

## **Oil Depletion in Islamic Fundamentalist Economic Thinking: The Future Trend?**

*By Mamdouh G. Salameh\**

During a panel discussion on energy security at the 22nd Annual International Energy Conference in Boulder, Colorado in April 1995, I coined the phrase, "The rise of Islamic Fundamentalism in the Middle East and North Africa is inversely proportional to the price of oil." In this article, I will endeavor to explore the links between the region's oil experience and the surge of Islamic fundamentalism. The salient factors are the sudden rise and subsequent decline of oil revenues by the oil-exporting countries of the region.

Islamic fundamentalism is, in essence, a mass mobilization of people against unpopular and unaccountable governments who have squandered the oil wealth of the Middle Eastern and North African oil-exporting countries through mismanagement of economic resources and excessive and wasteful expenditure on arms purchases. Its main objective is to alter or overthrow the present social and political order.<sup>1</sup>

In the 1970s and early 1980s, the Middle East and North Africa appeared to be an economic and social success story. Oil revenues soared and social conditions improved rapidly. In the 1990s, however, the region appears to be sliding towards economic and social failure. Per capita income is falling and social conditions are deteriorating quickly. The Middle East and North Africa now make up the only major region of the world which is unable to feed its rapidly growing population. This has ominous political implications.<sup>2</sup>

One of the greatest structural economic problems that the oil-producing countries of the Middle East and North Africa have faced since the early 1970s is their overwhelming dependence on oil-export revenues, accounting for 85 to 90 percent of total revenues. They evidently have not managed the transition from oil-based economies into more diversified ones, supplementing oil exports with other sources of income. As oil revenues decline, the governments seem to be running into ever more serious economic difficulties with rising foreign and internal debts and with steadily more severe social strains and potentially ominous political repercussions.

The rise in Islamic fundamentalism in the Middle East and North Africa in the mid-1980s coincided with the fall in oil prices and, therefore, oil revenues. However, Islamic fundamentalism has its roots in mounting conflicts of income distribution, exacerbated by rising social tensions. Oil may have reduced the conflict potential when revenues were rising and subsequently enhanced it when revenues started to fall. This is, perhaps, the major link between oil and Islamic fundamentalism. To this may be added the strong indirect effect of falling oil revenues in oil-exporting countries on the economies of countries such as Jordan, Lebanon, Yemen and Egypt as a result of reduced remittances. Even in 1995, with low oil prices, remittances were about US\$ 90 per capita in

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<sup>1</sup> See footnotes at end of text.

Egypt. This represented about 40 percent of exports or 10 percent of the gross domestic product (GDP) according to the World Bank.<sup>3</sup>

The question that begs an answer is what impact would an Islamic fundamentalist takeover in the Middle Eastern and North African oil-producing countries have on global oil supplies, the price of oil and the global arms industry, should the Islamic fundamentalist governments decide to reduce their oil depletion rates according to Islamic economic principles?

### **Islamic Economic Principles**

A cardinal principle in Islamic economic thinking is the prohibition of interest (usury). The purpose is to encourage the sharing of risk and profit and to prevent the rise of any rentier class. Participation with risk and profit sharing is the Islamic substitute for the use of interest. Another primary economic principle is the prohibition of waste and idleness. It concerns wasteful consumption, wasteful production and the idleness of productive sources including capital.

Sharing wealth and social justice are two other primary economic principles of Islam. Finally, the responsibility of the state for supervising and controlling the economy is the fifth principle in Islamic economic thinking. Private property and profit have a central position in Islamic economic thinking. The Islamic concept of ownership is pertinent in this respect. Natural resources like oil and gas can be in private ownership but the economic rent must be shared by all members of the community. The Islamic view is that natural resources are a "gift from God" and, therefore, belong to both present and future generations. Hence, exhaustible resources should not be misused by the present generation. The revenues from their exploitation should be invested in other durable sources of income.<sup>4</sup>

However, the two principles which are most relevant to oil depletion policy are the rejection of interest and the prohibition of waste.

### **Oil Depletion in an Islamic Economic Perspective**

Because oil represents the major national asset in the oil-producing countries of the Middle East and North Africa, oil policy is likely to be strongly influenced by Islamic fundamentalist's access to power in these countries. The salient issues are depletion rates and oil revenues. Policy issues on these matters have important economic and political repercussions in the countries concerned and for their relations with the outside world.

The choice of depletion rates for oil is the key policy parameter in any oil-producing country. The choice has to consider the current and future need for revenues.

Because Islam rejects the concept of interest, it is indifferent to the time preference of income. Hence concerns for revenue continuity and future income requirements argue in favor of keeping more oil in the ground than otherwise would have been the case.

