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The Persian Gulf, Global Oil Resources, and International Security

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The Persian Gulf, Global Oil Resources, and International Security

Duane Chapman and Neha Khanna*

This paper analyzes the interaction of politics and military security in global oil markets since the 1980s. We outline the historical evolution of the pricing structure that maintained a stable world oil market. We argue that the security framework underlying this pricing structure relied on a trade-off between price stability and military security that has contributed to growing instability in individual Persian Gulf countries, and the rise of Al Qaeda and similar groups. We conclude the paper with a discussion of the pros and cons of three possible policy approaches to this dilemma – a “hands-off” approach that is similar to the policy that prevailed between 1973 and 1990, a unilateral security system organized and led by the United States, and an international security framework.

JEL Classification Codes: D47, F02, L11, Q32, Q41, Q43, Q48

Key words: Target price, military security, OPEC, conventional weapons, oil export, oil import

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1. Introduction

Remaining global conventional crude oil resources are on the order of 3 trillion barrels, with more than 50% of that amount in the Persian Gulf. Consequently, Persian Gulf oil has been of considerable interest to Western oil companies and governments (and to Russia) for more than a century. In earlier work in this journal, we argued that a target price range framework initiated in 1986 had resulted in stable crude oil prices and reliable supply. Western military support has been an important part of this framework, which constituted a Nash equilibrium between Gulf producers and Western (and Asian) consumers (see Chapman and Khanna, 2001).

Has the current war in Iraq destroyed the target price band arrangement? This paper attempts to answer that question by analyzing the interaction of politics and military security in the global oil market since the 1980s. With the very low cost of production in the region (about \$5 per barrel) and the great magnitude of resources, the oil wealth in the Gulf is on the order of \$75 trillion. We will argue that it is the existence of this wealth that creates a major policy problem for the eight countries in this region, and for global security. We will also argue that the framework that ensured a steady supply at mutually acceptable prices to the Persian Gulf producers and the Western consumers has itself contributed to growing instability in individual countries, and the rise of Al Qaeda and similar groups. We conclude the paper with an outline of a proposed road map for the future.

II. Brief History: Petroleum, the Persian Gulf, and the West

Today's issues with security and oil have long roots. Table 1 summarizes the colonial history of the Persian Gulf countries and the evolution to their current governments. Turkey's

Ottoman Empire controlled most of the region at different periods over a 7-century span in the last millennium. The slow disintegration of the Empire was accelerated by the search for oil for naval vessels by Britain and France early in the 20th Century. After the 1907 Anglo-Russian Convention, Britain obtained concessions in southern Iran whereas Russia sought to control the northern sphere. In the years after World War I (WWI), Britain created borders throughout the Persian Gulf that ensured easy access to oilfields and much of the oil in this region came under the production control of Western oil companies. Initially British Petroleum, CFP (Compagnie Francaise de Petroles), and Royal Dutch/Shell dominated the region, reflecting the European concern for secure sources of petroleum. Russia and the Soviet Union also sought to establish their influence in the Persian Gulf but were mostly unsuccessful except for brief periods in Iran and Iraq. By the 1950's, however, American oil companies had become full partners. Figure 1 summarizes the composition of major oil production companies in 1972.

