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The Middle East and Development in a Changing World

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CAIRO PAPERS IN SOCIAL SCIENCE
Volume 20, Number 2

OIL: CHALLENGES AND PROSPECTS

PAUL SULLIVAN

It is always risky to discuss the future of oil markets. The oil markets in the Middle East and in the world as a whole generally function quietly, with businesslike meetings of the minds—then interrupted by turmoil and chaos—and then back again as things settle down. But of course the future of the oil markets is so important that it must be considered, no matter what the risk.

Let us start with some measure of the importance of the Middle East and North Africa (MENA) in oil. MENA has about 70 per cent of the world's reserves (British Petroleum, 1996). Total reserves in the MENA region are about 700 billion barrels (Middle East Economic Digest, 1996d). Future reserves could be much more than this. Saudi Arabia could have as much as 1 trillion barrels (Saudi.internet). Iraq could have as much as 215 billion barrels (Iraq.internet). Iran could have at least 140 bb (Iran.internet).

Other areas in MENA, such as Libya and Algeria could have significant, yet undiscovered, reserves. Ultimate Persian Gulf reserves, according to the U.S. Department of Energy could be as high as 876.4 bb (Energy Information Agency, 1996). Total known reserves in the Gulf today are about 655 bb.¹ The low estimate² of undiscovered reserves is about 74 bb. The high estimate is 232 bb (Energy Information Agency, 1996).

Even Jordan, a country generally considered resource poor, could have as much as 30 bb of oil equivalent (bboe) in shale oil (Jordan.internet). What would be needed for this oil to be extracted is either improvements in technology or an increase in the price of oil plus the solid expectation that the price would remain at level to make the present extraction and distillation economical. There are questions of technical as well as economic feasibility, but the oil is there in large quantities.

¹ This is out of a total world reserves known of 1 trillion barrels.

² Most of the future estimates of production and consumption of oil in this paper are from the EIA of the US Department of Energy, probably the most reliable and solid source of information and predictions for oil markets.

Total production in MENA is about 24 mbd of the total world supply of 71 mbd. Total OPEC supply is about 28 mbd (Middle East Economic Digest, 1996d). So MENA is a huge proportion of the total OPEC supply. Moreover, close to 3/4 of the production of MENA can be found in Algeria, Libya, Saudi Arabia, Iran and Kuwait. Once Iraq comes on line they could take a lion's share of the area's production. Even without Iraq, over 22 mbd comes out of the Gulf. Table 1 gives us the 1994 and 1995 production for the countries of MENA.

Table 1

**Oil Production for Countries of the MENA Region,
1994 and 1995 ('000 barrels per day)**

Country	1994	1995
Algeria	1,325	1,310
Egypt	920	930
Iran	3,710	3,705
Iraq	515	545
Kuwait	2,105	2,095
Libya	1,415	1,420
Oman	870	820
Qatar	460	450
Saudi Arabia	8,885	8,875
Syria	610	565
Tunisia	90	95
UAE	2,485	2,485
Yemen	335	335
Other MENA	55	55

Source: Middle East Economic Digest, 1996d.

Linkages with World Oil Markets

The Gulf is the source of about 24 per cent of the net petroleum imports of the U.S, 50 per cent of the net imports of Western Europe, and close to 70 per cent of the net imports of Japan. Nevertheless, the U.S. dropped its net demand from the Gulf from close to 28 per cent before 1990. Europe has remained about 48 per cent with a dip to 43 per cent just after the Gulf War and a return to 48 per cent in 1995(Persian Gulf.internet). Given the projected production/reserve ratios of the Gulf producers compared to non-

Gulf producers, it is likely that reliance on the Gulf by Europe and the U.S. will increase, *ceteris paribus*.

Japan has been shifting toward more reliance on countries such as Iran, to the point that the Japanese are supplying tankers made by Mitsubishi to Iran in return for oil. Japan now takes 900,000 b/d from Iran, the sanctions imposed by the U.S notwithstanding. Of Japan's total 1995 demand of 6 mbd, 85 per cent comes from the MENA and 70 per cent from the Gulf (British Petroleum, 1996). The United Arab Emirates supplied over 1/4 of Japan's oil needs in 1995, at a cost of \$8.2 billion (OPEC Bulletin, 1996a). Japan also has been importing around \$1.8 billion in oil from Kuwait (OPEC Bulletin, 1994d). Qatar has signed an agreement to export 2 million tons of natural gas per year to seven Japanese utilities (OPEC Bulletin, 1994e). The Japanese have also won large energy contracts in the MENA region (OPEC Bulletin, 1994a).

Japan is expected to increase its demand for oil to around 7-7.5 mbd by 2015 (Energy Information Agency, 1996). One may expect that most of this increase will come from the MENA region and most of that from the Gulf area. The Japanese are trying to develop good relations in the area in order to make the oil supply more secure (OPEC Bulletins, 1994b, 1994d, 1996c, 1996f). Japan has almost no oil reserves. Oil reserves in Asia (excluding Central Asia) are much smaller than in the Gulf, and the production-reserve ratios do not lend much security to the supplies in Asia compared to the potential supplies coming out of the MENA (Fesharaki, 1996).

One would also expect that much of the increase in the demand for oil by the Peoples Republic of China would find its way from the Gulf. This is especially so considering that most of the sweet crude comes from the Gulf (Wang, 1993). Most of Chinese refinery capacity is directed toward sweet crude. China's total demand of 3.7 mbd today may reach as much as 6-9.6 mbd by 2015--or about between what OECD Europe was demanding in 1985 and about 1.2 mbd more than the FSU was demanding in 1990 (Energy Information Agency, 1996). As Haijang Wang (1993) most aptly puts it:

Since 1970 the [Asia-Pacific's] economic activity has increased more than fourfold compared to the doubling of the world economy as a whole. Over the same period, oil demand in Asia-Pacific has also risen fourfold, while total global oil demand has increased a mere 40 per cent. This Asia-Pacific growth has found support mainly in the rising economic power of Japan and accelerating industrialization in the "four

dragons" (South Korea, Taiwan, Hong Kong, and Singapore), as well as the unprecedented opening of the Chinese economy.

Furthermore:

The generally accepted figures for Asia-Pacific proven crude oil reserves range from 40 to 50 billion barrels (compared to more than [700] billion barrels in the Middle East), representing just 4 to 5 per cent of global total proven reserves. In 1993 China's 19.5 billion barrels of proven reserves made up to 40 to 50 per cent of the Asian total. These numbers suggest that during the coming decade, if China's crude reserves cannot supply domestic needs for crude ... the only reliable source of exports for the required volumes is the Middle East.

China is getting very much involved in the MENA region on many levels. The Qatar-PRC relationship was given a more solid footing with recent visits by the Qatari Energy Minister to discuss joint efforts in natural gas, fertilizers, petrochemicals, as well as other investments (OPEC Bulletin, 1995b). Kuwait has also begun talks on joint ventures with China on pipelines (in China to go to Chinese refineries using only Kuwaiti crude), and on the export of Kuwaiti crude to China. According to Dr. Abdul Mohsen Medej Al-Medej, the Kuwait Oil Minister (OPEC Bulletin, 1995a):

We realize that demand for oil will rise during the coming 10 years, particularly in China. We will be glad that our co-operation will cover the exportation of crude oil and bi-products and petrochemical products.