Under an Islamic fundamentalist government, Islamic economic principles may become increasingly more important in the Muslim oil-exporting countries. The major issue is the relevance of the Islamic rejection of interest for the time preference of income and oil revenues in particular. This concerns the depletion rates of oil and gas. Another major issue is that the use of oil revenues should respect the prohibition of waste and idleness. To the extent that an

Islamic government prefers to use a negative discount rate to offset the private sector's focus on immediate profits and to take population growth into account, it has strong reasons for leaving oil in the ground. Even with an outlook for constant oil prices, for an Islamic government there might be an economic sense in leaving part of the oil revenues for the future. Contrary to perfectly competitive markets, the oil market is highly sensitive to acts or perceived acts of one of the major oil producers, especially in the matter of oil depletion policy. From a private investor's point of view, this would be a strictly economic consideration. For a government, the consideration is both economic and political.

Generalizations are difficult, however, because the economic situations vary profoundly among Muslim oil-exporting countries. Some countries like Saudi Arabia, Kuwait, Libya and the UAE have large oil reserves and small populations, while others such as Algeria, Egypt and Iran have large populations and relatively small oil reserves.

The Islamist opposition to the Shah of Iran for years criticized his government's oil policy for squandering resources by pumping oil out too quickly and not taking the revenue needs of future generations into account. A further criticism was that oil policy benefited the new technocratic class based in the public sector. Finally, there was a particularly strong criticism that the oil policy benefited the oil-consuming countries of the West, particularly the United States, by pumping oil out quickly and keeping prices low and also splashing out vast amounts of oil revenues on wasteful military expenditure. Similar criticisms are now being voiced by the Islamic fundamentalists in Saudi Arabia and Kuwait.<sup>5</sup>

From an Islamic point of view, an oil-exporting country can apply the rate of marginal utility in depletion policy if it is too small to influence the oil market. It can also do so if the revenues can be successfully invested in new sources of income at home – that is, domestically through industrial investment. Foreign investment makes the oil-exporting country an international rentier. This infringes upon Islamic economic principles.<sup>6</sup> The exception would be investment on a joint venture basis, sharing risk and profit. However, if the country is sufficiently important to influence the oil market, or oil revenues can't be successfully reinvested domestically in new sources of income, depletion policy should aim to keep oil in the ground. Otherwise, depleting oil to invest abroad represents wasteful production.

According to Islamic economic thinking, oil producers who, through their size, could influence the oil market and the price of oil, have a legitimate right to defend their price interests. Because changes in depletion policy can influence the price of oil in one or the other direction, such action is compatible with Islamic economic principles. The same holds for cooperation among oil producers to defend common interests. Hence cooperation in OPEC is not contrary to Islamic economic principles, especially if it can lead to stability and predictability in the oil market for the benefit of all parties involved.

#### Oil Revenues in Islamic Economic Thinking

Oil depletion according to revenue targets takes marginal utility explicitly into account. It implies keeping oil in the ground once the ability to reasonably absorb oil revenues has been reached. A minimum rate of return on investment puts

a limit on the need for revenue and consequently oil production. Furthermore, the rate of depletion becomes inversely linked to the price of oil because the volume required to meet the revenue target declines with a rising oil price and rises with a falling one.<sup>7</sup>

Adjusting oil depletion to demographic growth is likewise compatible with Islamic economic principles since it takes future generations' needs into account and seeks to avoid waste.

The requirement is to use the revenues for the transformation of a finite and depletable comparative advantage into a more lasting comparative advantage in international economic relations. Hence, revenue, depletion and productive investment should be linked.<sup>7</sup>

#### The Oil Cost of Military Expenditure

According to Islamic economic principles, it is wasteful to pump oil out to finance wasteful expenditure. When military expenditure reaches the magnitude that it has reached in the Middle East and North Africa since the early 1970s, it is probably the best single indicator of the wasteful use of public funds.

Over the period 1974-1996, the combined oil exports of the seven leading oil exporters of the region – that is, Algeria, Iran, Iraq, Kuwait, Libya, Saudi Arabia and the UAE – were 140 billion barrels (bb). The total export value of crude oil and refined products, measured in constant 1992 U.S. dollars, was about \$ 3664 billion.<sup>8</sup> The total government expenditure was about \$ 3318 bn. Military expenditure over the period 1974-96, still measured in constant 1992 U.S. dollars, has been estimated at \$ 1100 bn.<sup>9</sup> As data on military expenditure are based on less open sources, it is not known what percentage of the military expenditure is included in the overall figures for government expenditure, or whether it should be added. For the seven countries combined, seen over the period 1974-96, military expenditure seems to have taken 30 percent of the oil revenues (see Table 1).