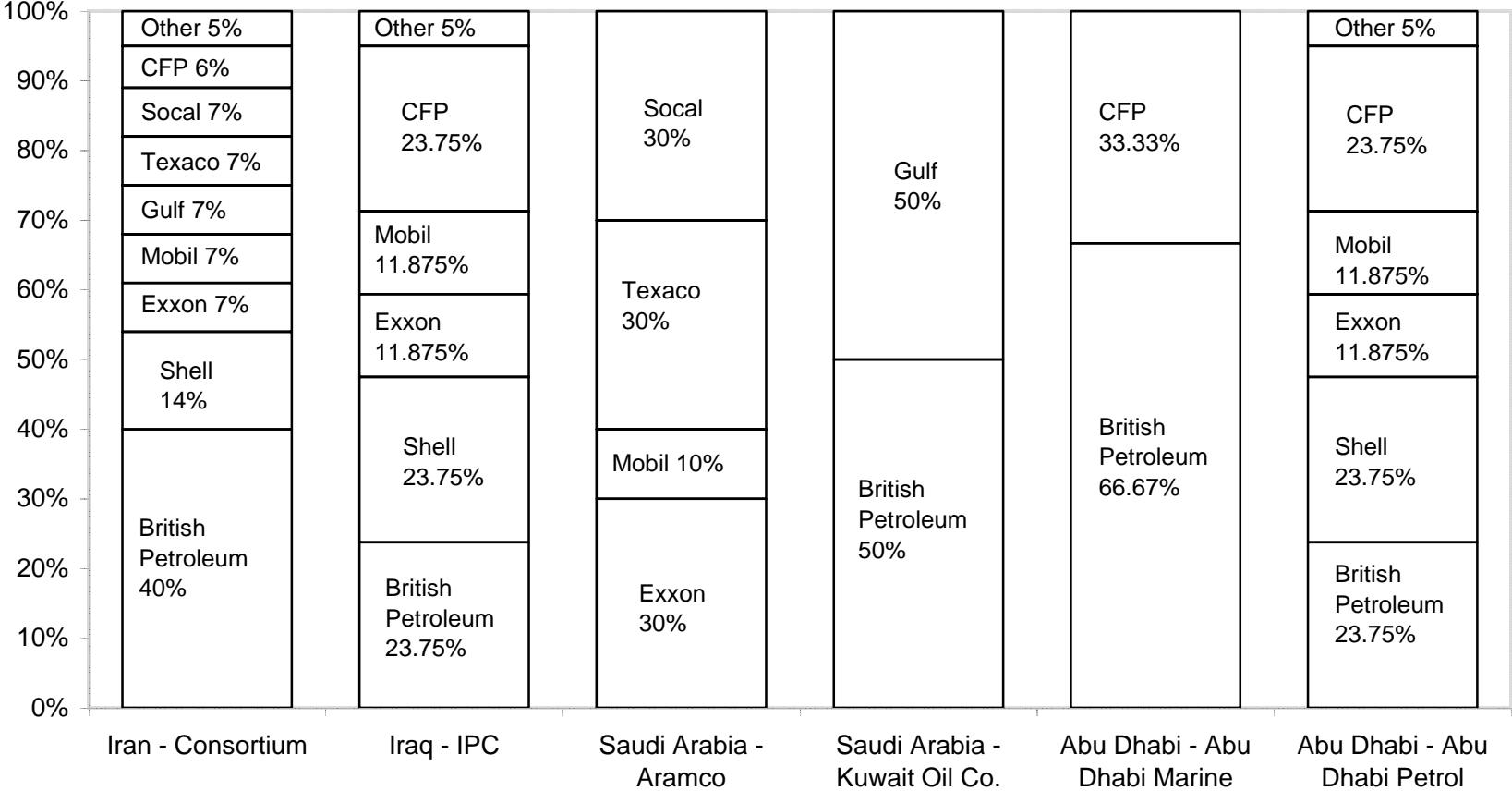
Virtually every country in the Persian Gulf region was under direct or indirect British control until the middle of the 20th century. Of course WWII interrupted British dominance in the region, but in effect, between WWI and the 1950s, Britain maintained military security in the Persian Gulf region. Between the 1950s and 1990, there were several international events that influenced the relationship between the Persian Gulf producers and the Western consumers of oil. These include conflict over the Suez Canal, the OPEC oil embargo, and the Iran-Iraq war. In 1986, OPEC and Western oil importers established the target price range arrangement, which continued into 2004 (see Figure 2 below and discussion). Throughout this period, there were minimal military security arrangements. It was only after Iraq invaded Kuwait in 1991 that the United States (and to a lesser extent, the United Nations) established a significant military presence in this region with a view to maintaining military security.

Table 1: Persian Gulf Countries: Notes on Government and Colonial History

<u>Bahrain</u>	British Protectorate from 1861 until independence in 1971. Monarchy. Al Khalifa family rule since 1783. Constitution, National Assembly created in 1973. National Assembly dissolved in 1975. In 1993, Consultative Council of appointed members formed. Government friendly to U.S.
<u>Iran</u>	Monarchy with significant British influence and parliamentary democracy to 1951. Conflict over oil nationalization until parliamentary democracy displaced by Shah monarchy in 1953 with assistance of US-CIA. Revolution in 1979 replaced Shah with an Islamic Republic, a combination of clerical theocracy and limited electoral democracy. The supreme spiritual leader has final authority in all executive, legislative, and judicial matters. Executive branch headed by an elected president. The Majlis is the legislative Consultative Body. Attitude of different parts of government and public to U.S.: complex.
<u>Iraq</u>	Turkish control until 1906. A British mandate after WWI. Monarchy overthrown in 1958 by army with communist support. Ba'ath Socialist Party took control in 1968 with minor assistance from US-CIA. Saddam Hussein established dictatorship in 1979. Government hostile to U.S. until American occupation in 2003.
<u>Kuwait</u>	British protectorate until independence in 1961. Monarchy. Al Sabah family rule. Constitution in 1962 vests power in an emir selected from ruling family. Elected National Assembly exists but subject to dissolution or suspension by the emir. Government friendly to U.S.
<u>Oman</u>	Independence from Portuguese control in 1650. British protectorate from 1789 until 1951. Monarchy. Al Said family rule. In 1991, a Consultative Council of regional representatives was formed. Government friendly to U.S.
<u>Qatar</u>	Ottoman control from 1878 until World War I. British Protectorate until independence in 1971. Monarchy. Al Thani family rule. In 1999 municipal elections were held. Government Friendly to U.S.
<u>Saudi Arabia</u>	Independence from the Turkish Empire after WWI. Unification in 1932. Monarchy. Al Saud family rule. No elections or political parties. Consultative Council of appointed members initiates laws and reviews policy. Government friendly to U. S.
<u>United Arab Emirates</u>	Independence from Britain in 1971. Confederation of monarchies. Rulers of 7 constituent emirates (Abu Dhabi, Dubai, Sharjah, Ajman, Umm al-Qaiwain, Ras al-Khaimah, and Fujairah) participate in a Supreme Council which elects one of the Emirs as President for a 5 year term. The Federal National Council is appointed. Government friendly to U.S.

Sources: CIA (2003), Banks and Muller (1999), *Encyclopedia Britannica* online, Kinross (1977), Kurian (1992), Morris (2003), Roosevelt (1979), Sampson (1975), Yergin (1992).

