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The Fourth Gulf War: Persian Gulf Oil and Global Security

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The Fourth Gulf War: Persian Gulf Oil and Global Security*

ABSTRACT

This paper reviews the evolution of the global oil market from the mid 20th century onwards. We analyze the unique “target price” framework brokered by the U.S. and Saudi Arabia in the mid 1980s. Over the 19 years of its life, this framework had been responsible for providing the world with a steady supply of oil at reasonable prices. However, stability in the global oil market was gained at the cost of a lingering political instability in the southern Persian Gulf, an instability that was made apparent with the Iraqi invasions of Iran and Kuwait, and the U.S. war and democratization effort in Iraq. The enormous magnitude of oil wealth in the Persian Gulf region has created a significant problem in terms of international policy and security. We conclude the paper by analyzing three possible roads to the future – laissez faire, an American system, and a multinational security framework.

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I. Introduction

Dominion in the Persian Gulf,¹ and alliance with its governments has been a bulwark of American strategy, a means to guarantee Europe, Asia, and the U.S. access to the extensive and reliable oil production in this region. But a greater objective is a framework that deters military appropriation of Gulf oil wealth, reduces the growing possibility of nuclear weapons use in the region, and addresses the intertwined nature of regional governance and the growth of terrorism directed against Gulf governments and the U.S. The ongoing effort of Operation Iraqi Freedom to create a democratic government there has both illuminated and obscured a larger, more dangerous problem: the international political framework that reliably produced a steady supply of oil at acceptable prices is increasingly unstable.

Since the historical relationships between the Gulf states, the British, the Americans, and the Russians have strongly influenced the development of petroleum production in the region, we begin our paper there. The next section analyzes the recent (1986-2003) framework for price stability and reliable oil production and its linkage to military policy. The third section is a partial review of military policy in the Gulf. The fourth section points to the slowly growing fragility of the allied Persian Gulf governments that have supported the long-term price and supply framework. The emergence of Al Qaeda and similar jihadist groups is placed in this context.

The following section reviews the status of crude oil resource estimates, globally and in the Persian Gulf. It includes a brief overview of the status of crude oil substitutes such as coal methanol and hybrid electric vehicles. The sixth section addresses the

¹ Also known as the Arabian Gulf.

question of the economic importance of petroleum to the U.S. and world economies; it also evaluates the magnitude of oil wealth in the region.

The final section ties together the preceding parts: pre-independence history, the stable pricing framework, the changing roles of Persian Gulf governments and Al Qaeda-type groups, the remaining crude oil and substitute resource estimates, the macroeconomic importance of petroleum, and the value of Persian Gulf oil. It raises new questions for analysis: Is there a political-military cycle that is eroding the prior framework? Is American primacy sufficient to control or deter local or regional attacks against Gulf nations and their oil resources? What is the significance of the expanding nuclear weapons capability in the region? Do the perspectives of realism and democratic liberalism give opposing answers?

II. The Legacy of Oil, History, and Security

From the late 19th century onwards, Western countries, including Russia, managed oil concessions throughout the Persian Gulf region. In the years following World War I Britain and France created national borders in this region so that the bulk of the regions oil came under the production control of Western oil companies. The expansion of British Petroleum (BP)² in the early years of the last century was facilitated by the existence of the prior system of British mandates and protectorates. By 1950 American companies had become major players, and other European companies also participated in joint production agreements with governments throughout the Gulf. Oil

² Now known as BP, the company began as the Anglo Persian Oil Company. Later known as the British Petroleum Company, its acquisition of Prudhoe Bay resources initiated its role as a leading American oil company.

concessions were typical of resource production agreements of that era throughout the world.³ The managing company held near-sovereignty in the area of its concession. The production company managed police, customs, education, health, employment, oil production, and revenue collection either wholly or in part. A production company typically consisted of several partners. In 1971 in Iran, for example, BP held 40%, and seven other American and European countries shared 55%⁴.

While the southern Gulf countries -- Saudi Arabia, Kuwait, Oman, Bahrain, United Arab Emirates, Qatar⁵ -- have remained more or less stable following their independence from colonial rulers, and their ruling families generally experienced no (or manageable) domestic opposition through the 1980s,⁶ the two northern Gulf countries have experienced considerable external influence. While the role of the U.S. and U.K. in Iraq and Iran is well known, the Soviet Union long sought influence in both countries. There were short-lived Soviet republics in northern Iran in 1921 and following World War II, and in the late 1940s, Iran's prime minister proposed a joint Russian-Iranian oil company, although nothing came of the proposal.⁷

³ In earlier work, Stephen Krasner reviewed American overseas production of petroleum and other industrial resources, and analyzed the interaction of corporate interests from a statist (or realist) perspective; *Defending the National Interest: Raw Materials Investments and U.S. Foreign Policy* (Princeton NJ: Princeton University Press, 1978). See especially Chapter 1, ("A Statist Approach to the Study of Foreign Policy"), and the material on Middle East and Indonesian oil in Chapters 4, 6, and 7. Krasner reports that in 1943 the Roosevelt Administration sought unsuccessfully to purchase Socal and Texaco concessions in Saudi Arabia and Bahrein.

⁴ Another 5% was divided amongst other companies.

⁵ The six nations constitute the Gulf Coordination Council.

⁶ Daniel Byman and Jerrold Green ("The Enigma of Political Stability in the Persian Gulf Monarchies," *Middle East Review of International Affairs*, 3(3), September 1999) report that Iran unsuccessfully encouraged opposition to the Saudi, Bahraini, and Kuwaiti governments in the last 20 years.

⁷ See Duane Chapman, *Energy Resources and Energy Corporations* (Ithaca, NY: Cornell University Press, 1983), pages 83-86; a brief summary.

In Iraq, the British-installed Faisal monarchy was overthrown in 1958 by the army with communist support. The Soviet Union became a major weapons supplier to Iraq, and continued in this role after the Ba'ath Socialist Party seized power in 1968.⁸ Thus, before 1979, Western governments and oil companies had been involved in “regime change,” both in the management of oil concessions, and in successful efforts to thwart the Soviet Union in its goals in the region.

But the establishment of the Saddam Hussein dictatorship in 1979 initiated a new era in Persian Gulf relations: for the first time, one of the eight Persian Gulf oil producers attacked the oil facilities of a neighboring country. This first Gulf war, began with Iraq's invasion of Iran in 1980, is believed to have resulted in a million fatalities⁹ while leaving the border between the two countries unchanged. Iraq's strategy, as faulty as it turned out to be, had been based in part on the perception of disorganization in Iran following the departure of the Shah and the establishment of the Islamic Republic of Iran and the Khomeini government.¹⁰

1990 saw Iraq attempt a second seizure of a major Gulf oil producer with its invasion of Kuwait.¹¹ It is easy to speculate that the ease of that conquest led the Iraqi

⁸ It is alleged that the US-CIA provided minor support to the Ba'ath Party in its coup. See Roger Morris, “A Tyrant in the Making,” *NYT (New York Times)*, March 14, 2003.

⁹ Stephen C. Pelletiere and Douglas V. Johnson II, *Lessons Learned: The Iraq-Iran War* (Marine Corps. Combat Development Command, 10 December 1990), page 118; quoting Anthony Cordesman, *The Lessons of Modern War: The Iraq-Iran War* (Boulder: Westview Press, 1990).

