Building "Hedgehogs" in the Persian Gulf Region

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EXECUTIVE SUMMARY

More than forty years ago, following Great Britain's decision to withdraw from its commitments east of Suez, the United States assumed greater responsibility for the security of the Persian Gulf. Since that time it has ensured unfettered access to the region's energy resources by preventing any hostile actor from achieving a preponderant position in this geostrategically crucial area. So long as the Gulf's petroleum and natural gas reserves remain the lifeblood of nations, the United States is unlikely to abandon this enduring objective.

Unfortunately, preserving access to the Persian Gulf is likely to prove far more challenging in the coming years. This is due to a confluence of trends that have the potential to erode American influence in the region: Washington's growing focus on the Asia-Pacific as the People's Republic of China (PRC) evolves into a major military power; declining defense resources as the United States enters what is likely to be a protracted era of fiscal austerity; and the eroding reliability of traditional security partners like Turkey and Egypt as political change sweeps across the greater Middle East. Meanwhile, the United States must address the long-term strategic challenge posed by Iran. After more than three decades of hostility toward Washington, Tehran is poised to emerge as a much more significant security threat in the years ahead, thanks to its continuing support for proxy forces, its ongoing acquisition of anti-access/area denial (A2/AD) capabilities, and its apparent pursuit of a nuclear weapons capability. Of course, Iranian intentions are notoriously opaque and its ultimate objectives are unclear. Nevertheless, these initiatives could enable Tehran to coerce its neighbors, deter intervention by outside parties, enhance its relative power position within the Gulf, and perhaps eventually establish a *de facto* sphere of influence extending throughout the region.

Given these emerging challenges and the United States' enduring security objectives, Washington may have to adapt its strategy toward the Persian Gulf region. If so, one option would be to rely more on local security partners—namely the Gulf Arab nations neighboring Iran—to preserve a stable balance of power. We argue below that the United States should encourage and enable these states to deter Iranian aggression and withstand Iranian coercion largely on their own, and to make significant contributions to any American-led military campaign against Iran should it instigate a conflict

THE ECONOMIC WARFARE COMPETITION IN THE PERSIAN GULF

How might the Gulf Arab nations deter Iranian aggression, impose costs on Tehran during peacetime, and help to defeat it in the event of a conflict? To answer this question, it is necessary to consider how the military competition between Tehran and the Gulf Arab nations might evolve over time. Looking forward to the 2025-2030 timeframe, we argue that a critical aspect of the strategic rivalry in the Persian Gulf region will be the prospect of economic warfare; that is, efforts by Iran to hold at risk the natural resources, civilian infrastructure, and sea lines of communication that underpin neighboring economies, and countervailing efforts by those neighbors (along with the United States) to defend these critical targets.

Iran, for example, could employ a variety of means to disrupt local economies. In fact, an economic warfare campaign could include several different dimensions that are often treated as distinct threats, even though they have the potential to be mutually reinforcing:

- ***Sabotage***. First, Iran could employ small units (namely elements of the Quds Force and/or irregular proxies that have been trained and equipped by the IRGC) to conduct attacks on key economic targets, with the goal of temporarily diminishing the amount of resources available for export. In particular, these units might attack pipelines and oil wells on land that are widely dispersed and difficult to monitor, offshore oil and gas infrastructure that could be damaged by well-armed groups on small boats, and port facilities that may be vulnerable to amphibious raids by special operations forces. Alternatively, Iran could engage in targeted assassinations or terrorist attacks against "soft" facilities to intimidate workers, prompt heightened security measures, and disrupt regular operations. In addition, Iran might conduct cyber attacks against its neighbors, for instance by targeting the supervisory control and data acquisition (SCADA) systems that regulate complex processes such as the extraction, treatment, and distribution of petroleum.

- ***Bombardment***. Second, Iran could use its ground-attack aircraft, rocket forces, and especially mobile ballistic missiles to launch strikes against critical fixed infrastructure in neighboring nations—a coercive option that has the potential to inflict far more serious damage than any limited attacks by individuals or small groups. In particular, Iran might single out a number of high-value targets: desalination plants that produce potable water; gas-oil separation plants and stabilization plants that are used to treat "sour" crude oil before it is loaded onto ships and transported abroad; very large crude carrier (VLCC) berths; and oil storage farms at key ports, oil refineries, and pumping stations. Although some of these targets cannot easily be destroyed or taken offline, repeated strikes could impede normal operations.

- ***Blockade***. Lastly, Iran could attempt to control or impede maritime traffic throughout the Persian Gulf, and especially in the narrow Strait of Hormuz. Specifically, IRGC naval forces and regular Iranian naval forces could use a variety of means to threaten commercial shipping, including small boats that can "swarm" larger ships and perhaps even conduct suicide attacks; fast-attack craft (FACs) armed with anti-ship cruise missiles (ASCMs); mobile, land-based ASCM batteries that are distributed across the Iranian coast and on Iranian-controlled islands in the Gulf; submarines armed with wake-homing and wire-guided torpedoes; and mining operations using a variety of delivery platforms. These capabilities would also pose a threat to any American or allied naval ships that attempt to reopen the Strait. Slow-moving minesweepers, for instance, would be vulnerable to ASCM attacks launched from FACs or trucks on land, while cruisers and destroyers might find it difficult to fend off swarms of small boats. Any clash between Iranian and American forces, moreover, could increase the risk and therefore the cost to commercial ships transiting the region, prolong the closure of the Strait by delaying mine-clearing operations, and ultimately inhibit oil and gas exports for an extended period of time (perhaps a month or more).

While these dimensions of an economic warfare campaign can be considered extant threats to the Persian Gulf region, each one could become far more serious over the next two decades,

particularly if Tehran is able to improve the conventional military capabilities at its disposal—an outcome that appears highly plausible given current trends.

For example, irregular forces equipped with advanced conventional munitions—in particular man-portable or easily transportable weapons with extended ranges and high levels of accuracy—could conduct attacks against a wide range of targets and inflict considerable damage on those targets. If so, proxy warfare could be transformed from a modest component into a central element of a broader economic warfare campaign. At the same time, while Iran's existing ballistic missiles are unable to reliably hit point targets at present, the introduction of accurate guidance systems would enable Tehran to hold at risk critical civilian infrastructure throughout the region. Lastly, the acquisition of supersonic ASCMs, sophisticated surface-to-air missile systems, ballistic missiles capable of targeting ships at sea, and remotely controlled "smart mines" would significantly increase the difficulty of overcoming an Iranian maritime blockade.

AN ALTERNATIVE REGIONAL STRATEGY

Despite these challenges, we argue that the Gulf Arab nations have the potential to serve as much more effective barriers to Iranian aggression than is currently the case, particularly if they emphasize measures that decrease their vulnerability to the threat of economic warfare. Doing so would have two critical effects on the strategic environment.

First and foremost, it would reduce the effectiveness of Iran's economic warfare threat. Second, greater economic resilience on the part of Iran's neighbors could enable the United States to divest itself, at least partially, of responsibility for patrolling the waters of the Persian Gulf, and relieve pressure on U.S. forces to reopen the Strait of Hormuz quickly in the event of an Iranian blockade. This, in turn, would enable the United States to reduce its peacetime military presence in the region (perhaps facilitating the redeployment of additional forces to other theaters, such as Northeast or Southeast Asia), and to prioritize other missions during a conflict. Given these considerations U.S. strategy should emphasize the following:

- ***Creating Alternatives to Hormuz.*** First, the most important step that the Gulf Arab nations could take to reduce their vulnerability to economic warfare over the long term would be to establish alternative methods of exporting oil and gas that do not require transiting the Strait of Hormuz. In general, the prospect of an Iranian blockade is arguably the most worrisome threat to its neighbors and to the United States for several reasons. Unlike the dangers of sabotage and bombardment, which could materialize in the future, Tehran is *already* capable of closing the Strait for at least a short period of time. By avoiding Hormuz, the Gulf Arab nations would not only remove one of Tehran's most dangerous coercive options, they could also undermine its most effective deterrent.

- ***Fielding Counter-Air and Counter-Sea Denial Capabilities.*** Second, while investments to enhance the resilience of their civilian infrastructure could play a crucial role in deterring or, if necessary, weathering an Iranian economic warfare campaign, the Gulf Arab states cannot simply avoid the threat posed by Tehran's various sea-denial capabilities. Some commercial ships would still need to transit the Gulf to reach export markets. Moreover, local nations have offshore and coastal infrastructure that is potentially vulnerable. Thus the Gulf States

may require counter-air and counter-sea denial capabilities to defend these potential targets. This could include, for instance, capabilities to roll back Iran's air defenses, suppress its land-based ASCM batteries, and counter its surface naval forces.

- ***Deploying Active Defenses for Economic Targets.*** Finally, Gulf Arab nations should also continue to invest in active defenses to protect critical economic infrastructure, to include purchasing additional ground-based kinetic interceptors and perhaps supporting American research and development efforts into more cost-effective, directed-energy defenses, which later could be deployed to or even procured by selected Gulf States.

While this strategic approach would be primarily defensive, enhanced economic resilience would also create a situation where *Iran is asymmetrically vulnerable* to economic warfare. If so, the United States and its Gulf State partners would enhance significantly their ability to impose costs on Tehran over the course of a long-term competition.

INTRODUCTION

More than forty years ago, following Great Britain's decision to withdraw from its commitments east of Suez, the United States assumed greater responsibility for the security of the Persian Gulf region. Since that time it has relied on a combination of diplomacy, foreign assistance, forward military presence, and the use of force to ensure unfettered access to the region's energy resources—resources that have fueled the economic growth of industrialized nations. Most importantly for the health of the global economy, the United States has attempted to guarantee steady exports and stable prices by preventing any hostile actor (either a rival great power like the Soviet Union or an ambitious and aggressive local power like Iraq) from achieving a preponderant position in this geostrategically crucial area. So long as the Gulf's petroleum and natural gas reserves remain the lifeblood of nations, the United States is unlikely to abandon this enduring objective.[1]

Unfortunately, preserving access to the Persian Gulf is likely to prove far more challenging in the coming years. This is due to a confluence of trends that have the potential to erode American influence in the region: Washington's growing focus on the Asia-Pacific as the PRC evolves into a major military power; declining defense resources as the United States enters what is likely to be a protracted era of fiscal austerity; and the eroding reliability of traditional security partners like Turkey and Egypt as political change sweeps across the greater Middle East. Meanwhile, the United States must address the long-term strategic challenge posed by Iran. After more than three decades of hostility toward Washington, Tehran is poised to emerge as a much more significant security threat in the years ahead thanks to its continuing support for proxy forces, its ongoing acquisition of A2/AD capabilities, and its apparent pursuit of a nuclear weapons capability.[2] Of course, Iranian intentions are notoriously opaque and its ultimate objectives are unclear. Nevertheless, these initiatives could enable Tehran to coerce its neighbors, deter intervention by outside parties, enhance its relative power position within the Gulf, and perhaps eventually establish a *de facto* sphere of influence extending throughout the region. The underlying issue this paper seeks to address, therefore, is how Washington might prevent these outcomes given the operational, fiscal, and diplomatic challenges enumerated above.

Given these emerging challenges and the United States' enduring security objectives, Washington may have to adapt its strategy toward the Persian Gulf region. If so, this would merely be the latest instance of a longstanding pattern. The United States has modified its regional security strategy several times, adapting to new developments such as the British

[1] According to recent estimates, nations in the Persian Gulf region possess 50 percent of the world's proven oil reserves and nearly 40 percent of all natural gas reserves. U.S. Energy Information Administration, *International Energy Outlook 2011*, September 2011, pp. 37-38, 63-64.

[2] Anti-access capabilities are used to prevent or constrain the deployment of opposing forces into a theater of operations, whereas area-denial capabilities are used to restrict their freedom of maneuver once in theater. Andrew Krepinevich, Barry Watts and Robert Work, *Meeting the Anti-Access and Area Denial Challenge* (Washington, DC: Center for Strategic and Budgetary Assessments, 2003); and Andrew F. Krepinevich, *Why AirSea Battle?* (Washington, DC: Center for Strategic and Budgetary Assessments, 2010).

withdrawal from the Middle East in 1971, the Soviet invasion of Afghanistan as well as the Iranian revolution in 1979, the Iran-Iraq War of the 1980s, and Iraq's annexation of Kuwait in 1990. Moreover, past strategies can be a useful guide to meeting future challenges. When the United States first took responsibility for preserving security in the Persian Gulf region it faced circumstances not unlike those it confronts today: it was in the latter stages of a costly and protracted counterinsurgency campaign; it was engaged in a long-term competition with a major power rival; and it was in the midst of an economic downturn. Under these conditions, Washington chose to rely on local allies—the "Twin Pillars" of Saudi Arabia and Iran—to counter the Soviet threat to the Gulf.[3] Looking ahead, the United States might once again become more dependent on local security partners—this time the Gulf Arab nations neighboring Iran—to preserve a stable balance of power.

Burden sharing with allies is often an attractive option for a leading power like the United States, particularly during periods when resources are highly constrained.[4] Importantly, a greater reliance on local nations is also consistent with a competitive strategies approach. In general, competitive strategies attempt to identify asymmetries (areas of relative advantage or disadvantage) between actors engaged in a long-term rivalry, and to align a nation's core strengths with an opponent's enduring weaknesses. By doing so, it may be possible to implement measures that impose disproportionate costs on an adversary and/or channel its resources into areas that are less threatening.[5] In this case, one of the key asymmetries between the United States and its rivals is Washington's global network of formal allies and informal security partners. Prospective opponents such as China and Iran are surrounded by nations that have the potential to serve as geopolitical counterweights, either individually or collectively. At the same time, many of these countries have a strong incentive to cooperate with the United States, which poses far less of a threat given its geographic isolation and its determination to preserve the status quo.

We argue below, therefore, that the United States should encourage and enable the Gulf Arab nations to deter Iranian aggression and withstand Iranian coercion largely on their own, and to

[3] Gary Sick, "The United States in the Persian Gulf: From Twin Pillars to Dual Containment," in David W. Lesch, ed., *The Middle East and the United States: A Historical and Political Assessment*, 3rd Edition (Boulder, CO: Westview, 2003); Thomas L. McNaugher, *Arms and Oil: U.S. Military Strategy and the Persian Gulf* (Washington, DC: Brookings, 1985); and Michael A. Palmer, *Guardians of the Gulf: A History of America's Expanding Role in the Persian Gulf, 1833-1992* (New York, NY: The Free Press, 1992).

[4] Andrew Krepinevich, Simon Chin and Todd Harrison, *Strategy in Austerity* (Washington, DC: Center for Strategic and Budgetary Assessments, 2012), p. 6.

[5] A.W. Marshall, *Long-Term Competition with the Soviets: A Framework for Strategic Analysis* (Santa Monica, CA: RAND, April 1972); Andrew W. Marshall, "Competitive Strategies—History and Background," Internal Department of Defense Document, March 3, 1988; Andrew Marshall, "Preface," in Henry D. Sokolski, ed., *Prevailing in a Well-Armed World: Devising Competitive Strategies against Weapons Proliferation* (Carlisle, PA: Strategic Studies Institute, 2000); Andrew W. Marshall, "Commentary: Strategy as a Profession in the Future Security Environment," in Robert Zarate and Henry Sokolski, eds., *Nuclear Heuristics: Selected Writings of Albert and Roberta Wohlstetter* (Carlisle, PA: Strategic Studies Institute, 2009); and Thomas Mahnken, ed., *Competitive Strategies in the 21st Century: History, Theory, and Practice* (Stanford, CA: Stanford University Press, 2012).

make significant contributions to any American-led military campaign against Iran should it instigate a conflict. Despite tensions among one another as well as differing views on the severity of the Iranian threat, the members of the Gulf Cooperation Council (GCC) and Iraq have a shared incentive to counterbalance a more powerful and assertive Iran. Not only do these nations have a natural desire to prevent unwanted Iranian influence over their foreign and domestic policies, but they also hope to avoid any conflicts that could result in enormous economic costs and trigger internal political turmoil.[6] The only way to achieve *both* of these objectives would be to offset Iran's quest for regional dominance through countervailing measures of their own.[7]

The purpose of this report, therefore, is to explore three main questions: What steps could local actors take to counterbalance Iranian military power over the next two decades? What measures might the United States adopt to facilitate these efforts? Finally, what new division of labor might emerge between the United States and its Gulf Arab security partners as they collectively work to contain a revisionist Iran?