Figure 1: 1972 Joint Oil Production Companies Composition

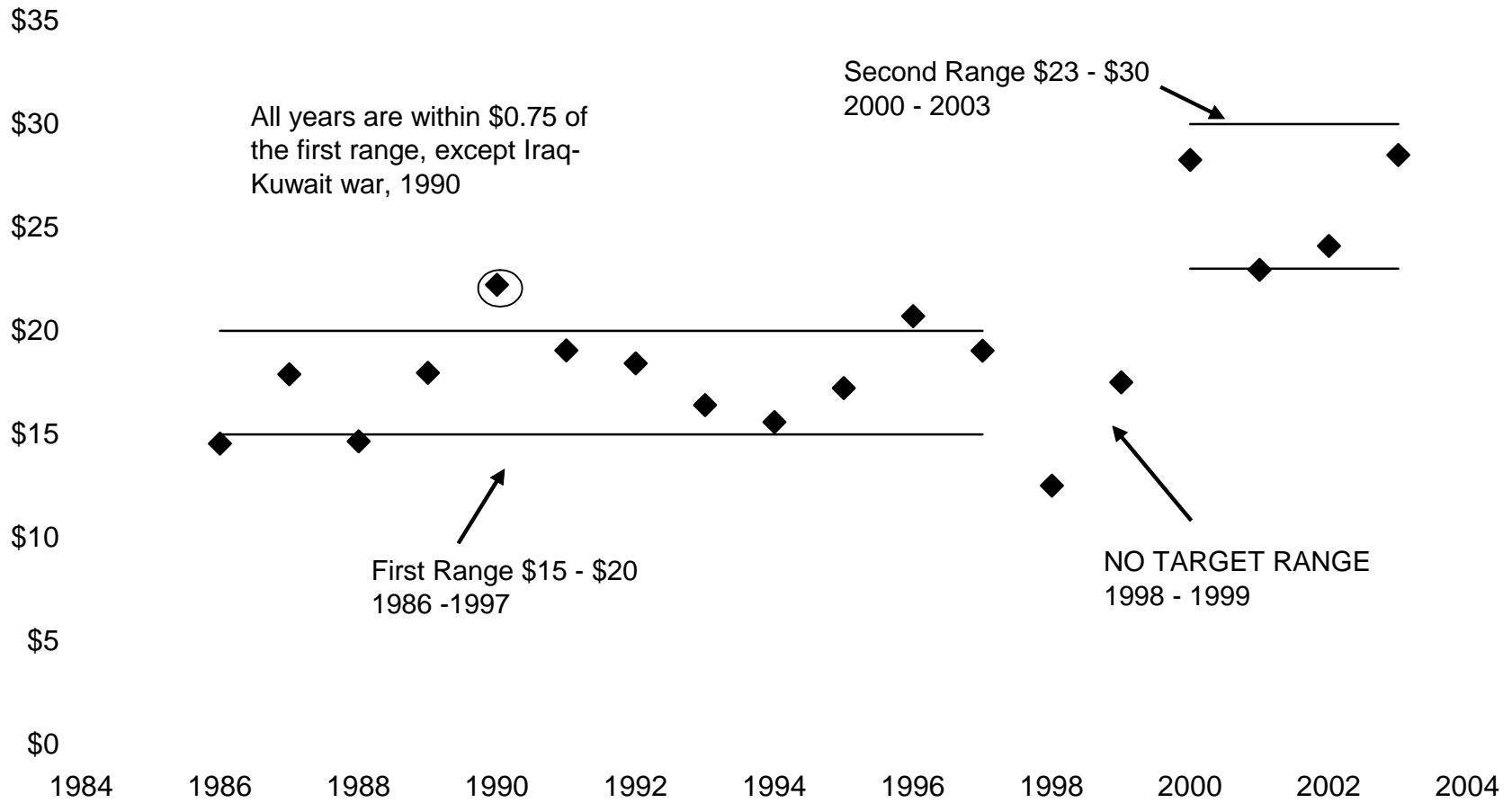


Source: Sampson (1975), page 136.

Against this historical backdrop, we can understand the evolution of the pricing structure in the global oil market. Due to their dominance in the region and low extraction costs, British Petroleum and the European companies were a major factor in the global market that established real world oil prices at a few dollars per barrel during the first half of the 20th century. With the emergence of American oil companies such as Aramco and other Figure 1 companies in the early 1950s, the market price was determined jointly by these companies. OPEC was established in 1960 to raise company-determined prices, but remained ineffectual for the first few years. However, the 1973 Arab-Israeli war created a surge of nationalism in the Arab world. 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 – but had collapsed by 1986 with crude prices at \$10 per barrel.

In 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 (Yergin, 1992, pages 755-758). The price range framework that was created in 1986 is essentially the price structure that existed into 2004. From 1986 to 1997 OPEC maintained prices within the first target range of \$15-20 per barrel. Average crude oil prices for all 12 years are within 75 cents of the first target range, except the 1990 price when Iraq invaded Kuwait. This price range collapsed in 1998 due to the combined influences of 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. A second price range of \$23-\$30 was established in 2000; coincidentally, it was equivalent to the old range adjusted for inflation. The four years 2000-2003 were all within the new range (see Figure 2).

Figure 2: Target Price Ranges



III. The Tradeoff: Price Stability and Military Security

Between them, Persian Gulf countries have 75% of world's known reserves and more than 50% of the world's remaining resources of crude oil (see Table 4). At the same time, extraction costs are less than \$5 per barrel (Chapman and Khanna, 2001, and *Financial Times*, 2003). Why then don't these countries pursue a low-price policy that would increase their sales, market share, and possibly revenues? Conversely, why didn't they seek to earn higher profits by charging monopoly prices before 2004? The answer to these questions lies in the joint pay-offs under the price band arrangement to Persian Gulf producers, and also to the importers of Gulf oil in the West (see also Chapman and Khanna, 2001).