Iran is buying a wide range of goods, from merchant ships to missiles, from China (OPEC Bulletin, 1995d). Iran has recently signed a multibillion dollar trade agreement with China (OPEC Bulletin, 1995c):

Visiting China as head of the 26-member Iranian delegation to the Iran-China joint commission in Beijing, the Vice-President [of Iran for Executive Affairs, Hamid Mirzadeh] said the agreements would be worth \$2 billion.

Among the areas covered by the agreements are Tehran's new subway system, the establishment of cement and glass factories, co-operation in the oil refining sector and joint investment in various scientific and research projects.

At present, Tehran-Beijing ties include ferro-alloy production in Kahnouj, a mineral condensing factory in Chador Malou, the Tehran-Karaj metro project, melamine power production in Orumiyeh, hydro-

electric power plants, and an agreement on the construction of two 300 megawatt atomic power plant units in Bushehr.

China has commitments to buy at least 3.5 million tons of oil from Saudi Arabia for the next few years (OPEC Bulletin, 1994c). A Saudi Arabian firm is supplying air conditioners to China (OPEC Bulletin, 1996d). The Chinese have also signed an agreement with Morocco on developing a water project for Morocco. Chinese relations with the Middle East, economic, political, military, and diplomatic are growing--and should be expected to continue to grow.

Kent E. Calder (1996) gives us another side of this:

Over the coming decade three powerful engines will propel rising Chinese demand for oil: an automotive revolution, growing industrial production generally and energy-intensive manufacturing in particular, and expanding air travel. In 1994 China produced only 350,000 autos, many of them for state enterprises. But the aspiration among the Chinese middle class--expected to exceed 200 million people within a generation--to own a car is clear and is supported by government plans for a "people's car". Given that the country has a population of 1.2 billion, a long-range projections of 300 million cars on the road is not unreasonable. The production of petrochemicals, which, like cars for China's masses, requires large quantities of oil, has been designated one of the country's "four pillars [industries] for the early 21st-century development," along with auto manufacturing. Annual increases in the demand for petrochemicals climb well into the double digits, with plastics and fertilizers leading the way. Air travel has risen 20 per cent a year in China since 1978 but still accounts for only 6 per cent of total transport--very low for so sprawling a country. During the next two decades the demand for aviation fuel should grow at least double the rate of overall energy consumption.

China has also been negotiating production sharing agreements with Iraq to help Iraq develop new oil fields in the post-sanctions era.

India's demand is expected to increase from 1.5 mbd to between 2.6 and 4.1 mbd by 2015 (Energy Information Agency, 1996). Its GDP growth rates have been recently in the 4-6 per cent per year category. The middle class is growing here also.

India has its Bombay High, Upper Assam, Cambay, Krishna-Godavari and Cauvery Basins (India.internet). The Indian government has put tens of billions into an Accelerated Exploration Program (AEP). Even with these huge investments, on average India is expected to import over 1 mbd of its

total demand of 1.6-2.0 mbd of oil demand expected until 2000. Oil imports in 1995 were 790,000 b/d -- mostly from the Middle East. Its largest sources of imported oil are Saudi Arabia, Kuwait and the U.A.E. The only significant non-MENA supplies are from Malaysia (India.internet).

India's state owned Oil and Natural Gas Corporation (ONGC) has large investments in Egypt, Iraq (on hold), Abu Dhabi, and Iran (India.internet). India is also involved with pipelines for gas coming out of the Middle East. Joint ventures in Energy have been discussed and signed between India and Kuwait and India and the UAE. Qatar has signed an agreement with Enron Corporation of Houston, Texas and India to supply LNG to India's new giant electrical plant built by Enron just outside of Bombay.

South Korea and Taiwan are energy poor and will have increasing needs for oil in the future. Much of this is expected to come from the Middle East. All of East Asia will be turning toward the Middle East as they develop and grow.

Demand from the U.S. is expected to increase from 17.5 mbd to 20-24 mbd by 2015 (Energy Information Agency, 1996). This is a moderate increase in demand in comparison to the Asian countries. Demand for oil in the FSU and other Eastern European countries is expected to be flat and under some scenarios may decrease. There is a great deal of uncertainty with regard to what might happen in this region over the next couple of decades.

Total world demand is expected to increase in 2015 to somewhere between 87 mbd to 113 mbd from its present 72 mbd (Energy Information Agency, 1996). Most of this demand is expected to arise in the Asia-Pacific area. Non-OECD Asian demand is expected to increase from its 10 mbd in 1996 to 25-30 mbd in 2015. This area may contribute about 1/2 of the total increase in oil demand in the next 20 years.

Overall the forecast is that oil demand will increase by 1.5 mbd each year up to 2015. Non-OPEC oil supply is expected to remain fairly flat. The dependency of the world on Gulf oil is about 30 per cent or so. This may increase to over 46 per cent by 2015 (Energy Information Agency, 1996).

In other words, the Gulf and the Asia-Pacific regions will become much more, not less, important in the oil trade. The real political-economic levers of the world may, therefore, shift more so in those directions. The increased interest in the Asia-Pacific and Middle East regions by the U.S. and the E.U. are signs that the levers have already started to move. The geographic centers

of the oil business will also shift toward these two areas in a bi-polar manner.

A dynamic Asia will become increasingly dependent on the volatile Middle East--including Iran and possibly Iraq--where the oil is abundant. By 2000, the East-West Center estimates, 87 per cent of the oil East Asian nations import will flow from the Middle East, up from 70 per cent today; by 2010 dependence on Middle Eastern oil could reach 95 per cent.... In the next 15 years, East Asian imports from the Middle East could easily triple to more than 15 per cent of global consumption.... So unless other forces intervene to arrest the trend, the Middle East and Asia, the two major economic and geopolitical centers of the non-western world, are likely to grow closer. (Calder, 1996)

Further evidence to support this shift can be found in the production reserves ratios across regions and across countries. These R/P ratios give us some idea of the number of years left to the known reserves given the present day extraction rates. They also usually give us (except in cases of unusual finds, sanctions, recovery from wars, and extreme underdevelopment of reserves like in Central Asia) the expected ratios in the future for many countries given a constant increase in discoveries and production. The underlying geology and estimated potential finds in the future can also give weight to these R/P ratios (British Petroleum.internet).

Table 2

World and Regional Production Reserve Ratios, 1995

Area	R/P as of 1995
North America	18.8
South and Central America	39.3
Europe (East and West)	6.9
Former Soviet Union	22.0
Total Middle East	92.3
Total North Africa	30.0
Total Asia and Australasia	17.0
Total World	42.8

Source: British Petroleum, internet

The countries that have over a 30 R/P and are major producers are shown in Table 3.

The OECD has and R/P of about 14.7, OPEC has one of 79.5 with most of the weight coming from the Gulf area. Asia has about 17. With increasing economic development and increased energy demand in the region the R/P in Asia may drop even more.

One, of course, has to calculate the effect of oil prices on exploration, output, research and development, on oil technologies and the technologies of competing fuels, such as natural gas and renewable resources. One also has to look at the geological studies for each region and then come up with something like probabilities of finds and their respective amounts.