To address these issues, the remainder of the paper is divided into four chapters. Chapter 1 argues that the United States can more effectively exploit its alliances and security partnerships by facilitating the wider proliferation of conventional precision-strike systems to friendly nations, thereby reducing their vulnerability to coercion by aspiring local hegemons. Moreover, this approach could have significant value in the Persian Gulf region despite the limits of Iranian economic and military power, the questionable reliability of its neighbors, and, most importantly, Tehran's apparent quest to develop a nuclear weapons capability. Chapter 2 outlines the strategic dimensions of the broader rivalry between Iran and its Gulf Arab neighbors and considers how this rivalry might evolve over the next two decades. In particular, it calls attention to the threat of Iranian economic warfare as the key factor that is likely to shape Arab-American security cooperation in the future. Based on this assessment, Chapter 3 presents a notional strategy for counter-balancing Iran. Specifically, this strategy has two related elements: first, enhancing the *resilience* of local nations, in particular by defending critical economic infrastructure and lessening dependence on the Strait of Hormuz; and second, posing the threat of *economic counter-coercion* once these vulnerabilities have been addressed, in particular by exploiting Iran's own dependence on the Strait. Finally, the Conclusion suggests possible avenues for future research.

[6] The GCC, which was formed in 1981, is composed of Saudi Arabia, the United Arab Emirates, Kuwait, Bahrain, Qatar, and Oman.

[7] Gulf Arab nations could also avoid a conflict by accommodating Tehran, but doing so would require ceding regional dominance to Iran and sacrificing autonomy.

CHAPTER ONE: BUILDING HEDGEHOGS IN THE FAR EAST AND NEAR EAST

How can the United States preserve a stable and favorable balance of power in key geographic regions despite the growing challenges posed by rising powers and resource constraints? As noted above, one of the principal advantages the United States enjoys in a long-term competition with rivals such as China and Iran is the support (whether overt or tacit) of allies and security partners. One option, therefore, is to rely more on these local nations to counterbalance potential regional hegemons.

Importantly, Washington may be able to exploit this advantage more effectively than it has in the past by adapting to recent changes in the strategic environment, namely the maturation of the guided-weapons warfare regime.[8] Although the United States was the only major participant in this regime during the first decade of the post-Cold War era, since that time conventional precision-strike systems have begun to proliferate both horizontally and vertically. This, in turn, has raised the possibility that a variety of actors could eventually be in a position to hold at risk the high-signature forces, overseas bases, lines of communication, and surveillance and communications infrastructure that collectively underpin the United States' ability to project military power abroad. While this development poses a serious threat to the credibility of American security commitments and the effectiveness of U.S. military operations, it also represents an important opportunity. That is, by selectively facilitating the wider proliferation of guided weapons and associated enabling capabilities, the United States can help friendly nations resist coercion, defend their territory if these efforts fail, engage in counter-coercion against aggressive neighbors, and ultimately become more robust counterweights to revisionist powers.

In a previous report, for instance, we argued that the United States should attempt to build "hedgehogs" by improving the capabilities of its allies and partners across the Indo-Pacific region.[9] Specifically, this approach would entail bolstering the conventional military capabilities of the PRC's neighbors so that they may better hold Chinese forces at risk throughout the East and South China Seas, contribute to an economic blockade against China by threatening its seaborne commerce, and withstand military coercion in the event of a conflict. By helping to arm local actors with these objectives in mind, Washington could achieve a number of goals: diminishing the probability that these nations will align with Beijing, dividing China's attention,

[8] Andrew F. Krepinevich, Jr., "The Pentagon's Wasting Assets," *Foreign Affairs*, 88, No. 4, July/August 2009; Thomas G. Mahnken, "Weapons: The Growth & Spread of the Precision-Strike Regime," *Daedalus*, 140, No. 3, Summer 2011; and Barry D. Watts, *The Maturing Revolution in Military Affairs* (Washington, DC: Center for Strategic and Budgetary Assessments, 2011).

[9] Center for Strategic and Budgetary Assessments, *Building "Hedgehogs" in the Indo-Pacific Region*, report prepared for the Office of Net Assessment/Office of the Secretary of Defense, August 2011. The term "hedgehogs" refers to the barriers used during World War II to impede the movement of armor and infantry formations, and that were most famously deployed along the "Atlantic Wall" in northern France to slow an amphibious assault by Allied forces.

complicating its military planning, helping to keep the Sino-American strategic competition localized to East Asia rather than becoming increasingly global in scope, and preserving a relatively stable military balance in the region at lower cost and risk to the United States.

The question this chapter seeks to address, then, is whether a variant of this strategy might be applicable to the Persian Gulf region as well, with Iran as the principal rival. Although preliminary research suggests that building hedgehogs could yield significant gains in the Indo-Pacific, there are obvious reasons to question the necessity and the viability of this approach in the Gulf. Iran, for example, is far less powerful than China, and therefore may not pose as great a threat to its neighbors. If so, these nations may not require additional (or different) capabilities to prevent Tehran from achieving a dominant position in the region. Alternatively, if the Iranian threat is sufficient to merit a change in U.S. strategy and alternative military postures on the part of the Gulf Arab nations, the latter may not be willing or able to take primary responsibility for preserving the status quo in the region. Finally, Iran's apparent pursuit of a nuclear weapons capability casts doubt on the virtues of helping local actors to bolster their conventional military capabilities and reduce their vulnerability to non-nuclear forms of coercion. We now proceed to address each of these issues in turn.

THE IRANIAN THREAT TO THE GULF REGION

China is a dynamic economic power with a rapidly modernizing military. Not only has it achieved a leading position in East Asia relative to its immediate neighbors, but it also has the potential to reshape the global balance of power over the coming decades. By contrast, Iran is neither the strongest conventional military power nor the strongest economic power within its own region. Moreover, it is treated as a pariah state by the international community and suffers from persistent internal instability, all of which suggests that it could have difficulty improving its relative position and extending its influence throughout the broader Middle East. Whereas the United States and its local allies confront a daunting challenge as they attempt to address China's rise, therefore, it is not self-evident that a major change in strategy and new patterns of security cooperation are necessary to prevent Iran from emerging as a local hegemon, to protect American allies in the Gulf from becoming "Finlandized," or to safeguard U.S. economic interests in the region.[10]

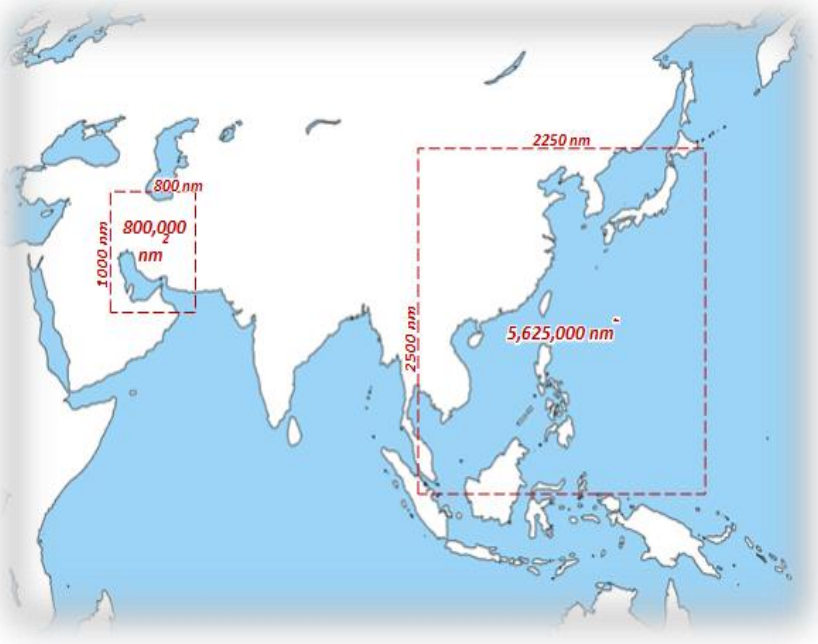
Unfortunately, this perspective may prove overly sanguine. Despite the limitations Iran confronts "on paper," it still poses a considerable threat to the region. As one indicator of the scope and scale of this threat, the Gulf Arab nations arguably fear Tehran far more than Asian nations fear Beijing, which can be attributed to Iran's intentions as well as its capabilities. For instance, Iranian political ideology is inherently hostile to the Sunni Arab monarchies of the Gulf, and Tehran has a history of exporting its ideology and attempting to undermine the stability of neighboring governments. The Iranian regime's opaque decision-making, aggressive rhetoric,

[10] "Finlandization" refers to a situation in which a nation retains autonomy in its domestic affairs and is not a formal satellite of a more powerful neighbor, but is informally aligned with that neighbor and gives it veto power over major foreign and defense policies. For a discussion of the latter possibility in the Western Pacific, see Andrew F. Krepinevich, "China's 'Finlandization' Strategy in the Western Pacific," *Wall Street Journal*, September 11, 2010.

internal factionalism, and separate military command structures also make its behavior extremely difficult to predict.

At the same time, while Iran's military does suffer from a number of limitations (many of which are discussed in greater detail below), it is still developing a wide variety of means to threaten its neighbors. In the next 15-20 years Tehran could be in a position to hold at risk regional military bases, population centers, and critical infrastructure using air and missile strikes; to conduct expanded terrorist and proxy force attacks against military, economic, or government targets in the region; to interdict commercial shipping in the Gulf itself; to conduct a limited cross-border invasion with the objective of capturing oil-rich, contiguous territory; and to engage in nuclear blackmail.

The geography of the Persian Gulf also creates potential advantages for Tehran and significant vulnerabilities for its neighbors. Unlike China, which must pursue the means to strike targets on land and at sea across a vast expanse to exercise influence throughout East Asia, Iran need only threaten nearby nations and ships traversing the relatively narrow waters of the Gulf to achieve a preponderant position within its own region. This can almost certainly be accomplished without highly advanced intelligence, surveillance, and reconnaissance (ISR) platforms or long-range strike systems of the kind that China's People's Liberation Army (PLA) would need to cover East Asia. Rather, Tehran can gain coercive leverage from relatively inexpensive capabilities such as short-range ballistic missiles (SRBMs) and rockets, ASCMs, mines, small boats, diesel-electric submarines, and "mini" submarines.



Moreover, due to the relatively short distances involved in the Persian Gulf region relative to the Western Pacific, tactical warning of an Iranian attack (in particular an attack using ballistic missiles) could be difficult to achieve. A robust defense against some forms of Iranian aggression may therefore be extremely challenging to mount. Tehran could also pose a significant threat to its neighbors by holding at risk a relatively small set of targets, given that civilian populations in the Gulf States are concentrated in a handful of major cities, many economies are almost entirely dependent on a single sector, and fresh water supplies can be interrupted by damaging the region's handful of desalination plants. Lastly, because Iran sits

astride a key maritime chokepoint, it is well placed to stem the export of energy resources to world markets and thereby undermine neighboring economies.

In sum, while Iran may be far weaker than China according to most metrics of economic and military power, the nature of its regime, the diverse coercive tools it is attempting to develop, and the geography of the Persian Gulf all suggest that it poses a significant threat to its neighbors and the region as a whole.

THE LIMITS OF LOCAL ALLIES

Although Iran may represent a serious threat to the Gulf region, there are reasons to doubt whether the Gulf Arab nations can emerge as genuine counterweights to Iranian military power, even with the encouragement and support of the United States.

First, many of these countries suffer from persistent internal instability and their regimes from questionable legitimacy, which can make it difficult for them to oppose Iran too openly or work with the United States too closely. Second, local militaries have traditionally demonstrated a preference for capabilities that "provide prestige and a 'glitter factor' in terms of regional status," rather than capabilities that will best enhance their military effectiveness.[11] Third, Arab nations often find it difficult to coordinate with one another on matters of military strategy, which has "prevented serious efforts at developing joint capabilities and interoperability."[12] Fourth, it is also unclear whether American security partners in the region can effectively maintain and employ military systems such as advanced combat aircraft and ballistic missile defenses, given that many of these nations suffer from a shortage of non-commissioned officers and technical expertise; insufficient emphasis on command, control, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems; and limited battlefield experience.[13]

These are all legitimate concerns. At the same time, however, there are reasons to conclude that the Gulf Arab nations can play a greater role in counterbalancing Iran. For example, nations in this region have already demonstrated deep concerns about Iranian aggression, along with a willingness to devote significant resources toward improving their military capabilities. Unlike U.S. allies in Europe and Asia, many of which struggle to spend even 2 percent of gross domestic product (GDP) on national defense, key Gulf Arab states allocate a considerable portion of their wealth toward military spending. The United Arab Emirates (UAE), Oman, and

[11] Anthony H. Cordesman and Alexander Wilner, "The Gulf Military Balance in 2012," *Center for Strategic and International Studies*, May 16, 2012, p. 53.

[12] Idem.

[13] Richard L. Russell, "Future Gulf War: Arab and American Forces against Iranian Capabilities," *Joint Force Quarterly*, No. 55, Fall 2009.

Saudi Arabia, for instance, currently devote 6.9, 8.5, and 10.1 percent of GDP to defense, respectively.[14]

Moreover, these countries and the other members of the GCC have demonstrated an increased appetite for American military hardware over the past several years as the threat from Iran has become more urgent. Between fiscal year (FY) 2007 and FY 2010, the United States sold more weapons to the GCC than to any other region of the world, totaling more than $26 billion in foreign military sales.[15] Since 2010, Washington has also announced tens of billions of dollars in additional arms exports to the Gulf, highlighted by the recent notice of a $30 billion agreement with Saudi Arabia that will provide Riyadh with dozens of new combat aircraft as well as a $3.5 billion deal with the UAE that will make Abu Dhabi the first overseas customer for the new Terminal-High Altitude Area Defense (THAAD) system.[16]

As discussed in greater detail below, not all of these arms sales involve capabilities relevant to countering the threat from Iran, particularly as it may evolve over time. Nevertheless, they do suggest that while the Gulf States still depend on the United States, they are not entirely willing to outsource their security to an external power, and may have the incentive, the resources, and the motivation to take on a greater role in countering Iran.

AMERICAN STRATEGY AND THE IRANIAN NUCLEAR QUESTION

When considering the virtues of a hedgehogs strategy for the Gulf, it is impossible to overlook Tehran's nuclear program. Should Iran acquire a latent, virtual, or overt nuclear weapons capability, the strategic dynamics of the region and the broader Middle East would experience a dramatic change.[17]

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[14] Stockholm International Peace Research Institute (SIPRI), "Military Expenditure Database," available at http://www.sipri.org/ research/armaments/milex.

[15] "The Gulf Security Architecture: Partnership with the Gulf Cooperation Council," Majority Staff Report Prepared for the Committee on Foreign Relations of the United States Senate, June 19, 2012, p. 2.

[16] Joby Warrick, "U.S. Steps Up Arms Sales to Persian Gulf Allies," *Washington Post*, January 31, 2010; Adam Entous, Jay Solomon and Julian E. Barnes, "U.S. Plans Bomb Sales in Persian Gulf to Counter Iran," *Wall Street Journal*, November, 11, 2011; Mark Landler and Steven Lee Myers, "U.S. Agrees to $30 Billion Arms Sale to Saudis," *New York Times*, December 29, 2011; Tony Capaccio, "UAE Said to Sign Lockheed Thaad Pact Valued to $3.49 Billion," Bloomberg, December 29, 2011; and Brian Murphy, "Amid Fears over Iran, Uneasy Gulf Allies Add to Their Arsenals," *Associated Press*, July 31, 2012.

[17] A "latent" nuclear power has the capabilities, knowledge, and materiel necessary to build nuclear weapons in a relatively short period of time but chooses not to do so (e.g., Japan). A "virtual" nuclear nation develops and deploys nuclear weapons but forgoes conducting nuclear tests or openly acknowledging its arsenal (e.g., Israel). See Avner Cohen and Benjamin Frankel, "Opaque Nuclear Proliferation," *Journal of Strategic Studies*, 13, No. 3, September 1990; Peter D. Feaver, "Proliferation Optimism and Theories of Nuclear Operations," *Security Studies*, 2, Nos. 3-4, Spring/Summer 1993, p. 175; and Ariel E. Levite, "Never Say Never Again: Nuclear Reversal Revisited," *International Security*, 27, No. 3, Winter 2002/03.

Specifically, Tehran would immediately gain a coercive advantage over its regional rivals, with the possible exception of Israel (given its widely-suspected nuclear arsenal). It could, therefore, use that newfound advantage to coerce its neighbors into reducing their oil production levels, accepting a withdrawal of forward deployed American military forces from local nations, and/or adopting other changes in policy that would strengthen Iran's position within the region. As a result, the Gulf States might find it necessary to rely on a nuclear guarantee provided by an extra-regional power, or else acquire their own nuclear weapons to offset any Iranian nuclear arsenal. For its part, the United States might be compelled to offer some type of formal or informal extended nuclear deterrent guarantee to allies and security partners in the region, both to counterbalance Iran and to dissuade them from pursuing their own nuclear capabilities. Nevertheless, powerful and/or wealthy nations such as Egypt, Saudi Arabia, Turkey, and the UAE would undoubtedly consider going nuclear as well, as a hedge against the possibility that Washington might fail to uphold its nuclear "guarantee."