Production costs in the lower 48 states of the U.S. are around \$15-20 per barrel, and about \$25 per barrel in the Artic National Wildlife Refuge (Chapman, 2001). When prices are below \$15, crude oil production in the U.S., which has been steadily declining since the early 1970s, falls even more rapidly 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. Therefore, at very low oil prices, U.S. petroleum companies move to influence American policy to raise prices, as in 1986 and 1998.

In contrast, with very high oil prices, American consumers and oil-using businesses formerly dominated American policy. Congressmen from states without oil production called for termination or reduction of military support for Persian Gulf governments. American policy considered withdrawing military and political support of the Gulf governments at either extreme of the price spectrum.¹

For the Persian Gulf producers, a long-term perspective is essential. Their economies are

¹ The role of Congressmen from oil consuming states was evident in 2000 in a period of high prices (see *New York Times* March 2, 19, 23, & 29, 2000). They were strongly critical of Gulf governments until prices declined.

critically dependent on crude oil revenues and it was in their interest to keep prices within a range that ensures a healthy rate of extraction. If prices are “too low,” Persian Gulf producers are likely to face domestic economic problems, even though world demand rises and their share in the global crude oil market is likely to rise as well. Conversely, when prices were “too high,” American support for Gulf governments changed to criticism. At the same time, high prices act as a break on the economies of their key importers, and these Western governments then have an incentive to reduce oil consumption.

Furthermore, by maintaining a steady supply of oil at prices that are acceptable to Western countries, Persian Gulf governments ensure a critical quid pro quo from their Western allies. Assuming the average price over the remainder of this century is about \$50 per barrel, the oil in the Persian Gulf region is worth about \$75 trillion (see also Chapman and Khanna, 2004, Table 13). This enormous wealth can be a serious problem insofar as it creates an incentive for military action such as the Iraqi invasions of Iran and Kuwait. Military support from U.S. and European allies was crucial in turning back the 1990 invasion, and we see this military support as a major incentive to the Persian Gulf countries for maintaining crude oil prices within the target range before 2004. Khanna and Chapman (2004) have shown that during the eleven year period from 1989-1999, the relationship between arms trade and oil trade was extremely close. The world’s largest crude oil exporters were the primary importers of conventional weapons, even after incorporating the influence of other factors such as the nature and strength of political and economic institutions, and the existence or potential for armed conflict.

IV. Military Security

Iraq's invasions of the oil regions of Iran (1980) and Kuwait (1990), if successful, would have gained for Iraq control of nearly half of known oil reserves and a fourth of total remaining resources (see Table 4 below). Success in these two invasions could have encouraged an Iraq influence, control, or occupation of the remainder of the Gulf countries. In this case, Iraq would have held three-fourths of known global reserves and one-half of remaining oil.

In reaction to these concerns, Persian Gulf governments undertook major military expansion in the 1990s. In the six years between 1994 and 1999, three Gulf countries -- Kuwait, Saudi Arabia, and the United Arab Emirates (UAE) -- purchased a quarter of the global supply of conventional weapons, spending nearly \$67 billion in weaponry (see Table 2).² The total population in these three countries was about 25 million. In other words, these three countries expended more than \$2,500 per capita on arms and 13% of their Gross Domestic Product over this period (see Chapman and Khanna, 2004, Table B7, for population and GDP data on Persian Gulf countries).

² Earlier, Chapman and Khanna (2001) analyzed similar data for a smaller three-year period.

Table 2: Value of Arms Transfer Deliveries by Major Supplier and Recipient Country
(Cumulative 1994-1999, millions of current dollars)

Supplier	Total	US	UK	France	Russia	Germany	China	Other NATO	Middle East	Other East Europe	Other West Europe	Other East Asia	All Others
Recipient													
World	274,685	158,695	32,140	22,395	16,440	8,580	3,960	10,130	4,880	5,770	5,970	1510	4,215
Developed	135,925	99,590	3,625	11,210	2,160	6,535	50	4,390	2,150	540	2,750	610	2,315
US	8,380	-	2,450	380	90	740	50	2,650	700	130	350	460	380
Israel	8,625	7,500	0	0	0	750	0	5	0	20	0	0	250
Russia	590	420	0	0	-	0	0	0	0	170	0	0	0
France	1,955	1,750	0	-	0	0	0	70	5	0	0	0	110
Germany	5,425	4,900	180	0	0	-	0	130	110	0	60	0	0
Japan	13,920	13,900	0	0	0	0	0	0	0	0	0	0	0
Developing	138,760	59,105	28,515	11,185	14,280	2,045	3,910	5,740	2,730	5,230	3,220	900	1,900
China	4,375	180	70	0	3,300	0	-	40	470	140	0	0	110
Taiwan	21,460	13,330	0	8075	0	0	0	0	0	0	0	60	10
OPEC	77,280	33,010	24,970	8,145	2,995	210	1,030	1,870	100	1,495	2670	230	555
Iran	2,440	0	0	0	995	0	900	20	10	350	30	70	15
Kuwait	6,625	4,200	1,275	310	750	0	0	0	0	50	10	0	10
Saudi Arabia	54,045	25,800	20,900	3,600	0	60	0	1,055	0	0	2,250	0	80
UAE	6,015	1,260	260	2,950	520	0	0	480	0	210	30	90	200
NATO	61,845	44,365	3,275	2,310	775	3,470	190	4,055	1,170	245	1,025	460	505