Table 3
Countries with Production Reserve
Ratios over 30, 1995

	R/P as of 1995
Mexico	47.1
Venezuela	63.5
Romania	31.5
Kazakhstan	35.5
Nigeria	30.2
Iran	65.9
Saudi Arabia	83.8
Yemen	32.9
Libya	57.5
Iraq	100+
Kuwait	100+
UAE	100+

Source: British Petroleum.internet

There is always room for surprise in the oil business. Yet, the only major shifts expected by the Energy Information Agency and others in the next 15 years or so are in the MENA region--and particularly in the Gulf. The FSU, particularly Russia, Turkmenistan and Kazakhstan may have some significant surprises on reserve finds, but that may be later in the future. If this happens earlier, then the calculus for oil markets has to be redone. The recent signing of a deal including Chevron, Lukoil, the Governments of Oman, Kazakhstan and Russia to build a \$2 billion oil and gas pipeline connecting Kazakhstan to the Black Sea could bode well for opening this oil up earlier. The infrastructure in Central Asia, however, is

primitive at best for the development of the massive oil industry that would be needed.

Again, we have to take a cautious view of things in the light of the past surprises in the oil industry and in the light of the virtually unknown and unexplored regions of the world, such as Kazakhstan. Under the sea could also hold significant unexpected finds. Hydrogas could be extracted more economically and easily. Deep water drilling might go beyond the limits we have considered in the past. Much of the ocean floor, some 75 per cent of the earth's surface, has yet to be fully explored for oil.

But let us work with what we know now and not with speculation. The most likely increase in reserves for the Gulf is another 116 bb (Energy Information Agency, 1996). Increases in reserves for other OPEC countries may be in the order of 35 bb. Eurasia may see another 108.3 bb and OECD another 108 bb. The cost of increased capacity is much higher in the OECD than for the Gulf. The costs of setting up the oil industry in Central Asia may be very much higher than in the Gulf.

The following give an idea of the differences in the costs to increase capacity within the MENA region (Arab Petroleum Research Center, 1995):

The costs of expanding capacity vary greatly from one country to another, however, ranging from as little as \$2,800 per daily barrel in Saudi Arabia to as much as \$18,000 for Syria. In between these extremes, APICORP estimates the costs per daily barrel at \$3,250 for Kuwait, \$5,000 for Qatar, \$7250 for the United Arab Emirates, Libya and Yemen, and \$13,500-15,000 for Egypt, Oman and Algeria. As regards the costs of maintaining effective production capacity at present levels. APICORP estimates that at \$165 per daily barrel for Saudi Arabia, \$175 for Iraq, \$185 for Kuwait, \$210 for the U.A.E, \$220 for Qatar and \$320 for other Arab countries.

These much cheaper capacity increase costs in Saudi Arabia may explain why they usually hold most of the excess capacity. The very high costs in the OECD, often thousands of dollars more than in the MENA region per daily barrel, make it more difficult for them to increase capacity and to carry excess capacity. Capacity increases in Central Asia and Russia must also include for some time the costs of improving and developing the infrastructure of the area. This may make excess capacity prohibitive. Central Asian, costs of increasing production by one daily barrel may drop over time as the area starts to take advantage of economies of scale and scope

with the further development of the oil, natural gas, and petrochemicals industries in the area. Estimates of the increase in per barrel costs could not be found, but intuitively they would, in the medium run, seem much higher than the GCC states and possibly between those of Egypt and the OECD Europe. In the long run they may drop to Gulf levels, but that is a highly speculative guess. Central Asia is mostly *terra incognita* on many issues related to oil.

Finding costs by area for 1994 are shown in Table 4.

Table 4
Oil Finding Costs in Selected
Countries and Regions, 1994 (in US\$)

U.S.	4.53
Canada	6.44
OECD	5.21
Africa	3.52
Middle East	3.88
Other Eastern Hemisphere	4.95
Other Western Hemisphere	3.39
World	4.69

Source: Feld, 1996.

It is noteworthy that finding costs worldwide have dropped considerably, from over \$20 in 1982 to around \$4.70 in 1994. Finding costs are lower on average in OPEC countries than in non-OPEC countries (nonopec.internet).

Non-OPEC oil reserves cost more to develop and produce than OPEC reserves. Based on data collected from major U.S. companies with overseas operations, finding costs in the Middle East and North Africa (where OPEC countries control most of the region's oil reserves) averaged less than \$4/barrel with over \$4.50/barrel in the United States, over \$5/barrel in western Europe, and over \$6/barrel in Canada.

Direct lifting costs and total lifting costs including production taxes are shown in Table 5.

Table 5

**Lifting Costs, Selected Countries and Regions,
1994 (in US\$)**

Region	Direct lifting costs	Total lifting costs including production taxes
U.S.	3.68	4.25
Canada	3.47	3.75
OECD Europe	4.90	5.75
Africa	3.08	4.21
Middle East	3.47	4.43
Other Eastern Hemisphere	2.15	2.97
Other Western Hemisphere	2.63	3.26
World	3.55	4.26

Source: www.eia.doe.gov/emeu/frs/pp94/t161in.internet

The Gulf States, particularly Saudi Arabia, seem to have the lowest cost per new barrel per day. They are much more likely to bring the new barrels on line, especially in low oil price scenarios, than the OECD and the other important oil areas, even Russia and Central Asia.

Future Directions

Taking a *reference case*³, an average highly educated guess, from the Energy Information Agency, (EIA), total world production is expected to increase from 72+ mbd in 1996 to 98.7 mbd by 2015 (Energy Information Agency, 1996). That is a total increase of some 26.7 mbd over 19 years, or about 1.4 mbd increase each year on average. Total OPEC production is expected to increase from 28 mbd to 55.5 mbd by 2015. That is, it is expected to just about double. The percentage of OPEC production in the world total is expected to increase to 56 per cent by 2015, up from its present 40 per cent. The Gulf is expected to take 43.7 mbd of the 55.5 mbd total in 2015. That is about 78 per cent of the total output of OPEC. Today the Gulf has about 68 per cent of the OPEC total.

So most of the increase in the oil supply from now until 2015 is expected to come from OPEC and especially from the Gulf, under the

³ This is a reference case from the EIA based on EIA research and data.

assumptions of reasonable oil prices in the 20-25 dollar range and no real political shocks to the region.

Non-reference cases including both higher and lower oil prices still lead to similar conclusions. Even under the assumption of a high-non-OPEC output, OPEC still is expected to produce 50 per cent of total output by 2015. The Gulf produces 40 per cent. Non-OPEC supplies increase from 43 mbd to 50 mbd. This is an increase of only 7 mbd. Saudi Arabia becomes a real big winner in all of this. Its production may increase from just over 8 mbd to over 18 mbd. Iraq will likely be coming back in line in the not too distant future. It may produce 6+ mbd by 2015.

There are, of course, many questions attached to these figures. Oil prices are notoriously unpredictable. What will one oil price trajectory do, compared to another, for the finding and lifting of oil in different regions. New methods and technologies may confound any prediction. New finds in unusual places may also change the view of the future of oil.

