metric tons) of low enriched uranium (LEU) at 3.5%, intended apparently for power reactor fuel. This stockpile could also be used to enrich enough material to HEU for four or five nuclear weapons—albeit with greater difficulty—should Iran decide to do so.⁶⁶

Given Iran's current centrifuge capacity (6,000–10,000 centrifuges at Natanz and Fordow, with the large majority at Natanz) and stockpiles of LEU, it would take Iran from one to four months between deciding to “dash” for a bomb and producing enough material for a single device. However, Iran would still need additional time to fashion other components for a nuclear device.⁶⁷ If Iran succeeds in producing a larger amount of material enriched to 20%, that could significantly reduce the amount of time required to produce HEU for a single weapon, perhaps to as little as a month. Under current IAEA monitoring arrangements, Iran would not be able to carry out such high-level enrichment at the Natanz or Fordow facilities without being detected. Moreover, Iran would need to overcome other technical challenges in fashioning even a crude, testable nuclear device.

Conservatively, it would take Iran a year or more to build a potentially deliverable bomb, with at least two years or more required to create a nuclear warhead that would be reliably deliverable by a missile.⁶⁸

3. Monitoring capabilities from enrichment to a weapon. Having HEU is not the same as having a working nuclear weapon, which would require additional design and testing; but HEU (or plutonium) is an absolute prerequisite for a bomb. Thus, the focus on Iran's timeline to produce sufficient HEU is appropriate. During the process of producing LEU, natural uranium (yellow cake) is converted to a gaseous form (UF₆). The UF₆ is then spun at high speed in centrifuges to separate the fissile isotope (U-235) and thereby enrich it. At higher levels of enrichment it can then be converted into a metallic form for a weapon.

Iran has two sites that can be used for conversion (Esfahan and Tehran) and two that can be used for enrichment (Natanz and Fordow). In order to be effective in slowing the timeline for Iran to produce uranium enriched for a bomb, any military action must destroy or disable some or all of these sites, along with some or all of Iran's stockpile of 20% and 3.5% enriched uranium. The destruction or disabling of all sites would of course make it impossible for Iran to enrich HEU until they had rebuilt the facilities or built other declared or non-declared sites at other locations.

This analysis is based on the belief that Iran does not at present have any large scale clandestine enrichment sites. The U.S. can take some comfort from the fact that American and allied intelligence agencies detected both of Iran's attempts to build sites (Natanz and Fordow) before they were declared. Iran could decide to disperse enrichment into smaller, more remote sites—although if IAEA inspectors were to remain in Iran, they might be able to detect the unexplained movement of some of Iran's limited number of trained and experienced nuclear personnel.

4. What does the IAEA know about Iran's weapons development efforts?

The presence or absence of an Iranian weapons program presents a unique case for the IAEA. The agency, with the help of intelligence generated by the United States and other nations, has determined that non-nuclear work related to a "structured nuclear weapons program" that had begun prior to 2003 has been discontinued. There is disagreement within the intelligence community about whether Iran is doing ad hoc research and development for nuclear weapons. In the eyes of most of the world, any activity by Iran that could contribute to the development of a nuclear weapons capability and that is not directly linked to a civil program would be seen as a violation of the NPT. Iran maintains that unless there is a diversion of fissile material from the civil program to a military program, there has been no violation of the NPT.

Traditionally, the IAEA has concentrated its efforts on detecting diversion at the declared facilities, particularly those where enrichment takes place, since those facilities can be used to produce material for weapons. But given Iran's possible military-related

activities in the past (prior to 2003), inspection of these sites has not provided the U.S. and others with the assurance they are looking for regarding Iran's intentions. According to the IAEA, the "possible military dimensions" (PMD) of the Iranian nuclear program remain "un-clarified" by Iran. In an effort to probe Iran's weapons work more deeply, the IAEA has been seeking permission to visit suspect military sites, such as Parchin. This kind of special inspection is within the IAEA's mandate, but Iran claims that the IAEA is discriminating against Iran, as a signer of the NPT, by seeking entry to military facilities.

5. Iran's intention to develop or use nuclear weapons. The U.S. and others have attempted to gain insights into Iran's intentions both from analysis of Iran's behaviors, and from the public statements of its leaders. As an example of the first kind of indicator, Iran is already producing large quantities of LEU without an active program to construct the power plants that could use this product, suggesting that Iran has a non-peaceful use in mind for the LEU. These types of indicators are relatively tangible and detectable. Yet many of the timelines predicated for Iranian weaponization do not begin until Iran's Supreme Leader takes the political decision to make a weapon. U.S. intelligence contends that Supreme Leader Khamenei has not yet made such a decision. In 2012, the Supreme Leader actually re-issued a second and stronger fatwa (religious decree) that bans the use or development of nuclear weapons as "against Islam." If such a fatwa were violated, the Supreme Leader would lose religious and political credibility and authority. Some authorities on Iran argue that a fatwa can be revised or changed on the basis of significantly changed circumstances—and military action against Iran or an all-out war might constitute such a change. In view of the international attention focused on Iran's every move, the Supreme Leader is likely aware that a move toward "break out" or a dash to build a nuclear weapon could provoke military action from several states.

6. The capacity of the IAEA to monitor and inspect Iran's nuclear program.

The IAEA has cameras and other monitoring devices at all declared sites, with seals on the monitoring devices to prevent or detect interference. In addition to remote monitoring, IAEA inspectors visit each site periodically and the IAEA publicly reports its findings every three months. These quarterly reports cover the number of centrifuges working in each site; the state of the facility; the level of enrichment (3.5%, 20%, or higher) in each facility; the size of the stockpile of enriched uranium that has been produced; and the general plans for expanding work or upgrading the centrifuges.

In addition to information made available in these IAEA quarterly reports, the U.S. and the many other nations that are watching Iran's actions closely can glean other insights from intelligence sources, reports from dissident organizations operating in Iran, and, in certain circumstances, the relationships developed between the IAEA inspectors and Iranian scientists. Of course, the greater the access the IAEA has to declared sites, the more information is available and the better chance the IAEA has to pick up clandestine activity or early signs that Iran might be preparing for a crash program to

develop a nuclear weapon. Current and former U.S. officials express “confidence that Iran does not currently have additional covert enrichment sites”⁶⁹—and as explained above, it is highly unlikely that Iran could develop a completely clandestine program. Iran would either have to dismiss the IAEA inspectors or exclude them from enrichment facilities that could be used to produce HEU, if it intended to produce weapons-grade uranium. That said, the IAEA has limited authority to investigate military sites, under provisions of the NPT, unless there are clear indications from other sources that Iran is working on weapons development.