Sources: Based on ACDA (1998, Table III) and BVC (2002, Table III)

Seventeen of the nineteen September 11, 2001 hijackers were born in Persian Gulf countries. In addition, seven of the nine apparently highest-ranking leaders of Al Qaeda are from Saudi Arabia or its neighbors (Chapman and Khanna, 2004). The May 2003 attacks against Westerners in Saudi Arabia were made primarily by Saudis. Osama bin Laden and Al Qaeda apparently see the governments of Saudi Arabia and the other southern Gulf nations as semi-colonial agents of the U.S. In part, the Al Qaeda political program is focused on the goal of replacing the Persian Gulf monarchies because of their strong association with the U.S. This was clearly expressed in a recent bin Laden audiotape:

*“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.”*³

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 (CSM 2004) asserted

“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.”

Recent attacks against oil export facilities in Saudi Arabia and Iraq were apparently undertaken by groups operating independently of Al Qaeda, but influenced by a similar ideology.⁴

³ 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.

⁴ *Wall Street Journal*, May 5, 2004.

V. Global Oil Resources and the Persian Gulf; U. S. Imports

Total remaining resources are estimated to be 2.855 trillion barrels (see Table 3). This is the sum of three components. “Known Reserves” (similar in meaning to “Proved Reserves”) are relatively firm values used in developing near-term production plans. It is the minimum amount of crude oil that is expected to be produced from a field or reservoir. “Potential Reserve Expansion” is a probabilistic concept and constitutes a best-guess estimate of additional future production beyond a proved reserves estimate at an existing site. As geological techniques have improved, potential reserve expansion has become more important in petroleum resource planning. For an existing field under production, remaining resources are the sum of “Known Reserves” and “Potential Reserve Expansion.” “Undiscovered Resources” is a term used by the U.S. Geological Survey (USGS). It could be roughly translated as “approximate probability distribution estimates of oil resources in areas which have not been explored in detail.” It is a category that relies on extrapolation. Suppose Area A is a region that has been producing for many years and has been extensively investigated. Known reserves are set at 500 million barrels. Area B is the same size with apparently identical geology. The undiscovered resource for Area B may have a mean estimate of the same 500 million barrel figure, with a 95% probability of at least 400 million barrels, and a 5% probability of 600 million barrels.

Figure 3 shows the changing nature of the probability distributions for “Original Resources.”⁵ At every probability level, the estimates have increased. For the latest assessment, the range between high probability low resource estimates and low probability high oil resource estimates has increased. For the 5% probability level, the estimate of original endowment has

⁵ Original resources refer to the amount of oil existing before production began in 1859. It combines the amount of cumulative production to date with the remaining resources estimate.

grown by 1.5 trillion barrels. Petroleum resources in the Persian Gulf are shown in Table 4.⁶

The dominant position of the Persian Gulf countries is evident. The region holds 76% of known reserves and 54% of estimated total remaining resources. The uniquely low production costs in the Persian Gulf (at about \$5 per barrel, compared with \$20-25 per barrel for new fields in the U.S. and Europe) multiplies the importance of this region.

⁶ The 5% high resource estimates are used in Table 4 because we assume (a) the Figure 3 probability distributions will continue shifting rightward for some time, and (b) at some future date the real price of oil will pass \$50, creating new incentive for increased recovery.