Under a broad range of scenarios, though, it remains the case that the Gulf, MENA and the present-day OPEC countries will increase in importance in the oil trade. Russia will have to deal with many severely damaged oil fields for some time to come. The Russian forecast of 300 bb in reserves seems a fantasy (russia.internet). Most likely there are about 100-150 bb under the ground there. And considering the political and military conditions of the region, it may be many years and many 10s of billions of dollars before the Russians can lift this oil at the rates that they did before the fall of the USSR. Russian exports and production have been in severe decline since the fall of the USSR (resuexp.internet). Domestic and international investments in the repair and development of the Russian oil industry are far below what is needed to even get it back to its pre-independence days.

What buffers are available against any possible future shocks? OPEC is expected to have increased its percentage of the oil trade from 37 per cent in 1990 to 40 per cent in 1996. World oil demand went up to 71.8 mbd, an increase of 5.8 mbd, since August 1990 (Middle East Economic Digest, 1996d). Oil demand has increased about 2.5 per cent per year since the opening of the Gulf Crisis. Of the increase of 5.8 mbd since the invasion of Kuwait non-OPEC production has increased only by 1.3 mbd ([British Petroleum.internet](http://BritishPetroleum.internet)).

OPEC has traditionally served as the world's reserve oil producer. The OPEC countries have also been the sources of most of the disruptions in the oil markets. They are also the most economically flexible oil producers in times of shock. Their relatively low cost of production and relatively low cost of capacity increases led to their recapturing some of the market share they lost during 1979-1986 after the Gulf Crisis.

Excess oil production capacity also gives some sense of the leeway allowed markets in times of stress. In August 1990 world excess production capacity was 5-5.2 mbd (iraqkurd.internet). Most of this excess capacity was to be found in the GCC countries. Saudi Arabia had most of the excess capacity. This can be shown by the direct capacity figures and by how easily Saudi Arabia increased its oil production by over 2 mbd after the loss of the Kuwait and the Iraqi oil.

For 1995 excess capacity was only 3.4 mbd (iraqkurd.internet). OECD total commercial and strategic stocks in March 1996 were just 3.5 bb, or 88 days supply. This is 10 days less than in March 1990 and the lowest since 1973. This gives much less of a buffer than the world oil markets had in August 1990. But, again, most of the excess capacity is to be found in Saudi Arabia, Kuwait, and the U.A.E. Their total excess capacity is 2.8 mbd. Most of this is to be found in Saudi Arabia. Iran has about 0.2 mbd in excess capacity. Only 0.4 mbd of excess capacity could be found outside of the Gulf area.

EIA predicts that in 2005 excess capacity will be much less. The excess capacity in the Gulf will be just 0.5 mbd (Energy Information Agency, 1996). The total for OPEC will be just 0.6 mbd. Other areas will have 0 excess capacity, according to the EIA. These figures were calculated by taking the predicted reference case production capacities of the regions and subtracting out the predicted production of the regions. If finding and capacity increase costs decline significantly and the trend for oil prices is strongly upward these excess capacity figures will have to be revised. They will also have to be revised if there are major shocks to the market.

These low excess capacity rates seem a bit on the risky side. One would expect, logically, that the decision to have an increase in excess capacity would build in the risk level of a shock to the market happening. As the risk of a disruption to oil flow increases in one area the producers in

the other areas would increase their excess capacity, or at least the flexibility of their output.

Recent behavior by major oil producers, however, has led to the opposite result. Increased risk is followed by less excess capacity. Then again, many of the oil producers might be waiting to see what happens to Iraq. Building excess capacity during a time when a major potential oil producer could come back fully into the market would be risky. The continued sanction on Iraq may be leading to an increase in the risk of a large oil price shock should something happen in the interim before Iraq is opened up again. The industry might be seeing the excess capacity as partly coming from Iraq in a probabilistic sense. Excess capacity increases are also determined by the expected price of oil. Right now oil prices are soft. Hence, excess capacity increases would be limited, or they might be reduced.

The timing and placement of any future disruption in global petroleum production is crucial. If it occurs during a time of low stocks, low strategic petroleum reserves and low excess capacity in other producing areas, then the effect of the shock on prices will be the greater.

It should be noted that excess production capacity is quite limited in regions that appear to be comparatively more stable. On the other hand, even severe disruptions of oil production have sometimes been short-lived. It is useful to review how oil producers in various regions responded to some recent crises.

In the Gulf Crisis of 1990-1991 Kuwait and Iraq's production went down 4.5 mbd. Most of the slack was taken up by other GCC states. The excess production capacity was there. Saudi Arabia, Oman, UAE, and Qatar went up 3.2 mbd (Watson, 1991). Other OPEC producers increased production by 1.1 mbd. Non-OPEC production went up by only .2 mbd. For the GCC the war was expensive, but they were able to gain increased market share at the same time. These increases in production remained even as Kuwait resumed production near its pre-invasion level.

Another example is the post-Iranian Revolution era. Iran's oil production dropped from about 5 mbd in 1978 to 3 mbd in 1979, and to a further drop to 1.3 mbd in 1980 (Petroleum Economist, 1996). Iran has only recently returned to 3.6 mbd after a slow recovery from the war with Iraq. During the war oil output was around 2 mbd on average. The Islamic Republic of Iran has also maintained lower production quotas than pre-

Revolutionary Iran in order to "preserve" Iran's natural reserves for a longer period.

The difference in overall supply and demand for oil worked itself out within a few years after the revolution. There was reduced demand for oil due to oil-price induced technological change and public policy changes toward conservation. There was also a significant increase in the non-OPEC production of oil due to the extremely high price of oil in the 1979-1981 era. By 1985-86 the price began a steep tumble to below \$10 (for a brief period) from above \$40 in 1979-80.⁴

This drop in 1985-86 was prompted not only by the long term change in the demand and supply elasticities of oil due to the high price trajectory, but also and more importantly, by the attempt by Saudi Arabia become the dominant OPEC producer. Saudi Arabia wanted to get control over any excess production over OPEC quotas. Saudi Arabia's solution was to flood the market with cheap oil, to demonstrate that Saudi Arabia could damage over-producers any time they exceeded their quota. Prices were driven so low that the economies of some oil producing countries were damaged for an extended period of time.

But over the longer term, OPEC lost its place in the world oil markets, mostly because the price trajectory was too high. The Organization dropped from producing 29.8 mbd in 1978 to about 17 mbd in 1985-1986 (Petroleum Economist, 1996). The high price of oil brought new oil sources on line. Exploration and lifting in places that were not deemed profitable before the price increase became very profitable after the price increase.⁵ New sources of oil flooded the market and drove the price down. Iraq may have accused Kuwait and the UAE of trying to drive the price of oil down, but the increase in production in Mexico, Norway, and the U.K., as well as in Kuwait and the U.A.E., were simply logical reactions to market forces.

The annual growth rate of oil consumption from 1979 to 1985 was a negative 1.86 per cent, due to conservation and fuel switching (Watson, 1991). Annual oil production in the GCC also dropped by 14.74 per cent per year during 1980-85. OPEC oil production dropped at an annual rate of 9.14

⁴ See *BP Statistical Review of World Energy 1996*, at <http://165.121.20.76/bpstats/nframe/oscpnf.html> for yearly averages. In 1985 it was 27.53 in 1986 it was 12.97.