¹⁰ Of course the interests of the UK and US governments in Iranian politics and oil policies are well known; e.g., Steven Kinzer, *All the Shah's Men* (Hoboken, NJ: Wiley, 2003); Kermit Roosevelt, *Countercoup: the Struggle for Control of Iran* (New York City: McGraw-Hill, 1979); Kenneth M. Pollack, *The Persian Puzzle: The Conflict between Iran and America* (New York City: Random House, 2004).

¹¹ In its efforts to justify both the Kuwait and Iran attacks, Iraq raised border issues. We do not think there are substantive issues here: the primary objective in each invasion was oil producing areas. See Daniel Yergin, *The Prize: The Epic Quest for Oil, Money, and Power* (New York City: Simon and Schuster,

government to consider the possibility of establishing an occupation in Saudi Arabia, or perhaps converting that country into a state dependent on Iraq. If successful in all of its military aims, Iraq would have established hegemony throughout the Gulf, and controlled 76% of proved reserves and 54% of estimated remaining global oil resources.¹² The independence of the remaining four producers south of Saudi Arabia would have been nominal at best.

Of course, the U.S.-led U.N. coalition forcibly removed Iraqi military forces from Kuwait in 1991. For the next 12 years the U.S., and to a lesser extent the U.N. Security Council, used military power to constrain Iraqi foreign relations. The U.N. managed oil exports, the U.S. and the U.K. enforced “no fly zones” in the north and south of the country, and international weapons inspectors sought to eliminate Iraqi programs in nuclear, chemical, and biological weapons.¹³

While the political and military history of the last two decades of the 20th century focused on thwarting Iraq’s ambitions for dominance, a new approach to the problem of reliable oil supply and satisfactory oil prices was established during the same period.

III. The Good Old Days: Price Stability and Reliable Production, 1986-2003

American and European oil companies had managed production in the Persian Gulf much the same way as in Texas or the North Sea: the production companies determined output levels, wellhead values, shipping, destination, and labor policy and

1992), pages 524, 707, and 772 for brief summary of these border points. Also Jill Crystal, *Oil and Politics in the Gulf: Rulers and Merchants in Kuwait and Qatar* (New York City: Cambridge University Press, 1990).

¹² See Appendix Table A-1 in this paper.

¹³ Hans Blix, *Disarming Iraq* (New York City: Random House, 2004).

security. However, the 1973 Arab-Israeli war created a surge of antagonism in the Arab world against the U.S. and Europe. The OPEC nations, led by Saudi Arabia, seized the authority to control oil production within their countries. Their efforts to raise oil prices were initially successful. Oil prices reached nearly \$40 per barrel in the early 1980s, but collapsed by 1986 with crude prices at \$10 per barrel.

According to Daniel Yergin, in April 1986 then-Vice President George H. Bush went to the Persian Gulf and worked with the Saudi King and government to stabilize oil prices at a higher level.¹⁴ This is perhaps a controversial assertion and merits some further discussion. With very low oil prices, American producers are affected in three ways. First, they lose market share to low-cost producers. Second, low prices that have fallen below production costs require reductions in drilling, as well as the shutting down of unprofitable wells. Third, U.S. producers receive less revenue and profit from wells that continue producing. All of these factors combined in 1986 to create strong incentives for American producers to support efforts by the U.S. government to raise oil prices. At the same time, from a national perspective, these economic factors were accelerating growth of imported oil into the country, increasing oil consumption, and raising the question of continued U.S. security support for Persian Gulf governments. This latter point on the linkage between American security support and the need for an acceptable minimum on oil prices was noted in widely different locations: Oklahoma City and New York City.¹⁵ Understandably, Vice-President Bush, with his background

¹⁴ Yergin explains this in his *The Prize, op. cit.* pages 755-764. Incidentally, he was awarded the Pulitzer Prize in general non-fiction in 1992 for this work.

¹⁵ See "Oil Prices Rebound after Sharp Plunge," *Journal Record*, Oklahoma City, April 2, 1986; and "Bush to Seek Saudis' Assistance in Stabilizing Plunging Oil Prices," *NYT* April 2, 1986.

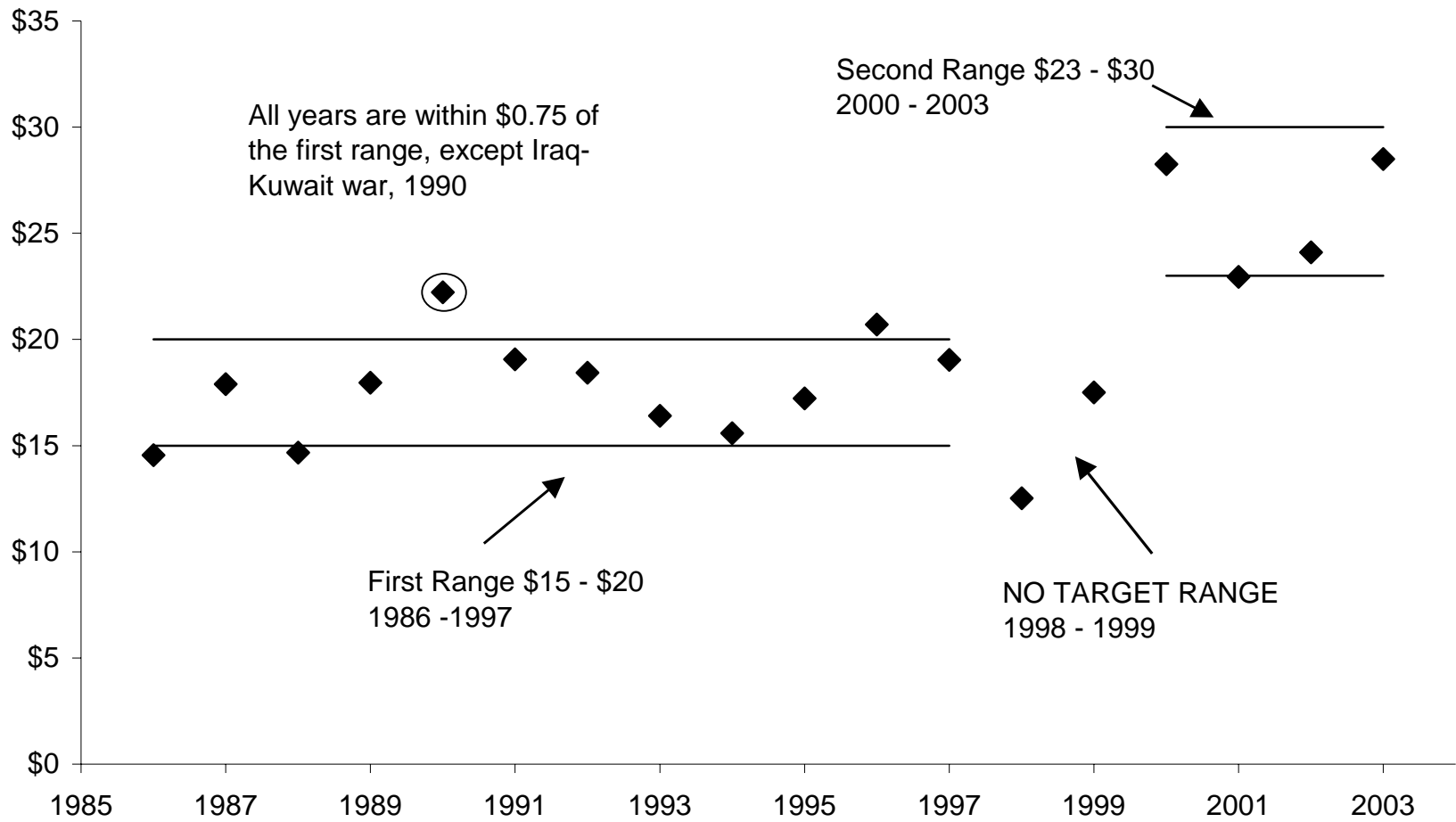
as an oil man and with political support from the industry,¹⁶ sought to resolve the problem.