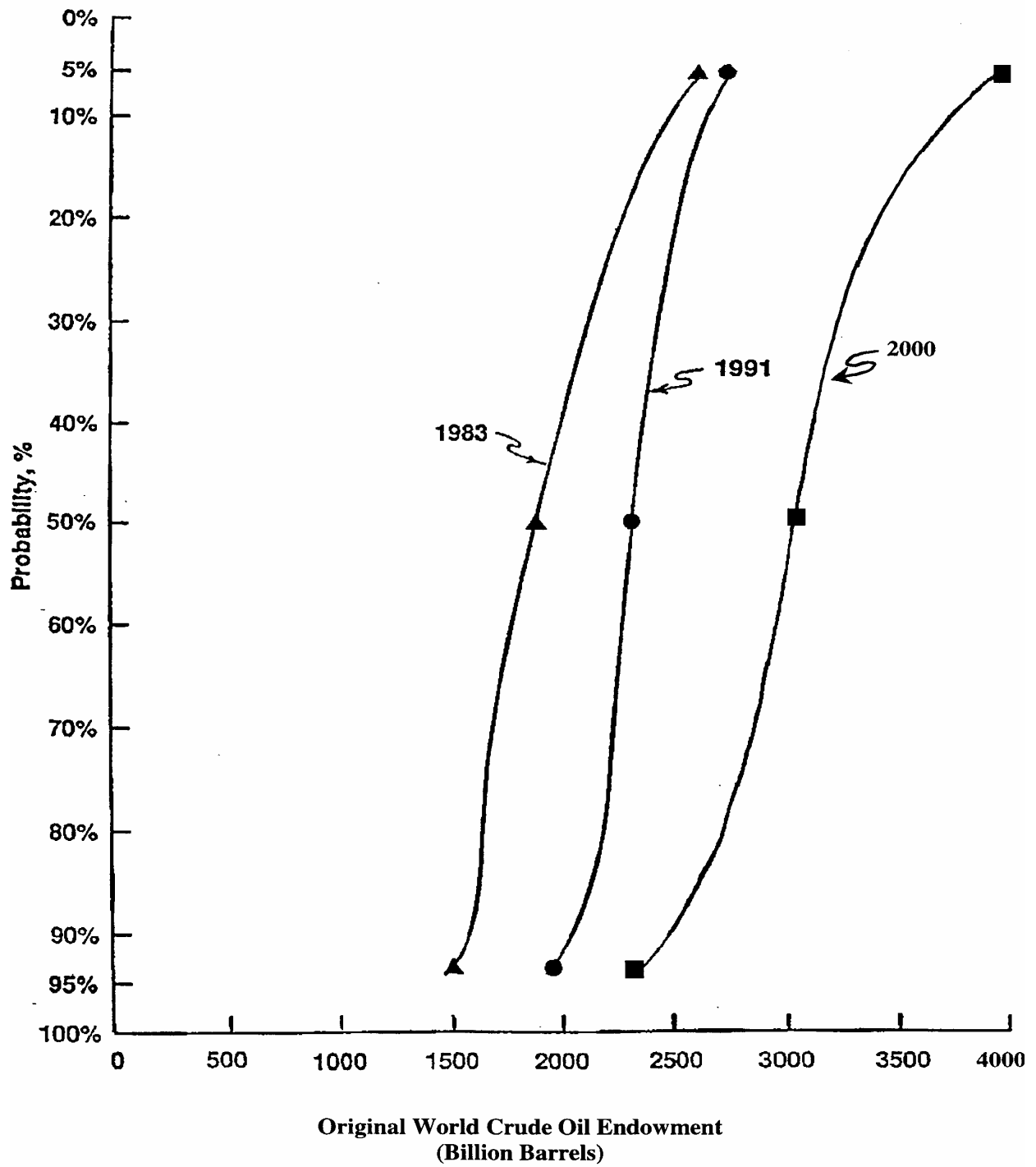
Table 3: Probability 5% of Remaining World Oil Resources

Category	Billion barrels
Known Reserves	883
Potential Reserve Expansion	682
Undiscovered Resources	1,290
Total Remaining Resources	2,855

Source: USGS (2000, 1995), MMS (2000)

Note: The 2000 Assessment data used a January 1, 1995 benchmark date. Production in the 9 years 1995-2003 was 218 billion barrels, implying a current remaining resource estimate of 2,637. World cumulative production 1859-2003 has been 957 billion barrels, implying an original endowment of 3.6 trillion barrels.

Figure 3: Change in Probability Distribution of Original Resource Endowment Estimates



Source: Chapman (2001)

Table 4: 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%
World	708	883	682	1,290	3,563	2,855	100%
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%)	
Rest of the world	539	859	612	1,107	3,117	2,578	90%
U.S.	169	24	70	183	446	277	10%

1. Some rows and columns do not add exactly because of rounding.
2. Remaining resources are the sum of Known Reserves, Reserve Expansion, and Undiscovered Resources.
3. 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 EIA (2004a, page 36).
4. Reserve expansion in Persian Gulf extrapolated from ratio of total Rest of World Expansion (612) to Known Reserves (859), or 0.712.
5. Together Iraq, Iran, Kuwait, and Saudi Arabia have 66% of known reserves, 61% of reserve expansion, and 47% remaining resources.
6. Current crude consumption per year: World, 30 Bbl.; U.S, 7.5 Bbl. U.S. crude production: 2 Bbl.

Sources: USGS (2000); USMMS (2000); Chapman and Khanna (2004).

Tables 5 and 6 illuminate the U.S. situation. U.S. imports are growing rapidly at about 4% annually. This is partly due to rising U.S. consumption, which is now approaching 8 billion barrels per year.⁷ But even in the hypothetical case of stabilized U.S. consumption, imports (less exports) must continue to grow because of the declining production in Alaska and in the lower 48 states. Oil production in the Arctic National Wildlife Refuge would be costly in both economic and environmental terms, and would only slow (not reverse) this trend of growing imports. Table 6 shows the 13 leading sources of U.S. petroleum imports. China is the only major oil producer that does not export petroleum to the U.S. (China is also a net importer). Eight of the thirteen countries listed in Table 6 are now involved in war or major internal conflict. Appendix A lists all of the 67 companies importing crude oil into the U.S. in 2002, with their total imports and imports from the Persian Gulf. Given the broad corporate network that handles world trade in crude and products, major production losses in any one exporting country do not necessarily cause significant near term supply problems for importing countries. (British Petroleum, owner of 80% of Prudhoe Bay production, is not considered a major importer because it produces U.S. oil for use in the U.S.)

But, in the long run, as U.S. and world oil consumption continue to grow, the role of the Persian Gulf countries will increase in importance, both in terms of quantity and value. The U.S. including Alaska is past its production peak. North Sea production is probably at its maximum. In contrast, the Persian Gulf has produced a much smaller proportion of its original endowment (11%) than the U.S. (38%): see Table 4.

⁷ We use 25%-26% of world consumption, a proportion that has not changed in 20 years. U.S. and world consumption have grown at the same rate.