**Table 1**  
Crude Oil Exports, Government Expenditure and Military Expenditure. 1974-96

| Country      | Oil Exports (Bbn) | Export Value (Bn 1992 U.S. \$) | Govt. Expend. (Bn 1992 U.S. \$) | Military Expend. (Bn 1992 U.S. \$) | Military Expend./Oil Value (Percent) |
|--------------|-------------------|--------------------------------|---------------------------------|------------------------------------|--------------------------------------|
| Algeria      | 10                | 246                            | 207                             | 26                                 | 11                                   |
| Iran         | 22                | 556                            | 1161                            | 274                                | 49                                   |
| Iraq         | 10                | 304                            | 457                             | 150                                | 49                                   |
| Kuwait       | 13                | 336                            | 155                             | 72                                 | 21                                   |
| Libya        | 12                | 340                            | 260                             | 50                                 | 15                                   |
| Saudi Arabia | 57                | 1502                           | 940                             | 490                                | 33                                   |
| UAE          | 16                | 380                            | 138                             | 38                                 | 10                                   |
| Total        | 140               | 3664                           | 3318                            | 1100                               | 30                                   |

Sources: OPEC Annual Statistical Bulletin, 1994-1996; BP Statistical Review of World Energy, June 1997; International Institute for Strategic Studies' *Military Balance*, 1993-97; The World Bank, *World Tables*, 1992-96.

Without the burden of military expenditure, these oil exporters could alternatively have increased investment in labor-intensive industries, agriculture and public services. This would have improved the welfare of the people. Alternatively, without the wasteful burden of military expenditure, a much improved financial situation would have permitted the

(continued on page 24)

## Islamic Fundamentalist Thinking (continued from page 23)

seven major Middle Eastern and North African oil exporters to keep more oil in the ground, hence they would have been more able to constrain supplies to defend oil prices. Indeed, without the extra oil exported above the volumes required to finance civilian needs, the oil market in the 1970s and 1980s could have taken a completely different turn.

For the seven countries, total oil output less that needed to finance military expenditure would have been 98 billion barrels over the period 1974-1996, as opposed to actual oil exports of 140 bb. The saving of 42 bb amounts to an average production of 5.23 million barrels per day (mbd) over the entire period of 22 years. This is virtually equivalent to the combined production of both Mexico and Canada. In this perspective, the huge and wasteful military expenditure of the leading Middle Eastern and North African oil exporters doubly serves outside interests. It directly returns money to arms exporters in the major consuming countries, hence neutralizing part of the oil bill and keeps their armaments industries afloat in the post-Cold War era.

Indeed, one would argue that without the need to sell oil to finance huge military expenditures, it is doubtful whether oil prices would have collapsed in 1986. In the actual course of events, massive and rising military spending by Iran and Iraq preceded and accompanied the oil price collapse of 1986. In the late 1980s and early 1990s, oil prices could have stayed high if Iran, Iraq and Saudi Arabia had kept more oil in the ground instead of pumping it out to finance military spending. Most likely, higher real oil prices would have more than offset reduced export volumes. With less military spending, Iraq's financial situation could have been far better and the attack on Kuwait in 1990 probably would not have taken place.

The first lesson is that the high level of military expenditures in the Middle Eastern and North African countries is detrimental to the economic and social welfare of the population whether seen from an Islamic fundamentalist or a conventional Western perspective. The second lesson is that the major oil-importing countries and their armaments industries have an interest in maintaining rivalry and hostility among the Middle Eastern and North African oil exporters to prevent an agreement on oil quotas and prices. The problem with the Western oil-consuming countries is that in relation to these countries, oil and arms interests tend to drive them to compromise their long-term interests for short-term gains. Against this backdrop, there could be a potential risk of confrontation between the West and future fundamentalist regimes in the Middle East and North Africa over oil policy.

In conclusion, a thorough application of Islamic economic principles with regard to oil depletion rates and the use of oil revenues could have an enormously positive impact on the economies of the Middle Eastern and North African oil exporters by stopping the squandering of oil reserves on wasteful military expenditure and also by taking into account the health of the oilfields and the revenue needs of future generations. This will also impact global oil supplies, the price of oil and the global industry.

However, I hasten to add that any democratically-elected government in the Middle East and North Africa could apply similar depletion policies whether they are labeled Islamic or not to protect the nation's assets and pursue an oil policy

favorable to the welfare of its people and future economic development of the country.

## Footnotes

<sup>1</sup> Mamdouh G. Salameh, "The Price of Oil and the Future of the Saudi Monarchy". IAEE's *Newsletter*, Spring 1996, p-12.

<sup>2</sup> Oystein Noreng, "Oil & Islam: Social & Economic Issues" (Chichester, England: John Wiley & Sons, 1997, pp. 1-3.