Thus the prospect of a nuclear-armed Iran would overshadow all other threats in the region, from Tehran's ability to interrupt commercial shipping in the Gulf, to its support for irregular proxy forces, to its large and growing ballistic missile arsenal. An important question, therefore, is whether the United States should still seek to bolster the conventional capabilities of local actors given the prospect of a nuclear-armed Iran.

We argue that Iran's nuclear ambitions should *not* discourage the United States from pursuing a version of the hedgehogs strategy for two reasons. As many analysts have noted, the most likely danger is not that a nuclear-armed Tehran will launch a premeditated nuclear strike against its neighbors, but rather that it will become far more willing to make demands on those neighbors, to escalate crises, and to threaten the use of the various conventional and subconventional military instruments. In short, Iran may become more risk-acceptant if it concludes that a nuclear arsenal makes its threats more credible while also deterring reprisals for any hostile actions on its part.[18] This is particularly true if the Gulf states forgo their own nuclear weapons and if Washington does not extend its nuclear umbrella to the region (or cannot do so credibly). Even with a nuclear guarantee from the United States or possessing their own nuclear arsenals, however, local nations could still confront a version of the "stability-instability paradox," which holds that nuclear weapons deter large-scale conventional conflicts and nuclear war while simultaneously increasing a nation's ability to engage in limited conventional military operations or irregular warfare via non-state proxies.[19]

[18] See, for example, James M. Lindsay and Ray Takeyh, "After Iran Gets the Bomb: Containment and its Complications," *Foreign Affairs*, March/April 2010; and Eric S. Edelman, Andrew F. Krepinevich, and Evan Braden Montgomery, "The Dangers of a Nuclear Iran: The Limits of Containment," *Foreign Affairs,*, January/February 2011.

[19] This is not unlike the situation that India confronts today with respect to Pakistan. Michael Krepon, "The Stability-Instability Paradox, Misperception, and Escalation Control in South Asia," in Michael Krepon, Rodney W. Jones and Ziad Haider, eds., *Escalation Control and the Nuclear Option in South Asia* (Washington, DC: Henry L. Stimson Center, 2004); and Sumit Ganguly, "Nuclear Stability in South Asia," *International Security*, 33, No. 2, Fall 2008.

Ultimately, *the United States and its partners in the Persian Gulf may need to guard against many of the same threats whether Tehran fails to acquire nuclear weapons or is emboldened by a nuclear arsenal.* Therefore a hedgehogs strategy that reduces the vulnerability of the Gulf Arab states to non-nuclear threats might have significant value irrespective of Iran's nuclear status.

CONCLUSION

Although Washington has declared its intention to "pivot" toward the Asia-Pacific region, it will continue to face security challenges in the Persian Gulf region, notably the rise of a hostile Iran. Moreover, it will also confront fiscal and operational challenges that will make it increasingly difficult to sustain a robust forward military presence in this crucial area or to reinforce local allies under assault—particularly if the Gulf region becomes a secondary priority relative to East Asia as stated in the Obama administration's defense planning guidance.[20] Even with the looming possibility of a nuclear-armed Iran, a variant of the hedgehogs strategy initially devised for the Indo-Pacific region has the potential to help the United States achieve its longstanding objectives in the Gulf, namely preventing a hostile nation from achieving a preponderant position in the region and restricting outside access to its resources. The specific elements of that strategy, however, will depend on how the military competition between Iran and its Gulf Arab neighbors is expected to evolve over the next two decades. The next chapter addresses this issue to provide a foundation for the strategy that follows.

[20] Department of Defense, *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense* (Washington, DC: Department of Defense, January 2012), p. 2.

CHAPTER TWO: THE EVOLVING MILITARY COMPETITION IN THE PERSIAN GULF REGION

How might the Gulf Arab nations in particular deter Iranian aggression and impose costs on Tehran during peacetime? To answer this question, it is necessary to first consider how the military competition between Tehran and the Gulf Arab nations might evolve over time. Looking forward to the 2025-2030 timeframe, we argue that a critical aspect of the strategic rivalry in the Persian Gulf region will be the prospect of economic warfare; that is, efforts by Iran to hold at risk the natural resources, civilian infrastructure, and sea lines of communication that underpin neighboring economies, and countervailing efforts by those neighbors (along with the United States) to defend these critical targets. Although Tehran is also highly dependent on oil and gas exports and is therefore susceptible to economic warfare as well, it arguably enjoys an asymmetric advantage in this area of the competition due to the variety of coercive means at its disposal, its geographic position astride the Strait of Hormuz, and the possibility that international pressure to halt a local conflict could actually serve its interests as the likely first-mover in an economic warfare campaign against its neighbors.[21] If this diagnosis is correct, then a key task for the Gulf Arab nations will be to cope with this threat, and to identify measures that might reduce their own vulnerability to an economic warfare campaign while enabling them to exploit the continuing vulnerability of Iran.

STRATEGIC DIMENSIONS OF THE IRAN-GULF ARAB RIVALRY

As noted above, Iran is currently pursuing a variety of means to threaten its neighbors, deter military intervention by an outside actor like the United States, and perhaps even establish a *de facto* sphere of influence throughout much of the Persian Gulf region. In fact, it is the multifaceted nature of the Iranian challenge that makes Tehran such a worrisome adversary, despite its domestic instability, its fragile economy, and the current limitations of its conventional military forces. It is, therefore, difficult to predict how the strategic competition between Iran and its neighbors will evolve over time.

Despite these uncertainties, it is possible to identify four existing, non-nuclear military competitions that will shape the Persian Gulf region over the next two decades:

- ***Territorial Expansion versus Territorial Defense***. Over the past several decades the possibility of territorial aggrandizement has arguably been the most significant threat to the stability of the Persian Gulf and American interests in this region, from the Soviet threat to Iran, to the Iran-Iraq War, to the Iraqi annexation of Kuwait. There is perhaps no quicker route to regional hegemony than a single nation capturing resource-rich territory beyond its borders, which could be used to fund a major military buildup, manipulate global energy prices, and extort nations that remain dependent on the Gulf's petroleum and gas exports.

[21] As described below, although the United States or its local allies might initiate a conflict against Iran, for example by targeting its nuclear program, Tehran would likely be the first actor to deliberately strike economic targets in the region.

Moreover, given Iraq's tremendous oil reserves, its weakened condition in the aftermath of the American invasion and occupation, and its shared border with Iran, the possibility exists that Tehran might be tempted to assert control over southern Iraqi oil fields at some point in the future.

- ***Military Counterforce versus Military Resilience***. One of the greatest threats to Gulf Arab nations is the possibility that they will be caught in the middle of a war between Iran and the United States, which could in turn lead to direct attacks on their territory. At present, Washington has a significant military presence in Kuwait, Qatar, Bahrain, and the UAE, while there is a strong possibility that it could gain access to additional military bases in Saudi Arabia and perhaps even Iraq during a conflict with Iran. As one element of a broader A2/AD strategy, which would seek to constrain American military operations in the Gulf and inhibit the deployment of additional U.S. reinforcements to the region, Tehran might therefore target these facilities. With key bases, ports, and staging areas under assault, the United States could confront significant operational and logistical challenges, while local nations might become increasingly reluctant to offer passive or active support to U.S. forces. At the same time, Iran could target allied air and naval facilities as well to improve its own freedom of maneuver in the Gulf and to prevent those nations from conducting combat operations in support of any American-led military campaign.

- ***Internal Subversion versus Internal Security***. Rather than launch a conventional military campaign, Iran could impose heavy costs on its neighbors and even threaten the stability of ruling regimes through lower level forms of aggression, namely terrorism and insurgency. Tehran not only has a long history of conducting and sponsoring attacks overseas (employing its Quds Force, an elite unit of the Iranian Revolutionary Guard Corps devoted to operations abroad), it also continues to provide considerable material support (including money, weapons, and training) to opposition movements in Lebanon, Gaza, Iraq, and elsewhere. Thus Gulf Arab nations must remain vigilant against the possibility that Iran or its local proxies could engage in a variety of destabilizing actions. Tehran could, for instance, engage in assassinations of key officials, conduct attacks on civilian and military targets, or instigate large-scale uprisings in an effort to coerce, distract, weaken, and potentially overthrow opposing regimes.

- ***Economic Warfare versus Economic Resilience***. Because of their dependence on the revenue generated by oil and gas exports, Gulf Arab nations are potentially quite vulnerable to threats against this critical sector of their economies. Thus Iran could attempt to disrupt energy shipments in order to coerce its neighbors. Specifically, it could employ clandestine military units or proxy forces to conduct attacks against key economic targets; launch air, rocket, and missile strikes against fixed infrastructure such as ports, refineries, and pipelines; and/or use the sea denial capabilities it has accumulated to target commercial ships in the Gulf and perhaps close the Strait of Hormuz. In addition, Gulf Arab nations are highly dependent on desalination plants to supply potable water, a vulnerability that Iran could also exploit as part of a broader economic warfare campaign.

These competitions are not mutually exclusive. For instance, a conventional-counterforce campaign could inhibit the Gulf Arab nations from defending their economic infrastructure from

attack; an economic warfare campaign could threaten the stability of ruling regimes; and irregular proxies could be used in lieu of conventional military forces to gain *de facto* control over foreign territory, particularly in resource-rich areas with large Shiite populations such as southern Iraq or eastern Saudi Arabia. While these competitions are "ideal types," however, they do highlight important and very different aspects of the Iranian threat to the region.

Moreover, as the United States looks to strengthen its local partners, establish a more robust line of defense against Iranian aggression, and prevent the emergence of a regional hegemon that would undermine longstanding American objectives, a critical first step is to identify which of these competitions is likely to be most consequential over the next two decades. Although there are no simple criteria for making this determination, a number of questions are relevant: Which threats are most likely to materialize, and which are more likely to remain latent? Which competitions highlight significant vulnerabilities among the Gulf Arab nations, particularly vulnerabilities that can be mitigated? Where can the United States usefully assist its local allies in strengthening their defenses and perhaps even improving their coercive capabilities? Lastly, but perhaps most importantly, which competitions present the greatest opportunity to actually impose costs on Iran?

With these issues in mind, we argue below that *the competition between economic warfare and economic resilience is the most significant aspect of the broader strategic rivalry that exists in the region*, with major implications for Gulf Arab nations, the United States, the wider international community, and Iran itself. By comparison, other prospective threats appear much less plausible during the timeframe of this assessment, insufficiently worrisome to serve as the core basis of an alternative American strategy toward the region, or largely immune to any countervailing actions on the part of the United States.

Territorial Expansion

Consider, for instance, the possibility that Iran might attempt to gain control over oil-rich territory beyond its borders, in particular the petroleum reserves located in southern Iraq. While this scenario undoubtedly has the potential to reshape the entire region, the likelihood that Iran would launch a ground campaign against its western neighbor, as well as the prospect that it could successfully capture and incorporate Iraqi territory, is likely to remain low.

In general, the Iranian military does not appear well equipped to conduct an invasion and occupation. Despite having hundreds of thousands of troops at its disposal, Iran's manpower and equipment "lack effective unity and readiness, and are declining in overall capability."[22] Therefore, as an unclassified Department of Defense report notes, "Iran's forces are sufficient to deter or defend against conventional threats from Iran's weaker neighbors, such as post-war Iraq, the GCC, Azerbaijan and Afghanistan, but lack the air power and logistical ability to project power much beyond Iran's borders."[23] Moreover, building on the lessons of Afghanistan since

[22] Cordesman and Wilner, "The Gulf Military Balance in 2012," p. 6.

[23] Department of Defense, *Unclassified Report on Military Power of Iran*, April 2010, p. 7. For a similar assessment, see also *Jane's World Armies: Iran*.

2001, Iraq since 2003, and Lebanon in 2006, Iranian ground forces are increasingly trained to employ asymmetric tactics and capabilities that are far more suitable for *repelling* an invasion than taking and holding territory. Specifically, both the Iranian Army and the IRGC emphasize "a defensive, attrition-oriented doctrine that relies heavily on guerilla [sic] warfare and special forces operations."[24]

Of course, this situation could change over time. Tehran is upgrading some of its main battle tanks, armored vehicles, and artillery and could plausibly make additional improvements in mobility and sustainment that would enhance its ability to project military power. Moreover, Iraq could remain a tempting target for invasion if it remains militarily weak and internally divided. Nevertheless, there are still reasons to doubt the severity of this threat.

First, the Iraqi Army is already beginning to rebuild its capacity for territorial defense (rather than just internal security), for example by acquiring modernized equipment such as M1A2 tanks, armored vehicles, and both towed and self-propelled artillery—much of it supplied by the United States, which continues to train Iraqi forces.[25] If Baghdad can expand its armored and mechanized infantry units over time, enhance their proficiency, and perhaps improve its rotary-wing capability by adding attack helicopters such as the *Apache* to its inventory, it could develop a conventional military capability adequate to deter an Iranian invasion—or at the very least adequate to slow an invasion long enough for the United States to provide reinforcements. Second, even without significantly more robust Iraqi ground forces, any incursion by Iran could be slowed (and perhaps deterred) by relatively low-cost measures such as the use of landmines along possible invasion routes, or perhaps the creation of minefields just beyond the boundaries of southern oil fields that are likely to be targeted by an invader (although this would require Baghdad to abandon its support for the Ottawa Convention on Anti-Personnel Mines). Finally, the United States has already demonstrated its willingness and ability to defeat a conventional invasion that threatens to create a regional military and economic hegemon.

Perhaps a more realistic possibility over the next two decades, then, is that Iran might attempt to neutralize Iraqi oil rather than gain direct control over it; that is, Tehran could use the threat of stand-off strikes, sabotage, or maritime interdiction to compel Baghdad to reduce (or to forgo increasing) its oil production levels in order to keep prices artificially high. Therefore, as discussed in greater detail below, a critical issue for the United States and Iraq (as well as other resource-exporting allies in the region) is how to reduce the vulnerability of fixed economic infrastructure and diminish friendly nations' reliance on the Gulf's sea -lanes.

Military Counterforce

Alternatively, the prospect of an air and missile campaign against ports and airfields in the region represents a much more plausible scenario, one that would pose significant challenges for the

[24] Steven R. Ward, *Immortal: A Military History of Iran and Its Armed Forces* (Washington, DC: Georgetown University Press, 2009), p. 322. On the defensive orientation of Iranian ground and paramilitary forces, see Frederick Wehrey, et al., *Dangerous But Not Omnipotent: Exploring the Reach and Limitations of Iranian Power in the Middle East* (Santa Monica, CA: RAND, 2009), chapter 3.

[25] *Jane's World Armies: Iraq*.

United States and the Gulf Arab nations. At present, however, this danger is only latent. Although Tehran has recently threatened to launch attacks against local bases in response to any U.S. military action against it, the Iranian air force remains quite weak, while its short- and medium-range ballistic missiles "do not possess the precision necessary…to be effective against point or high value targets."[26] As discussed in greater detail below, however, Iran's offensive strike capabilities could grow far more robust over the next two decades. In particular, if its ballistic missile arsenal becomes more accurate, then "key export, power, desalination facility, and military targets would then become targets or hostages."[27] Even without attacking American bases, the prospect of highly accurate missile strikes could compel local allies to place restrictions on the types of operations U.S. forces are allowed to conduct from their territory.

While the United States and its allies should therefore take reasonable steps to increase the resilience of their military postures, there are nonetheless a number of reasons not to *overemphasize* this aspect of the competition. For example, although forward deployed American forces in Kuwait, Bahrain, Qatar, and the UAE are all potentially vulnerable to a missile campaign, the A2/AD threat in the Persian Gulf is not as serious as it is in other theaters. In northeast Asia, China's capabilities are not only far more robust than those of Iran, but the loss of bases in Japan and South Korea (due to direct attack or political denial) and the high risk to aircraft carriers could force the United States to operate from distant locations such as Guam, Hawaii, and Diego Garcia. In the Gulf, however, the United States could still conduct an air campaign from carriers based in the Eastern Mediterranean and especially the Arabian Sea, unless Iran gains the ability to hold surface combatants at risk beyond the Gulf of Oman—an unlikely prospect over the next two decades. Moreover, American and allied air bases in Eastern Europe, Southern Europe, and Turkey could also help to support combat operations, depending on their availability.

As for local nations whose own military facilities could be targeted by Iran, this threat also appears to be manageable. Airfields in Iraq, Saudi Arabia, Kuwait, the UAE, Oman, and Qatar are already hardened to varying degrees. Saudi Arabia alone has at least five airfields with enough hardened shelters to accommodate more than 270 combat aircraft, and perhaps double that number if fighters were towed outside of their shelters before starting their engines.[28] In concert with the American and allied ballistic missile defense systems that are already deployed in the region or soon will be, Iran would require a significant number of extremely accurate ballistic missiles to shut down many of these airfields, perhaps outstripping its inventory even two decades from now.[29] Moreover, frontline Gulf nations like the UAE that depend on a

[26] Cordesman and Wilner, *The Gulf Military Balance in 2012*, p. 132.