Table 5: Basic U.S. Petroleum Data

	1995	2003	Annual Change
	(billion barrels)	(billion barrels)	(%)
Consumption	6.47	7.32	+1.6
Exports	0.35	0.37	+0.7
Imports	3.22	4.47	+4.2
Domestic Production Total	3.15	2.88	-1.1
- Alaska	0.54	0.36	-4.9
- Lower 48	1.85	1.74	-0.8
- Natural Gas Liquids; Other	0.76	0.78	+0.3

Notes: Each entry includes both crude oil and petroleum products. Consumption includes small amounts of ethanol.

Source: EIA (2004b).

Table 6: U.S. Petroleum Imports, Major Sources (2003)

Source	Thousand barrels/day	% U. S. Total
*Saudi Arabia	1,774	14%
*Iraq	481	4%
*Other Persian Gulf	246	2%
*Total Persian Gulf	2,501	20%
Canada	2,072	17%
Mexico	1,623	13%
*Venezuela	1,376	11%
*Nigeria	867	5%
UK	440	4%
*Algeria	382	3%
*Angola	371	3%
*Colombia	195	2%
Norway	270	2%
Russia	254	2%
Other 15 Countries	1,913	16%
Total 33 Countries	12,264	100%

1. Imports are overwhelmingly crude oil rather than products or natural gas liquids.
2. Asterisk denotes the authors' judgment of existence of severe current or potential internal conflicts.
3. Percentages do not add to 100% because of rounding error.

Source: EIA (2004).

VI. The \$75 Trillion Prize: Roads to the Future

For the past two decades, the problems of production and price stability have been addressed by the reciprocal arrangement that constituted the target price band. Persian Gulf countries maintained stable oil output and prices and, in return, their Western allies provided military security (for example, the U.S and European militaries helped turn back the Iraqi invasion of Kuwait in 1990). Today, the price framework is facing major difficulties due to the unstable military and political situation in Iraq (and to some extent in Saudi Arabia). Political instability, the spread of conventional (and nuclear) weapons, and the growing ferocity of the military conflicts and terrorist activities in, or originating in, the Persian Gulf are indicative of a breakdown of civil authority in the region. This has affected the coordination necessary for the effective management of production and prices and destabilized the price framework in the near term. World oil markets experienced a risk premium on the order of \$10-\$15 per barrel for much of 2004.

However, the economic logic underlying the target price arrangement remains intact for the long term. Thus, an era of stable oil prices can be obtained if there are:

- (a) political or military institutions in place that deter appropriation of the oil wealth in the Persian Gulf. This includes protection against control of oil by the providers of military security,
- (b) national governments in this region that are supported by their citizens, and
- (c) acceptable oil revenues to the governments of this region.

With extraction costs at \$5 per barrel, Persian Gulf oil is the lowest cost petroleum in the world. This cost estimate includes exploration, capital investment, a return on capital, and a risk allowance. Throughout the Persian Gulf every dollar above \$5 is a dollar of additional producer

surplus. So when the world price is \$50 per barrel, as it was in October 2004, the profit or economic rent per barrel is \$45. However, for the remainder of this century, assume that \$50 per barrel represents the economic rent from Persian Gulf crude oil. This yields a value of \$75 trillion for the remaining resources in the Persian Gulf.⁸

This, then, is the global problem: \$75 trillion in oil wealth in an area with 120 million people. This enormous wealth has been an attraction to Western oil companies and governments; it was also the goal of the Iraqi invasions of Kuwait and Iran. Recognizing the threats to their stability, the governments of the Gulf acquired considerable weaponry in the 1990s and 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 in the U.S., and elsewhere.

Any global policy that leaves Persian Gulf nations undefended invites future aggression from within or outside the region, with the goal of that aggression to seize and hold oil wealth. Thus a “hands-off” policy that relies on self-government and sovereignty for each country in this region is unlikely to succeed in the future.⁹ Of course, such aggression is not an immediate threat today, but the prize remains, and the countries of this region continue to amass weaponry.

Can the U.S. provide the necessary security? 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. However, the presence of American armed forces on all 13 of Iran’s borders is a major concern. The acquisition of nuclear weapons will appeal to some in Iran’s leadership as a means to deter possible U.S. invasion. For Russia, China, and perhaps

⁸ This is obtained by multiplying the remaining resource estimates in Table 4 by \$50. Discounting, of course, gives lower values. See Table 13 in Chapman and Khanna (2004).

⁹ The severe defect in this approach was made evident by Iraq that saw a \$75 trillion prize, and fought to seize it through war. All together, the first two Iraqi wars killed a nearly million combatants and civilians.

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 weapons capabilities (conventional and nuclear), regionally and globally.

A unilateral approach suffers from serious economic and political defects. The major consumers of Persian Gulf oil include Europe, China, Japan, South Korea, Taiwan, and the Philippines. As long as the U.S. (and to a lesser extent the U.K.) manage security, these countries are able to free-ride and have no incentive to participate in security measures.¹⁰ But the U.S. will experience considerable difficulty in attaining legitimacy as the sole influence on the governing authority in Iraq.

An international security framework would have some potential advantages. Given the success experienced from 1986 to 2003 with the price range system, an international approach ought to be able to manage stable oil production and prices, and generate sufficient revenues for Gulf governments. With participation from the U.S. and others, it would be able to deter wars of appropriation of Gulf oil. As an international group, it would be well placed to forestall control of the region's oil by any security providers in the international organization. In contrast to a unilateral system, a multilateral system would have lesser problems with legitimacy, both internationally and in the Gulf region itself.

