

Organization of Petroleum Exporting Countries (OPEC) and Role of Saudi Arabia

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Abstract

The aim of this research is to explain the OPEC position and the role of Saudi Arabia within OPEC. Saudi Arabia as the largest producer and country with largest oil reserves of oil attract many attention and many studies try to explain which role Saudi Arabia plays within OPEC, is it the role of dominant producer and which strategy Saudi Arabia used during its membership in order to keep its position and its market share. Saudi Arabia role is to keep the balance of production within OPEC. Saudi Arabia was explained as swing producer, and in order to protect itself and its interest because of cheating of other members of OPEC, it was forced to adopt the strategy tit-for-tat. There is big question of it is good to have dominant producer, or all of them to be equal.

Keywords: OPEC, Saudi Arabia, Cartel, Oil prices, dominant producer

1. INTRODUCTION

Organization of Petroleum Exporting Countries (OPEC) is the international organization composed of the twelve member states. These countries mainly depend on the revenues from oil export. They work together in the coordination of the overall oil price in the world market. OPEC is by market structure Cartel, which represents intergovernmental organization. As it is stated in OPEC's Statute it is an international organization with aim to influence and maintain the price of oil through the control of production levels and to generate revenue, which goes towards meeting the development needs of its members. By

controlling production, by system of quotas, the OPEC has large influence on the determination of the price on the world market. It is hard to distinguish what is OPEC exactly, is it real cartel with cooperative or non-cooperating behavior. Every cartel face with three factors that must be accomplished in order to properly function as the cartel: coordination, cheating and entry. In the case for entry in OPEC case there is really high barriers to entry, so new producers are prevented from entrance on the oil market. Cheating is big problem in OPEC. Each country has incentive to cheat because the dominant strategy for most of the OPEC members is cheating. Each member has different needs. OPEC imposes production quotas to its members and meets twice a year to define their oil production policies. If their coordination is effective there would not be any member that violates the rule of quota. On the meeting the OPEC assigns the ceiling of the total output and assigns to each member the share that it should produce. If the member cheats the cartel should be able to detect and punish cheating. (Smith 2005) Aguiar-Conraria and Wen(2011) show that equilibrium depends crucially on the cartel's choice of the control variable: price or quantity.

According to the Hochman and Zilberman (2011) the OPEC is not economic but political cartel among big-oil exporting countries, which set fuel policy to maximize aggregate welfare. OPEC can be kind of the monopoly and can act as monopolist, but because there is some oil supply by the non-OPEC countries it is cartel. Market of the oil is not competitive, OPEC as a cartel fixes the output, production level, while other non- OPEC countries react to satisfy world demand (leader-follower game). OPEC knows how others will react so it is able to determine own demand and oil price so it defines its quota level to maximize own net revenue. It is example of Stackelberg game, where OPEC is leader and followers are Non-OPEC producers and oil consumers. Demand for the oil of the OPEC is residual demand. There is still the question whether OPEC is a cartel or not.

The work by Gulen (1996) investigates if the OPEC is cartel through causality test. Causality test should detect if the OPEC is able to affect prices by changing the production. Researches done before try to explain the OPEC as a cartel or non-cartel model. Non –cartels models are focused on competition, changes in ownership and revenue target modes. Cartel models attempt to make the OPEC classification as the monopoly, oligopoly or dominant firm. Tests done in the Kaufman et al 2008, reject the hypothesis about the competitive behavior, changes in ownership and revenue target. Increase in the price of oil is affect by four factors: capacity utilization by OPEC, production quotas established by OPEC, the degree to which OPEC production exceeds these quotas and private stock crude oil that are held in OPEC nations. It implies that OPEC through decisions about production, quotas, and operable capacity can influence real prices of oil. Many studies try to describe the nature of OPEC. Is it cartel or non-cartel market model? According to models the quotas have a statistically measureable effect on crude oil production in most of the countries. OPEC quota decisions influence the decision about price. Also it is shown that oil production by other OPEC nations has a measurable effect on the own production of individual member of OPEC. (Kaufman et al 2008) Many factors influence the production of oil by OPEC. Those factors are mostly: price of oil and condition on market, the level of oil production by other producers that are