[27] Idem. See also International Institute for Strategic Studies (IISS), *Iran's Ballistic Missile Capabilities: A Net Assessment* (London: IISS, 2010), pp. 132-133. On the recent Iranian threat to attack regional military bases, see "Iran Says It Can Destroy US Bases 'Minutes after Attack'," *Reuters*, July 4, 2012.

[28] Author's email correspondence with Dr. Alan Vick, RAND Corporation, July 11, 2012.

[29] It might be easier for Iran to shut down naval facilities than airbases, however, which are much more difficult to harden and are far fewer in number. Nevertheless, if local nations were less dependent on the Strait of Hormuz (a

relatively small number of air bases in close proximity to Iran could take other measures to enhance their resilience, to include dispersing their combat, surveillance, and battle management aircraft in the event of a crisis or conflict. For example, these platforms could deploy temporarily to Saudi Arabia; not only does the Kingdom have a large number of hardened shelters, but it also has considerable strategic depth and 15 military airfields located throughout its territory.[30]

Finally, and perhaps most importantly, prioritizing the defense of military facilities puts the United States and its allies on the wrong end of an Iranian cost-imposing strategy, given that offensive ballistic missiles are far less expensive than interceptors and passive defenses. It does not, however, open up new avenues to impose costs on Iran.

Internal Subversion

In contrast to the prospect of a "land-grab" or the bombardment of military facilities, the threat of internal subversion is both highly plausible *and* highly consequential. As one author notes, "Iran's ability to develop subversive political and radical groups abroad is the strongest element of its deterrence capability, offering the only real means by which Tehran could respond effectively to a significant first strike by Israel or the US."[31] In addition to its support for Hezbollah and various Palestinian terrorist organizations, Tehran has "established a strong presence in post-Saddam Hussein Iraq," and also "remains capable of sanctioning terrorist activity in GCC states."[32] In fact, there is perhaps no greater Iranian danger to the region than the possibility that it could destabilize existing regimes, which could result in the removal of key American allies from power, widespread violence, or both. Like an Iranian air and missile campaign, moreover, this threat affects all of the Gulf nations, although those nations with majority Shiite populations (Iraq and Bahrain) or sizeable Shiite minorities (Saudi Arabia) are particularly vulnerable. Nevertheless, there is little the United States can do to significantly affect the competition between subversion and internal security, or to help its local partners better defend themselves against this threat.

Although Washington can undoubtedly be a source of some assistance, to include sharing relevant intelligence and perhaps supplying useful surveillance platforms, in general the Gulf Arab nations have far more experience addressing internal threats than does the United States, and have far more latitude in the means they can employ to counter those threats. Consequently, they appear to be well equipped to address the danger of Iranian subversion. According to Michael Knights, "the longstanding perception that local security establishments can handle internal threats is correct in broad terms." Every one of the GCC states, he notes, "invests

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possibility discussed in greater detail below), then they and the United States could more easily weather the loss of those facilities and the consequent disruption to naval operations *inside* of the Gulf during a conflict.

[30] The Institute for National Security Studies, *Middle East Military Balance*, "Saudi Arabia," p. 14 (updated August 27, 2012).

[31] Michael Knights, "Deterrence by Punishment Could Offer Last Resort Options for Iran," *Jane's Intelligence Review*, April 1, 2006.

[32] Idem.

heavily in internal security, typically maintaining paramilitary forces that benefit from strong funding and the direct oversight of influential royal personages." At the same time, "GCC states are also highly capable of physically disrupting terrorist networks."[33]

Given this assessment, efforts to help preserve internal security and regime stability are unlikely to be the crux of a U.S. strategy to bolster its frontline allies in the Gulf, despite the salience of this threat.

ECONOMIC WARFARE IN THE PERSIAN GULF

Although each of the potential threats described above could have a significant impact on the future of the Persian Gulf region, an Iranian economic warfare campaign against its neighbors would pose unique challenges. Such a campaign would not only affect the Gulf Arab nations (which rely on oil and gas exports as a critical source of revenue), but also countries across Europe and Asia (which depend on energy imports from the Middle East to sustain their transportation and manufacturing sectors) as well as the United States (which has pledged to maintain freedom of navigation in the Persian Gulf and has a strong interest in preventing major disruptions to global commerce).

Possible Elements of an Iranian Economic Warfare Campaign

There is no ready blueprint outlining what an Iranian economic warfare campaign might look like. Nevertheless, Iran could potentially employ a variety of means to hold at risk the resources, infrastructure, and sea lines of communication that collectively underpin regional economies. In fact, such a campaign could include several different dimensions that are often treated as distinct threats, even though they have the potential to be mutually reinforcing:

- ***Sabotage***. First, Iran could employ small units (namely elements of the Quds Force and/or irregular proxies that have been trained and equipped by the IRGC) to conduct attacks on key economic targets, with the goal of temporarily diminishing the amount of resources available for export. In particular, these units might attack pipelines and oil wells on land that are widely dispersed and difficult to monitor, offshore oil and gas infrastructure that could be damaged by well-armed groups on small boats, and port facilities that may be vulnerable to amphibious raids by special operations forces. Alternatively, Iran could engage in targeted assassinations or terrorist attacks against "soft" facilities to intimidate workers, prompt heightened security measures, and disrupt regular operations. In addition, Iran might conduct cyber attacks against its neighbors, for instance by targeting the SCADA systems that regulate complex processes such as the extraction, treatment, and distribution of petroleum.

- ***Bombardment***. Second, Iran could use its ground-attack aircraft, rocket forces, and especially its mobile ballistic missiles to launch strikes against critical fixed infrastructure in neighboring nations—a coercive option that has the potential to inflict far more serious damage than any limited attacks by individuals or small groups. In particular, Iran might single out a number of high-value targets: desalination plants that produce potable water;

[33] Michael Knights, *Troubled Waters: Future U.S. Security Assistance in the Persian Gulf* (Washington, DC: The Washington Institute for Near East Policy, 2006), pp. 122-123.

gas-oil separation plants and stabilization plants that are used to treat "sour" crude oil before it is loaded onto ships and transported abroad; very large crude carrier (VLCC) berths; and oil storage farms at key ports, oil refineries, and pumping stations. Although some of these targets cannot easily be destroyed or taken offline, repeated strikes could still impede normal operations.

- ***Blockade***. Lastly, Iran could attempt to control or impede maritime traffic throughout the Persian Gulf, and especially in the narrow Strait of Hormuz. Specifically, IRGC naval forces and regular Iranian naval forces could use a variety of means to threaten commercial shipping, including small boats that can "swarm" larger ships and perhaps even conduct suicide attacks; FACs armed with ASCMs; mobile, land-based ASCM batteries that are distributed across the Iranian coast and on Iranian-controlled islands in the Gulf; submarines armed with wake-homing and wire-guided torpedoes; and mining operations using a variety of delivery platforms. These capabilities would also pose a threat to any American or allied naval ships that attempt to reopen the Strait. Slow-moving minesweepers, for instance, would be vulnerable to ASCM attacks launched from FACs or trucks on land, while cruisers and destroyers might find it difficult to fend off swarms of small boats. Any clash between Iranian and American forces, moreover, could increase the risk and therefore the cost to commercial ships transiting the region, prolong the closure of the Strait by delaying mine-clearing operations, and ultimately inhibit oil and gas exports for an extended period of time (perhaps a month or more).

Of course, it is impossible to predict whether and how Iran might engage in theses potential lines of operation. For example, it could simultaneously attempt to sabotage, bombard, and blockade Gulf Arab nations in an effort to maximize the amount of damage that is inflicted before these countries could retaliate effectively or the United States could intervene. Alternatively, Tehran could pursue these measures sequentially in the hope of controlling escalation and minimizing the likelihood of American military involvement—for instance, by initiating a limited sabotage campaign, threatening to target infrastructure with ballistic missile attacks, but forgoing a blockade of the Strait. In either case, however, efforts to undermine the oil and gas industries within neighboring nations could have a major impact on domestic stability within those countries, many of which rely on the generous provision of public goods to maintain the loyalty of their populations. These efforts would almost certainly have a significant and adverse effect on the global economy, particularly if nations have not yet fully recovered from the recent economic downturn; and could also create a financial windfall for Iran—if it was able to export its own petroleum while barring the export of its neighbors' oil and gas.

The Proliferation of Precision and the Potential Evolution of Economic Warfare

These dimensions of an economic warfare campaign can be considered extant threats to the Persian Gulf region, although how effectively Iran can engage in sabotage, bombardment, and blockade at present is open to debate. Nevertheless, each of these coercive options could become far more serious over the next two decades, particularly if Tehran is able to improve the conventional military capabilities at its disposal—an outcome that appears highly plausible given current trends.

It is increasingly clear that one of the most significant developments affecting the future security environment is the proliferation of conventional precision-strike systems to a variety of actors, to include aspiring major powers, smaller countries, and non-state groups. Absent countervailing measures by the United States and local nations, the acquisition of these systems could allow hostile, revisionist actors to intimidate their neighbors, deter American military intervention in local conflicts, and perhaps even establish spheres of influence across their immediate periphery.[34] At present, China's military modernization is the most obvious example of this trend, as Beijing continues to field advanced combat aircraft, robust surface and undersea naval forces, a variety of counter-network capabilities, and precision-guided ballistic and cruise missiles—all of which represent a significant challenge to the United States as well as nations throughout the Indo-Pacific region.

Iran, however, is also at the center of this trend in two important ways. First, it is already in the process of fielding its own A2/AD capabilities, many of which are less sophisticated than those possessed by China, but which nonetheless could pose a significant threat to its neighbors as well as American forces operating in or deploying to the Persian Gulf—particularly given the much smaller size of the Gulf region in comparison to the Indo-Pacific. Second, Tehran has also supplied a variety of precision-guided weapons to non-state actors like Hezbollah, which has accumulated a significant stockpile of guided anti-tank, anti-aircraft, and anti-ship missiles.[35] These capabilities could enable the group (or others like it) to field a "low-end" A2/AD network, especially when combined with its existing surveillance and communications infrastructure. Likewise, other Iranian proxies could become a much more potent coercive tool for Tehran if they are equipped with guided weapons by their patron.[36]

Looking forward, therefore, it is not unreasonable to assume that Iran's inventory of guided weapons will expand and improve over the next two decades, particularly if China continues to provide it with critical missile technology—perhaps in the hope of bolstering Tehran's capabilities with an eye toward compelling the United States to retain a significant military presence in the Gulf, and, as a result, limiting Washington's ability to "pivot" its defense posture toward East Asia.[37] Moreover, it is also reasonable to assume that Iran will remain willing to put conventional precision-strike capabilities into the hands of proxy forces—to impose added costs on its rivals and present a more credible threat of horizontal escalation in the event of a conflict.

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[34] Center for Strategic and Budgetary Assessments, *Strategy for a Post-Power-Projection Era.*, report prepared for the Office of Net Assessment/Office of the Secretary of Defense, January 2011.

[35] Aram Nerguizian, *U.S. and Iranian Strategic Competition: The Proxy War in the Levant, Egypt, and Jordan* (Washington, DC: Center for Strategic and International Studies, 2012), pp. 48-51.

[36] On the potential evolution of Iranian A2/AD capabilities and what Hezbollah's own A2/AD network might look like, see Center for Strategic and Budgetary Assessments, *The Proliferation of Precision-Guided Weapons and the Future of Naval Irregular Warfare: Assessment and Implications*, report prepared for the Office of Net Assessment/Office of the Secretary of Defense, September 2010.

[37] Robert Hewson, "Analysis: Silent Partner Boots Iranian Capabilities," *Jane's Defence Weekly*, April 19, 2010.

If either or both of these propositions are correct, then the dynamics of an Iranian economic warfare campaign could change substantially.

Proxies, G-RAMM, and the Future Sabotage Threat

At present, efforts to sabotage economic infrastructure in neighboring nations would likely be confined to attacks on targets such as oil wells and especially pipelines, which are widely dispersed and therefore difficult to monitor and defend continuously. Saudi Arabia, for instance, has hundreds of oil wells along with thousands of miles of pipelines stretching across its territory. Because the former are so numerous, however, it is unlikely that proxy attacks would have a major impact on overall production levels, while the latter can be repaired relatively quickly once an attack has taken place. By contrast, more lucrative targets such as refineries, ports, stabilization plants, and desalination facilities are likely to be heavily guarded given their importance, and much more difficult to damage or destroy given their size.[38] Realistically, then, this dimension of an economic warfare campaign would have a limited impact: increasing global oil prices, imposing remediation costs on state-run oil companies, and perhaps signaling Tehran's willingness to escalate a crisis and use other, more robust means to undermine neighboring economies.[39]

If Iranian special operations forces or irregular proxies were armed with more advanced conventional munitions, however, to include guided rockets, artillery, missiles, and mortars (G-RAMM), this threat would be far more serious. Specifically, man-portable or easily transportable weapons with greater range and accuracy would enable attackers to hold more targets at risk, and to inflict much greater damage on those targets. For instance, 120 millimeter rocket-assisted and gliding mortars have ranges of approximately 14-16 kilometers, twice the distance that traditional mortar rounds can travel, while GPS or laser guidance systems can give mortars a circular error probable (CEP) of roughly 10 meters or less. Equipped with extended-range, precision-guided systems, small, mobile, and highly distributed units could launch effective strikes against critical infrastructure from well beyond any reasonable defensive perimeter.[40] All that attackers would require is accurate targeting data for fixed sites, which could be acquired from commercially available satellite mapping programs or clandestine "spotters" equipped with laser designators depending on the type of guidance system employed. Ultimately, with the proliferation of more advanced conventional weapons, proxy warfare could be transformed from a modest component into a central element of a broader economic warfare campaign—one that

[38] Saudi Arabia, for example, has established a 35,000-member force to defend its oil infrastructure from terrorism and sabotage. Glen Carey, "Saudi Arabia Deploys Specialized Force to Protect Oil Facilities," *Bloomberg*, January 10, 2011.

[39] Even limited attacks could have a significant impact, however. For instance, in March 2012 unconfirmed reports of a pipeline explosion in Saudi Arabia caused oil prices to increase by nearly two percent. Summer Said, Christian Berthelsen, and Liam Pleven, "Crude Awakening: Oil Spikes on Saudi Pipeline-Blast Rumor," *Wall Street Journal*, March 2, 2012.

[40] James Bonomo et al., *Stealing the Sword: Limiting Terrorist Use of Advanced Conventional Weapons* (Santa Monica, CA: RAND, 2007), pp. 25-27. CEP is the radius of a circle within which 50 percent of a weapon's munitions are expected to fall.

would be extremely difficult to defend against given the ability of low-signature attackers to conduct strikes from miles away and then rapidly disperse afterward.

Could Iran attain this capability? Guided mortars are currently being produced by several nations, to include the United States, Russia, Israel, and Sweden.[41] It appears plausible, therefore, that within the next two decades a significant international market will emerge for these systems, potentially allowing Iran to purchase them from a foreign supplier. Moreover, Tehran already claims to have tested an indigenously produced, laser-guided artillery system. If true, this would indicate that it could be capable of producing its own precision-guided mortars during the timeframe of this assessment.[42]

Missile Accuracy and the Future Bombardment Threat

Not unlike the risk of proxy attacks and sabotage, the ballistic missile threat to economic infrastructure in Gulf Arab nations is currently not as severe as it is sometimes portrayed, but could become much more grave if Iran is able to improve the accuracy of its arsenal. As noted above, despite Tehran's efforts to build a large and varied inventory of missiles, its existing systems are not yet capable of reliably striking point targets. Unless they are armed with nuclear or chemical warheads that could inflict significant damage and/or heavy casualties over a wide area, these weapons are most useful as a "tool of terror and intimidation."[43]

Consequently, Iran's ability to hold at risk critical oil and gas infrastructure is limited. According to one analysis, it would require anywhere from several hundred to several thousand missiles to significantly impede operations at a single major facility—such as Saudi Arabia's stabilization plant at Abqaiq or its port at Ras Tanura—even if terminal-phase, ground-based missile defense interceptors were used to defend against an attack.[44] Importantly, however, these estimates are sharply reduced if Iran's short- and medium-range ballistic missiles are assumed to be more accurate (Iran's most accurate SRBMs are reported to have a CEP of approximately 100 meters, and its MRBMs are believed to be significantly less accurate).

As the authors of the study conclude:

> Whereas analysts in the United States often highlight the increasing range of Iranian missiles, the more worrisome development from the standpoint of regional security would be Iran's acquisition of increasingly accurate missiles. Even moderate gains in accuracy… result in sizable reductions in the number of missiles required to destroy a facility. Therefore, sustained improvements in the accuracy of Iranian ballistic missiles would enable Iran to do significantly greater damage with an arsenal of a given size.

[41] Steven Good, "Guided Mortar Rounds in the Hands of Non-State Actors," Briefing, April 17, 2008.