However, any important and successful international structure must have the U.S. taking a leadership role. U.S. participation must be significant both militarily and organizationally. The military dimension could perceivably be 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. Potential participants would be the 8 Persian Gulf States, the

¹⁰ We thank Richard Fullerton, U.S. Air Force Academy for this point.

U.S., the U.K., China, France, Japan, Germany, Russia, and perhaps members from Africa, Latin America, and the Middle East. It might be financed by a tax on oil exported from the Gulf. Such revenues (both tax revenue and revenue from export oil sales) could be allocated to Gulf States, and also utilized to support the military forces employed to protect and stabilize the Persian Gulf.

Insuring popular support for Persian Gulf governments is particularly challenging. If the goal is stable global oil markets at reasonable prices, then there is logical motivation to encourage the democratization of governments in the Gulf. Yet the understandable U.S. quest for democratization in the region appears to have been set back by the reaction to the Iraqi occupation, itself an effort at democratization. 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. and its allies. As discussed above, Al Qaeda's political support is based upon its fervent opposition to Gulf monarchies, American influence, and secularism. A security system linked to a continuation of the monarchies would seem to accelerate popular support for Al Qaeda-type policies and actions. (Perhaps unexpectedly, a Defense Science Board report makes a similar observation (p. 36).)

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, a unilateral framework is even less likely to contain the growing instability throughout the Gulf region. 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 has not provided definitive answers, but has raised what we believe to be useful questions.

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**Appendix A: Company Network Importing Oil into the U.S.,
Total and Persian Gulf, January – December, 2002 (1000 barrels)**

Company	Total	Persian Gulf	% Persian Gulf
Totals:	3,302,012	802,891	24%
Chevron Corp	264,555	133,243	50%
Motiva Enterprises LLC	246,619	203,527	83%
Phillips 66 Co	233,958	24,842	11%
Exxon Co USA	219,197	70,758	32%
Mobil Oil Corp	201,803	9,204	5%
Sunoco Inc	198,113	2,428	1%
Valero Mktg & Supply Co	195,576	120,088	61%
Marathon Ashland Petro LLC	170,267	77,313	45%
Amoco Oil Co	156,733	32,861	21%
Flint Hills Resources LP	138,454	7,898	6%
Citgo Petro Corp	130,634	13,421	10%
Shell Oil Co	110,102		
Conoco Inc	95,155	617	1%
Lyondell Citgo Refg LP	89,117	9,525	11%
Phillips Petro Co	85,454	14,564	17%
Port Arthur Coker Co	61,243	2,969	5%
BP Oil Supply Co	52,970	2,260	4%
Atofina Petrochemicals Inc	46,018	19,009	41%
The Premcor Refg Group Inc	44,039	6,313	14%
Orion Rfng Corp	44,007	1,447	3%
El Paso Merchant Energy-Petro	42,490		
Arco Prod Co	38,080	6,095	16%
Murphy Oil USA Inc	36,810	7,012	19%
Chalmette Refg LLC	32,387		
Tesoro Petro Corp	30,311		
Citgo Asph Refg Co	23,978		
PDV Midwest Refg LLC	23,794	517	2%
Equiva Tradg Co	21,383		
United Refg Co	21,286		

Company	Total	Persian Gulf	% Persian Gulf
Tesoro Hawaii Corp	19,233		
Williams Refg & Mktg LLC	18,628		
Cenex Harvest States Coop	16,827		
Shell Chem LP	16,766		
Diamond Shamrock Refg & Mktg	15,522	2,415	16%
Lion Oil Co	12,508	12,508	100%
Shell US Tradg Co	12,161		
Crown Central Petro Corp	11,774		
Ultramar Inc	11,249	632	6%
Hunt Crude Oil Supply Co	10,627	5,370	51%
Sinclair Oil Corp	10,460		
TPI Petro Inc	9,805	7,515	77%
Giant Yorktown Inc	9,007		
Fina Oil & Chem Co	8,882	4,039	45%
Frontier Oil & Refg	8,438		
Ergon Refg Inc	6,638		
Strategic Petro Reserve	5,767		
Koch Supply & Trading Co	5,656	1,039	18%
Trigeant Ltd	5,421		
Vitol S A Inc	4,667		
Shell Oil Prods US	4,499		
Bayoil USA Inc	3,462	3,462	100%
Edgington Oil Co	3,235		
Farmland Indus Inc	2,553		
Montana Refg Co	2,183		
Nexen Mktg	1,903		
Flying Petro Inc	1,653		
Statoil Mktg & Trdg (US) Inc	1,096		
Morgan Stanley Capital Grp Inc	1,074		
Husky Trdg Co	1,004		

Company	Total	Persian Gulf	% Persian Gulf
NCRA	971		
Atlantic Trdg & Mktg Inc	948		
Equilon Enterprises LLC	882		
Cannat Energy Inc	664		
Hess Energy Trading Co LLC	548		
Marquest Ltd Ptnrshp	406		
Equistar Chemicals LP	252		
Texaco Refg & Mktg Inc	110		

The data are based upon operating companies; consequently Chevron and Texaco are separate entries; and so are Exxon and Mobil; and BP, Amoco, and Arco. We do not know the cause of the apparent difference in reported proportions of U.S. imports from the Persian Gulf for 2002 as reported in this Appendix (24%) and Table 6 (20%). The EIA is the source for both tables.

Source: EIA (2002).

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