7. Behavioral indicators of possible intent to build a nuclear weapon.

The IAEA and the intelligence communities of many nations use on-site inspections; satellite images; human, signals, and other intelligence; public statements; and diplomatic progress or the lack thereof—among other means—to determine whether Iran has made the decision to weaponize and is preparing a “breakout” move toward a nuclear weapon. The most immediate signal would be a decision to expel the IAEA inspectors from declared sites. Other actions that would make it more possible for Iran to produce a weapon quickly might include, for example, accumulating enough MEU (20%) to use as the basis for enrichment of the HEU needed for one or more weapons; and installing large numbers of next generation centrifuges (IR-2m or IR-4, which are three to four times more efficient than the centrifuges currently in use in Iran).⁷⁰

8. Concern about Iranian activities other than the nuclear program. While the purpose of this section has been to describe Iran’s nuclear program, it is also important to note that other factors could influence policymaker thinking about not only the possibility of taking military action against Iran, but also the objectives and scope of such action.

In addition to the high level of concern about Iran’s nuclear program, the U.S. retains serious concerns about other Iranian behavior—including Iran’s hostility toward Israel, exemplified by Iran’s support of Hezbollah and Hamas and its rhetorical threats against Israel’s very existence. The U.S. government has also been disturbed by Iranian efforts to undermine and seriously harm U.S. interests in Iraq, Afghanistan, and elsewhere in the region—including by contributing to the deaths of American servicemen through the provision of weapons to hostile insurgents in the region.

In addition, the U.S. has objected to the Iranian regime’s treatment of its own citizens, particularly following the June 2009 elections, when the Iranian regime suppressed the opposition “Green Movement.” The regime’s intimidation, imprisonment, and execution of opposition leaders has been a source of growing concern among the American people and in the U.S. Congress, which has legislated resolutions and sanctions against Iran because of those repressive policies.

Endnotes

1 Iran’s capability of eventually producing a nuclear weapon, should it decide to do so, is described on page 6 of the January 31, 2012, “Unclassified Statement for the Record on the Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence,” presented by James R. Clapper, Director of National Intelligence. In an earlier hearing (March 10, 2011) before the U.S. Senate Committee on Armed Services, Clapper expressed a high level of confidence that Iran had not decided to restart its nuclear weapons program, <http://armed-services.senate.gov/Transcripts/2011/03%20March/11-11%20-%203-10-11.pdf>.

2 H.RES.568, “Expressing the Sense of the House of Representatives Regarding the Importance of Preventing the Government of Iran from Acquiring a Nuclear Weapons Capability” March 2012, <http://thomas.loc.gov/cgi-bin/bdquery/z?d112:h.res.568;> and S.RES.380, <http://thomas.loc.gov/cgi-bin/bdquery/z?d112:s.res.380>.

3 Frederik Dahl, “Iran Submarine Plan May Fuel Western Nuclear Worries,” Reuters, July 5, 2012.

4 Because Natanz and Fordow are both declared facilities, the IAEA could detect any suspicious behavior, or Iran would signal to the international community that it is making a dash for the bomb by kicking out the inspectors. If Iran were to build weapons in secret, it could take several years. (Colin H. Kahl, Melissa G. Dalton, and Mathew Irvine, “Risk Rivalry: Iran, Israel and the Bomb,” Center for a New American Security, June 2012, p. 10.) Additionally, “if weapons-grade enrichment were to occur at Fordow or Natanz under IAEA safeguards (assuming that Iran was cooperating with the IAEA), the international community would probably learn of it because of the difficulty in diverting significant amounts of nuclear material from safeguarded centrifuge facilities without detection.” See Jim Zanotti, Kenneth Katzman, Jeremiah Gertler, and Steven A. Hildreth, “Israel: Possible Military Strike Against Iran’s Nuclear Facilities,” Congressional Research Service, R42443, March 27, 2012, p 12–13. While it is possible that Iran may have hidden enrichment sites, it is worth noting that both Natanz and Fordow were detected by western intelligence years before they became operational.

5 As Jim Walsh notes, the important question to ask is not ‘would we know if the Iranians had a secret program,’ but rather ‘could the Iranians be confident that they could get away with it?’ The empirical evidence clearly indicates that the U.S. has excellent detection capabilities, especially when it is looking for clandestine activities. Iran, on the other hand, has ample reason to believe they would be caught. On improving satellite detection capabilities, for example, see Gotthard Stein, “Detection of Clandestine Nuclear-Weapons-Useable-Materials Production with Satellite Imagery,” INESAP Information Bulletin, No 27, December 2006, pp. 23–26. On the topic more generally, see Jim Walsh (with Owen Cote), “Notes on Clandestine Nuclear Weapons Programs,” MIT SSP, 2012, http://web.mit.edu/ssp/people/walsh/jim_walsh_activities.html. For an alternative view, see Houston G. Wood, Alexander Glaser, and R. Scott Kemp, “The Gas Centrifuge and Nuclear Weapons Proliferation,” *Physics Today*, 61(9), 2008, p. 40–45., <http://www.princeton.edu/~rskemp/Kemp%20-%20Gas%20Centrifuge%20and%20Nonproliferation%20-%20SPLG.pdf>.

6 Timeline calculations depend on several variables, including estimates of how many centrifuges Iran can use and how much enrichment each can accomplish; the enrichment level of the “feed” uranium—whether natural (less than 1%), 3.5%–5%, or 19.75%–20%; and how much weapons-grade uranium is enough for a single bomb (25 kg is the amount typically cited, but it could be somewhat less). The four-month timeline comes from David Albright and is based on using 3.5% enriched feed in the 9,000 centrifuges at Natanz, each producing roughly .5–.6 SWU (separative work units) and needing to yield at least 25 kg. (http://armedservices.house.gov/index.cfm/hearings-display?ContentRecord_id=b3c53146-0c0e-4eea-b99e-3c1f308ad5a6&Statement_id=2aeeb4fa-97ea-4fe5-ad9a-96997ec5deb4&ContentType_id=14f995b9-dfa5-407a-9d35-56cc7152a7ed&Group_id=41030bc2-0d05-4138-841f-90b0fbaa0f88&MonthDisplay=6&YearDisplay=2012). Albright is adjusting his estimate based on a just-released IAEA report, <http://www.latimes.com/news/nationworld/world/la-ig-iran-nuclear-20120824,0,877367.story>. Olli Heinonen has estimated six months is needed to breakout under the same scenario, but only one month using 20% feed., http://www.foreignpolicy.com/articles/2012/01/11/the_20_percent_solution. Austin Long’s estimates focus on Fordow and assume that Iran maintains about 1 SWU per centrifuge, using 20% feed, with a resulting timeline of three months. (“Stall Speed: Assessing Delay of the Iranian Nuclear Program from Military Action,” forthcoming). By spring of next year, Long estimates that the timeline could be as short as seven weeks, but this would require Iran to be more effective in using its centrifuges than it has been.