[42] "Iran Says it Has Laser-Guided Artillery Rounds," *Defense News* [Agence France-Presse], January 30, 2012.

[43] Cordesman and Wilner., *The Gulf Military Balance in 2012*, p. 128.

[44] Joshua R. Itzkowitz Shifrinson and Miranda Priebe, "A Crude Threat: The Limits of an Iranian Missile Campaign against Saudi Arabian Oil," *International Security*, 36, No. 1, Summer 2011.

> Evidence that Iran has made the technological leap to designing missiles fully able to exploit the gains in accuracy from GPS-based guidance would be the most worrisome: at that point, Iran would be able to disrupt oil production even with a small arsenal.[45]

Although it is uncertain whether or when Tehran will develop the guidance systems necessary to hold point targets at risk, it does appear to be moving in this direction. For instance, a recently released Department of Defense assessment concludes that Iran is improving the quantity and quality of its ballistic missiles. In addition to "steady growth in its missile and rocket inventories," the report notes, Tehran has also "boosted the lethality and effectiveness of existing systems with accuracy improvements and new submunition payloads."[46]

Missiles, Mines, and the Future Blockade Threat

Finally, Iran frequently threatens to close the Strait of Hormuz, particularly when tensions are high with the United States, which suggests that it views this dimension of economic warfare as a "trump card" that will deter any outside military intervention.[47] This is hardly surprising; Hormuz remains "the world's most important oil chokepoint," with approximately 17 million barrels of oil per day passing through the Strait.[48]

Although U.S. officials have expressed confidence that they can reopen and keep open the Strait in the event of a conflict, they have also publicly acknowledged that Iran has the ability to close this vital waterway for an unspecified period of time.[49] As the Director of the Defense Intelligence Agency recently testified, "If attacked, or if sanctions on its oil exports are enacted, Iran has threatened to control traffic in or temporarily close the Strait of Hormuz with its naval forces, *a capability that it likely has*."[50] Iran could, however, take a number of measures over the next two decades that would significantly improve its ability to threaten commercial shipping,

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[45] Ibid., p. 200. See also Wehrey et al., *Dangerous but Not Omnipotent*, p. 66.

[46] Department of Defense, *Annual Report on Military Power of Iran* (Washington, DC: Department of Defense, April 2012), p. 4. See also LTG Ronald L. Burgess, Jr., Director, Defense Intelligence Agency, "World Wide Threat Assessment," Statement before the Committee on Armed Services, United States Senate, March 10, 2011, available at http://www.dia.mil/public-affairs/ testimonies/2011-03-10.html.

[47] Rick Gladstone, "Noise Level Rises over Iran Threat to Close Strait of Hormuz," *New York Times*, December 28, 2011; Mitra Amiri, "Iran Says Sanctions to Fail, Repeats Hormuz Threat," *Reuters*, January 24, 2012; and Yeganeh Torbati, "Iran Renews Hormuz Closure Threats," *Reuters*, July 15, 2012.

[48] This amounts to nearly 20 percent of all oil transported worldwide and 35 percent of all oil transported by sea. U.S. Energy Information Agency, "World Oil Transit Chokepoints," updated December 30, 2011, available http://www.eia.gov/ EMEU/cabs/World_Oil_Transit_Chokepoints/pdf.pdf.

[49] Kathleen Hunter and Viola Gienger, "Iran Able to Block Strait of Hormuz, General Dempsey Says on CBS," *Bloomberg*, January 9, 2012; and Elisabeth Bumiller, Eric Schmitt and Thom Shanker, "U.S. Sends Top Iranian Leader a Warning on Strait Threat," *New York Times*, January 12, 2012.

[50] LTG Ronald L. Burgess, Jr., Director, Defense Intelligence Agency, "Annual Threat Assessment." Statement before the Senate Armed Services Committee, February 16, 2012, available at http://www.dia.mil/public-affairs/testimonies/2012-02-16.html Emphasis added.

hold at risk military targets in the Gulf, and close the Strait of Hormuz for an extended period of time.

First, it could acquire a larger inventory of more advanced ASCMs, namely land-based and sea-launched cruise missiles capable of supersonic "sprint" speeds, terminal maneuvers, or both. If so, this would present a much greater threat to American or allied warships in the Gulf, particularly if Iranian forces could launch coordinated, multi-axis saturation attacks on surface ships from a variety of platforms.[51] This would, in turn, make convoy escort, mine-clearing, and offensive operations far more difficult. Second, Iran could deploy more advanced surface-to-air missile systems (either short-range systems stationed along its coast or its islands in the Gulf, or long-range systems located deeper inside the country). At present, most ground-based Iranian air defenses are concentrated near Iran's cities and strategic nuclear sites.[52] More robust air defenses providing coverage over the Gulf would enable Tehran to threaten combat and surveillance aircraft operating in this area, complicating American or allied airborne anti-surface warfare (ASuW) and cruise missile suppression efforts.

Third, Iran recently announced that it had developed an anti-ship version of its Fateh A-110 SRBM, which has a 300-kilometer range and (according to reports) a laser-homing or infrared terminal guidance system.[53] There are, of course, reasons to doubt Iran's claims given its prior

[51] Joby Warrick, "Iranian Threat to Navy Grows," *Washington Post*, July 27, 2012.

[52] Michael Knights, "Iran's Conventional Forces Remain Key to Deterring Potential Threats," *Jane's Intelligence Review*, February 1, 2006. Iran has attempted to acquire the SA-20/S-300PMU-2 air defense system from Russia for several years, presumably to deter attacks against its nuclear infrastructure.

[53] Doug Richardson, "Iran Reveals Anti-Ship Ballistic Missile," *Jane's Missiles & Rockets*, March 8, 2011; and "Iran Tests Upgraded Version of Short-Range Missile," *Washington Post* [Associated Press], August 4, 2012.

history of exaggerating its military capabilities. Nevertheless, if it could field a viable anti-ship ballistic missile (ASBM) capability over the next two decades, this would represent a major threat to civilian and military vessels in the region. In comparison to most ASCMs, for example, ASBMs would be much more difficult to intercept with point defenses and could inflict far greater damage given their larger warheads. Moreover, whereas land-based ASCMs must be deployed along the Iranian coast (or on islands in the Gulf) due to their linear trajectory and the Zagros Mountains that extend along Iran's western border, ASBMs could be located deeper inside of Iran thanks to their range and ballistic trajectory. By exploiting the country's strategic depth, therefore, Tehran could make efforts to target launch platforms much more difficult.

Fourth, although Iran already has a large inventory of sea mines, including an unknown number of so-called "smart" mines, more advanced capabilities could substantially enhance an offensive mining campaign. Specifically, one of the biggest obstacles that Tehran would confront in its efforts to close the Strait of Hormuz is the possibility that its mining operations would be detected and countered at an early stage; all else being equal, the fewer mines it can deploy, the less likely those mines will strike a commercial or military ship, and the less time it will take for mine-countermeasures (MCM) ships and airborne MCM platforms to establish a "Q-route" or completely clear the minefield.[54] Should Iran acquire a large number of remote-controlled mines, however, it would be in a position to lay minefields covertly over a lengthy period of time—reducing the likelihood of detection—and then activate those mines once it was prepared to initiate a conflict.[55]

ECONOMIC WARFARE: MUTUAL VULNERABILITY OR IRANIAN ADVANTAGE?

Although the potential consequences of economic warfare are significant and its possible evolution is worrisome, some might argue that it is not a plausible threat given Iran's own dependence on oil and gas exports—and therefore its own vulnerability to sabotage, bombardment, and blockade. Perhaps most importantly, any effort by Tehran to disrupt commercial shipping in the Gulf and restrict traffic through the Strait of Hormuz would harm Iran's economy as well (unless it was able to control traffic in the Strait and regulate which ships could enter or exist the region, which seems unlikely). As one Iranian Oil Ministry official bluntly noted, "We would be committing economical suicide by closing off the Hormuz Strait. Oil money is our only income, so we would be spectacularly shooting ourselves in the foot by doing that." Likewise, President Obama's former special assistant on Iran, Dennis Ross, has argued that Iranians will not attempt to shut down the Strait, because "They will be the ones who

[54] Kenneth Katzman et al., "Iran's Threat to the Strait of Hormuz," *Congressional Research Service*, January 23, 2012, p.5; Caitlin Talmadge, "Closing Time: Assessing the Iranian Threat to the Strait of Hormuz," *International Security*, 33, No. 1, Summer 2008, p. 89; and William D. O'Neil, "Costs and Difficulties of Blocking the Strait of Hormuz," *International Security*, 33, No. 3, Winter 2008/2009, p. 192.

[55] There are reports that Iran possesses remote-controlled mines, but whether this is accurate and, if so, how many mines of this type are in its inventory remain unclear. See, for example, Fariborz Haghshenass, *Policy Focus #87: Iran's Asymmetric Naval Warfare* Washington Institute for Near East Policy, Policy Focus #87, September 2008, p. 16.

suffer the most from that."[56] In short, this threat may be a form of "mutually assured destruction," and therefore an option that is unlikely to be exercised by Iran or its Gulf Arab rivals.

Admittedly, the negative ramifications of a blockade for Iran's own economy suggest that it is most likely to interrupt commercial shipping in the Gulf if the prospect of a military strike against its nuclear facilities appears unavoidable or it is unable to export its own petroleum due to international economic sanctions. Under these conditions, Tehran might have little to lose by engaging in open economic warfare. Nevertheless, Iran does enjoy a number of existing or potential advantages relative to its neighbors—advantages that make an economic warfare campaign a credible threat and a plausible option even in the absence of these potential "triggers."

First, Iran—unlike its neighbors—has invested in a variety of means that could be particularly useful for conducting economic warfare, namely "asymmetric" naval forces to threaten shipping, a growing ballistic missile arsenal to hold at risk fixed infrastructure, and a broad network of proxies to engage in sabotage. Second, because Iran's coast stretches across the entire length of the Persian Gulf, and because its sits astride the Strait of Hormuz, it is well positioned to threaten commercial ships transiting the region. Third, with a regime that has demonstrated its willingness and ability to crush political opponents, as well as a population that has already lived under strict economic sanctions, it is possible that Iran may have a higher "pain tolerance" than its neighbors—or that political and military leaders might reach this conclusion, even if in error. In comparison to the Gulf Arab nations, therefore, it may be more willing to tolerate the economic dislocation that would result from an interruption in oil and gas exports.

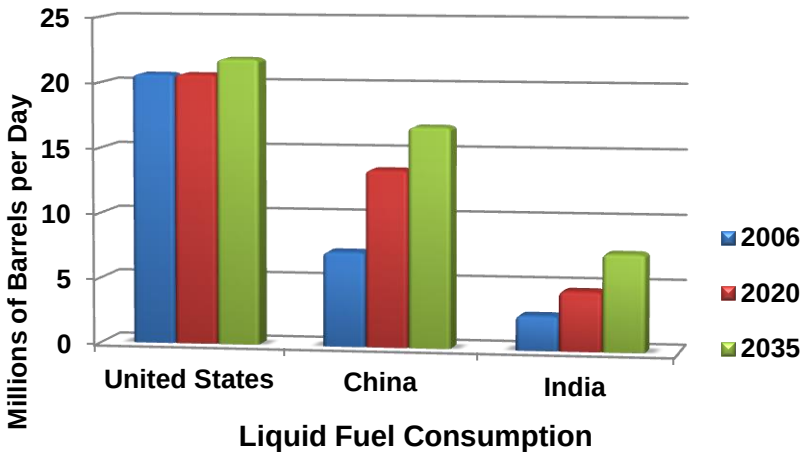
Finally, it is also possible that Iran could enjoy a "first mover advantage" in any economic warfare campaign. Many nations, including influential powers in Europe and especially Asia, depend on oil and gas exports from the Gulf. Most importantly, rising powers such as China and India will account for a significant portion of total global energy consumption over the next two decades (as much as 31 percent by 2035). China in particular is projected to see its demand for oil increase more than any other nation over this time period and, at present, much of its

	Oil as Percentage of Total Energy Consumption	Percentage of Oil Imported from Middle East
Japan	42	87
South Korea	45	75
India	24	63
China	19	47
Source: U.S. Energy Information Administration Country Factsheets		

[56] Anonymous Iranian official quoted in Thomas Erdbrink, "Iran Unlikely to Block Oil Shipments through Strait of Hormuz, Analysts Say," *Washington Post*, December 28, 2011. Ross quoted in Indira A.R. Lakshmanan, "Iranian 'Bluster' May Overstate Threat to Strait of Hormuz's Oil Shipping," *Bloomberg*, January 10, 2012.

imported petroleum comes from the Middle East.[57] Thus Beijing, New Delhi, and perhaps other nations might intervene diplomatically in the early stages of any conflict, for example by pressuring Iran, its neighbors, and the United States to accept a ceasefire.[58]

Because Tehran is likely to strike the first blow against regional economic targets (either to start a war or to retaliate for an attack on its nuclear program), it could inflict significant damage on neighboring economies and then offer to negotiate before Washington and its allies could execute a significant military reprisal. In short, Iran could exploit the international community's fear of a prolonged conflict and a lengthy disruption of oil and gas exports. Even if the United States and local partners dismissed Iran's "offer," they might still be constrained in their ability to retaliate by an international community concerned primarily with restoring the flow of resources, not punishing Tehran. Moreover, if Iran did manage to inflict heavy losses on its neighbors during a short war, it could actually emerge in an advantageous economic position over the long run.



Liquid Fuel Consumption
Source: EIA International Energy Outlook 2011

CONCLUSION

These Iranian advantages suggest that the threat of economic warfare is not only serious but plausible as well. Nevertheless, thanks to the significant disparity in resources that favors wealthy Gulf Arab nations as well as their shared interest with the United States in preventing Iranian regional hegemony, over the next two decades these countries could take steps not only to reduce this vulnerability, but to turn an existing liability into a potential advantage. The following chapter lays out the key elements of a strategy that could accomplish just that.

[57] U.S. Energy Information Administration, *International Energy Outlook 2011*, pp. 10, 29; and U.S. Energy Information Administration, "China," updated November 2010, available at http://www.eia.gov/EMEU/cabs/China/pdf.pdf.

[58] Wehrey et al., *Dangerous But Not Omnipotent*, p. 68.

CHAPTER THREE: A HEDGEHOGS STRATEGY FOR THE PERSIAN GULF

Given the continuing importance of the Persian Gulf Region and the evolving military competition between Iran and its neighbors, what strategic options are available to the United States? Can the Gulf Arab nations make a greater contribution to containing Iran over the coming decades and, if so, what specific measures could they take to deter or counter Iranian coercion? Finally, what division of labor should the United States pursue with its allies and security partners? The purpose of the following chapter is to address each of these questions. In brief, we argue below that the Gulf Arab nations have the potential to serve as more effective barriers to Iranian aggression, particularly if they emphasize measures that decrease their vulnerability to the threat of economic warfare. This might include, for example, the development of alternative oil and gas export routes that avoid the Strait of Hormuz; more robust active defenses for critical economic targets; and counter-air and counter-sea denial capabilities to defend commercial ships, offshore infrastructure, and coastal facilities. Importantly, while this strategic approach would be primarily defensive, enhanced resilience would also create a situation where Iran is asymmetrically vulnerable to the prospect of economic warfare. If so, the United States and the Gulf Arab allies would be in a much better position to impose costs on Tehran over the course of a long-term competition, and to deter Iranian aggression by the threat of punishment as well as the likelihood of denial.[59]

BUILDING PARTNER CAPACITY IN THE GULF REIGON

As noted in Chapter 1, Washington is already taking steps to enhance the military capabilities of its Gulf Arab partners in an effort to create more robust local bulwarks across Iran's western periphery. The United States, of course, has long been an important arms supplier for the GCC nations, and these nations have only demonstrated a growing interest in acquiring American military hardware over the past several years. In general, recent arms sales are encouraging insofar as they indicate a readiness on the United States' part to exploit its alliances and security partnerships, as well as a willingness on the part of local actors to prevent Iran from overturning the regional balance of power. Nevertheless, they also suggest that American policy toward the Persian Gulf may not be guided by a coherent strategy—or at least a strategy that adequately reflects the changing strategic environment.

Although some of the capabilities being acquired by the Gulf Arab nations might be quite useful for countering Iran, namely missile defense interceptors and ASuW helicopters, others seem far less relevant, to include armored vehicles and anti-armor weapons.[60] Even some of the highest profile—and most expensive—items being sold to the Gulf Arab nations have questionable utility in a long-term competition with Iran. For instance, the United States is equipping many of

[59] *Deterrence by punishment* involves the threat to retaliate in the aftermath of an attack. *Deterrence by denial* entails measures that will reduce the likely effectiveness of an attack.

