

The Role of OPEC in the World Oil Market

Submission to the Joint Economic Committee, U.S. Congress, May 23, 2007

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The *Organization of the Petroleum Exporting Countries* (OPEC) is an international cartel of oil-producing states that has attempted with varied success to manipulate world oil prices during the past thirty-five years. OPEC was founded in 1960 by Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela, a group of major oil producing countries who wished to coordinate national petroleum policies and forge a more united front in dealings with the multinational oil companies who were licensed to produce and export petroleum from their lands. Within the next dozen years, eight additional members (Algeria, Ecuador, Gabon, Indonesia, Libya, Nigeria, Qatar, and the United Arab Emirates) joined in, which brought the total membership of OPEC to 13 by 1973. At that time, the combined membership of OPEC accounted for over half of worldwide crude oil production. Two small producers (Gabon and Ecuador) withdrew during the 1990s, and in 2007 Angola joined OPEC, bringing current membership to 12 nations.

As with any cartel, OPEC's ability to hold the price of oil above the competitive level is dependent upon barriers to entry, which in this case hinge upon OPEC's dominant ownership and control of low-cost oil reserves. By accident of nature, some 75% of the world's proved reserves of crude oil are located in OPEC nations. Proved reserves constitute that portion of the ultimate resource base that has already been

discovered and is commercially producible. Additional reserves can and will be developed through exploration, discovery, and development of new fields, but this process has become increasingly difficult and expensive—even more so outside the OPEC nations than within. Thus, while production of crude oil from non-OPEC sources does expand in response to the higher prices that result when cartel members restrict output, the scope for this is limited and will remain so. Moreover, OPEC's coordinated efforts to manipulate the price of oil are protected from anti-trust enforcement and legal intervention by the sovereign rights of its members.

Economists have debated and tested various theories about how OPEC actually goes about exerting its influence on the market, whether through the independent initiatives of individual members, via actions and strategies undertaken by semi-autonomous coalitions working within the larger organization, or through concerted plans embraced and executed by the organization as a whole. Some researchers might question whether OPEC has ever managed to operate successfully in the manner of a classic cartel. Whatever are one's opinions on those matters, there is no question that OPEC members have restricted production in ways that are unrelated to the inherent scarcity of crude oil. Although OPEC's proved oil reserves were steadily rising during 1973-1985, production was cut by nearly half during that twelve year interval, falling from 31 million barrels per day (mbpd) in 1973 to an all-time low of 16 mbpd in 1985. Today, OPEC continues to hold production below the 1973 level, although the proved oil reserves of OPEC members have doubled in volume since then and total worldwide consumption of crude oil has grown by roughly 50%. It does appear that OPEC members have been up to something.

Evolution of OPEC

To better understand OPEC, its history and development can be viewed in three phases. During the first phase (1960-1970), OPEC's primary objective was to win for its members a larger *share* of the oil profits that private companies generated within their territory. The stated goal of increasing government take from 50% to 80% of total profits was pursued largely through the imposition of tax and administrative reforms by individual OPEC members, including the introduction of fictional "tax reference prices" that boosted the tax base, and therefore government take, without altering the stated tax rate and without much impact on the market price of oil. During this phase, there was no direct attempt by OPEC to raise the overall level of world oil prices, and perhaps there was not even the realization that such a feat would be possible. In those early years, OPEC was concerned with winning for itself a bigger share of the pie, rather than growing the size of the pie.

The second phase (1970-1982) saw greater reliance on collective deliberations and coordinated actions designed to reverse a long period of decline in world oil prices (and therefore tax revenues) that had set in after World War II. These efforts began with a series of dictated agreements (the so-called Teheran-Tripoli agreements of 1970-71) by which the OPEC members unilaterally raised posted tax reference prices by 21%. The members also announced that further increases could and would be imposed as they saw fit under the doctrine of "changing circumstances," one of which was the declining exchange value of the dollar, the currency in which oil prices were denominated. Indeed, it was during a special OPEC conference convened to review these matters that the October 1973 Arab-Israeli war broke out, which prompted the Arab members of OPEC to

declare an embargo on sales to Israel's allies (the United States and the Netherlands). Although the embargo did not have much effect on actual deliveries of oil to those countries, and was soon rescinded, this bold move panicked the markets and fueled a speculative demand for oil inventories, which ultimately drove prices in the spot market to unprecedented levels and taught OPEC ministers something about the value of their oil. By 1974, the "official" OPEC price had reached \$11.25 per barrel, a startling increase from the \$2.18 price level that had been established just two years before. By 1975, the posted price was no longer merely a fictional "tax reference" price used by OPEC members to compute their share of company profits. Indeed, the multinational companies were mostly removed from the equation by a wave of nationalizations that began in earnest in 1974, after which OPEC members sold their oil outright to whichever customers were willing to pay the official price. The posted price was successively increased during the 1970s by collective agreement of the OPEC ministers, but the real price of oil actually declined as the decade progressed since the posted price failed to keep pace with accelerating inflation. Such was the state of affairs at the onset of the Iranian Revolution, when the expulsion of foreign oil field service firms and a series of labor strikes in 1978 and 1979 disrupted Iranian output. Disruptions spread to Iraq in 1980 with the outbreak of the Iran-Iraq war. Again the market panicked, and again the OPEC members were taught something about the value of their oil. By October, 1981, the posted price of OPEC oil reached \$34 per barrel (which in real terms still represents the all-time high).