7 The IAEA report released on August 30, 2012, shows that Iran is increasing its rate of production of 20% enriched uranium (a total of 189kg, which is 43kg more than at the time of the IAEA’s May report). However, almost 98kg has been (or is being) converted into fuel plates for the Tehran Research Reactor, meaning that it is no longer available for rapid enrichment. This leaves only 91kg of 20% (same level as in February 2012), which is still not enough to build a bomb. One should expect that Iran may cross that threshold at some point in the future, given current trends. Tehran has also installed nearly double the prior number of centrifuges at Fordow, but has not started to use them. Iranians likely understand that the international community would know if the closely monitored Fordow facility began to enrich at 90% (weapons grade)—and that military action against Iran would likely be taken at that point. This underscores the importance of the IAEA’s role. All nuclear material, installed cascades, and the feed and withdrawal of stations at those facilities are subject to IAEA containment and surveillance. “Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran,” IAEA Board of Governors, August 30, 2012.

Endnotes

The common assumption is that Iran would not risk a “dash” to fissile material (or a bomb) until: 1) They have enough LEU for more than one device (currently they have sufficient 3.5% for five to six weapons, but don't have enough 20% for a single weapon yet)—the first bomb they build will likely be a test for future bomb(s) of deterrence. They may however calculate that a single weapon (or even the fissile material for one) is sufficient to deter attackers. 2) They can dash to a weapon (or perhaps just the fissile material) so quickly that the international community will not notice or have enough time to react with military action. 3) They can do so in a facility they are convinced we don't know about. 4) They can do so in facilities immune from an attack. They are unlikely to approach any of these threshold points for a political decision to build a bomb until late 2013 or early 2014. Colin Kahl (personal interview), August 31, 2012.

8 The latter estimate is from http://www.isisnucleariran.org/assets/pdf/USIP_Template_5March2012-1.pdf. Secretary of Defense Leon Panetta argued, “The consensus is that, if they decided to do it, it would probably take them about a year to be able to produce a bomb and then possibly another one to two years in order to put it on a deliverable vehicle of some sort in order to deliver that weapon.” CBS, 60 Minutes, Scott Pelley (interview), June 10, 2012.

9 The Obama administration's redline on Iran's nuclear program is subject to considerable speculation and debate. U.S. Secretary of Defense Leon Panetta, said repeatedly that “all options,” including military force, are on the table to stop Iran, should sanctions and diplomacy—the preferred means of persuasion—ultimately fail. See, “US force an option against Iran nuclear programme, says Leon Panetta,” *Telegraph*, August 1, 2012, <http://www.telegraph.co.uk/news/worldnews/middleeast/israel/9443278/US-force-an-option-against-Iran-nuclear-programme-says-Leon-Panetta.html>. Additionally, the President has stated “I will do everything in my power to prevent Iran from obtaining a nuclear weapon.” See, Barack Obama's Remarks at American Israel Public Affairs Committee Policy Conference, June 4, 2008, <http://www.nytimes.com/2008/06/04/us/politics/04text-obama-aipac.html?pagewanted=all>. We understand these statements to mean that his administration may be willing to resort to military force as a means to prevent a nuclear-armed Iran. Also, for more on U.S. redlines with Iran, see “The Thin Red Line: Six Observations on Obama's Iran Policy,” Carnegie Endowment, February 28, 2012, <http://carnegieendowment.org/2012/02/28/thin-red-line-six-observations-on-obama-s-iran-policy#1>.

10 If Iran saw an attack as imminent, it could move some assets out of fixed facilities, thereby reducing the impact of damage done to those facilities by U.S. and/or Israeli air strikes. On the other hand, as discussed briefly later in this paper, Iran's ability to reconstitute its nuclear program after attack may be delayed by shortages of centrifuge components, especially if air strikes have targeted component production facilities.

11 “On Friday, August 31, General Martin Dempsey, the U.S. chairman of the Joint Chiefs of Staff stated that an Israeli military strike on Iran would have dangerous consequences in a highly volatile region. He warned that an Israeli military attack on Iran would be ‘counter-productive’ and there were no guarantees that it would end Tehran's nuclear ambitions. ‘What I am saying is based on what I know of their [Israeli] capabilities and I may not know about all their capabilities,’ he stated, ‘but military strikes would possibly delay but not destroy Iran's nuclear capabilities.’” Kim Sengupta, “America's most senior general warns against rash action on Syria and Iran,” *Independent* (online), August 31, 2012.

12 Little is known about how the American public would view the use of force to delay rather than eliminate Iran's ability to build a nuclear weapon, since the debate has not been framed in these terms. A recent Pew poll found that 63% of Americans would agree to the use of military force against Iran to prevent it from acquiring a nuclear weapon. (Pew Research Center, “Divisions on Sanctions and Use of Force a Global ‘No’ to a Nuclear-Armed Iran,” May 18, 2012 (<http://www.pewglobal.org/2012/05/18/a-global-no-to-a-nuclear-armed-iran/>)). But neither this poll nor any other with which we are familiar has asked whether Americans would support military action to delay Iran's nuclear program, for how long, or with what costs.

13 With forces on the ground, the U.S. can hold some of Iran's most valuable material resources, deny Iranian paramilitary and proxies terrain and secure bases of operation, and threaten the lines of communication. Ground-based operations do not have to imply regime change. Jon B. Alterman (ed.), *Gulf Kaleidoscope: Reflections on the Iranian Challenge*, Center for Strategic and International Studies, May 2012, http://csis.org/files/publication/120518_%20Alterman_GulfKaleidoscope_Web.pdf; Ch. 2, Nathan Freier, “Containment” p 31; Ch. 3, Michael O'Hanlon, “Deterrence,” p 34, which specifies 25,000 ground troops would likely be needed.