[60] Recent arms sales notifications are listed on the Defense Security Cooperation Agency website available at http://www.dsca. mil/PressReleases/36-b/36b_index.htm.

its local partners with advanced combat aircraft such as the F-16 Block 60 that was recently acquired by the UAE as well as the F-15SA that will soon be acquired by Saudi Arabia, along with large numbers of precision-guided air-to-air and air-to-ground munitions. Ensuring that local partners have a robust ability to conduct strike operations could be a valuable contribution to deterrence—although it does appear to replicate an area where the United States enjoys a comparative advantage, and could also lead to significant complications during a conflict unless all sides have agreed to a clear division of labor regarding potential target sets. Yet bolstering allied capabilities for air defense and air superiority seems increasingly unnecessary given the advantage these nations already possess. As then Commander of U.S. Central Command General David Petraeus observed several years ago, the UAE's air force alone "can now take out Iran's air force."[61]

To a significant degree, then, recent arms sales to the Persian Gulf appear driven by symbolic considerations, namely Washington's hope that it can dissuade Iran from pursuing nuclear weapons and its related need to demonstrate a strong commitment to the security of the region. Although this is certainly understandable, it also enables local nations to purchase capabilities that may not be optimal for deterring and containing Iran, that are more prestigious than operationally relevant, or both.

COUNTERING IRANIAN ECONOMIC WARFARE

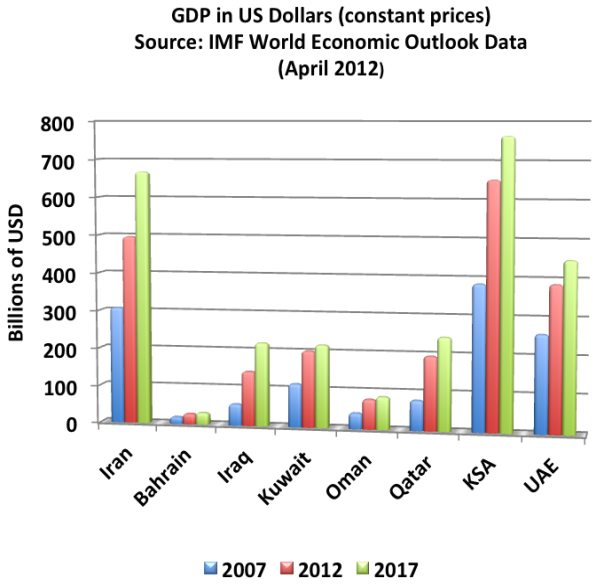
By contrast, an alternative approach to building partner capacity in the Persian Gulf region would encourage and enable the Gulf Arab nations to adopt measures that counter the most pressing threat over the long run, namely the prospect of an economic warfare campaign. This would, of course, present a number of challenges given the magnitude of the threat, the many advantages Iran presently enjoys relative to its neighbors in this area of the military competition, and the possibility that Iran might acquire the conventional precision-strike capabilities necessary to make such a campaign far more effective. Yet the Gulf Arab nations have crucial asymmetries in their favor that could be leveraged to improve their position substantially over the long run: the considerable resources at their disposal and their close ties to the United States.

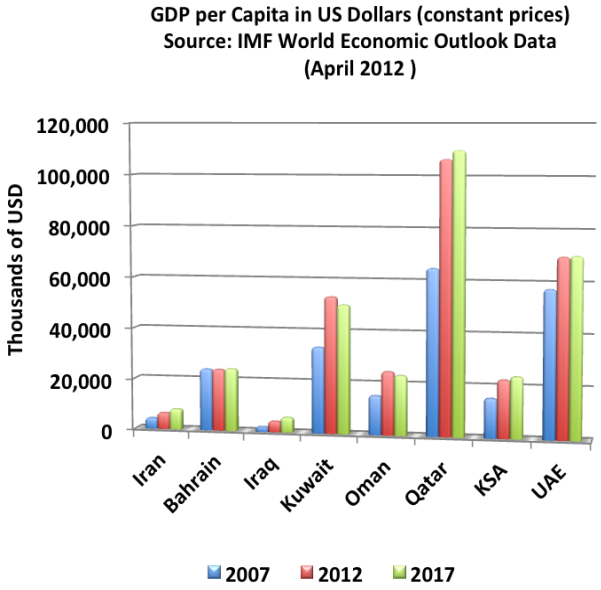
Gulf Arab Advantages

Despite its tremendous oil and gas reserves, Iran is not a wealthy nation. Although it has the second largest economy in the Gulf region (following Saudi Arabia), its population of nearly 75 million translates into the region's second smallest gross domestic product per capita (followed by war-torn Iraq). Perhaps even more revealing is the size of Iran's defense budget, which is comparable to that of the UAE (despite the fact that Iran fields over 500,000 active duty personnel whereas the UAE fields just over 50,000) and is dwarfed by Saudi Arabia (which spends nearly five times as much on its military than the Islamic Republic despite having a population only one-third of its size). Moreover, with the exception of Bahrain, defense spending

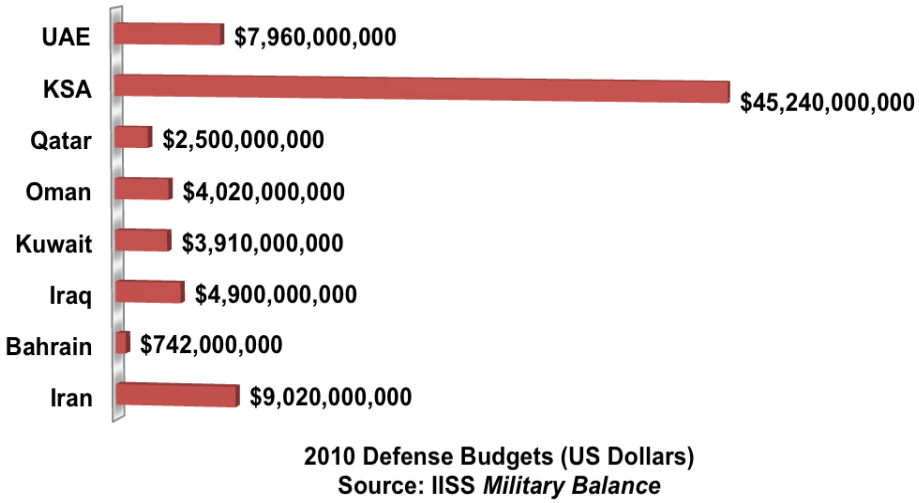
[61] Quoted in Vivienne Walt, "Rattled By Iran, Arab Regimes Draw Closer," *Time*, December 15, 2009. On the improved capabilities of the UAE's Air Force and Air Defense Force, see Tim Ripley, "Raising the Stakes: United Arab Emirates Air Force," *Jane's Defence Weekly*, November 14, 2007.

among the GCC states is expected to increase by another 14 percent between 2013 and 2016, presuming oil prices remain high.[62]





Over the next two decades, therefore, it may be possible for the Gulf Arab nations to fundamentally alter the economic warfare competition in the region, creating a situation where Iran is far more vulnerable than its neighbors. Put simply, these nations have the economic means to secure their civilian infrastructure and reduce their level of dependence on the Strait of Hormuz. By contrast, Iran is far less likely to have the financial resources needed to protect its economic infrastructure from attack, or to develop export methods that avoid this maritime chokepoint.



Just as important as this disparity in resources, the Gulf Arab nations also benefit from their relationship with the United States. Specifically, if Iran did attempt to reduce the vulnerability of its own economy, either by hardening its infrastructure or developing alternative pipeline

[62] "Briefing: Shifting Sands," *Jane's Defence Weekly*, April 20, 2012.

systems and shipping routes that bypass the Strait of Hormuz, the United States would remain capable of holding these targets at risk—either through airstrikes against fixed sites or maritime blockade operations in the Arabian Sea.[63]

Strategic Objectives

If the Gulf Arab nations enhance the resilience of their infrastructure and develop the ability to export a significant portion of their natural resources despite the prospect of economic warfare, then Tehran's own economic infrastructure and especially its continuing dependence on the Strait would become asymmetric vulnerabilities. If so, this would change the Persian Gulf strategic environment in two major ways. First and foremost, it would reduce the effectiveness of Iran's most potent non-nuclear threat—a development that could have enormous implications for Tehran's willingness to pursue nuclear weapons as well as its ability to use any nuclear arsenal it might develop to coerce its neighbors.

Iran's nuclear program and economic warfare are interrelated. At present, for example, Iranian civilian and military leaders consider their ability to blockade the Strait of Hormuz as the best way to deter an attack on the country's nuclear infrastructure, as evidenced by their repeated threats to close the Strait whenever tensions with the United States escalate. In short, *retaliatory economic warfare* is the shield that enables Tehran to defy the international community and continue its nuclear program without interruption. By contrast, if Iran does cross the nuclear threshold and no longer fears a direct attack, then this relationship could be reversed. Specifically, a nuclear-armed Iran could become far more willing to conduct (or threaten to conduct) economic warfare against its neighbors. It could, for instance, use the prospect of sabotage, bombardment, and/or blockade to pressure local nations into reducing their oil production levels, distancing themselves from the United States, or simply recognizing Iran as the dominant power in the region. Nuclear weapons would, therefore, be the shield that enables Tehran to pursue *offensive economic warfare* against the Gulf Arab nations as a coercive tool.

Enhanced economic resilience would therefore benefit Iran's neighbors (and the United States) in both cases. By reducing their vulnerability to economic warfare, these nations would make Iran's pursuit of nuclear weapons much more difficult. If Tehran cannot easily disrupt neighboring economies in retaliation for an attack on its nuclear program, then Washington's threat to launch an attack against that program would become far more credible. Likewise, reduced vulnerability to economic warfare would make a nuclear-armed Iran much less threatening, enabling the Gulf Arab to ignore its warnings of economic disruption and oppose its demands.

Second, greater economic resilience on the part of Iran's neighbors could enable the United States to divest itself of responsibility for patrolling the waters of the Persian Gulf, either in whole or in part. Moreover, it could also enable the United States to forgo efforts to immediately reopen the Strait of Hormuz in the event of an Iranian blockade. If so, then the United States

[63] These targets would not likely include desalination plants, given that Iran has few large facilities in comparison to its neighbors. This situation could change over time, however, given that Iran does face issues of water scarcity and recently began a $1 billion dollar project to desalinate water from the Caspian Sea for use in central Iran. "Iran Starts $1 Billion Dollar Project to Bring Water to Desert," *Al Arabiya* [Agence France-Presse], April 16, 2012.

would be in a position to reduce its peacetime military presence in the region (perhaps facilitating the redeployment of additional forces to other theaters, such as Northeast or Southeast Asia), and to prioritize other missions during a conflict (to include holding at risk economic targets that might compel Iran to concede more quickly).

Not surprisingly, Tehran's persistent threat to commercial shipping imposes significant costs on the United States, and would likely impose major constraints on American military operations should a war occur. For example, at any given time the U.S. Navy maintains an aircraft carrier strike group, an expeditionary strike group, four minesweeping ships, and various support ships in the Persian Gulf region, stationed at Naval Support Activity Bahrain.[64] As tensions between the United States and Iran have increased over the past several months (and in particular as the European Union's embargo on Iranian oil exports has gone into effect), Washington has deployed additional forces to the Gulf region, including a second aircraft carrier, another four minesweepers, rotary-wing MCM platforms, and a newly converted amphibious transport ship that can serve as a staging platform for MCM operations and perhaps also special operations forces. Moreover, the United States has deployed two squadrons of F-15 combat aircraft and an unknown number of F-22 combat aircraft to the region in a clear show of force, along with additional missile defense units.[65]

So long as global markets depend on energy resources that must travel through the Strait, Iran has the ability to impede those exports, and the United States is the only nation capable of guaranteeing freedom of navigation in the Gulf, Washington will have to maintain a significant military presence in the region—and may have to periodically expand that presence when threats become more urgent. Yet the need to deploy and sustain additional carriers, surface combatants, MCM assets, and strike aircraft will almost certainly limit the United States' ability to "pivot" its defense posture to the Asia-Pacific, given that many of these capabilities could also prove useful for preserving the balance of power in that region.

The United States would face even more significant constraints during wartime. To meet its obligations as guarantor of the maritime commons, to ensure that the global economy does not suffer a prolonged crisis, and to dampen opposition among major powers that depend on imported oil and gas, the United States would almost certainly have to protect shipping in the Gulf—to include reopening the Strait of Hormuz and keeping this vital waterway open

[64] In addition to playing a key role in countering Iranian threats to commercial shipping, American surface combatants would also be counted on to intercept ballistic missiles launched against Gulf Arab nations—to include missiles targeting critical economic infrastructure.

[65] David S. Cloud, "U.S. Boosts its Military Presence in Persian Gulf," *Los Angeles Times*, January 12, 2012; Tim Ripley, "Analysis: US Air Power Poised for Confrontation with Iran," *Jane's Defence Weekly*, April 5, 2012; Thom Shanker, Eric Schmitt and David E. Sanger, "U.S. Adds Forces in Persian Gulf, A Signal to Iran," *New York Times*, July 3, 2012; David S. Cloud, "U.S. Moving Dozens of Underwater Crafts to Persian Gulf," *Los Angeles Times*, July 11, 2012; and Adam Entous and Julian E. Barnes, "Pentagon Bulks up Defenses in the Gulf," *Wall Street Journal*, July 17, 2012. With the exception of six B-1B bombers located at al Udeid in Qatar and a squadron of F-16s that recently relocated from Iraq to Kuwait, all American land-based, fixed wing aircraft forward deployed in the Persian Gulf region are reconnaissance, refueling, battle management, maritime patrol, and transport platforms.

throughout the duration of any campaign against Iran. Given the variety of methods Iran has developed to threaten shipping, doing so could be difficult, risky, and resource-intensive. For instance, these efforts would likely entail sweeping for mines, escorting convoys, conducting anti-surface and anti-submarine warfare operations, and suppressing coastal ASCM batteries. The latter mission, in turn, might require the Joint Force to conduct an opposed theater entry, using both regular and special operations forces to occupy Iranian controlled islands in the Gulf as well as key pieces of territory along its coast. Should an economic campaign include ballistic missile attacks against fixed infrastructure, the United States might also be compelled to employ strike assets to hunt down mobile launchers along with naval surface combatants to help defend key targets in allied nations.[66] Collectively, these missions would place the United States in a reactive position, limit its freedom of action, play to Iranian strengths, and perhaps contribute to a prolonged conflict—even if the United States should eventually prevail.

In the end, if the Gulf Arab nations were less vulnerable to economic warfare and the United States were less constrained by the need to deter and combat this particular threat, both sides would be in a much more favorable position relative to Iran in any long-term competition. Rather than suffering from their own asymmetric vulnerability, the Gulf nations could create an asymmetric vulnerability for Iran, one that Washington would be better positioned to exploit thanks to its newfound freedom of maneuver. In peacetime, this could compel Iran to take steps that heavily tax its limited resources. It could, for instance, field new offensive strike capabilities with greater range and accuracy to hold at risk export routes that bypass the nearby Strait of Hormuz and to overcome more robust defenses that guard its opponents' economic infrastructure. In addition, it might take steps to better protect its own economy, to include hardening key facilities and searching for alternative methods of exporting its oil and gas. During wartime, moreover, Iran could lose many of the advantages it would likely enjoy today: local opponents that are highly vulnerable, a United States that is preoccupied with operations that do not directly threaten the regime or the nation as a whole, and an international community that is quick to demand a cessation of hostilities because energy exports are not reaching global markets.