<sup>3</sup> The World Bank, *World Tables*, 1995 & 1996.

<sup>4</sup> Oystein Noreng, "Oil & Islam". pp. 104- 110.

<sup>5</sup> Sheikh Ahmed Zaki Yamani, "Containment is too Risky", *Petroleum Review*, May 1997, p. 211.

<sup>6</sup> Oystein Noreng, "Oil & Islam" p. 310.

<sup>7</sup> *Ibid.*, p. 310.

<sup>8</sup> Data from OPEC Statistical Bulletins, 1994-1996 and also *BP Statistical Review of World Energy*, June 1997.

<sup>9</sup> The International Institute for Strategic Studies' (IISS's) *Military Balance*, 1993-1997.

## Letters to the Editor

In M. G. Salameh's article (*Crude Oil Prices on an Upward Trend?*, Summer, 1997 issue) Table 2 gives me as source for the "cost of maintaining capacity" for Iraq, Libya and Iran: respectively \$160, \$300 and \$200 per daily barrel. No reference. In my *Genie Out of the Bottle* (1995), page 264, one can read my actual estimates: \$180, Not Available and \$1475. So his respective errors are: 12 percent, infinity and 640 percent. He does not explain how he separates newly created capacity into the part which is offset by decline and the part which is not offset. If he did so, he could go on to explain why he thinks unit investment to expand exceeds unit investment to maintain by a factor of 6 or of 33 or of 40.

Morris A. Adelman  
MIT

Salameh responds:

The figures I quoted in Table 2 of my article for the "Cost of maintaining capacity" for Iraq, Libya and Iran: respectively \$160, \$300 and \$200 per daily barrel of output (\$/db) are rough and ready estimates gleaned from a variety of sources. These include various issues of *Middle East Economic Survey (MEES)* and *Petroleum Intelligence Weekly (PIW)*, but especially Gault and Hartshore in *MEES* (17/8/92) and Dr. Henry Azzam's (Chief Economist of the National Commercial Bank of Saudi Arabia) in *MEES* (1/2/93) and *Energy Compass* (29/1/93); also estimates of fully-built-up costs of capacity expansion by the Center for Global Energy Studies (CGES) in London and also Professor Adelman, MIT, prior to the publication of his book *Genie Out of the Bottle* (1995), hence, the variation from his actual estimates of \$180, not available and \$1475.

The estimated average cost of maintaining capacity in the OPEC countries is \$229 per daily barrel of output compared to Iraq's \$160, Libya's \$300 and Iran's \$200. On the other hand, the average estimated cost of expanding capacity over the period 1996-2000 for OPEC is \$7462 per peak daily barrel (\$/pdb). Thus the average unit investment to expand capacity exceeds the average unit investment to maintain capacity by a factor of 33. This compares with a factor of 33 for Libya, 40 for Iran, 6 for Iraq and 27 for Saudi Arabia.

Estimating the cost per peak daily barrel of new capacity

is, of course, easier said than done, because of the confusion that abounds in the literature about whether "gross" or "net" capacity increases are being discussed. When an entirely new oil field is being considered, the capacity increase resulting from exploitation of the field is both "gross" and "net" - there is no distinction between the two. However, when the production capacity of an existing oil field is to be boosted, then one needs to differentiate between the investment need simply to maintain capacity at current levels and the spending needed to boost capacity. Producing oil fields decline as a matter of course, which implies that a distinction needs to be drawn between gross capacity increases and net increases, i.e., after taking into account the natural rate of decline of the oil fields. The associated capital costs per peak daily barrel are also separated into two categories - those needed to maintain capacity and those needed to add to capacity.

In order to calculate the incremental yield (or capacity added to offset reservoir declines), we must determine the gross capacity increase in each year, which consists of two parts. The first component is any increase in total output, which is easily observed. The second component is the additional capacity that must be installed to offset reservoir decline. That decline is primarily the result of the steady drop in bottom-hole pressures as reservoirs are depleted which can only be inferred - it can't be directly observed or measured. This component of the capacity addition, even though very important, must be estimated using an assumed value for the reservoir decline rate since empirical data on decline rates are rare. The assumed decline rates are 5 percent for major producers in the Gulf.

My estimates for the cost of maintaining and expanding capacity in Iraq, Libya and Iran have taken into account the average rate of decline of the oil fields and have also made a differentiation between investment needed simply to maintain capacity at current levels and the spending needed to boost capacity, hence the excess of unit investment to expand over the unit investment to maintain capacity by a factor of 6, 33 and 40 for Iraq, Libya and Iran respectively.

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### The Potential for Use of Modern Asset Pricing Methods for Upstream Petroleum Project Evaluation

*Guest Editor David Laughton (University of Alberta)*

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