The price range framework that was created in 1986 is essentially the price structure that existed through 2003: see Figure 1. The OPEC countries, principally Saudi Arabia, managed production so as to maintain crude prices within the target range. The first price range of \$15-\$20 per barrel had a 12 year life. Its collapse in 1998 was influenced by the economic recession in Asia in that year, the 300% increase in Iraq's oil output between 1996 and 1998, and the inflation-reduced value of revenues generated under the old price range. The new price range of \$23-\$30 per barrel was established in 2000; it is equivalent to the old range adjusted for inflation. The system as a whole (i.e., both price range periods) was remarkably successful. In its 16 years of effective life,¹⁷ only one year lies more than 75 cents beyond the target range. In that year, 1990, Iraq's invasion of Kuwait increased the average crude price to \$22 per barrel.

¹⁶ As examples of this political support, see *Houston Chronicle* April 16, 1986, "Bush PAC Reports \$1.4 Million Raised;" the article discusses his support in the oil business, and his comments criticizing low oil prices as he was about to leave for Saudi Arabia. In "Cheap Oil Stirring Clamor for Relief in the Southwest" (*NYT* April 15, 1986), wide criticism of the low crude price by Republican supporters is noted.

¹⁷ 1986-1997 and 2000-2003. Although the 1999 value is within the first range, we do not include this in our count of successes for the price range system. In 1999, the first price range was inoperable, and the second had yet to be firmly established.

Figure 1: Target Price Ranges, Old and New



Persian Gulf production costs are \$5 per barrel or less (see following section VI). Why, then, did the Gulf countries not pursue a low-price policy that would have increased their sales, market share, and perhaps their revenues? The explanation of Persian Gulf policy lies in the economic effect of low oil prices on American oil producers noted earlier. When prices are low, the normally slow rate of production decline in the U.S. is accelerated as high-cost facilities are shut down and drilling plummets. American oil producers' revenues are affected twice: first by reduced production, and second by a lower price. As discussed, with very low prices, American oil companies will not encourage the U.S. government to support the existing allied Persian Gulf governments, and they move to influence American policy to raise prices, as in 1986 and again in 1998.

In contrast, in the era before 2004, a period of very high oil prices created a political environment in which American consumers and oil-using businesses dominated American policy. Congressmen from states without oil production called for termination or reduction of military support for Persian Gulf governments.¹⁸ In summary: American policy considered withdrawing military and political support of the Gulf governments at either extreme of the price spectrum.

The Gulf governments understood these reactions, and the potential threat to their security if prices were outside the target range. Appendix Table A-2 summarizes several of the political, economic, and military factors that worked to keep prices within the price range. It is a system that economists describe as a Nash equilibrium.¹⁹ Neither side can

¹⁸ See, for example, the positions taken by Congressmen from consuming states in the high-price period in 2000: *NYT* 2000 March 2, 19, 23, and 29.

¹⁹ After the Nobel prize winner John Nash, who pioneered game theory concepts.

improve its overall situation by working to move crude prices outside the target price range.

The price range framework now seems to be disintegrating because of two major problems: the confusing military and political situation in Iraq and Saudi Arabia is affecting the coordination necessary for the effective management of production and prices within the framework, and demand for crude oil has grown more rapidly than expected. (We return to this subject later.)

IV. Military Policy

In response to the first two Gulf wars initiated by Iraq against Iran and Kuwait, other Persian Gulf governments undertook major military expansion in the 1990s. Weapons acquisitions programs relied primarily on purchases from the U.S. (45%) and the U.K. (29%).²⁰ In just over half a decade between 1994 and 1999, total Persian Gulf weapons imports were \$153 billion (current dollars). Saudi Arabia led the Gulf nations, spending \$103 billion in purchases of conventional weapons.

While these purchases enhanced, to some degree, the ability of Saudi Arabia and other Gulf nations to deter direct aggression, they also had other benefits. In Gulf countries, the brokers who coordinated the purchases received considerable compensation, and these brokers supported the stable price/supply framework.²¹ In the U.S., U.K., and France, the weapons exporters also supported the role of military policy

²⁰ See Neha Khanna and Duane Chapman, "Weapons Trade and Petroleum Price Stability: Are Measures of Political and Economic Openness and Income Important?" Binghamton University, Department of Economics, Working Paper WP 0408, 2004, Table 3. Presented at the Western Economics Association International 79th Annual Conference, Vancouver, British Columbia.

²¹ Anonymous; former U.S. ambassador to a country in the region.

in the stable price/supply framework. As a result, a strong association between weapons and oil trade has emerged. The world's major oil exporters (i.e., the Persian Gulf countries) are also significant weapons importers, and the primary source of these weapons are the principal oil importing countries in the West, most significantly the U.S. and the U.K.²²

U.S. military policy did and continues to have a second, more significant source of strength in addition to the arms sales programs. After the second Gulf war, the U.S. increased its use of major bases, prepositioned material, and naval forces in the region. The strategic goal has been to protect the security of Persian Gulf oil and its availability to the global economy. The means to this goal have been (a) to contain or change Gulf governments hostile to the U.S., and (b) to support the allied Persian Gulf governments that are friendly to the U.S.²³

This two-part military policy (American power in the Persian Gulf; weapons trade) linked to reliable oil supply and pricing seems to have operated with limited linkage to the nuclear weapons policies of states in the broader region. Consider the broad region from Egypt and Israel east to Afghanistan, and from Turkey and Pakistan south to Yemen: we might term this area the "PMSA" region, including the Persian Gulf, and parts of the Middle East and South Asia.²⁴ For academic purposes, these areas and

²² Khanna and Chapman, *op cit*. The strong relationship between weapons and petroleum trade is essentially unaffected by national or per capita income, political openness, economic freedom, or income inequality.

²³ Andrew Rathmell, Theodore Karasik, and David Gompert, "A New Persian Gulf Security System," Issue Paper, RAND, Santa Monica, CA, 2003.

²⁴ Specifically, the 8 Persian Gulf states, Yemen, Egypt, Israel, Jordan, Syria, Turkey, Pakistan, and Afghanistan. It might be argued that Somalia, Chechnya, and perhaps some other areas are tied to the political affairs of the PMSA region.

the countries in them have been considered as separable and perhaps distinct. U.S. military policy, in contrast, has viewed the region as more of a single entity. The ad-hoc “PMSA” region just described is (almost) wholly within the area of responsibility of a single Unified Combatant Command, the Central Command. The two exceptions, Israel and Turkey, are in the European Command presumably because of military and political factors.