⁵ Such as in Prudoe Bay, Alaska. There were some significant increases in production in Mexico, Norway and the U.K.

per cent. High prices solved production shortages by bringing down demand and increasing alternative suppliers.

Political shocks can lead to oil shocks, but historic experience shows that that is not inevitably the case. Algeria continues to pump oil in the midst of a bloody civil war, and new deals with foreign oil and gas companies continue to be signed there. Iran has also been active in signing up joint ventures, despite US sanctions. Angola also went forward with production throughout its civil strife. Yemen increased its oil production during its recent civil war.

Transportation Bottlenecks in the MENA Region

The Middle East and North Africa are the locations of some of the most important potential bottlenecks in the transport of oil: Bab al Mandab, the Suez Canal, the Straights of Hormuz, the Straights of Tiran and the Bosphorus. These bottlenecks, potential points of closure, carry 18+ mbd of the total world supply of about 72 mbd (choke.internet).

The Straights of Hormuz carries 14 mbd. Much of this oil ends up in the U.S., Japan, and Western Europe. These Straights are a 2-mile channel with a 2-mile buffer zone. They are bordered by Iran near Bandar-e-Abbas, Qeshm Island and other small and relatively well-armed islands, and Oman. The Gulf does not have that wide a channel throughout. As the "Tanker War" during the Iran-Iraq war made clear, oil tankers in the Gulf are vulnerable (Cordesman, 1987).

Tankers going through the Straights are literally floating targets that can be easily shot at or damaged by mines. The Straights of Hormuz include a sharp turn to the north and east followed by another turn to the south and east. Oil tankers take quite a bit of time and space to make such a turn. The Straights themselves and the entry and exit areas are about 60-90 miles long. A lot can happen in a tight spot running for such a distance.

Alternate routes could be the 4.8 mbd Petrolina, the 2.2 mbd IPSA 1 and 2 and the Abuqaiq-Yanbu pipeline (choke.internet). Cutting a canal through the UAE and Oman, or just the UAE might produce another alternative, but canals can be risky also. Going overland to the East may be more possible as East Asian demand increases relative to Western demand.

The Suez Canal and the Sumed pipeline carry some 3.5 mbd. About 1.1 mbd goes through the canal in VLCC-sized ships, 2.4 mbd goes through the SUMED pipeline (choke.internet). Most of this oil finds its way to Western Europe. Some of it goes as far as North America. Alternatives are across land in other oil pipelines, possibly to be built in Jordan and Syria.

The Canal was closed for long period during the 1960s and 1970s due to the Arab-Israeli conflict. Any resumption of international conflict in this area could again disrupt Canal traffic.

This, however, is not the only potential threat to the flow of oil through this area. Any serious domestic strife could also disrupt the flow of oil through Egypt. Any pipeline can be damaged. The sinking of just one ULCC or VLCC ship at a narrow point could easily block the Suez Canal. The Canal is as narrow as 160 meters at some places. Ships with a beam of more than 160 or so feet cannot pass (Arab Petroleum Research Center, 1995).

The Sumed can compete with the Suez Canal by transporting oil much more cheaply to the Mediterranean. It can also complement transport of oil through the Canal.

Sumed has a function which is directly complementary to that of the Suez Canal. It enables large tankers to discharge their cargoes fully or partially into the pipeline at Ain al-Sokhna, to transit the canal in ballast or partly laden, and to reload to full capacity at Sumed's northern terminal at Sidi Krir. Alternatively, supertankers can discharge oil into the pipeline at Ain al-Sokhna while other smaller vessels carry it on from Sidi Krir to markets in Europe and elsewhere. (Arab Petroleum Research Center, 1995)

These complementary and competitive characteristics may help reduce the risk of a bottleneck in oil transport due to domestic strife in Egypt. If, however, Ain al-Sokhna or Sidi Krir were disrupted, then oil transport in Egypt would be threatened. Some shipping would have to revert to the old Cape route.

Bab al-Mandab is also a problem for the Suez-Sumed oil, for all oil going North from the Red Sea ports of Saudi Arabia. This is the narrow channel between Yemen on one side and Djibouti and Ethiopia on the other. It is in a region that has experienced considerable strife and instability in recent decades.

Tensions between Ethiopia and Yemen came to a head last year with the battles over the Hanish islands that are just north of the Bab al-Mandab Straights. The channel at Bab al-Mandab is not more than 2 miles wide. The Straights themselves are just a little over 20 miles wide. There are no alternative pipelines in Yemen or Ethiopia as yet. The alternative is to go all the way around the Cape of Good Hope, but the additional time and expense would significantly reduce the profit margins on the transport of oil from the Gulf to Western Europe.

Another bottleneck in the MENA region is the Bosphorus. About 1.2 mbd travels through here to western and southern Europe. Most of the oil originates in the former Soviet Union and the Caspian basin. This channel goes through populated areas. It is as narrow as 1/2 of a mile at one point. The Bosphorus is notorious for ship collisions because of its narrowness and the speed with which the current flows through. The thick fog that often blankets the channel also does not help. Alternatives to the Bosphorus are possible but they may be very expensive.

How sensible it will be to build these alternatives will be determined by the degree of risk perceived to the disruption of oil and to the environment of the Black Sea and Turkey due to oil tanker and other collisions. As Central Asian oil becomes more developed these alternatives will become more economically feasible. More oil may be flowing through Turkey via the Black Sea ports such as Novorossiysk. Oil and Gas connections between Iran, Turkmenistan, Kazakhstan and Turkey will also become more developed in the next 30 years or so. Oil pipelines from Iraq to the southeastern coast of Turkey could also be used as linkages to reduce some of the risk.

Iraq

Table 6 gives some idea of the relative importance of Iraq and the GCC when it comes to oil reserves proven in billions of barrels in 1994-1995.⁶

Iraq is clearly in a pivotal position with regard to oil. It may be that as the sanctions are kept on, Iraq's importance in the regional oil picture will increase. That is, the other regional "giants" such as Kuwait are lifting their

⁶ MEED, 19 July 1996, p. 16. Their source: *BP Statistical Review of World Energy 1996*.

oil while Iraq's remains in the ground. As we will see in the next section of the paper, Iraq has barely touched its potential reserves.

Table 6

**Oil Reserves and Reserve/Production Ratios,
Selected Countries**

Country	Reserves, end 1994	Reserves end 1995	Regional share per cent	Reserve/ production ratio
Algeria	9.2	9.2	1.3	20.5
Egypt	3.3	3.9	0.6	11.8
Iran	89.3	88.2	12.6	65.9
Iraq	100	100	14.2	>100
Kuwait	96.5	96.5	13.7	>100
Libya	22.8	29.5	4.2	57.5
Oman	4.8	5.1	0.7	16.2
Qatar	3.7	3.7	0.5	23.1
Saudi Arabia	261.2	261.2	37.2	83.8
Syria	2.5	2.5	0.4	11.2
Tunisia	0.4	0.4	0.06	12.7
UAE	98.1	98.1	0.14	>100
Yemen	4.0	4.0	0.6	32.9
Total	696.0	702.5	100	80.9

Source: Middle East Economic Digest, 1996d.