14 Currently there are about 89,000 U.S. troops in Afghanistan, and a dwindling number in Iraq. An occupation of Iran would require about 1 million U.S. and other foreign troops over an extended period of time. See, Alterman (ed.), O'Hanlon “Deterrence,” p 35 and p 45.

15 It has recently been reported that the U.S. had contracted the production of new more powerful “bunker-busters” or Massive Ordnance Penetrators (MOPs), which indicates a need for increased penetration capacity perhaps to deal with Fordow. (Joby Warrick, “Iran's Underground Nuclear Sites not Immune to U.S. Bunker-Busters,” *Washington Post*, February 29, 2012.) See also “GBU-57A/B Massive Ordnance Penetrator (MOP),” Jane's Air Launched Weapons database entry, April 12, 2012. Most unclassified sources, including Warrick above, indicate Fordow is 200–300 feet deep so we use this estimate. See also “Iran Nuclear Sites May be Beyond Reach of ‘Bunker Busters,’” Reuters, January 12, 2012.

Endnotes

16 In order to comprehensively deter Iran, the U.S. would need include a range of options using conventional forces, from gradual escalation, to preemptive attacks and offensive retaliation against targets such as military, industrial, command and control, and infrastructure. [See also Alterman (ed.), p 33.] For information on recent U.S. deployments to the region intended to support these options, see Thom Shanker, Eric Schmitt, and David Sanger, “U.S. Adds Forces in Persian Gulf, a Signal to Iran,” *New York Times*, July 3, 2012.

17 Israel also reportedly has more than 100 nuclear warheads that can be delivered by Jericho missile. Lionel Beehner, “Back-grounder: Israel's Nuclear Program and Middle East Peace,” Council on Foreign Relations, February 10, 2006, <http://www.cfr.org/israel/israels-nuclear-program-middle-east-peace/p9822>.

18 This discussion of Israeli capabilities against the Iranian nuclear program is based on Whitney Raas and Austin Long, “Osirak Redux? Assessing Israeli Capabilities to Destroy Iranian Nuclear Facilities,” *International Security*, v 31 no 4 (Spring 2007), and Austin Long, “Can They?” *Tablet*, November 2011.

19 There are several paths that Israel may choose to use in order to strike Iran. According to two U.S. analysts in 2010, “it seems likely that Jordan, Saudi Arabia, and Kuwait would be able to detect the over flight of Israeli aircraft” and Israel should not take for granted that Syria will not detect flight such as in 2007. Another potential route is over Kurdistan in Northern Iraq given its cooperation with the U.S. and NATO forces. Israel may also choose to take different paths for each set of sorties to guarantee less reaction or anticipation. A U.S. defense analyst said that any Israeli attack would likely be a one-time event: “given the unfriendly airspace Israeli strike aircraft would have to traverse to reach Iran's facilities as well as Israel's geographic distance from Iran, the likelihood of Israel being able to carry out repeated strikes is low...[they] would only have one opportunity to strike at Iran's nuclear facilities.” For more see Zanotti et al., p 27.

20 A note on Israel's use of threats of air strike to pressure Iran: Israel carefully guards its real plans concerning any attack on Iran. It maintains a public posture that it is ready at any time and that the decision to strike will remain unpredictable and undetectable for operational security reasons. The first objective is to maximize pressure on Iran. Israel is aware of its limitations and therefore faces a hard choice between striking alone and not striking at all. The U.S. commitment not to permit Iran a weapons program has eased somewhat the tensions in making such a decision. It also seems clear that Israel would prefer to see the U.S. strike first, and perhaps even alone, if it had high confidence the U.S. would do the job. It remains an interest of Israel's leaders in this scenario to maintain as far as possible decision dominance for themselves and in the final analysis to be able to rely on their own capacities to do the job. As that posture appears to erode, an Israeli initiative becomes more likely. There is no clear red line from the Israeli side—merely the growing concern about Iran's nuclear capacity—and that too suits their interests both with regard to Iran and in a different way the United States. However, the development of the Fordow site, which will be difficult if not impossible for the Israelis to attack, appears to be a major driver of Israeli calculations of the benefit of military action.

21 Former Central Intelligence Agency and National Security Agency Director Michael Hayden said “that airstrikes capable of seriously setting back Iran's nuclear program were ‘beyond the capacity’ of Israel.” Elizabeth Bumiller, “Iran Raid Seen as a Huge Task for Israeli Jets,” *New York Times*, February 19, 2012.

Many Israelis officials also are unsure of the plausibility of successful attacks. As one noted: “a great deal could go wrong, especially against multiple hardened targets at the planes' maximum range...planes could get lost or crash or have to turn back. Planes arriving over the targets could miss, or accidentally drop their bombs on civilians, or simply not do much damage. Many targets would remain unscathed.” Barry Rubin, “Israel Isn't Going to Attack Iran and Neither Will the United States,” PJ Media, January 26, 2012.

According to a recent congressional research report, “Israeli officials and analysts generally agree that a strike would not completely destroy the program...a successful strike...would... inflict significant damage that would end with a delay of three to five years.” In February 2012, however, a senior Israeli official was cited in Time magazine as stating “given the wide geographic dispersion of Iran's atomic facilities, combined with the limits of Israel's air armada, the Jewish state can expect to push back the Iranian program by only a matter of months—a year at most.” Zanotti et al., p 32.

Former U.S. Secretary of Defense Robert Gates said on several occasions, “a military attack will only buy us time and send the program deeper and more covert. It would at best set back Iran's nuclear program by two or three years.” Tony Capaccio, “Attack on Iran Facilities Would Only Delay Nuclear Program, Panetta Says,” Bloomberg.com, November 10, 2011, <http://www.bloomberg.com/news/2011-11-10/attack-on-iran-facilities-would-only-delay-nuclear-program-panetta-says.html>.

For more details on estimates of one to two years, see Steven Kull and Shibley Telhami, “Americans on Israel and the Iranian Nuclear Program: A Study of American Public Opinion,” Program on International Policy Attitudes, University of Maryland. March 13, 2012. See also Kahl et al., p 35.