Two of these PMSA nations, Israel and Pakistan, possess nuclear weapons. With American forces on ten of its borders, it is easy for Iran’s theocratic leaders to argue for the acquisition of nuclear weapons. Obviously, Iranian nuclear weapons capable of use against Persian Gulf oil facilities or against U.S. forces change the calculus of possible Western military action against that government. Less obviously, nuclear weapons would strengthen the religious leadership in their internal conflict with reform and democratization. In open elections the mullahs would today be defeated, and nuclear weapons are seen as a barrier against internal opposition as much as against the U.S.²⁵ While American policy in Iraq has strengthened the pro-nuclear groups in Iran, it is unclear if American policy by itself can reverse this incentive. It is equally unclear whether military action by Israel against Iranian nuclear facilities would increase or reduce the possibility of nuclear weapons use in the region.

In Pakistan, the commercial black-market for nuclear material sales has become well-known. Before its closure by President Musharraf (with major contributions by U.

²⁵ See for example “Iranians Unite over Nuclear Row,” BBC News, October 21, 2004. Writing in 1994, Etel Solingen argued that Iran’s centralized economy and political system favored nuclear weapons development. Solingen quotes then-Vice President Sayed Ayatollah Moharjerani : “We, the Muslims, must cooperate to produce an atomic bomb, regardless of UN efforts to prevent proliferation.” Etel Solingen, “The Political Economy of Nuclear Restraint,” *International Security* 19(2): 126-169. Solingen develops a conceptual argument that economic liberalization and democratization build the context for nuclear nonproliferation.

S. intelligence) the A. J. Khan network sold nuclear weapons blueprints, centrifuge equipment, and raw uranium.²⁶

Less well known are individual ties to Al Qaeda by Pakistani nuclear weapons scientists prior to the 9/11 attack.²⁷ It would seem a likely possibility that Al Qaeda-type groups would seek to work again with a government in Pakistan dominated by fundamentalist Islamic organizations. In this case, Pakistani nuclear weapons could be targeted against Persian Gulf oil facilities or the Straits of Hormuz, or against American and British military forces. While actual use of Pakistani nuclear weapons is unlikely, it is a scenario with a slowly increasing probability.

V. The Fragility of Persian Gulf Governments and the Importance of the Petroleum Framework

All eight of the Persian Gulf governments were monarchies through the 1940s, and their economies became increasingly dependent upon oil exports. Exports went primarily to Western Europe and the U.S. British Petroleum and American and other European oil companies managed production. Foreign policy and defense were strongly

²⁶ See the *NYT*: “A Tale of Proliferation: How Pakistani Built His Network” (February 12, 2004), and “Pakistani’s Nuclear Earnings: \$100 Million” (March 16, 2004). Also *Christian Science Monitor*, “New Nuclear Threat: Stateless Rogues” (March 19, 2004), and *Wall Street Journal*, “Pakistan Targets Nuclear Scientists for Selling Secrets” (January 26, 2004).

²⁷ Two nuclear scientists, both retired from the Pakistan’s Atomic Energy Commission, met with Osama bin Laden in August 2001. According to both men, they were discussing educational funding with bin Laden (*NYT* December 17, 2001 and March 3, 2002).

influenced or managed by the U.K. This picture wobbled occasionally (most notably during World War II) but generally prevailed from World War I until the 1950s.

The emergence of American primacy as the guarantor of the security framework in the Persian Gulf has coincided with the slow growth of opposition to this framework. In the northern Persian Gulf, Iran is governed by a theocracy that dominates the military and security forces, opposed by a weak, reformist, elected civil opposition. The situation in Iraq continues to evolve: a democratic Iraq, a new dictatorship friendly to the U.S., an Islamic government, and civil war all seem possible.²⁸ In the six countries of the southern Persian Gulf, family monarchies continue to govern. The Al Saud rule in Saudi Arabia seems to face the greatest internal opposition. In terms of foreign policy, all of the southern governments have formal defense agreements with the U.S., U.K., or France, and all host American military bases.

In the remaining five monarchies, stability continues. Qatar, for example, hosts both Al-Jazeera television and U.S. military forces. Cornell University has established a medical school there. The al-Thani family has faced greater problems from royal divisions than from other opposition. Prince Hamad bin Khalifa Al Thani's government is promoting increased democratization with a new constitution that envisions election of two-thirds of the Majlis.

However, the five stable monarchies hold only 23% of the Gulf's remaining 1.54 trillion barrels of remaining oil resources, as shown in Appendix Table A-1. The three governments with the greatest remaining oil resources (Saudi Arabia, Iran, Iraq) face the greatest internal division. In 2004, attacks undertaken against oil production facilities

²⁸ Royal Institute of International Affairs, Chatham House, "Iraq in Transition: Vortex or Transition?" Middle East Programme Briefing Paper 04/02, September 2004.

and personnel in Saudi Arabia and Iraq²⁹ have created a “risk premium” of \$10-15 per barrel in world oil markets. These attacks reflect the long-standing hostility of Al Qaeda and Osama bin Laden towards American and Western oil interests. From bin Laden in early 2004:³⁰

“The occupation of Iraq is a link in the Zionist-crusader chain of evil. Then comes the full occupation of the rest of the Gulf states to set the stage for controlling and dominating the world. For the big powers believe the Gulf and the Gulf states are the key to controlling the world due to the presence of the largest oil reserves there.”

Later in the year, another Al Qaeda leader claimed credit for a May 2004 attack on a Saudi Arabian compound housing oil company personnel. Abdel Aziz al-Muqrin asserted:³¹

“Our heroic fighters were able, by the grace of God, to raid the locations of the occupying American oil companies ... which are plundering Muslims’ resources. [The Saudi government is] supplying the United States with oil, according to their master’s wish, so that their economy does not collapse.”

Notwithstanding the minor impact on Persian Gulf oil exports, the attacks in Saudi Arabia and Iraq created considerable political uncertainty. Figure 2 is a representation of the cycle of violence arising from the Persian Gulf security framework. At levels one and two, an autocratic government supported by the U.S. reduces the

²⁹ “Al Qaeda Targets U.S. Oil Supplies,” *Christian Science Monitor* (CSM), June 1, 2004. “Oil Related Terrorism Mounts,” JINSA Online, June 24, 2004. The Institute for the Analysis of Global Security (IAGS) records 6 attacks in Saudi Arabia against oil company and military personnel in 2003 and early 2004. IAGS records 118 sabotage attacks against Iraq petroleum facilities and personnel in 21 months. See www.iags.org.

³⁰ BBC News Online – UK Edition, translated transcript of audiotape said to be of Osama bin Laden on 4 January 2004, page 1. Also see CNN March 1997 interview with Osama bin Laden, especially transcript pages 1, 2, and 5.

³¹ CSM, June 1, 2004, *op cit*.

strength of secular opposition. Civil dissent and criticism are marginalized and rendered ineffective. Then (level 3) jihadist organizations fill the space of opposition to the autocracy. In Saudi Arabia, this was followed by the Al Qaeda attacks in the U.S. on September 11, 2001, and by the recent attacks against Westerners in Saudi Arabia.^{32,33} This, in turn, was followed by U.S. military action against Al Qaeda and its allies in Afghanistan and elsewhere.³⁴

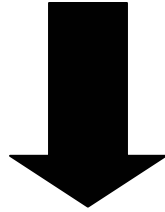
³² Kenneth M. Pollack persuasively delineates the nature of what we term stages 1, 2, and 3 in pages 7-9 of "Securing the Gulf," *Foreign Affairs*, 82(4), July/August 2003.