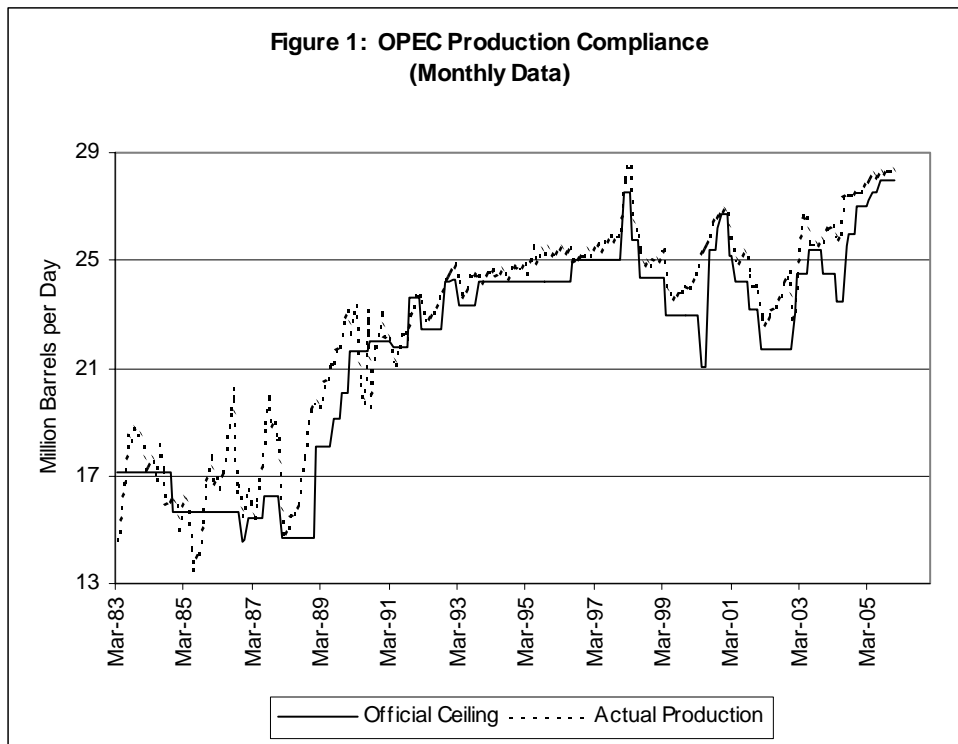
A sharp downturn in the oil market led to the third (and current) phase in OPEC's evolution. Already by 1982, individual OPEC members were offering customers large

discounts below the “official” OPEC price in order to maintain or even increase their share of what had become a dwindling market. Sluggish OPEC sales and falling prices were the product of reduced consumption and rising non-OPEC oil supplies, both spurred by the price shocks of the 1970s. To deal with the growing surplus of oil in the marketplace, OPEC adopted in March 1983 a formal system of production allocations that imposed—for the first time—individual ceilings on the output of each member. During this third phase of OPEC’s development, which continues today, OPEC members meet at regular intervals (and sometimes more frequently on an emergency basis) to review market conditions and adjust members’ quotas as needed to support or “defend” the market price within a desired range. This phase of OPEC’s history is the one that most resembles the textbook example of a cartel, at least outwardly.

OPEC’s Future Prospects

When judging OPEC’s past success or contemplating its future course of action, several things must be kept in mind. Foremost is the fact that any system of output restraint is vulnerable to the classic free-rider problem. OPEC as a whole may be made better off by reducing total output, but each member has an incentive to produce beyond its assigned quota. From the individual member’s point of view, marginal revenue from incremental sales exceeds the marginal cost of extraction, which creates the temptation to cheat. Cartel membership is most beneficial to a producer when other members are doing the hard work. But if they won’t, who will? Without a system to detect and punish cheating, the cartel is hampered by a prisoner’s dilemma in which the dominant strategy for most, if not all, members is to ignore their assigned production quotas.

In fact, OPEC lacks an effective means to monitor, detect, and punish members who exceed their quotas. A monthly chart of OPEC's combined crude oil production level relative to the agreed ceiling indicates the scope and persistence of this problem (see Figure 1). Compliance has been sporadic. Since the inception of the quota system, total OPEC production of crude oil has exceeded the ceiling by 4% on average, but on numerous occasions the excess has run to 15% or more. For the most part, compliance has been achieved only during episodes (like 2005-2006) when the production ceiling itself pushed the limits of each member's available production capacity.