22 There is a serious question whether Israel can destroy any of the 20% enriched uranium. Uranium stored as uranium hexafluoride (UF6) is a relatively small target and the containers it is kept in are durable so even bombs penetrating into facilities such as Natanz or Fordow might not destroy them. Destroy in this context means to scatter the UF6 sufficiently that it interacts with water vapor in the atmosphere. According to Argonne National Laboratory this would cause a reaction that would reduce the

Endnotes

UF6 to “corrosive hydrogen fluoride (HF) and a uranium-fluoride compound called uranyl fluoride.” This would prevent further enrichment of the uranium as well as make recovery of the material or centrifuges more difficult if not impossible., <http://web.ead.anl.gov/uranium/guide/uf6/propertiesuf6/index.cfm>.

However, an Israeli strike is unlikely to succeed in destroying Fordow, though it may inflict some damage on the facility. According to a report by the Center for Strategic and International Studies (CSIS), “The hard target bombs [Israel] has acquired from the U.S. are bunker-busters, however, not systems designed to kill underground facilities...they could damage entrances but not the facilities.” (Zanotti et al., p 30.) Another report contends that it is not clear if a strike would penetrate deep enough to affect the stockpiles themselves. A senior Israeli official was cited in one report as quoting a senior commander who reportedly told the Israeli cabinet in September 2011 that “we have no ability to hit the Iranian nuclear program in a meaningful way.” Karl Vick, “Can Israel Stop Iran’s Nuke Effort?” *Time*, February 6, 2012.

23 Estimates for delay from U.S. military action vary widely. The most pessimistic public estimate, from a 2012 U.S. war game, is roughly three years. Some retired senior U.S. military officers and nonproliferation officials argue delay from U.S. military attacks could be longer, possibly exceeding five years, while some Israeli estimates argue that an Israeli strike could also produce such an extended delay. Estimates based on IAEA data on Iranian centrifuge capacity and uranium stockpiles along with the construction timeline for Fordow suggest four years, a midpoint between the optimist and pessimist position, is a reasonable estimate for U.S. delay. See Mark Mazetti and Thom Shanker, “U.S. War Game Sees Perils of Israeli Strike Against Iran,” *New York Times*, March 19, 2012; Jeffrey Goldberg, “Israelis Grow Confident Strike on Iran’s Nukes Can Work,” *Bloomberg*, March 19, 2012; Lee Smith, “Why the U.S. Could Bomb Iran,” *Tablet*, July 11, 2012; and Austin Long, “Stall Speed: Assessing Delay of the Iranian Nuclear Program from Military Action,” (forthcoming).

24 See citations in endnote 12. Calculations based on the unclassified parameters of the MOP suggest that each MOP would penetrate about 60–95 feet of high-quality limestone (the major mineral of the mountains near Qom) so it would likely take at least three and might take as many as five or more of the weapons impacting the same aim point to penetrate the facility. (C.W. Young, “Penetration Equations,” Albuquerque, NM: Sandia National Laboratories, 1997). However, targeting entrances and ventilation shafts may be sufficient to destroy the centrifuges inside with fewer weapons.

25 Karen DeYoung and Michael D. Shear, “U.S., Allies Say Iran Has Secret Nuclear Facility,” *Washington Post*, September 26, 2009.

26 A U.S. defense analyst discussed a hypothetical U.S. strike on Fordow in stating that: “there are good outcomes short of destroying’ the centrifuge hall. Strikes against more accessible targets—from tunnel entrances and air shafts to power and water systems—can effectively knock the plant out of action.” Zanotti et al. quoting Joby Warrick, “Iran’s underground nuclear sites not immune to U.S. bunker-busters, experts say,” *Washington Post*, February 29, 2012.

Regarding the location of Iran’s centrifuge workshops, the IAEA has had limited knowledge of such production since 2006. A former U.S. government official with direct experience on the issue stated on February 27, 2012, that “Iran’s centrifuge production is widely distributed and that the number of workshops has probably multiplied ‘many times’ since 2005 because of an increase in Iranian contractors and subcontractors working on the program.” An executive branch official said in a February 27, 2012, interview “that Iran does not have sufficient spare centrifuges or components that would enable it to install new centrifuges immediately after an attack... [however]...most centrifuge workshops could probably be rebuilt or replicated within six months.” Zanotti et al., p 34.

27 David Albright and Andrea Stricker, “Iran’s Nuclear Setbacks: A key for U.S. diplomacy,” in *The Iran Primer*, United States Institute of Peace, January 18, 2011, <http://iranprimer.usip.org/blog/2011/jan/18/iran%E2%80%99s-nuclear-setbacks-key-us-diplomacy>.

28 A U.S. defense analyst discussed a hypothetical U.S. strike on Fordow in stating that: “there are good outcomes short of destroying’ the centrifuge hall. Strikes against more accessible targets—from tunnel entrances and air shafts to power and water systems—can effectively knock the plant out of action.” Zanotti et al. quoting Joby Warrick, “Iran’s Underground Nuclear Sites Not Immune to U.S. Bunker-Busters, Experts Say,” *Washington Post*, February 29, 2012.

Regarding the location of Iran’s centrifuge workshops, the IAEA has had limited knowledge of such production since 2006. A former U.S. government official with direct experience on the issue stated on February 27, 2012, that “Iran’s centrifuge production is widely distributed and that the number of workshops has probably multiplied ‘many times’ since 2005 because of an increase in Iranian contractors and subcontractors working on the program.” Additionally, former Central Intelligence Agency and National Security Agency Director Michael Hayden stated in January 2012 that “neither the United States nor Israel knows the location of all key Iranian nuclear-related facilities,” which significantly contributes to the level of uncertainty of a successful strike. An executive branch official said in a February 27, 2012, interview “that Iran does not have sufficient spare centrifuges or components that would enable it to install new centrifuges immediately after an attack... [however]...most centrifuge workshops could probably be rebuilt or replicated within six months.” Zanotti et al., p 34.

Endnotes

29 Although the U.S. may choose to sell or secretly provide Israel with the following weaponry, the U.S. already possesses what is necessary to inflict more damage: Guided Bomb Unit (GBU)-27 2000-lb class weapon carries 550 lbs of high explosives, and can penetrate more than six feet of reinforced concrete. The GBU-28 5000-lb class weapon penetrates at least 20 feet of concrete and 100 feet of earth. According to CSIS, “The key weapon to be used against hard targets and underground sites like Natanz might be the GBU-28, 5000-lb class weapon, which penetrates at least 20 feet of concrete and 100 feet of earth. Zanotti et al., p 29.