Iraq's production has been small since 1990, i.e., 700,000 barrels a day in 1994 (Arab Petroleum Research Center, 1995) and 550,000 b/d in 1995 (iraq.internet), compared to its available supplies of up to 215 bb. Iraq's oil resources are second only to Saudi Arabia's.

As of the beginning of 1997, Iraq is permitted to export \$1 billion in oil every 90 days. Iraq was given a 1.2 mbd quota by OPEC (an increase in 800,000 b/d) in June 1996 (iraq.internet), almost certainly in expectation of the UN move to let Iraq export oil under resolution 986.

UN Resolution 661, imposed following Iraq's invasion of Kuwait in 1990 and renewed every 60 days since then continues to prevent Iraq from exporting oil, except for small amounts (around 50,000 b/d) to Jordan. Prior to the war, Iraq was producing over 3 million b/d and exporting 2.8 million b/d. (sanctions, internet)

Iraq has significant oil resources and oil infrastructure. The Minister of Energy of Iraq recently said that Iraq would be able to produce 2.5 mbd fairly

quickly after the sanctions are taken off. (Arab Petroleum Research Center, 1995) Others see that amount as something of an overestimate. The Energy Information Agency thinks that 1-1.5 mbd is reasonable (iraq.internet). Nazem Abdalla at UNESCWA in Amman estimates about the same capacity to export oil.

Iraq has some super giant and giant fields that are far from fully developed:

Of the 73 fields discovered in the country, only 15 have been brought into production up to now, but once the embargo is lifted Iraq is planning to develop 25 new fields and eight reservoirs that are only partially exploited. Those 33 structures have a combined production capacity of 4.5 million b/d, with the 10 biggest fields alone having a potential of 3 million b/d between them. They include 5 supergiant fields in the south of the country, whose development Iraq is planning to contract out to foreign companies under production sharing agreements--Majnoon (Elf Aquitaine), Nahr Umr (Total), Nasirayah (Agip)...[and another large field under Lukoil of Russia]...Work had started on West Qurna before the Gulf crisis. (Arab Petroleum Research Institute, 1995)

West Qurna could have 15 bb. Majnoon could have 20 bb. Nahr Umr could have 6 bb and Halfaya 5 bb. (Arab Petroleum Research Institute, 1995) The development of these fields and some smaller ones could lead to at least 50 bb being added to Iraq's proven reserves. 150-215 billion barrels of oil is a lot of wealth sitting underground for a country devastated by war and sanctions. If the oil price goes up to \$30-35, there may be even more oil found in less time.

Iraq could produce as much as 2.1-2.5 mbd after 3 months or so. After 3-5 years they may be producing, according to Paul Heuber at EIA, as much as 6 mbd. Of this 6 mbd, Majnoon could produce up to 2 million b/d. Three smaller fields could add up to over 250,000 b/d fairly quickly (Arab Petroleum Research Institute, 1995). These are significant numbers that could bring a real shock to the oil markets--after all sanctions are lifted. The nature of this shock will depend on how Iraq is brought back into the markets--and how fast. Speed and timing, as well as the general health of the rest of the oil market, will determine the effects of the opening up of Iraq.

However, in the short run in Iraq the greatest limitations are in storage and transport, not production. Mina al-Bakr on the Fao Peninsula is still in disrepair. Storage is a problem, particularly near Basrah. Gulf exports will

be slow in developing because the sea has to be dredged and the port almost entirely rebuilt. The pipelines leading out of Iraq to Turkey, Saudi Arabia, Syria and Jordan are in disrepair (iraq.internet). The ports on the Gulf and in the Shatt-al-Arab have to be dredged of silt, sand, and war debris, and the docks and oil facilities repaired. The terminal at the end of the Foa Peninsula at Iraq's end of the Shatt-al-Arab is in fairly bad shape.⁷ Presumably, foreign oil companies will move in to solve this problem, with sufficient incentives. When oil production is resumed, money will be invested in improving storage and transport. Oil is too important for Iraq to let these important facilities sit in disrepair and the country tries to lift itself from despair.

Repairing the oil industry to the state where Iraq could produce some 2-2.5 mbd, and export all but the Iraqi domestic needs, could cost as much as \$5 billion. To get production up to a rate of 3.5 million b/d could cost \$5-7 billion. (Arab Petroleum Research Center, 1995) Already Iraq has put some \$6 billion into repairing the oil refineries damaged by the 1991 war. Refining capacity now is greater than it was before the war mostly because of the increased needs of the population of Iraq for refined products. It may cost as much as \$30-\$40 billion to get Iraq to its targeted production capacity of 6+ mbd by 2010. (Energy Information Agency, 1996) After the major repairs are finished, Iraq will likely have a relatively low cost for increasing production capacity, compared to most other oil producers.

The Energy Information Agency (1996), projects oil production capacity in Iraq in 2010 to be as high as 8 mbd in 2015 (assuming higher oil prices) and as low as 6.5 mbd (assuming high non-OPEC production). Table 7 gives the EIA estimates for production capacity in mbd for the years 2000-2015 under three assumptions.

⁷ Paul Hueber at the U.S. Energy Information Agency, DOE: email message of October 21, 1996

Table 7**Projected Oil Production Capacity, Iraq,
2000-2015**

Assumption Year	Low Oil Price Case	High Oil Price Case	High Non-OPEC Production
2000	4	4.2	4.2
2050	4.5	6.4	5.0
2010	5.8	7.6	5.8
2015	6.5	8.6	6.4

Source: Energy Information Agency, 1996.

Even under the so-called reference case the production of oil in Iraq will eventually reach over 6 mbd. Table 8 indicates how much money Iraq might earn to help pay for reconstruction, development, penalties and other payments to the United Nations, and war reparations.

Table 8**Potential Earnings from Oil, Iraq, 2000-2015
(US\$ billions)**

Price of Oil Year (mbd)	\$20/b	25/b	\$30/b
2000 (4.13)	30.17	32.72	45.75
2005 (5.3)	38.69	48.36	58.04
2010 (6.4)	46.72	58.40	70.08
2015 (7.17)	52.43	65.43	78.51

Source: Based on Energy Information Agency (1996) projections

Whatever the potential, how Iraq actually re-enters the world oil market, and how quickly, will determine the effect on oil prices, and hence oil revenues for other oil producers. Many oil producers have been benefiting from Iraq not being part of the market.

Other Possible Shocks

Table 9 shows the extent to which the countries of the MENA region rely on oil for their hard currency export revenues and their GNPs.

Table 9

**The Importance of Oil in National Economies,
Selected Arab Countries, Recent Dates**

Country	Per cent of export earnings from oil	Per cent of GDP from oil
Saudi Arabia	90	37
Iran	75	25
UAE	50	36
Kuwait	90	45
Oman	75	30
Qatar	70	20
Algeria	97	30

Source: Country Analysis Briefs for each country from Energy Information Agency, as found on the internet at eia.doe.gov/emeu/cabs

Oil prices have historically been unstable, and this limits the contribution oil earnings can make to growth and development. The leading engines of development are often seen as technology change, education, trade, improvements in human and physical capital, or investment. Oil is not an engine of growth, but it can contribute to development. But so far it has generally not been. Most of the GCC countries could not be considered developed--even though they may be "wealthy".