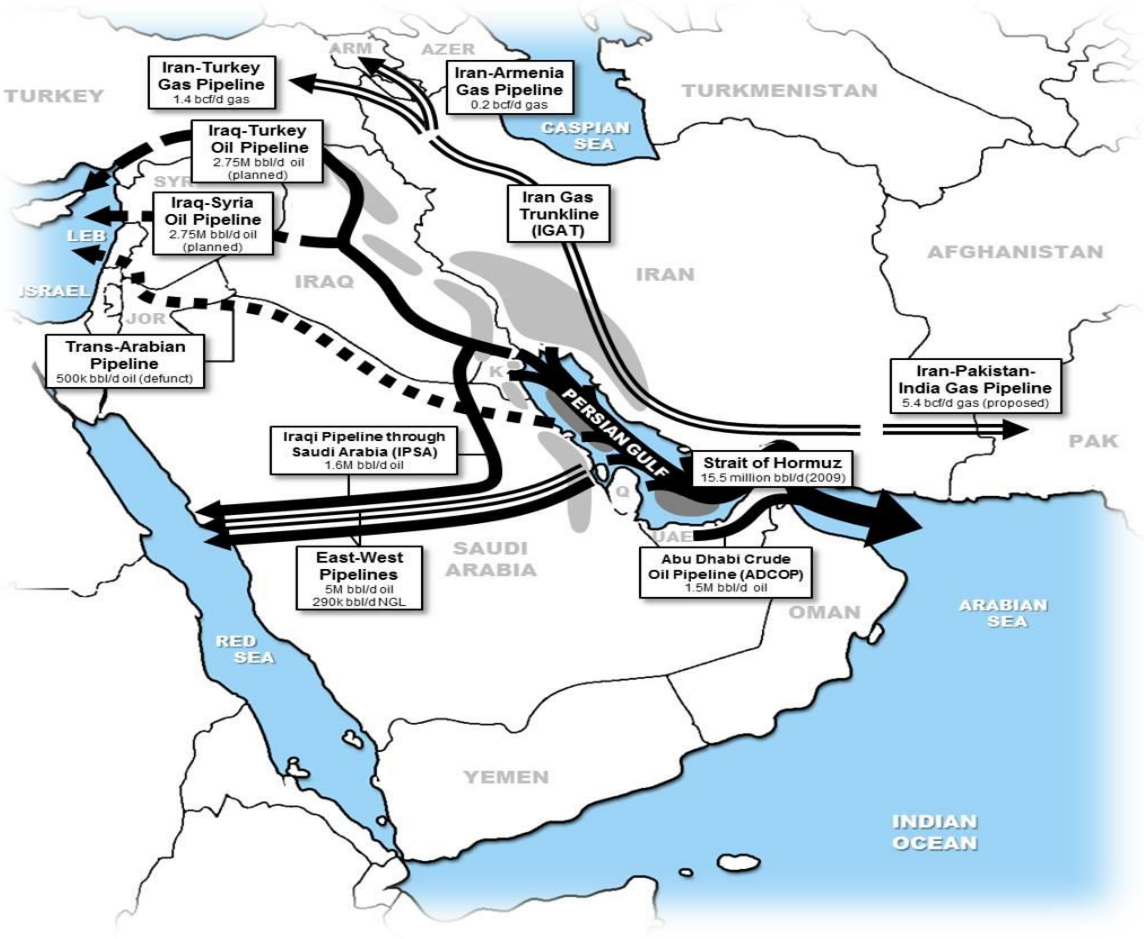
KEY ELEMENTS OF A GULF HEDGEHOGS STRATEGY

For the Gulf Arab nations, a strategy that attempts to achieve the objectives outlined above would be characterized by three distinct lines operation: finding alternative supply lines that would allow these states to export their energy resources without relying on the Strait of Hormuz; enhancing the security of critical fixed infrastructure from sabotage or bombardment with improved active defenses; and countering Iran's sea-denial capabilities in order to protect coastal and offshore infrastructure, defend commercial shipping, and, if necessary, to hold Iran's own exports at risk. Each of these dimensions would have important implications for allied investments, their military capability requirements, and for the characteristics of American material support.

[66] See, for example, the discussion in Mark Gunzinger with Chris Dougherty, *Outside-In: Operating from Range to Defeat Iran's Anti-Access and Area Denial Threats* (Washington, DC: Center for Strategic and Budgetary Assessments, 2011).

Developing Alternatives to Hormuz

Perhaps the most important step that the Gulf Arab nations could take to reduce their vulnerability to economic warfare over the long term would be to establish alternative methods of exporting oil and gas that do not require transiting the Strait of Hormuz. In general, the prospect of an Iranian blockade is arguably the most worrisome threat to its neighbors and to the United States, for several reasons. Unlike the dangers of sabotage and bombardment, which are only likely to materialize in the future, Tehran is *already* capable of closing the Strait for at least a short period of time. Even a relatively ineffective blockade could have a major impact on the global economy given that supply disruptions and increased insurance rates could lead to dramatically higher energy prices, and any Iranian campaign in the waters of the Gulf would likely result in an American military intervention, one that could quickly escalate if U.S. forces are attacked during mine-clearing or escort operations. By avoiding Hormuz, the Gulf Arab nations would not only remove one of Tehran's most dangerous coercive options, they could also undermine its most effective deterrent.



At present, it is not possible for the region's energy producers to bypass the Gulf entirely and use alternative export routes for the estimated 17 million barrels of oil per day (bbl/d) that transit the Strait on their way to markets abroad. Nevertheless, a number of small but important steps have already been taken that could help to mitigate the Iranian threat to commercial shipping.

Saudi Arabia, for example, already has a pipeline running from the Abqaiq stabilization plant near its eastern oilfields to the port of Yanbu on the Red Sea coast, a distance of roughly 750 miles. This "Petroline," which was built to supply markets in North America and Europe, actually is composed of two parallel pipelines that have a total capacity of nearly 5 million bbl/d of crude oil. Given that demand for Middle Eastern oil is highest in Asia, however, the smaller of these two pipelines (which can accommodate approximately 2 million bbl/d) was converted to carry natural gas several years ago, while the larger pipeline (which has a capacity of 3 million bbl/d) is only used to move 2 million bbl/d to Yanbu.

Recently, however, Riyadh has taken steps to increase the amount of oil it can transport to its Red Sea coast. Reports indicate that it has converted the smaller Petroline pipeline to once again carry crude oil rather than gas. In addition, it has apparently refurbished another extant pipeline, the 1.65 million bbl/d Iraq Pipeline in Saudi Arabia (IPSA), which runs from eastern Saudi Arabia to a storage facility just south of Yanbu. Built by Saddam Hussein during the 1980s, this pipeline was intended to provide Baghdad with an export route that bypassed the Persian Gulf as the Iranian threat to commercial ships in the Gulf increased. Nevertheless, it fell into disuse after the Iraqi invasion of Kuwait and was later confiscated by Saudi Arabia as partial recompense for Iraq's unpaid wartime debts. Although the IPSA has not been used for more than two decades, Riyadh has been conducting tests to demonstrate its viability. Together, these measures could theoretically allow Saudi Arabia to pump 6.5 million bbl/d to the Red Sea—a significant portion of its daily output but still well short of the 7.5 million bbl/d it currently exports abroad.

Even more impressive than Saudi Arabia's plans to utilize its existing infrastructure are the UAE's efforts to put new, more secure infrastructure in place. Over the past several years the Emirates have been building the Abu Dhabi Crude Oil Pipeline (ADCOP), which runs from Abu Dhabi's oil fields to a terminal in Fujairah along the Gulf of Oman. The project, which cost $3.29 billion and was recently completed after several years of delays, will enable the UAE to ship 1.5 million bbl/d to world markets. This capacity is also expected to increase to 1.8 million bbl/d over time, which would account for more than 75 percent of the country's daily crude oil exports. The UAE is also expanding its infrastructure at the Fujairah terminal to accommodate the ADCOP, to include greater oil storage capacity and more berths for tankers.

For its part, Iraq currently has an aging pipeline that is capable of transporting 1.5 million bbl/d north to a Turkish export terminal in the eastern Mediterranean (although it only uses approximately a third of this capacity at present). Baghdad hopes to eventually increase its capacity by an additional 1 million bbl/d. Unfortunately, the pipeline is in poor shape due to years of neglect and repeated attacks by insurgents since 2003. It is unclear when it might be able to return to full capacity, let alone when it might be possible to increase the amount of oil that can be shipped to Turkey. There are also early-stage plans to build several pipelines connecting Iraq's northern oil fields to the Syrian port of Banias, with a potential capacity of some 2.5 million bbl/d, although it is unclear whether these plans will come to fruition given the instability currently consuming Syria.[67]

[67] Kadhim Ajrash, "Iran, Syria Agree to Build Cross-Border Oil, Gas Pipelines, Officials Say," *Bloomberg*, September 16, 2010; Sara Hamdan, "Pipeline Avoids Strait of Hormuz," *New York Times*, January 11, 2012; "Few Export Options for Gulf Oil States," *United Press International*, January 19, 2012; "Tiny Emirate Could Save Gulf

In addition to these efforts by American allies and security partners, even Iran is planning to build a new export terminal along the Arabian Sea coast that would avoid the Strait of Hormuz, along with new pipelines to connect the facility to its oil fields—developments that will impose significant costs on Iran and will create additional targets that could easily be held at risk by the United States during a conflict.[68] It appears, therefore, that a competition is already underway in the region to increase economic resilience and reduce dependence on the Strait. What more could be done by the Gulf Arab nations to improve their position in this competition?

First, for relatively little cost it might be possible to increase significantly the capacity of existing pipelines by adding chemical drag reduction agents (DRAs) that can increase the speed at which oil travels through them, thus expanding throughput. In the case of Saudi Arabia's east-west pipelines, the use of DRAs would require some added infrastructure, including injectors to introduce the DRA directly into the pipelines, added horsepower at pumping stations to propel the larger quantity of oil through the pipeline, and stockpiles of DRA located near injectors, as well as increased oil storage capacity and additional tanker berths at Yanbu. According to one estimate, the cost of increasing capacity in the Petroline and IPSA to a combined 11 million bbl/d would by approximately $600 million. Taking into account these costs and the five additional days at sea that would be required to transport oil from Yanbu to Asian markets, the price of oil would increase by only $1 per barrel.[69] Even if this estimate is quite low, this still appears to be a reasonable and cost-effective way to reduce dependence on the Strait of Hormuz.

Should the option of using DRA's prove insufficient, unreliable, or both, more conventional (and significantly more resource-intensive) options would include the development of additional pipelines (along with additional infrastructure such as oil storage facilities at terminals) that would enable the Gulf nations to export their oil and gas in the event of a blockade. If new pipelines are a viable option, the key question is where they should be built: in Saudi Arabia to the Red Sea, through northern Iraq to the Eastern Mediterranean, across the UAE and Oman to the Arabian Sea, or some combination of the above. Given the persistent instability that characterizes much of Iraq, the likelihood that Arabian Sea ports could grow more vulnerable over time as Iran's ballistic missile arsenal becomes more accurate, and the presence of existing infrastructure in Saudi Arabia that could potentially be expanded, building up the Red Sea as the

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Oil Exports," *United Press International*, June 13, 2012; "Emirates, Saudis Pump Oil to Bypass Hormuz," *United Press International*, June 28, 2012; Amena Bakr and Daniel Fineren, "Exclusive: Saudi Readies Oil Line to Counter Iran Hormuz Threat," *Reuters*, June 28, 2012; Javier Blas, "Pipelines Bypassing Hormuz Open," *Financial Times*, July 15, 2012; and U.S. Energy Information Administration, "The Strait of Hormuz is The World's Most Important Oil Transit Chokepoint," January 4, 2012, available at http://www.eia.gov/todayinenergy/ detail.cfm?id=4430.

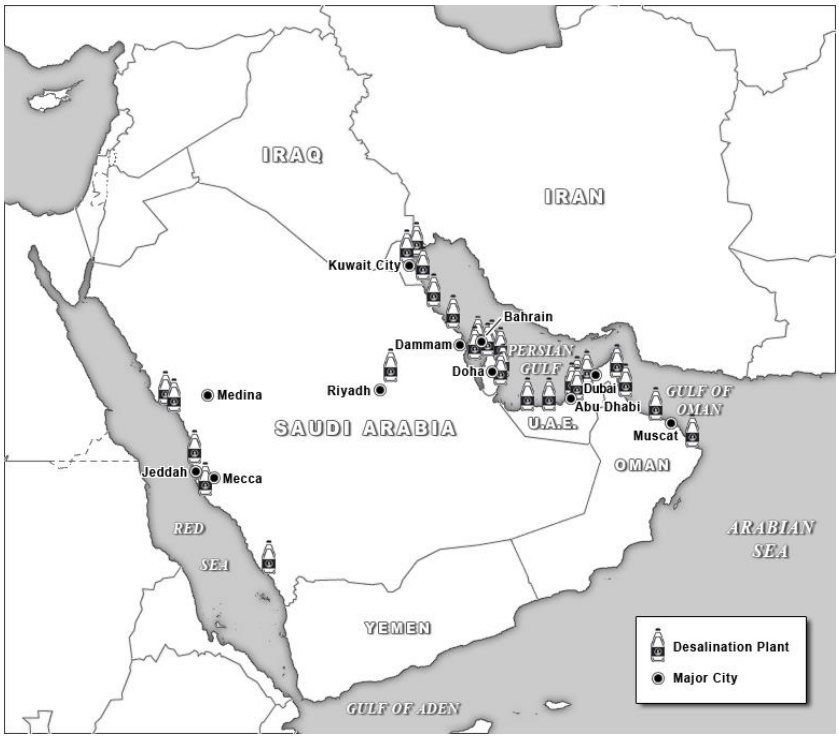
[68] "Battered Iran Seeks New Oil Export Route," *United Press International*, June 7, 2012.

[69] Webster M. Ewell, Dagobert L. Brito and John Noer, "An Alternative Pipeline Strategy in the Perisan Gulf," Paper Sponsored by the James A. Baker III Institute for Public Policy, the Center for International Political Economy, and the Office of the Secretary of Defense, 2000. According to a more recent update to this analysis, the costs of DRAs and the associated infrastructure have increased over the past decade, but corresponding improvements in DRAs suggests that output through the Petroline and IPSA could be increased by as much as 20 percent beyond the initial 11 million bbl/d estimate. Dagobert L. Brito, *Revisiting Alternatives to the Strait of Hormuz* (Houston, TX: James A. Baker II Institute for Public Policy, January 26, 2012).

key outlet for the region's oil and gas exports could be the best option despite the added cost this would place on shipments to Asia.[70]

What is most important, however, is the critical role of Saudi Arabia. As the region's largest oil exporter and, thanks to its reserve production capacity, the key "swing state" that can help to compensate for supply disruptions to other Gulf nations, ensuring that Riyadh's oil can get to market is crucial to deterring or withstanding an Iranian blockade. Moreover, any alternative export routes that bypass Hormuz must be able to accommodate more than the 7.5 million bbl/d that Saudi Arabia currently sends abroad. The Saudis should have sufficient capacity to handle any additional production that might occur during a crisis, given their consistent willingness to increase production levels to keep energy prices stable during crises or periods of heightened tensions.[71]

Fielding Counter-Sea-Denial Capabilities



Although investments in civilian infrastructure could play a crucial role in deterring or, if necessary, weathering an Iranian economic warfare campaign, the Gulf Arab states simply cannot avoid the threat posed by Tehran's various sea-denial capabilities for several reasons. First, it is unlikely that local nations will ever be in a position to completely substitute alternative export routes for the Strait of Hormuz given the high costs of additional pipelines and terminals; even if they aspired to this goal, it would take many years before the bulk of the region's oil exports could reach markets abroad via the Red Sea, Arabian Sea, and Eastern Mediterranean. Second, due to the nature of global energy

[70] It is difficult to estimate the cost of additional pipelines, although a rough estimate suggests that another 1.5 or 2.0 million bbl/d pipeline across Saudi Arabia to the Red Sea would cost between $6-11 billion. As a low-end estimate, the IPSA pipeline that began construction in 1983 cost $2.7 billion at the time, which amounts to approximately $6.2 billion today when adjusted for inflation. At the higher end, the UAE's recently completed ADCOP pipeline cost $3.29 billion, but only runs 230 miles. Using cost per mile, the price for a 750-mile pipeline across Saudi Arabia with the same diameter (and thus the same capacity) would come to roughly $10.7 billion.

[71] Given its large oil reserves and ambitious production goals over the next decade, Iraq could perhaps emerge as a near-peer to Saudi Arabia in oil production levels, if internal stability prevailed and if Baghdad could develop sufficient export capacity to get more oil to market. "Lots of Black Stuff," *Economist*, June 16, 2012.

markets, any export alternatives that bypassed Hormuz would not likely be utilized to their full capacity until after a crisis or conflict began; even then, adjusting the flow of oil and rerouting shipments would take time to fully implement. In sum, there would still be a need to defend commercial shipping in the Gulf from attack or interdiction, particularly at the start of a war but perhaps throughout an entire campaign.

In addition, most of the Gulf Arab nations have considerable offshore energy infrastructure that would need to be defended from sea-based threats, such as small boats and FACs armed with guided munitions. This would include, for example, Iraq's export terminals in the northern Gulf, as well as the pipelines and platforms used to exploit Qatar's massive undersea gas deposits, among other potential targets. Even if this infrastructure was not being used during a conflict because of the threat environment, heavy damage could prevent the Gulf Arab nations from returning to normal production levels and resuming previous export routes in the aftermath of a war. Finally, many nations also have civilian infrastructure located along their coastline that could be vulnerable to attacks from the air and the sea, in particular the many desalination plants that provide a significant portion of the region's potable water.

Given these threats, what steps could the Gulf Arab nations take and what capabilities might be required?

- ***Rolling Back Iranian Air Defenses.*** Perhaps the most effective way to defend against the variety of Iranian sea-denial threats would be to first gain control of the airspace over the Persian Gulf, which would give local nations the freedom to employ fixed- and rotary-wing assets to suppress land-based ASCM batteries, hunt for mines, and conduct ASuW operations. Using a combination of surveillance aircraft, satellites, and possibly special operations forces to locate and designate surface-to-air missile batteries and radars, Gulf Arab nations could conduct a destruction of enemy air defense campaign against key targets located along Iran's coast or on the islands Tehran controls in the Gulf. At the same time, allied air forces would also clear the skies of any maritime patrol aircraft and unmanned aerial vehicles (UAVs) that could be used to locate and track friendly ships at sea as well as enemy fighters that attempt to launch attacks on shipping, offshore infrastructure, or coastal facilities.