Another study concludes that “massive new bunker buster” munitions recently added to the U.S. arsenal would not necessarily be able to penetrate the deepest bunkers to cause irreparable damage to infrastructure or highly sensitive nuclear equipment. Additionally, while Israel is capable of launching its own bunker-buster bombs against Fordow, “it lacks the United States’ more advanced munitions and the ability to wage a bombing campaign over days and weeks.” Joby Warrick, “Iran’s Underground Nuclear Sites not Immune to U.S. Bunker-busters,” *Washington Post*, February 29, 2012.

30 Although evidence is “far from overwhelming” that this would bolster regime change, some maintain that a possible outcome of an airstrike campaign would turn Iranians against their leaders. Alterman, (ed.), O’Hanlon, “Deterrence,” p 41.

31 See citations in endnote 16. As with delay from U.S. military action, there is a wide array of estimates on length of delay from an Israeli strike, with one year being the most pessimistic public U.S. estimate and over five years the most optimistic Israeli estimate. Based on the assumption that Israel will not be able to substantially damage the Fordow facility and analysis of IAEA data, two years is a reasonable estimate of delay.

32 This is very difficult to estimate because it is scenario dependent, both in terms of the type of strike (surgical vs. large-scale), duration (a day or two vs. a weeks-long bombing campaign), what the scale of retaliation and escalation look like (which would determine the scale and duration of hostilities beyond the strike itself), how big the coalition (and therefore burden-sharing) is, and the nature and extent of the post-strike containment regime. Any comparison would only be illustrative. The direct costs of enforcing post-Gulf War containment against Saddam Hussein in Iraq cost roughly \$19 billion per year directly with upward estimates from \$300 billion to \$700 billion. Several risks, such as additional costs in homeland security, were taken into account, which would likely be similar in the case of Iran but cannot be directly correlated. It is important to note that these are only the direct budgetary costs. Some of the largest financial costs would come through the spike in oil prices, which could be modest and short-term or large and extended, depending on the scenario. For more details see Steven J. Davis, Kevin M. Murphy and Robert H. Topel, “War in Iraq Versus Containment: Weighing the Costs,” University of Chicago, March 2003.

33 As noted by Michael Eisenstadt and Michael Knights, “Iran’s initial response to an Israeli preventive strike would likely be to lash out at Israeli and Jewish targets while seeking to avoid a broader conflict with the United States or its Gulf Arab neighbors. Yet Tehran would be sorely tempted to take additional actions that might increase the chances of such escalation.” Iran would be tempted by a menu of options but unlikely to exercise all of them, or to “not bite off more than it can chew.” Michael Eisenstadt and Michael Knights, “Beyond Worst-Case Analysis: Iran’s Likely Responses to an Israeli Preventive Strike,” in *Policy Notes*, Washington Institute for Near East Policy, no. 11, June 2012.

34 *Iran’s Ballistic Missile Capabilities: A Net Assessment*, London: International Institute for Strategic Studies, 2010; and “Iran Sanctions Halt Long-range Ballistic-missile Development,” *Strategic Comments*, July 2012.

35 Since the Iran-Iraq war in the early 1980s, Iran has been developing ballistic missile capabilities based on Russian, North Korean, and Chinese technology. Iran currently possesses the largest ballistic missile inventory in the Middle East, and the country’s military and scientific establishments are working to increase the sophistication, scale, and reach of its missiles. Iran’s missile capabilities make up for its conventional shortcomings and play an integral role in its asymmetric warfare. See: Alexander Wilner, “Iran and the Gulf Military Balance,” Center for Strategic and International Studies (CSIS) October 27, 2011, p 70. Michael Eisenstadt and Michael Knights argue that Iran would likely use Shahab-type longer range missiles to strike several Israeli targets such as the Defense Ministry in downtown Tel Aviv (which would inflict civilian casualties given the poor accuracy of these missiles), including its nuclear reactor in Dimona, but would seek to avoid a broader conflict with the United States or its Gulf Arab neighbors to avoid increasing the changes of escalation. A U.S. strike on Iran would almost certainly prompt a more expansive response. Tehran would likely target not only U.S. interests, but also Israel and Washington’s Gulf Arab allies, punishing them for their presumed encouragement of the attack and attempting to deter them from further assistance to the U.S. military effort. See Michael Eisenstadt and Michael Knights “Beyond Worst-Case Analysis Iran’s Likely Responses to an Israeli Preventive Strike,” *Policy Notes*, Washington Institute for Near East Policy, No 11, June 2012.

36 Adam Pentous and Julian Barnes, “Pentagon Bulks Up Defenses in the Gulf,” *Wall Street Journal*, July 17, 2012. This ballistic missile defense deployment has been complemented by a build up of other U.S. capabilities, such as minesweeping, in the region over the past year.

37 The Iranian Supreme Leader Khamenei openly declared that Iran would retaliate to the same level of an attack on Iranian soil: “We do not have atomic weapons and we will not build one. But against an attack by enemies—to defend ourselves against

Endnotes

either the U.S. or Zionist regime—we will attack them on the same level that they attack us.” Khamenei: Iran Will Strike Back if Attacked,” CBS News, March 20, 2012, http://www.cbsnews.com/8301-202_162-57400874/khamenei-iran-will-strike-back-if-attacked.

38 It is argued that Iran could attack petrochemical infrastructure in the Gulf, and attack commercial ships as well as the U.S. 5th Fleet, Eisenstadt and Knights, p 3.

39 Office of Naval Intelligence, “Iran’s Naval Forces: From Guerilla Warfare to Modern Naval Strategy,” Fall 2009.

40 For more details, see Eisenstadt and Knights, p 9–12. Iran would likely retaliate with terrorist attacks on Israeli and U.S. targets overseas, perhaps in conjunction with Hezbollah, conduct proxy attacks on U.S. personnel in Iraq and Afghanistan, clash with the U.S. Navy, kidnap U.S. government personnel, and close the Strait of Hormuz. To mitigate these costs the U.S. may take preventative measures, such as sending a message to Hizballah indicating that if it assists in an Iranian attack the U.S. could seek more vigorous implementation of the Proliferation Security Initiative and the arms embargo called for by U.N. Security Council Resolution 1701, effectively disrupting the group’s efforts to resupply its weapons stocks. Washington may also consider redeploying to the Gulf of Oman the aircraft carrier that it currently keeps on station in the Persian Gulf and maintain as small naval fleet there. This would enable it to be less vulnerable to surprise and better positioned to wage an “outside-in” campaign to ensure free navigation in the Gulf.