The Arab Syndrome is like the Dutch Disease, but in many cases with the added problems of low water reserves, food insecurity, missing marketing and trade linkages for non-oil goods, low development infrastructure, and inadequate leadership. (Kubursi, 1995) As the oil windfall earnings pour in, the value of the domestic currency goes up. Manufactured exports generally go down or the incentives are to reduce them. Relatively cheap imports pour into the country. Industrialization for import substitution or any other reason becomes more difficult. It is easier and cheaper to import needed goods. Industry and agriculture are generally neglected. Foods can be imported. Investment begins to focus on the oil industry where returns are often greater and easier to make than elsewhere. Then, balance of payments and balance of trade shocks tend to follow the relative neglect of industry and agriculture.

Consumption goes up, but domestic production does not follow. A rentier mentality takes hold. Little effort produces massive returns. Easy money too often leads to misspending. In many of the oil states one can see

large investments in seemingly useless and monumental projects that will require maintenance over a very long run. After the oil prices drop these projects will still be there and will need to be kept up. Military expenditures also usually go up. This does not usually lead to the development of a productive military industry, but rather to the import of weapons, technology and expertise from abroad. For every \$1 spent on education in the Arab world \$166 goes to the military. (Kubursi, 1995) Of the \$2 trillion windfall that came to the Arab World from the oil boom in the 1970s and early 1980s, close to half went to the military.

Employment of nationals often can take the form of sinecures or bureaucratic jobs in the government that require little effort but produce much income. The bureaucracy becomes a drain on the economy. When the price of oil is high and the revenues are good this does not seem to be a problem. But when oil prices drop and revenue shrink, as happened in the mid-1980s, it is very difficult to move people out of their government jobs and into productive employment.

Oil is a notoriously price-unstable commodity. The "glory days" of the late 1970s and early 1980s were short-lived. OPEC's control over production and price lasted a very short time.

In 1972 the average price of a barrel of crude oil was about \$2.80. By the end of 1979 this had increased to over \$11. The price of oil boomed to over \$40 for a while during 1979. In 1981 oil was over \$34. In 1985-85 the oil price collapsed for a short while to below \$10 and remained agonizingly low until just recently. In real terms the price of crude today is as low as it was in the trough of 1985-86.

The countries now known as the Gulf Cooperation Council (GCC) had earning of about \$10 billion in 1973. In 1981 these earnings were about \$157 billion. (Roberts, vol.12) In 1973 dollars AOPEC oil revenues were \$97 billion in 1980 and in 1993 they were just \$33 billion. Between 1987 and 1990 annual revenues in 1973 dollars were \$23-26 billion for all Arab countries. (Arab Petroleum Research Center, 1995)

Saudi oil earning dropped from \$113 billion in 1981 to \$20.3 billion in 1986. During the same period the UAE's earnings dropped from \$19.5 billion to \$6.2 billion. Kuwait earnings dropped from \$18 billion to \$6.9 billion. (Roberts, vol.12) Nevertheless, spending continued and deficits ballooned.

Some of the oil states, which had been awash in petrodollars, were now borrowing on the international financial markets. The average annual real GDP growth of GCC countries from 1980-85 was -21.36 per cent, from 1985-89 it was -3.79 per cent. (Roberts, vol.12) To give an even stronger impression of the problem:

OPEC member countries increased their production by 64.6 per cent between 1985 and 1994, whereas the real value of their exports declined by 31.4 per cent and the share of their oil exports in total world exports fell from 7.02 per cent to just 3.29 per cent. (Arab Petroleum Research Interest, 1995)

Total official Arab assistance to other Arab countries may serve as a proxy measure of how much this oil revenue decline effected the external relations of the oil countries. Total net disbursements of Official Assistance from Arab countries and Arab Multilateral Aid Agencies topped out in 1980 at just over \$10 billion. There was a precipitous fall from 1981 through 1987 to the 1987 level of \$2.7 billion. By 1989 it was less than \$2 billion--or less than nominal figure for 1973. After the war it dropped even further, although one can notice increased aid to Egypt, Lebanon and Syria.

Another source of instability is in the use of the money. There were enormous expenditures on the military, especially in the GCC, after the Gulf war. From 1992-1994 Kuwait spent \$25.6 billion on the military. (Arms Control and Disarmament Agency, 1995) During 1990 and 1991 they spent close to \$30 billion. Saudi Arabia had spent some \$131 billion on the military from 1990-1994. Close to \$70 billion was spent from 1992-1994. The U.A.E. spent some \$80.2 billion since 1990, almost \$6 billion since 1992. Table 10 provides information on arms imports in the Middle East from 1992-1994.

These massive military expenditures cut into the aid that these countries can give. They will also give it more selectively. The countries of the GCC will also have to either tighten their budget belts or go into increasing debt. Unfortunately, most have chosen debt rather than the budget tightening.

Table 10

**Arms Imports in the Middle East, Selected Countries,
1992-1994 (US\$ billions)**

Country	Amount of arms imported	Percentage of Middle East Arms Imports
Saudi Arabia	20.5	60
Egypt	4.1	12
Israel	3	9
Kuwait	2	6
Iran	1.8	6
Others	2.8	8

Source: Arms Control and Disarmament Agency, 1996

Even though the oil holiday was short lived, considering the long history of the Arab world, many people got used to the oil lifestyle. It has been hard for them to re-adjust. Also, some of those with lower incomes in these oil countries are now coming to believe that their lives could have been improved quite a bit more than they were during the oil holiday -- and they resent it. Their resentment is heightened by their perception that others have gained enormously. Those at the bottom saw a little trickle down effect, but perhaps not enough to satisfy them in the future.

In general, the volatility of the oil markets has brought, along with enormous wealth, considerable economic, social and political strains into the producing countries. Saudi Arabia, especially given its relative importance, is a particular case in point.

The bottom line on this is that the GCC states have had to deal with uncertain oil revenues. But they have not really "dealt" with them. The Gulf War showed how fragile these enormously wealthy countries were. The GCC, outside of Kuwait, received short term returns due to increased oil exports. Yet, the costs of the war in political and economic terms may have nullified these gains in the long run.

Unless they get their economic and political houses in order there could be some real oil shocks in the future. Saudi Arabia is one country that many persons are worried about on this score.

The following views from the Energy Information Agency (hot.internet) are worth close attention.

Terrorist bombings--in November 1996 and June 1996--have highlighted concerns regarding the long-term stability of Saudi Arabia, by far and away the world's most important oil exporting nation. These bombings are considered by many analysts to be a direct challenge to the Saudi ruling family, already preoccupied with the question of choosing a successor to King Fahd, who had been ailing for years and in November 1995 suffered a serious stroke. Fueling opposition to the ruling Saudi family in recent years has been economic difficulties brought about by: 1) greatly reduced oil revenues compared to the late 1970s and early 1980s; 2) a rapidly growing population and a relative decline in the population's economic standing; 3) the 1990/1 war with Iraq, which cost Saudi Arabia approximately \$50 billion in military expenditures; and 4) massive government debt, which makes it more difficult for the government to maintain expansive social spending considered critical to maintaining popular support.