- ***Suppressing Land-Based ASCMs.*** With air superiority over the Gulf achieved, local allies would be in a position establish persistent aerial surveillance orbits over the Iranian coast, for example by using high-endurance, unmanned ISR platforms like Global Hawk. These systems, along with special operations forces, could be used to locate mobile ASCM batteries, which would then be targeted from the air. In addition, surface-to-surface tactical ballistic missiles and rocket artillery could potentially be used for counter-battery fire against ASCM batteries that are detected after launching their missiles against surface ships.

- ***Countering Enemy Naval Forces.*** Simultaneously, local allies could launch attacks against Iranian naval bases along the Gulf coast, as well as any ships or submarines that might be leaving port, using a combination of strike aircraft and land-based rocket and missile systems. Allied air forces could also use rotary-wing assets to conduct ASuW operations against Iranian small boats and FACs. Rather than patrol open waters, these airborne ASuW

assets would concentrate in the vicinity of potential offshore and coastal targets. Finally, local navies equipped with larger vessels could escort commercial ships as they transit the Gulf.

Undoubtedly, much of the responsibility for these efforts would fall to Saudi Arabia and the UAE, which stand out among other Gulf Arab nations for the size and the effectiveness of their militaries respectively. Saudi Arabia, for example, has been "the region's geo-political counterweight to Iran," since the fall of Saddam Hussein, and possesses "some of the most advanced equipment in the region."[72] For its part, the UAE has been engaged in a significant military buildup over the past decade. As a result, its "military capabilities are second to none in the region," while the country has emerged as a "lynchpin of U.S. strategy to defend the Gulf."[73] Both nations have the Gulf region's most capable air forces (and the most capable air forces in the broader Middle East, with the exception of Israel), which are only likely to improve as Saudi Arabia acquires new F-15s from the United States and the UAE replaces its aging Mirage 2000s with either the Dassault *Rafale* or the Eurofigther *Typhoon*.[74]

Moreover, both nations are upgrading their naval capabilities, with Abu Dhabi already procuring the *Baynunah*-class corvette from France and Riyadh in discussions to purchase a variant of Lockheed Martin's *Freedom*-class Littoral Combat Ship.[75] If these vessels were equipped with unmanned rotary-wing platforms like the U.S. Navy's Fire Scout, they would help efforts to field an effective capability against the small boat threat, enhancing their ability to engage in escort operations.

Infrastructure Defense

Finally, Gulf Arab nations would also need to take additional steps to protect their economic infrastructure from ballistic missile attacks and attempted sabotage by proxies equipped with G-RAMM capabilities such as guided mortars—a threat will only become more pressing if these nations build the additional infrastructure necessary to reduce their dependence on the Strait of Hormuz. In general, efforts to defend against the prospect of bombardment and sabotage should continue to prioritize high-value targets such as ports, oil stabilization plants, and desalination facilities; there is simply no easy way to guard thousands of miles of pipelines, although ensuring that the material necessary to repair them quickly is prepositioned and available in sufficient quantities will be crucial. Among these high-value targets, moreover, priority should be given to defending those facilities that are not only most valuable, but also most susceptible to damage and difficult to repair or replace.

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[72] "The Gulf Security Architecture: Partnership with the Gulf Cooperation Council," Majority Staff Report Prepared for the Committee on Foreign Relations of the United States Senate, June 19, 2012, p. 10.

[73] Ibid., p. 17; and Kenneth Katzman, "The United Arab Emirates (UAE): Issues for U.S. Policy," Congressional Research Service, December 23, 2011, p. 12.

[74] Pierre Tran, "UAE Also Eyeing Typhoon in Combat Aircraft Competition," *Defense News,* November 13, 2011.

[75] Kate Tringham, ""Briefing: Building New Capabilities," *Jane's Defence Weekly*, March 9, 2012.

What specific steps should be taken? Many nations in the region have already acquired (and are continuing to purchase) ballistic missile defense systems such as Patriot and THAAD. Although these systems could be a useful deterrent to attack, they have significant drawbacks, namely their high cost. Given that Iranian ballistic missiles are highly inaccurate at present, overinvesting in active defenses may not be operationally necessary. Moreover, if and when Iran is able to field a large arsenal of highly accurate missiles, relying on these defenses may not be cost-effective. Unfortunately, the prospect that Iran could mate a nuclear warhead to a ballistic missile, even an inaccurate one, and the inability to discriminate between nuclear and non-nuclear warheads, suggest that the Gulf Arab nations will continue acquiring these systems to deter Iranian nuclear blackmail—at least until other alternatives become available.

One near-term option that could supplement existing ground-based defenses is the air-launched hit-to-kill (ALHTK) program, which combines the F-15 C/D with the PAC-3 interceptor to shoot down ballistic missiles in either their boost phase or terminal phase.[76] Saudi Arabia, for instance, is not only home to many of the region's most high-value economic targets, but will soon acquire more than eighty new F-15s with advanced electronically scanned array (AESA) radars in addition to upgrading its existing inventory of F-15s. Equipped with PAC-3 missiles, these aircraft could establish combat air patrols (CAPs) in the vicinity of likely targets. Although the acquisition costs of ALHTK would likely be less expensive than ground based defenses (given that nations would only acquire PAC-3 missiles rather than missiles, batteries, radars, and fire control systems), the operating costs of maintaining persistent CAPs would likely outweigh ground-based alternative. As a result, ALHTK might best be employed as a complement to ground-based defenses that could be mobilized to protect extremely high-value targets during a crisis.

Over the long term, however, the best option to counter the ballistic missile threat remains directed-energy defenses, which offer the prospect of dramatically lower cost-per-shot relative to kinetic interceptors, as well as magazines that are limited only by the availability of an adequate power source. Given their tremendous wealth, it might be desirable for nations like Saudi Arabia and the UAE to contribute funding toward American research and development efforts—which could potentially spur the maturation of directed-energy technologies—in exchange for preferential arrangements in future arms sales.

Directed-energy defenses could also play an important role in countering the G-RAMM threat. In the meantime, however, it would be advisable for the Gulf Arab nations to consider defending key facilities with existing systems. For example, the Centurion platform is a land-based version of the U.S. Navy's Phalanx Close-In Weapon System, which could be used as a last-ditch point defense for infrastructure that might be subject to G-RAMM attack. Finally, although it may not always be possible to intercept G-RAMM attacks, it may be possible to neutralize saboteurs immediately after they strike. With a combination of UAVs conducting aerial surveillance and attack helicopters on call, Gulf Arab nations could establish localized hunter-killer teams in the vicinity critical facilities, detecting launches and conducting counter-strikes.

[76] Martin Sieff, "BMD Watch: F-15s May Air-Launch PAC-3s," *United Press International*, January 17, 2007; and Stephen Trimble, "Lockheed Proposes Funding for Air-Launched Patriot Missile," *Flight Global*, April 7, 2009.

CONCLUSION

Collectively, these measures could place the Gulf Arab nations in a far more favorable position than Iran over the coming decades. That is, whereas U.S. allies and partners would be able to weather an economic warfare campaign, Tehran could be compelled to invest significant resources to protect its own infrastructure and supply lines, yet these targets would still remain vulnerable to attack by the United States. Under these conditions, moreover, Washington would be able to divest itself of responsibility for patrolling the waters of the Gulf and ensuring that the Strait of Hormuz remains open, which would in turn allow it to concentrate its forces in other theaters during peacetime and focus on coercing Iran (rather than just defending against Iranian threats) during wartime.

Of course, the United States would in all likelihood still conduct some operations in the Gulf region during a conflict with Iran, in particular operations where it can be expected to retain a significant comparative advantage over its local allies. For example, Washington might engage in undersea ASuW operations to defend offshore infrastructure and commercial shipping from Iranian submarines and mini-submarines. In addition, if Tehran is able to field a highly effective, ground-based air defense system that covers its coast as well as the Gulf, the United States might also have to take a leading role in the initial stages of an air campaign by employing low-observable surveillance and strike platforms to attrite Iranian radars and mobile missile batteries, thus creating a more permissive air environment that allows allied forces to engage in ASuW and ASCM suppression operations more effectively. Nevertheless, the demands on the United States would still be far less than they are today or would be in the future absent these measures by its partners in the region.

CONCLUSION

Despite a growing focus on the Asia-Pacific region as China evolves into a near-peer competitor, the United States will continue to have enduring economic and security interests in the Persian Gulf, namely to ensure that no single actor is able to restrict outside access to the region's energy resources. Achieving this objective could become far more difficult, however, as Iran develops a range of coercive tools to threaten its neighbors and hold at risk forward-deployed American military forces, and as Washington enters a protracted era of fiscal austerity. Under these conditions, how can the United States achieve its longstanding objectives in the region and prevent Iran from emerging as a dominant local power? One strategic alternative that would exploit a key U.S. competitive advantage (namely Washington's broad network of allies and security partners) as well as the changing strategic environment (in particular the proliferation of precision-guided weapons) is to build "hedgehogs," or more robust local counterweights to Iranian military power.

ECONOMIC WARFARE AND ECONOMIC RESILIENCE

Over the next 15-20 years one of the most significant Iranian threat to the region is likely to be that of economic warfare. That is, Tehran might seek to weaken its neighbors by targeting the resources, infrastructure, and sea lines of communication that underpin local economies. It could do so, moreover, by employing a variety of means, including efforts to sabotage pipelines, ports, or critical facilities; launching air and missile attacks against fixed economic targets; and attempting to disrupt maritime traffic in the Gulf, and especially in the Strait of Hormuz.

Although these threats exist today, each one could become far more serious in the future if Iran acquires more advanced conventional military capabilities. For example, proxy forces equipped with advanced conventional munitions—in particular man-portable or easily transportable weapons with extended ranges and high levels of accuracy—could conduct attacks against a wide range of targets and inflict considerable damage on those targets. As a result, proxy warfare could be transformed from a modest component into a central element of a broader economic warfare campaign. At the same time, while Iran's existing ballistic missiles are unable to reliably hit point targets at present, the introduction of accurate guidance systems would enable Tehran to hold at risk critical civilian infrastructure throughout the region. Lastly, the acquisition of supersonic ASCMs, sophisticated surface-to-air missile systems, ballistic missiles capable of targeting ships at sea, and remotely controlled "smart mines" would significantly increase the difficulty of overcoming an Iranian maritime blockade.

Given the nature of the Iranian threat, a hedgehogs strategy for the Persian Gulf would seek to reduce the vulnerability of Gulf Arab nations to economic warfare. This would include establishing alternative methods of exporting oil and gas that do not require transiting the Strait of Hormuz, acquiring counter-air and counter-sea denial capabilities to guard any remaining commercial ships that must use the Gulf and protect any offshore and coastal infrastructure that is susceptible to attack from the air or the sea, and continuing to invest in active defenses to guard critical facilities from ballistic missile strikes or sabotage by G-RAMM-equipped proxies. Ultimately, enhanced resilience would create a situation where Iran is asymmetrically vulnerable

to the prospect of economic warfare. If so, the United States and the Gulf Arab allies would be in a much better position to impose costs on Tehran over the course of a long-term competition, to deter Iranian aggression, and to conduct a coercive campaign against Iran in the event of a war.

IMPLEMENTING THE STRATEGY AND MANAGING ALLIANCES

Despite the potential appeal of the hedgehogs strategy described above, an important question is whether the Gulf Arab nations would be willing participants. In particular, would they be content to adopt a defensively oriented approach to counterbalancing Iran, or would they resist sacrificing the ability to conduct offensive operations against their chief adversary?

When considering this issue, it is critical to note that a hedgehogs strategy would *not* require the Gulf Arab states to forgo an independent retaliatory capability generally or the ability to hold at risk sensitive Iranian targets such as economic infrastructure and sea lines of communication specifically. For instance, counter air- and sea-denial capabilities could easily be used to interdict Iranian commercial shipping—if Tehran attempted to regulate maritime traffic in the Persian Gulf rather than simply disrupt all shipping in the region. Likewise, ground-attack aircraft and munitions useful for targeting ground-based air defenses and ASCM batteries along Iran's coast could also be used to launch strikes against Iranian oil infrastructure due to the relatively small size of the theater, as well as the considerable range of aircraft already in the inventory of some nations.[77]

Ultimately, while a successful hedgehogs strategy would benefit from close coordination between Washington and its local partners, including a clear division of labor for offensive and defensive combat operations during a war, local allies would still retain an independent coercive capability. Of course, this has both benefits and drawbacks. On the one hand, it should encourage the Gulf Arab states to adopt this strategy because, by doing so, they would not significantly increase their dependence on the United States during a crisis or conflict. In fact, quite the opposite situation would obtain. On the other hand, a hedgehogs strategy would not obviate the inherent alliance dilemma that American partners often have the ability to instigate or escalate a conflict despite Washington's objections.

AREAS FOR FUTURE RESEARCH

The analysis in this report suggests several potential avenues for future research, of which three in particular stand out.

First, what are the prospects for increased inter-Arab security cooperation, in particular on issues such as integrated air- and missile-defense systems? Although the United States has been bolstering missile defenses in the Persian Gulf region, to include deploying additional American military units as well as increasing arms sales to local nations, so far the latter effort has been

[77] The UAE's block 60 F-16s, for instance, have a combat radius of more than 1000 miles thanks to a new engine and conformal fuel tanks. "The UAE's F-16 Block 60 Desert Falcon Fleet," *Defense Industry Daily*, November 30, 2011.

conducted almost entirely on a bilateral basis.[78] While an integrated regional network of radars and interceptors located across multiple countries has the potential to be far more effective, it also raises a number of complex and potentially contentious issues, including the nature of command-and-control arrangements, the extent of intelligence-sharing required, and how to prioritize the defense of potential targets. The question, then, is whether these issues are surmountable and, if so, how.

Second, how might China impact the stability of the Persian Gulf region as well as the viability of a hedgehogs strategy over the timeframe of this assessment? Beijing arguably has conflicting incentives: while it could benefit strategically from continuing to bolster Iran's conventional military capabilities (by making it more difficult for the United States to withdraw its forces from the region and perhaps shift them to the Asia-Pacific), it also stands to lose from a local conflict (which could disrupt the oil exports on which its economy depends). A worrisome possibility, and one that merits further exploration, is that China could actually play both sides of the Iranian-Gulf Arab rivalry to its benefit. It could, for example, remain a major supplier of weapons to Iran, increasing the threat to its neighbors and forward-deployed U.S. forces, while simultaneously taking steps to increase the resilience of the Gulf Arab nations. Notably, it was a Chinese state-owned oil company that was hired to construct the UAE's new ADCOP pipeline. If local nations were willing to make a significant investment in additional civilian infrastructure to bypass the Strait of Hormuz, then, the PRC could very likely be used to build that infrastructure—potentially enabling Beijing to extend its influence in the region.

Finally, although they are often addressed separately, American military strategy and force posture in the Western Pacific and the Persian Gulf are obviously interrelated. An important issue, therefore, is how different options in one theater could have second-order effects in another. In the case of the Western Pacific, for example, there is currently a debate under way over the relative merits of the AirSea Battle operational concept and an alternative approach to counterbalancing China that places greater emphasis on employing a distant maritime blockade in the event of a crisis or conflict.[79] An important question, therefore, is how these two alternatives would impact the desirability and feasibility of a hedgehogs strategy in the Persian Gulf. That is, would one option make it more difficult to sustain the United States' current military presence in the Gulf region—potentially making hedgehogs even more useful? Is one approach more flexible than the other, enabling the United States to shift forces between theaters in the event of a local war? Ultimately, considering the virtues of alternative strategies in a more holistic manner could be a useful way to adjudicate between them, or to determine the appropriate balance between them.

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[78] Thom Shanker, "U.S. and Gulf Allies Pursue a Missile Shield Against Iranian Attack," *New York Times*, August 9, 2012.

[79] See, for example, Jan van Tol with Mark Gunzinger, Andrew Krepinevich, and Jim Thomas, *AirSea Battle: A Point of Departure Operational Concept* (Washington, DC: Center for Strategic and Budgetary Assessments, 2010); T.X. Hammes, "Offshore Control: A Proposed Strategy for an Unlikely Conflict," *NDU Strategic Forum*, June 2012; and Jeffrey E. Kline and Wayne P. Hughes, Jr., "Between Peace and the Air-Sea Battle: A War at Sea Strategy," *Naval War College Review*, 65, No. 4, Autumn 2012. Of course, these two options can be considered complementary rather than mutually exclusive, but most analysts place greater emphasis on one or the other.