³³ It is interesting to note that considerable informative discussion on the linkage of oil, American security policy, authoritarian governments, and jihadism has been undertaken by military analysts. For example, Brent Talbot, "Mailed Fist or Velvet Glove? Approaches to Deterrence in the Middle East," USAFA, Colorado Springs CO, 2004, especially page 11, Diagram 1. Jeffrey Record, "Bounding the Global War on Terrorism," Strategic Studies Institute (SSI), Army War College, Dec. 2003, page 25. Raymond A. Millen, "Strategic Ends in the Middle East," SSI, July 6 2004, page 1. Andrew Rathmell, Theodore Karasik, and David Gompert, "A New Persian Gulf Security System," RAND, Santa Monica CA, 2003

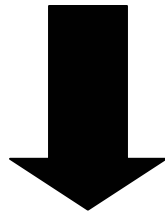
³⁴ This point is covered by Chaim Kaufman, pages 16-19 and pages 30-32, "Threat Inflation and the Marketplace of Ideas," *International Security*, 29(1), Summer 2004, pages 5-48.

Figure 2. A Cycle of Violence

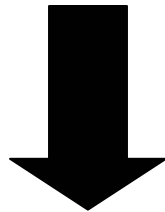
1. Autocratic Governments



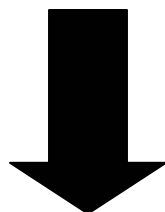
2. Marginalize Dissent



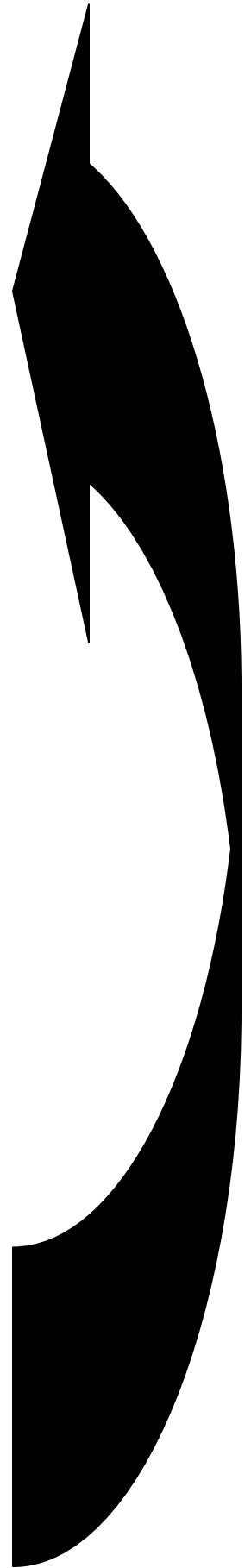
3. Al Qaeda Grows



4. AQ Attacks → U.S.



5. U.S. Military Actions
-Against Al Qaeda
-U.S. Support For



U.S./Saudi relations were particularly difficult in 2004 and U.S. support for the Saudi monarchy was more ambiguous than usual. This cycle has not been directly applicable to Iran since the monarchy there, and the other five Persian Gulf monarchies have generally been outside the process, at least to the present.³⁵ Nevertheless, we anticipate much greater difficulties in the future than exist now. However, before addressing these future problems and their possible resolution, we summarize global and regional crude oil estimates in the next section.

VI. Global Oil Resources and the Persian Gulf; Future Substitutes

The U.S. Geological Survey has been evaluating global oil resources for more than 20 years. It uses three basic concepts to categorize remaining oil resources:³⁶

- Proved Reserves – Economically recoverable conventional crude oil at known fields and reservoirs. Similar to an inventory concept used to schedule production (883 billion barrels).
- Potential Reserve Expansion – Identified reserves expected to be developed in existing fields, including the addition of new reservoirs and pools (682 billion barrels).
- Undiscovered Resources – Geological extrapolation of potential crude oil based upon knowledge of geological formations outside existing fields (1,290 billion barrels)³⁷.

³⁵ It should be noted that Oman, Qatar, UAE, Bahrein, and Kuwait have various forms of limited electoral democracy, although throughout the southern Gulf immigrant Shia residents are generally excluded from citizenship. Speculatively, perhaps 40% of the residents of these 5 countries are in this category. Iranian intelligence has periodically attempted to exert political influence with these groups.

³⁶ See Chapman, “Conceptual Definitions of Oil Resources,” Table 9.2 in *Environmental Economics: Theory, Application, and Policy* (Reading MA: Addison Wesley, 2000); and Table 2 in “A Review of the New Undiscovered Conventional Crude Oil Resource Estimates and Their Economic and Environmental Implications,” Cornell University Department of Applied Economics and Management Working Paper WP 2001-22, 2001.

Taken together, the amounts for each category yield a 2.9 trillion barrel estimate for remaining world oil resources. Global oil consumption is 30 billion barrels annually. It has been increasing at 2% per year, with China accounting for more nearly half of the growth.³⁸ Of course, on a per capita basis, American oil use is many multiples of Chinese consumption.

Visualize a series of stacked demand curves.³⁹ Each demand curve indicates how consumption of oil products responds to price. Usually both global per capita income and population rise each year, as does the world's stock of petroleum-using automobiles, planes, and equipment. So, usually, each year's demand curve is higher than that for the previous year. Also consider a series of supply curves, which reflect a range of production costs, from low costs in the Persian Gulf to high costs for new production in the North Sea and Alaska. These supply curves shift outwards each year as oil producers and refiners regularly expand capacity to meet expected growth in demand.

When the world economy and oil markets expand as expected, the cooperative implementation of the target price range system works fairly smoothly on a global basis. Each year, the equilibrium intersection of supply and demand is higher than the year before, and defines a rising trajectory of world consumption at stable prices as Saudi Arabia and other Persian Gulf producers increase or reduce production to stabilize prices within the target range.

³⁷ These assessments are developed for individual regions throughout the world. An example: in Russia's Western Siberia, the Togur-Tyumen Petroleum System has 5 fields. The 95% probability estimate is 2.3 billion barrels, and the 5% probability estimate is 14.7 billion barrels. For all of Russia, the USGS analyzed 45 assessment units with 331 oil fields. The results: 95% probability of at least 25 billion barrels, and 5% probability of at least 148 billion barrels; this, recall, in the "Undiscovered Resource" category.

³⁸ From USEIA, "International Petroleum Monthly," Table 2.4, www.eia.doe.gov/emeu/ipsr/t24.xls. November 18, 2004. World consumption in 2004 is increasing about 3%.

³⁹ This can be seen visually in Duane Chapman and Neha Khanna, "World Oil: The Growing Case for International Policy," *Contemporary Economic Policy* 2000, 18(1): 1-13; and also Chapman 2000 *op. cit.*, Chapter 9, "World Oil: A Strategic Limited Resource?"

Other major producers, OPEC and non-OPEC, cooperate in setting their production levels to work within this system as well.