On the positive side, the war helped Saudi oil production increase significantly. It rose from 5.6 mbd in June 1990 to 8.2 mbd in September 1990. The Saudis made up for most of the oil lost to the world markets due to the invasion of Kuwait and the shutting off of Iraqi oil by UN Resolution 661. (Kanovsky, 1992) The Saudis saw this as a chance to increase their share in the market and to possibly take the swing producer position in OPEC. However, even though the Saudi Arabia's oil revenues were booming, economy was in trouble in 1991.

1991 was a year of large deficits. While the current account deficit was \$4 billion in 1990, unofficial estimates are that this rose sharply to \$24 billion in 1991. The deficit was equivalent to 23 per cent of GDP. The commitments undertaken by Saudi Arabia in relation to the crisis (i.e., payments to the U.S. and others who had stationed forces in Saudi Arabia, and to those to be compensated for losses related to the war) needed to be paid, for the most part, in 1990 and 1991. The official estimates for total war costs in 1990 and 1991 were \$49.6 billion, of which the U.S. received \$12.8 billion in cash plus \$4 billion in kind. (Kanovsky, 1992)

And more ominously:

In May 1991, a consortium of twenty international bank signed an agreement with Saudi Arabia for a loan of \$4.5 billion. In addition the government borrowed \$2.5 billion from local banks. They were given no choice on the matter and each was assigned a minimum "contribution". These figures do not include loans made to public and semi-public companies. Between 1983 and 1988, the government financed its deficits by drawing down its financial reserves accumulated

in the "years of plenty". Since 1988, and especially since the Kuwait crisis, the government has had to increasingly have recourse to debt, external and domestic, to finance its deficits. (Kanovsky, 1992)

The government has made some progress in privatization, structural change, and diversification in the economy since the war. (United Nations Economic and Social Commission for Western Asia, 1994) Oil trade as a percentage of GDP had dropped from 90 per cent in 1974 to 30 per cent in 1993, but oil still was responsible for 99 per cent of its export revenues. (World Bank, 1995a)

The current account for Saudi Arabia has been in decline since the war. It first boomed because of the oil windfall. Then as imports increased, mostly military imports, the current account balance dropped from \$22.7 billion in 1990 to \$13 billion in 1994. (Middle East Economic Digest, 1994f) The oil price drop in 1993 did not help matters. Imports were especially high in 1992-1993, averaging about \$30 billion. (International Monetary Fund, 1995) Total reserves dropped from about \$13 billion in 1989 to about \$5 billion in 1994. They dwindled from a 1981 high of close to \$28 billion. Foreign exchange reserves dropped from \$24 billion in 1981 to \$8.5 billion in 1989 and on to \$4 billion in 1994. Nongold reserves could cover about 16 weeks of imports in 1994. In 1992 they could only cover about 9 weeks. But in 1989 they could cover 40 weeks. GNP per capita has dropped from \$9,660 in 1984 to \$6,270 in 1989. It increased after the war to close to \$8,000 in 1995.

The private sector has been growing at very good rates recently. The Saudis hope that therein lies the solution to the growing employment problem. Yet, this year's government deficit is expected to be \$5 billion; in 1995 it was \$4 billion. (Evans, 1996) In 1993 the deficit was \$8 billion. For the years 1988-1990 the deficits were \$14 billion, \$10 billion, and \$18.6 billion respectively. (United Nations Economic and Social Commission for Western Asia, 1994) Oil revenues still constitute 75 to 80 per cent of export earnings. That is, the country relies on a very unstable source of income for its budget. That, in part, explains the swings in deficits over the years.

Saudi Arabia's debt appears to be increasing. The declining reserves and declining real oil revenues since the early 1980s are added to the costs of the war and the build up of the military. Saudi Arabia had spent some \$131

billion on the military from 1990-1994. Close to \$70 billion had been spent from 1992-1994. (Arms Control and Disarmament Agency, 1995)

A year ago, the economy looked to be on the verge of collapse, burdened by more than 12 years of deficit financing and the heavy costs incurred by the Gulf war to liberate Kuwait. Bankers now estimate that the kingdom can call on no more than \$5 to \$10 billion of liquid assets out of a total foreign holdings estimated by the International Monetary Fund at about \$45 billion. Oil revenues meantime continue to give cold comfort to the situation; income from crude oil and refined products was expected to total \$33 billion last year compared with \$37 billion the year before. Such figures contrast sharply with the 1981 peak of \$116 billion. Its ability to recover will depend on world demand for oil and whether Iraq will be allowed to return to the oil market. (Evans, 1996)

Final Comments

The focus here has been on the oil markets and on the potential sources of instability and their effects based in the oil states. There are many connections among the oil states and the non-oil states. The recursive nature of oil revenues and their connections with the remittance sensitive states (RSS) of the MENA region are clear. The 1985-1986 oil price shock sent many remittance workers back and their home countries paid a heavy price, economically and politically. Egypt is a case in point.

Other types of shocks in oil states can also effect the RSS states. The Gulf Crisis of 1990-1991 is a devastating example of this. (Sullivan, 1997) Most of the RSS countries of the MENA region were to pay short-term costs that were heavy. Millions of workers were sent back home. The countries that supported Iraq (Yemen, Palestine, Jordan) were to pay an even heavier price. The turmoil caused by the Gulf Crisis is still effecting the Middle East. In general, the effects of oil prices are much greater than just on the bottom lines of oil companies and oil countries:

In conclusion, let us try to take one more brief look into the near future. Table 11 gives some idea of the differences in the amounts of petromoney that would be available to the Gulf states in 2015 given assumptions of \$16, \$25 and \$36 per barrel, and various output measures. Of course, these figures should be considered illustrative, not predictive.

Table 11

**Potential Oil Revenues, Selected MENA
Countries, 2015**

Country	Output (mbd) Reference Case	Output (mbd) high oil price case	Output (mbd) low oil price case
Saudi Arabia	21.2	18.7	28.5
Kuwait	4.5	3.8	5.1
Iraq	7.2	6.5	8.0
Iran	6.0	5.4	6.7
UAE	4.8	3.8	5.3
Country	Revenues \$25/ barrel	Revenues \$36/ barrel	Revenues \$16/ barrel
Saudi Arabia	\$193	\$245	\$166.4
Kuwait	\$41	\$49.9	\$29.7
Iraq	\$65.7	\$85.4	\$46.7
Iran	\$54.7	\$71	\$39.12
U.A.E	\$43.8	\$49.9	\$31

Source: Same as Tables 7 and 8

What these numbers will mean in real terms will of course be determined by international and domestic inflation rates, which are even more difficult to predict than oil output and revenues. Clearly, the oil revenues and oil outputs available to these countries for development expenditures will be greatly determined by the world markets and the incentives these countries and others have for producing and using crude oil.

These countries can use of these petrodollars wisely or face painful consequences. The great challenge facing the oil producing countries is to use their wealth productively. If the linkages between oil and development are not kept fully in view and acted on, then the quality of life of the people of the MENA region will be less than it might be.

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