Source: Ceilings, OPEC Annual Statistical Bulletins; Actuals, U.S. Energy Information Administration

A second factor that confounds OPEC's attempt to manage the market price is the lack of timely and accurate information about changes in the level of demand for oil and the availability of non-OPEC oil supplies. Several forecasts of demand and supply are available at any given time (including those prepared by the U.S. Energy Information

Administration, the International Energy Agency, and by the OPEC Secretariat itself), but the precision of these forecasts is low and surprises are frequent. For example, none anticipated the surge in Asian demand that triggered the sudden tightening of oil markets in 2005. OPEC's forecasting problem is compounded by the fact that several years may elapse, due to rigidities in both supply and demand, before the full impact of a price change can be observed—so if a mistake is made, it may go undetected for several years and then take several years more to rectify.

Even if perfect information about future market conditions were available, there is no assurance that the interests of individual OPEC members could be easily aligned around a single “correct” price or production target. In part, this is due to the fact that OPEC has very limited means by which to redistribute earnings among members. Therefore, any given set of quotas determines not only the overall profit of OPEC, but also the individual revenues that accrue to each member.

If the members were more homogeneous demographically and economically, the problem of misaligned interests would be less severe. As things happen, however, large volumes of low-cost reserves are concentrated in certain countries with small populations and relatively high incomes (e.g., Kuwait, Saudi Arabia, and the United Arab Emirates), while smaller volumes of higher-cost reserves are found in populous and relatively poor countries (e.g., Nigeria, Indonesia, and Venezuela). Table 1 sets forth some of the more salient differences among the members of OPEC. The potential for conflicting interests involves not only the question of which members “deserve” larger quotas, but what is the preferred market price level for OPEC oil. What price would the respective members of the cartel like to see? Members with low-cost, long-lived reserves will take a long view

of the future and may be reluctant to push prices too high given the fear of induced technological innovations that would usher in new forms of energy (or energy conservation) that eventually compete against OPEC. Members holding fewer reserves and shorter horizons are less vulnerable to this type of risk and therefore perhaps less averse to high prices. Internal divisions between “price hawks” and “price doves” have been observed previously and will likely surface within OPEC again.

TABLE 1: DIFFERENCES AMONG OPEC MEMBERS

Member	since	GDP \$ per capita	Value of Oil Exports \$ per capita	Proved Oil Reserves bbl per capita	Crude Oil Production bbl per capita	Reserves to Production Ratio years
Algeria	1969	3,113	999	373	15	25
Indonesia	1962	1,290	42	20	2	11
Iran*	1960	2,863	704	1,986	22	91
Iraq*	1960	1,063	812	3,989	24	165
Kuwait*	1960	27,028	15,429	36,775	340	108
Libya	1962	6,618	4,839	7,084	106	67
Nigeria	1971	752	355	275	7	42
Qatar	1961	45,937	22,614	18,455	339	54
Saudi Arabia*	1960	12,931	6,876	11,029	143	77
UAE	1967	29,367	11,044	21,733	193	113
Venezuela*	1960	5,240	1,796	2,990	43	70
OPEC Average		2,649	941	1,660	21	81

* Founding member of OPEC

Source: OPEC Annual Statistical Bulletin, 2005

A final factor that looms large in the future of OPEC is the role to be played by serendipitous events and geopolitical tensions. A large portion of OPEC’s apparent historical impact on the price of oil has come about not as the result of deliberate plans crafted by a purposeful cartel, but as the by-product of clashing national agendas that encompass far more than the petroleum sector. During the past thirty-five years, most of the idle capacity held by OPEC members has been involuntary—taken out of production due to military conflict. Much of the hard work that any cartel has to do—commanding the determination and discipline to restrict output—has in OPEC’s case been provided

fortuitously. For that reason, the ultimate strength and cohesion of OPEC has perhaps not yet been tested.

The value of crude oil produced and sold on the world market exceeds \$1 billion each day. Even a relatively small impact on the unit price of oil represents an enormous transfer of wealth between consumers and producers. Moreover, the disruptive impact of sudden price “shocks” and heightened volatility threatens the goal of sustained and steady global economic growth. As consumers, investors, and government officials continue to wrestle with these problems, it is no exaggeration to say that OPEC has left an indelible imprint on the world economy through its impact on the price of oil.

Biographical Note

James L. Smith holds the Cary M. Maguire Chair in Oil and Gas Management at Southern Methodist University. Having specialized in energy studies since receiving his Ph.D. in Economics from Harvard University in 1977, Dr. Smith was recently appointed to serve as Editor of *The Energy Journal*, which is a leading scholarly publication in the field of energy economics. Dr. Smith’s publications on various aspects of energy economics and management have appeared in numerous academic and trade journals, including the *American Economic Review*, *Journal of Economic Theory*, *Quarterly Journal of Economics*, *Economic Journal*, *Oil and Gas Journal*, and *World Oil*. Dr. Smith is a member of the Executive Council of the US Association for Energy Economics, and serves as a Research Associate of the MIT Center for Energy & Environmental Policy Research.