More than 50% of the world's production of crude oil is exported through the global oil market for consumption in a country other than the source of the crude production. The U.S., for example, imports petroleum from more than 34 different countries. Twenty percent of U.S. imports originate in the Persian Gulf and are managed by 30 different companies.⁴⁰ Although many oil exporters experience periods of political turmoil (for example, Nigeria, Venezuela, Iraq), the system has adjusted smoothly in the past to these and other contingencies such as an unexpected growth in Chinese imports.

The growing cost-effectiveness of non-petroleum transportation fuels adds additional strength to the overall global oil market. Richard Fullerton recently completed a balanced assessment of the status of liquid transportation fuels from coal methanol, corn (and sugar) ethanol, hybrid electric vehicles, tar sands, compressed natural gas, and hydrogen fuel.⁴¹ He concludes, "It should be apparent that our nation and the world do not face a long-term energy crisis." We agree. Five of these six new technologies are in use now in North America on a commercial basis (the exception is hydrogen fuel). With remaining world oil resources on the order of 3 trillion barrels, and additional new sources of transportation energy even now entering oil markets, there is no reason to be concerned about depletion in the near future. As Fullerton notes, "So, in the short-term, we do not worry about how much oil the world has – we worry

⁴⁰ Chapman and Khanna, "The Persian Gulf, Global Oil Resources, and International Security," Cornell University Department of Applied Economics and Management Working Paper WP 2004-15, December 2004, Appendix A.

⁴¹ Richard Fullerton, "The Political Economy of Oil and Conflict," USAFA, Colorado Springs CO, Presented at the WEAI Annual Meeting, July 2, 2004, Vancouver B.C.

about where it is located.”⁴² Indeed, Fullerton’s emphasis on the destabilizing aspect of Gulf petroleum wealth is shared by us, and taken up in the next section.

VII. Economic Importance of Price Stability; Magnitude of Persian Gulf Oil Wealth

Stephen Brown (Federal Reserve Bank, Dallas) observes that 9 of the 10 U.S. recessions since WWII were preceded by significant oil price shocks.⁴³ Economists believe that the strength of the American and global economies are linked to oil price changes, though the strength of that linkage is slowly weakening. As a rule of thumb, the empirical findings imply that a \$10 per barrel increase from a base price of \$40 per barrel would reduce gross domestic product by \$165 billion from an initial level of \$12 trillion (the value of GDP in the second quarter of 2004).⁴⁴ This fact alone would cause political leaders to seek to stabilize oil prices. In addition, the GDP reduction creates multiple economic problems as well.

Monetary policymakers face a difficult dilemma in responding to the inflationary potential of oil price increases. If they raise interest rates, the demand for housing and durable goods is reduced, real GDP falls, and unemployment increases. On the other hand, if they avoid interest rate increases, employment and real GDP are maintained but inflation may be significant.

⁴² Fullerton, *op. cit.*, page 15.

⁴³ Including the 2001/2002 recession. Stephen P.A. Brown, “Oil and the U.S. Macroeconomy,” Federal Reserve Bank of Dallas, June 2004. Presented at the WEAI Annual Meeting, July 2, 2004, Vancouver B.C.

⁴⁴ D.W. Jones, P.N. Leiby, and I.K. Paik, “Oil Price Shocks and the Macroeconomy,” *Energy Journal* 2004, 25(2): 1-32. Technically, this example assumes a .055 elasticity, a value reflecting Jones/Leiby/Paik as well as Brown. Jones *et al.* reviewed 76 recent studies of this relationship. The total GDP and employment impact is spread over several quarters.

Sudden oil price increases have a significant impact on job losses, but the reverse is not true. Sudden price declines have minimal effect on job creation.⁴⁵ This differential impact of oil price increase versus decrease adds to the political value of oil price stability in the U.S. In trade balances, oil price increases usually have an immediate effect on import values, increasing trade deficits. In 2003 the American trade deficit⁴⁶ was \$500 billion, and about 25% was due to net petroleum imports. The much higher oil prices of 2004 will cause a greater total trade deficit and a greater proportion of this total deficit to be in the form of oil imports.

Persian Gulf oil is the lowest cost petroleum in the world, on average about \$5 per barrel.⁴⁷ This includes the cost of exploration, capital investment, a return on capital, and a risk allowance above normal rates of return. Throughout the Persian Gulf every dollar above \$5 is a dollar of additional profit. If the price is \$55 the additional profit above a normal profit is \$50.⁴⁸ Assume that \$50 per barrel represents the profit from Persian Gulf crude oil over the remainder of the century. This yields an estimated value of remaining resources in the Persian Gulf of \$77 trillion.⁴⁹ It is a result of multiplying the remaining resource estimates in Appendix Table A1 by \$50.

This, then, is the global problem: \$77 trillion in oil wealth, in an area with 120 million people. The \$77 trillion has been an attraction to Western oil companies and governments. It

⁴⁵ A point made in Jones/Leiby/Paik, page 6.

⁴⁶ Including both merchandise and services. Actual deficit was \$494.9 billion.

⁴⁷ See Table 2 and discussion in Chapman and Khanna 2001. According to data in the *Financial Times*, February 21, 2003 (page 3), the comparable cost is \$2.40 per barrel in Iraq before shipping.

⁴⁸ In economic terminology, this is considered to be either producer surplus, or economic rent.

⁴⁹ Discounting of course gives different values. In one optimal control analysis where rising demand curves intersect a sequence of supply curves under a fixed constraint of remaining world oil of 3 trillion barrels, the discounted values are of course smaller than the Table 13 figures. See Chapman, December 2001, *op. cit.*

was the goal of the Iraq invasions of Kuwait and Iran. Recognizing the threats to their stability, Persian Gulf governments amassed considerable weaponry in the 1990s. The governments of the southern Gulf strengthened their alliances with the U.S. At the same time, the continuation of monarchies and dictatorships seems to have stimulated the growth of Al Qaeda, and the armed attacks against the U.S. on September 11, 2001, and elsewhere.

For the past two decades, the problems of production and price stability had been solved in a reasonable economic framework. However, political instability, the spread of nuclear and conventional weapons, and the growing ferocity of the military conflicts and terrorist activities in, or originating in the region show us that a breakdown of civil authority throughout the Persian Gulf can lead to a collapse of the framework of stable oil production. In the concluding section of our paper, we discuss three broadly different approaches to address the problem.

VIII. Is American Primacy Sufficient?

We describe the three possible roads of choice as the semi-autonomy approach, the American security framework, and an international framework. Each of these has already been used to some degree in the past.

A. Semi-Autonomy: “Hands Off Mostly”

Autonomy suggests self-government and sovereignty for each individual country. It implies that other nations (outside the Gulf) do not seek to dominate the region; or, if they seek to do so, they are unsuccessful.

Between 1973 and 1990, Persian Gulf governments pursued their own goals with varying degrees of independence from Western governments.⁵⁰ In the northern Gulf, Iran replaced its monarchy, which had itself been strengthened with the active support of the U.S. C.I.A. Iraq (with alleged minor support from the U.S. C.I.A.) changed its government from a military dictatorship supported by communists, to a Ba'ath party dictatorship. In the first Gulf war, Iraq invaded Iran. The U.S. sold arms to Iran in the Iran-Contra program, and provided limited support to Iraq in its war with Iran. The southern Gulf states continued as oil exporters under independent monarchies dominated by leading families and without major civil disturbances.