Note: There are still 16,000 U.S. personnel in Iraq and 90,000 in Afghanistan, vulnerable to attack (Zanotti et al., p 45). Also, in order to manage and minimize the risk to the U.S., the U.S. could: 1) adjust clear red lines regarding nuclear use so that if it were crossed it would trigger massive retaliation; 2) bolster early-warning systems and integrate air and ballistic missile defenses of the U.S. and regional partners to detect and defend against terrorist attacks; 3) enhance diplomatic, intelligence, military, and economic efforts to disrupt Iranian covert operations; and 4) help establish mechanisms for direct dialogue, crisis communication, and arms control among Israel, Iran, and the U.S., Kahl et al., p 31.

41 Israeli defense minister Ehud Barak stated on January 12, 2011, “There is no scenario for 50,000 dead, or 5,000 killed—and if everyone stays in their homes, maybe not even 500 dead.” Jeffrey Heller, “Israel’s Barak Plays Down Talk of War with Iran,” Reuters, November 8, 2011, <http://www.reuters.com/article/2011/11/08/us-iran-nuclearisrael>.

42 This estimate is found in Hamed Aleaziz and Robin Mills, “Do We Even Need the Strait of Hormuz?” *The Atlantic*, January 13, 2012, <http://www.theatlantic.com/international/archive/2012/01/do-we-even-need-the-strait-of-hormuz/251348/>. Other estimates are as high as 35% of the world’s “seaborn oil” which would cause a spike in crude oil by about \$39 a barrel. Brad Plumer, “Could the World Handle an Iranian Oil Crisis?” Washington Post, February 1, 2012 http://www.washingtonpost.com/blogs/ezra-klein/post/how-the-world-would-deal-with-an-iranian-oil-crisis/2012/02/01/gIQAAtuI8hQ_blog.html.

43 Caitlin Talmadge, “Closing Time: Assessing the Iranian Threat to the Strait of Hormuz,” *International Security*, vol 33 no 1 (Summer 2008).

44 Clifford Krauss, “Oil Price Would Skyrocket if Iran Closed the Strait of Hormuz,” *New York Times*, January 4, 2012.

45 In 2006 Hezbollah fired nearly 4,000 rockets into Israel, and had an inventory of 30,000. Today Hezbollah has many more. Israeli and American sources have even claimed, “Hizbullah now has Scud missiles capable of hitting deep into Israel from deep inside Lebanon.” It also has more surface-to-sea missiles, such as the one it used in 2006 to strike an Israeli Navy ship. In 2006, Hizbullah rained fire on Israel’s northern cities, including Haifa; today it can do that and more, including targeting Tel Aviv and West Jerusalem, and Israel’s only international airport. Because of this increased capability, Israel has considered preemptively attacking Hizbullah as well. (Bruce Reidel, “Israel’s Dilemma: If It Attacks Iran, Will It Also Have to Hit Hizbullah?,” *Daily Beast*, February 9, 2012.

46 Eisenstadt and Knights, p 4.

47 Jonathan Levinson, “A Third Lebanon War,” *Small Wars and Insurgencies*, vol 23, no 2.

48 Charlie Savage and Scott Shane, “Iranians Accused of a Plot to Kill Saudis’ U.S. Envoy,” *New York Times*, October 11, 2012.

49 Nicholas Kulish and Eric Schmitt, “Hezbollah Is Blamed for Attack on Israeli Tourists in Bulgaria,” *New York Times*, July 19, 2012; and Joel Greenberg, “Israel Says Thai Bombs Similar to Those in India, Georgia,” *Washington Post*, February 15, 2012.

50 In December 2011, Secretary of Defense Leon Panetta warned that “We would have an escalation that would not only involve many lives, but I think it would consume the Middle East in a confrontation and conflict that we would regret.” Remarks by Secretary of Defense Leon E. Panetta, Saban Center, U.S. Department of Defense Office of the Assistant Secretary of Defense Public Affairs Transcript, December 2, 2011, <http://www.defense.gov/transcripts/transcript.aspx?transcriptid=4937>.

51 Anne Gearan, “Western Nations Ask Israel to Not Attack Iran,” *Associated Press*, February 2, 2012.

Endnotes

52 Speaking of the current sanctions regime, General Martin Dempsey, the U.S. chairman of the Joint Chiefs of Staff, observed, “There are now economic sanctions in place which are being effective, the international community may achieve its aims without military action.” See, Kim Sengupta, “America’s most senior general warns against rash action on Syria and Iran,” *The Independent* (online), August 31, 2012.

53 Andrew Kramer, “Russia Ends Talk of Missile Sale to Iran,” *New York Times*, September 22, 2010.

54 See February 2012 and May 2012 IAEA reports cited earlier for discussion of Iran’s advanced centrifuges and its difficulties deploying them effectively. For an example of current Iranian efforts to avoid sanctions to procure these materials, see Charlie Savage, “U.S. Charges Men in Plot to Violate Iran Embargo,” *New York Times*, July 13, 2012. These allegedly include “20 tons of high-strength maraging steel, 40 tons of aluminum alloy rods, radioactive materials, mass spectrometers, measuring instruments and vacuum system equipment.”

55 See Málfrid Braut-Hegghammer, “Revisiting Osirak: Preventive Attacks and Nuclear Proliferation Risks,” *International Security*, vol 36, no 1 (Summer 2011), p 101–132; Bennett Ramberg, “Osirak and Its Lessons for Iran Policy,” *Arms Control Today*, May 2012, http://www.armscontrol.org/act/2012_05/Osirak_and_Its_Lessons_for_Iran_Policy; and Colin H. Kahl, “Before Attacking Iran, Israel Should Learn from its 1981 Strike on Iraq,” *Washington Post*, March 2, 2012, http://www.washingtonpost.com/opinions/an-israeli-attack-against-iran-would-backfire--just-like-israels-1981-strike-on-iraq/2012/02/28/gIQATOMFnR_story.html.