During the semi-autonomy years, Western oil companies continued to manage the production and export of oil in much of the southern Gulf. The U.S. was involved politically and economically in this region, but much less so than it would be after 1990. At the same time, from 1973 (the year of the "Oil Embargo") to 1986, the Gulf nations and OPEC sought to organize a cartel with production quotas to support high world oil prices. For most of this period the West reacted to OPEC initiatives not with military power but rather through the development of high-cost oil supplies in Alaska and the North Sea. Mexico and Russia became major exporters. These two developments (OECD oil in the North Sea and Alaska, and the emergence of major exports from Mexico and Russia) unraveled OPEC's hopes to control prices. In 1986, as we noted earlier, then-Vice President George H. Bush worked to initiate the organization of the OECD/OPEC price framework which continued into early 2004.

The severe defect in this semi-autonomy approach to the Gulf was made evident by Iraq. Iraq saw a \$77 trillion prize in Persian Gulf oil, and fought to seize it through war. All together,

⁵⁰ Pollack (*Foreign Affairs, op. cit.*) uses the term "offshore balancing" (somewhat similar to our "semi-autonomy") to describe a circumscribed on the ground American military presence in the Gulf. He considers the period to span the 1970s and 1980s; we prefer 1973-1990. He (and us) believe this approach to be inadequate.

the first two Gulf wars (the Iran-Iraq war and the war to remove Iraq from Kuwait) killed approximately one million combatants and civilians, but world oil markets remained essentially unchanged.

While the 1986-2003 price framework maintained the stability of supply and price with considerable success, the second Gulf war clearly ended the “semi-autonomy” period with respect to Western governments. Beginning with the 1991 U.S.-U.N. military effort that removed the Iraqi occupying forces from Kuwait and restored the Al Sabah monarchy, the U.S. moved forcefully to combine military and diplomatic policy in support of the southern monarchies, and to contain and deter Iran and Iraq.

It now seems clear that any global policy that leaves Persian Gulf nations undefended invites future aggression from within or without the region, with the goal of that aggression to seize and hold oil wealth. Of course aggression by Iraq is not a threat to global stability today. But the prize remains, and the nuclear and conventional weaponry in the region continue to expand.

In the unlikely event that the Persian Gulf were to experience a return to the international laissez faire conditions of 1973-1990, the only certainty is that new efforts would be made to lay hold of the oil. These new efforts would involve the increasingly destructive power of conventional weapons, and the possible use of the growing arsenals of nuclear weapons. This, then, is the powerful force that leads to the need for a Persian Gulf security framework. Considerations of equity and practicality require that a Persian Gulf security system have the following basic desirable characteristics:

1. Stable oil production and the continuation of a price range mutually acceptable to OECD consumers and Gulf exporters.

2. Sufficient military power to deter wars to expropriate Gulf oil.
3. Political or military mechanisms to reduce the growing nuclear threat in the region.
4. Institutional protection against control of oil by the providers of military security.
5. Governments in the Gulf that are supported by their citizens.

B. An American Security Framework

Can the United States provide the necessary military security?⁵¹ The U.S. has demonstrated military strength that is clearly adequate to deter or defeat any Persian Gulf nation or regional power that might consider the pursuit of Gulf oil. From 1991 through the end of 2003, the American security framework worked well and ensured stable crude output at prices that were mutually acceptable to the Persian Gulf and other OPEC producers (in the sense that crude oil exports generated sufficient revenues for these governments) and their Western consumers. However, the 19-year target price framework is facing disintegration because of the political reaction in the region to U.S. Iraqi policy. Certainly other factors have strained the price framework: the acceleration of growth in Chinese imports, the petroleum requirements for the U.S. military for transport to and operations in Iraq, and uncertainties in Venezuela and Nigeria. In previous years these strains would have been accommodated within the system. But the recent attacks against oil export facilities in Iraq and Saudi Arabia have shifted the demand curve upward for spot and future prices.⁵²

⁵¹ Pollack develops two versions of an American security framework, one being a regional defense alliance and the second, a Gulf security condominium. While we agree with his rejection of semi-autonomy (our term)/offshore balancing (his term), we do not concur in his support of an American security framework.

⁵² Surprisingly, Saudi production in the first 6 months of 2004 was 4% or 5% lower than in the first 6 months of 2003.

The third condition (containing nuclear weapons expansion) is less supportive of a unilateral American security structure. Consider the economic implications regarding electricity generation for Iran. First, nuclear power will be more costly than oil-fired generation from Iran's extensive low-cost resources. Second, since Iran has no uranium resources, nuclear generation increases that country's reliance on an outside energy source. We cannot suppose, then, that Iran develops uranium processing because it expects economic benefits from nuclear power generation. However, for Iran, the presence of American armed forces on 13 of its borders is a major concern. As discussed above, the acquisition of nuclear weapons appeals to some in Iran's leadership as a means to deter possible U.S. invasion. For Russia, China, and perhaps France, the maintenance or expansion of nuclear weapons capability will seem a potential counterweight to growing American power. Overall, an American security framework in the Persian Gulf is likely to expand rather than reduce nuclear weapons capabilities, regionally and globally.

The implications of the fourth condition – protection against control of Persian Gulf oil by the providers of military security – are perhaps impossible to evaluate today. The coming months will give some insight into possible future management of Iraqi oil by the U.S.

The last condition of popular support for Persian Gulf governments is particularly challenging. If the American goal is the protection of stable global oil markets at reasonable prices, then it is logical to encourage the democratization of governments in the Gulf. As outlined earlier, an American security system linked to the continuation of the southern monarchies that marginalize dissent would augment popular support for Al Qaeda-type policies and actions. Yet the U.S. quest for democracy in the region appears to have been set back by the reaction to the Iraqi occupation. A still different outcome might be that democracy and elections in some Gulf countries could bring to power governments fundamentally opposed to the U.S.

The unilateral approach suffers from a serious political defect. The American effort to establish democracy in Iraq increases the unpopularity of the U.S., and reduces support for democratic reform throughout the Middle East. (This latter point is supported by the Defense Science Board.⁵³)

C. An International Security Framework

An international approach would have some potential advantages. Given the prior success of the price range system, an international approach ought to be able to secure stable oil production and prices, and sufficient revenues for Gulf governments. (A new, third target price range would be higher than the second range.) With participation from the U.S. and others, an international security framework would be able to deter wars of appropriation of Gulf oil. As an international entity, it could also be well placed to forestall control of the region's oil by security providers in the international organization. If an international framework is satisfactory on these points, then the motivation for nuclear weapons in the region is likely to be reduced as well.⁵⁴

The last requirement seems most problematic: how would an international organization lead to increased democracy and governments that have a greater degree of popular support of their citizens? Is it realistic to expect that democratic governments and elections can be imposed upon the region? Would this lead to greatly reduced incentives for Al Qaeda-type organizations?

⁵³ Defense Science Board, "Report of the Task Force on Strategic Communication," Office of the Secretary of Defense, September 2004, pages 33-37.

⁵⁴ The concept of forcible counterproliferation (FCP) raises challenging issues for both the American and international security frameworks. Fish, McCraw, and Reddish propose this strategy as a refinement and application of the doctrine of preemption. See their "Fighting in the Gray Zone: A Strategy to Close the Preemption Gap," Strategic Studies Institute, U.S. Army War College, Carlisle PA, September 2004.

Or would the opposite occur with greater public participation, would there be a growth in hostility towards the U.S. and Europe, and increased state-supported terrorism?

The elephant in this concept, certainly, is the nonexistence of any organization of the type hypothesized. Any important and successful international structure must have the U.S. playing a leadership role, and that generally applies here. American participation must be significant both in terms of military power and in terms of its role in the organizational structure. The military dimension is perceivable as something patterned after NATO. As with NATO, a Persian Gulf Organization would include major military powers, and also nations that see themselves as in need of military protection. Just as NATO now includes former enemies such as Poland and Germany, Greece and Turkey, a Gulf organization would incorporate Iraq, Kuwait, Iran, Saudi Arabia, and the other Gulf states. Other potential participants include the U.S., the U.K., China, France, Japan, Germany, Russia, and perhaps members from Africa, Latin America, and the Middle East.⁵⁵ It might be financed by a tax on oil exported from the Gulf. Such revenues (both tax revenue and revenue from oil export) could be allocated to Gulf states, and also utilized to support the military forces employed to protect and stabilize the Persian Gulf. There are partial parallels here with the World Trade Organization, the European Union, OPEC, the 1991 Persian Gulf Coalition, the Gulf Cooperation Council, and the U.N. Security Council.

The current unilateral U.S. security system inherently manifests what economists call the “free rider” problem⁵⁶. The major consumers of Persian Gulf oil are Europe, China, Japan, South Korea, Taiwan, and the Philippines as well as the U.S. As long as the U.S. (and to a lesser

⁵⁵ The hypothetical organization outlined here for discussion seems to have parallels to the recent proposals for restructuring the Security Council; United Nations, Report of the Secretary-General’s High-Level Panel on Threats, Challenges and Change, *A More Secure World: Our Shared Responsibility* (New York City: UN, 2004).

⁵⁶ A point suggested by Richard Fullerton.

extent the U.K.) manage security, there is no incentive for these countries that consume Persian Gulf oil to participate financially in security measures. Similarly, the political and human cost is borne by the U.S. and Persian Gulf states, and not by other regions that depend upon and use Persian Gulf oil. In contrast, under a multilateral system, the burden would be shared among all participating nations.

The five conditions outlined earlier in this section seem to be best met by a multilateral approach. However, any multilateral or international security structure in the Persian Gulf must have the U.S. as a military and political leader and supporter.⁵⁷ The international political difficulties surrounding the issues of Iraqi weapons, inspection, disarmament, and occupation all indicate the problems to be encountered in establishing an international system. There is no certainty that an international structure is feasible. On the other hand, we are not confident that a unilateral framework can contain the growing instability throughout the Gulf region.

We are unsure if this work places us with realists, with democratic liberals, or with new conservatives in the dialogue on American power and governance in the region. We believe that what is needed is a rethinking of the global role of Persian Gulf oil, and the significance of democracy (and its absence) to the security of the region. This paper does not provide definitive

⁵⁷ The highly effective Blix/Baradei UN inspections became feasible only because of the clear movement of the U.S. toward war with Iraq. The irony is that American war plans made the inspections effective, thereby reducing the strength of the WMD motivation for war. The point here is not an endorsement of American policy, but rather to emphasize the necessity of American support for effective UN policy.

answers, but it is intended to raise useful questions. A fourth Persian Gulf war may lie below the horizon, perhaps involving nuclear weapons, and new jihadist governments. Can it be averted?

Appendix

Table A-1: Persian Gulf, 2000 Assessment, billion barrels

Country	Cumulative Production	Known Reserves	Reserve Expansion	Undiscovered Resources	Original Endowment	Remaining Resource	Rem. Res. % World
Bahrain	0.9	1.1	0.8	1.7	4.5	3.6	0%
Iran	33.7	105.0	74.8	100.5	314.0	280.3	10%
Iraq	22.4	100.1	71.3	83.9	277.7	255.6	9%
Kuwait & NZ	31.0	93.6	66.6	7.2	198.4	167.4	6%
Oman	3.6	7.3	5.2	7.3	23.4	19.8	1%
Qatar	5.0	9.2	6.6	6.4	27.2	22.2	1%
Saudi Arabia	72.8	283.5	201.9	160.9	719.1	646.3	23%
UAE	15.7	72.9	51.9	15.5	156.0	140.3	5%
Total Persian Gulf	185.1	672.7	479.0	383.4	1,720.2	1,535.1	54%
% World	26%	76%	70%	30%	40%	54%	
World	708	883	682	1,290	3,563	2,855	100%
Rest of the world	539	859	612	1,107	3,117	2,578	90%
U.S.	169	24	70	183	446	277	10%

Notes to Table

1. Reserve expansion in Persian Gulf extrapolated from ratio of total Rest of World Expansion (612) to Known Reserves (859), or .712.
2. Some rows and columns do not add exactly because of rounding.
3. Iraq's goals in the last 25 years: Iran, Kuwait, and Saudi Arabia. These four constitute 66% of known reserves, 61% of reserve expansion, and 47% remaining resources; worldwide.
4. Current consumption per year: World, 25 Bbl; U.S, 7 Bbl. U.S. crude production: 2.1 Bbl; U.S. imports, 2.9 Bbl.
5. Remaining resources is the sum of Known Reserves, Reserve Expansion, and Undiscovered Resources.
6. The EIA estimate (using a similar approach and somewhat different sources) for remaining resources is a nearly identical world total of 2.93 trillion barrels. See U.S. Energy Administration, *International Energy Outlook 2004*, page 36.

Sources: USGS, "World Petroleum Assessment 2000 – Description and Results," 2000, website www.usgs.gov; USGS, "1995 National Assessment of United States Oil and Gas Resources;" website www.usgs.gov; U. S. Minerals Management Service, "Outer Continental Shelf Petroleum Assessment," 2000, website www.mms.gov.

**Table A-2: General Economic Impact of Crude Oil Price Decision–Making
in a Game Theory, 1986-2003 Price Range Framework**

Price per barrel	OECD Countries	Persian Gulf Oil Producers
\$15 or less	<ul style="list-style-type: none"> • higher GNP growth • shut some domestic production • greatly increased oil consumption • much more imports • more pollution, climate change • end Persian Gulf political support by OECD oil industry 	<ul style="list-style-type: none"> • loss of political support from OECD oil industry • lower revenue, greater volume • internal economic problems • faster depletion • higher market share
\$23 - \$30	<ul style="list-style-type: none"> • stable GNP growth • stable OECD oil production • slow growth in oil consumption • slow growth in import share • stable prices • ANWR production feasible • continued Persian Gulf support 	<ul style="list-style-type: none"> • continued OECD political, military support • stable revenue, rent • stable market share • cooperation with OECD oil industry
\$40	<ul style="list-style-type: none"> • decline in GNP growth • rapid near-term growth domestic production • stable or declining consumption • ANWR production profitable • OECD Persian Gulf support opposed by oil consumers 	<ul style="list-style-type: none"> • loss of OECD political, military support • increased incentives for Central Asia, other non-OPEC production • less market share • less production, more profit, rent • greater payoff to successful Iraq-type action