56 Michael Hayden, CIA Director in the Bush administration stated, “When we talked about this in the government, the consensus was that [attacking Iran] would guarantee that which we are trying to prevent—an Iran that will spare nothing to build a nuclear weapon and that would build it in secret.” Josh Rogin, “Bush’s CIA director: We determined attacking Iran was a bad idea,” *The Cable*, *Foreign Policy*, January 19, 2012.

57 Mohsen Milani, “Iran’s Ties to the Taliban, in *The Iran Primer*, United States Institute of Peace, August 10, 2011. <http://iranprimer.usip.org/blog/2011/aug/10/iran%E2%80%99s-ties-taliban>.

58 Economist James Hamilton projected the impact on oil prices of a potential confrontation with Iran by looking at the 1973 OPEC embargo, the Iranian Revolution of 1978, the 1980 Iran-Iraq War, and the 1990 Persian Gulf War. Hamilton found that at peak “these events took out 4-7 percent of net world productions and were associated with oil price increases of 25-70 percent.” (James Hamilton, “Possible Implications of the Iranian Oil Embargo,” *EconBrowser*, January 15, 2012.) This does not include the potentially disastrous consequences of the closing of the Strait of Hormuz. While Iran accounts for 4.3% of the world’s oil production, the Strait of Hormuz passes over 17%, any affects to this passageway would be significantly higher. This would not only cause a direct cost to oil prices in the U.S. but to our key trade partners, causing perhaps even higher indirect costs.

59 Without support of other nations, the U.S. would have weak recourse to international law and public opinion. All of the recent U.N. resolutions on Iran for example, stipulate very clearly that they do not authorize the use of force to ensure compliance. Alterman (ed.), p 41.

60 See discussion in Robert Pape, *Bombing to Win: Air Power and Coercion in War*, Ithaca, NY: Cornell University Press, 1996.

61 See discussion in Goldberg.

62 For further reference on both sides of this discussion, see Zanotti et al., p 35. Also, Secretary of Defense Leon Panetta, at a December 2, 2011, Brookings event, stated that one of the unintended consequences of a military strike on Iran’s nuclear program would be that “the regime that is weak now... would suddenly be able to reestablish itself, suddenly be able to get support in the region.” Transcript of Panetta’s remarks at the Brookings event available at <http://www.defense.gov/transcripts/transcript.aspx?transcriptid=4937>.

Also, in October 2011, the Public Affairs Alliance of Iranian Americans (PAAIA) commissioned Zogby Research Services (formally known as Zogby International) to conduct its third national public opinion survey of Iranian Americans to gather accurate attitudinal and demographic information about the Iranian American community. This poll found that more than six in ten respondents felt that military strikes would strengthen the Iranian government (63%) and would be ineffective and encourage Iran to develop nuclear weapons (62%). For the complete PAAIA survey see <http://www.paaia.org/CMS/2012-national-survey.aspx>.

63 Ray Takeyh, “The Iran-Iraq War: A Reassessment,” *Middle East Journal*, vol 64 no 3 (Summer 2010).

64 For more details see Jason Starr, “The UN Resolutions” in *The Iran Primer*, U.S. Institute of Peace, <http://iranprimer.usip.org/resource/un-resolutions>. The current unclassified U.S. intelligence community view of the program is available in James Clapper, “Unclassified Statement for the Record on the Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence,” January 31, 2012, p 4–5. The International Atomic Energy Agency’s current view of the program is available in International Atomic Energy Agency, “Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions in the Islamic Republic of Iran,” February 24, 2012.

Endnotes

65 H.RES.568 “Expressing the Sense of the House of Representatives Regarding the Importance of Preventing the Government of Iran from Acquiring a Nuclear Weapons Capability,” March 2012., <http://thomas.loc.gov/cgi-bin/bdquery/z?d112:h.res.568;> and S.RES.380, <http://thomas.loc.gov/cgi-bin/bdquery/z?d112:s.res.380>.

66 For discussion of enrichment in this context, see Allan S. Krass et al., *Uranium Enrichment and Nuclear Weapon Proliferation* (London and New York: Taylor and Francis, 1983).

67 The latter estimate is from http://www.isisnucleariran.org/assets/pdf/USIP_Template_5March2012-1.pdf.

68 Albright et al., “Preventing Iran from Getting Nuclear Weapons,” p 10. See also Olli Heinonen, “The 20 Percent Solution,” *Foreign Policy* (online), January 11, 2012, http://www.foreignpolicy.com/articles/2012/01/11/the_20_percent_solution.

69 Tabassum Zakaria and Mark Hosenball. “Special Report: Intel shows Iran nuclear threat not imminent” Reuters: March, 23, 2012.

70 The May 25, 2012, IAEA report indicates that on February 15, 2012, Iran had “showed the presence of particles with enrichment levels of up to 27% U-235, which are higher than the level stated in the DIQ” at the Fordow facility. When the Agency requested an explanation for the presence of these particles, on May 9, 2012, Iran replied that “the production of such particles ‘above the target value’ may happen for technical reasons beyond the operator’s control.” The IAEA is currently assessing these claims. For more details see IAEA Director General, “Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council resolutions in the Islamic Republic of Iran” May, 26, 2012. p.6, <http://www.iaea.org/Publications/Documents/Board/2012/gov2012-23.pdf>.

This paper was drafted by Austin Long, of Columbia University and William Luers, Director of the Iran Project. They were advised by Colin Kahl of Georgetown University and received important contributions from Thomas R. Pickering, Jim Walsh of MIT, and Stephen Heintz of the Rockefeller Brothers Fund. The other core members of The Iran Project and a large number of the endorsers of the paper made valuable additions to the paper. Priscilla Lewis, the editor, has been an excellent partner and is largely responsible for the final version. Iris Bieri, The Iran Project Coordinator, has managed the complex process of bringing together the many different points of view and individuals involved, to get the paper to completion. Our copy editor, Trish Leader, and design team from On Design, Inc., led by Okey Nestor, contributed their invaluable talents and time to make this publication possible.

The Iran Project is a non-governmental organization that seeks to improve official contacts between the United States and Iranian governments. Founded in 2002 by the United Nations Association of the USA and Rockefeller Brother’s Fund, The Iran Project became independent in 2009. The core members of The Iran Project for over a decade have been: Stephen Heintz, William Luers, William Miller, Thomas Pickering, Jim Walsh, and Frank Wisner.

© 2012 The Iran Project

THE **IRAN** PROJECT

The Iran Project
475 Riverside Drive
Suite 900
New York, NY 10115