not members of OPEC and the geopolitical environment. New discovered reserves of oil in the other countries non –OPEC members leads to the increase in the oil supply on the international level, with better technology and declines in the market share of OPEC. More producers on the market increase the competition and brought market to more competitive conditions and more competitive prices, so the OPEC abandoned the administer oil pricing system in mid 80-s and moved to market-reference pricing based on the price quotas provided by oil price reporting agencies. In the OPEC interest is to adjust production quotas in order to achieve price target zone. Ability of OPEC to influence prices depends on the market participants` expectations in the future markets. In order to keep the price target range in the condition when the global oil demand declines, the OPEC would decrease production. These decisions are dependent on the coordination efforts and bargaining power of OPEC member countries. In the case of greater demand, OPEC would not respond immediately because of the large uncertainty of future demand. Another limitation of oil production lies in the unfavorable geopolitical climate in OPEC member countries regarding security and there could be adopt the sanction that could have adverse impact on the investments and create limitation of expansion of capacity. (Barros et al 2011).

The OPEC success is based on three factors: its overwhelmingly high share in world oil supply, the absence of close substitutes and consequently the inelastic demand for oil, and inelastic non- OPEC supply. (Panayotou 1978)

According to Bagheri 2011: In order to realize the goals OPEC does the following policy:

The excess production capacity in major producing member countries

The quota system by which member countries are obligated to consider the upper limits for their oil production.

The OPEC use the excess production capacity to stabilize the price.

2. SAUDI ARABIA ROLE IN OPEC

As the largest world producer of oil role of Saudi Arabia in OPEC is discussed in many articles. Saudi Arabia acted as swing producer in 80s with adjusting output of oil in order to keep stable the production of oil and the price. After the persistent cheating of other members, Saudi Arabia was forced to adopt tit –for- tat strategy to keep its market share. Most stated that the Saudi Arabia is the leader in the OPEC production. In Smith 2005 found indicator that Saudi Arabia may have played a special role within OPEC.

2.1 Swing producer

The Saudi Arabia leadership within cartel is established in order to stabilize or moderate oil prices and achieve its political objectives (Al Yousef 2011). The Saudi Arabia is represented in some studies as the swing producer or the balance wheel which absorb fluctuations in the supply and demand in order to maintain the monopoly price. As is it quoted in AlYousef

2011, the monopoly price and the stability of OPEC depends more on whether Saudi Arabia's share of the production of oil by cartel satisfies its objective than on the cohesion of the cartel, according to proposed model Arabia chooses the price path in order to maximize its wealth and taking into consideration the reactions of the other members. In order to achieve and keep the cartel price OPEC defines its own production level, and Saudi Arabia acts as the swing producer. Griffin and Teece 1982 stated that Saudi Arabia is the swing producer or the balancing wheel absorbing demand and supply fluctuation in order to keep stable monopoly price. They found that price level and level of stability in OPEC mostly depends on how Saudi Arabia satisfies its own needs, then on the cartel behavior. It is found that OPEC is choosing its production level to keep stable cartel price while Saudi Arabia acted as the swing producer. Especially it is shown in period of 1975 when Saudi Arabia decreased its production level in order to keep stable oil price at the monopolistic level. (AlYousef,2011). In the case of OPEC (Smith 2005) there is compensating behavior. One producer increase own production in order to offset the decline in production of others. (Smith 2005) examines the comparative static properties of equilibrium adjustment and he found that differences in the frequency of compensating the changes in the output are connected with the degree of the independence among the producers. This gives explanation in order to define which type of behavior is applied, competitive, oligopolistic or collusive behavior.

In 1980s Saudi Arabia acts as a swing producer and Saudi Arabia adjusted its production of oil in order to stabilize the production of OPEC and target price. In the work of Griffin et al 1994, the empirical results were designed to show that Saudi Arabia played the role of swing producer, when the profits fell below the Cournot profit floor, the swing producer strategy was abandoned and tit-for-tat strategy was implemented later. In the earlier ages the Saudi Arabia in order to stabilize prices adjust output by adopting the swing producer strategy. In period of 1983 to 1985 there was swing producer role assigned to Saudi Arabia and quotas to other members. Swing producer role is favorable if the Saudi Arabia profits more than under the Cournot production level. The success of this strategy depends on the willingness of other OPEC countries to restrict their output below Cournot level and follow quota. If others exceed the quotas, the Saudi Arabia decided to produce according to Cournot model in order to punish them. Everyone would be better off if produces within quota and Saudi Arabia acts as a swing producer. If others increase the production level and exceeds the quota it decrease revenue of Saudi Arabia and transfer it to the others and creates incentives for others to cheat and produce more. One of the explanation of the oil collapse in 1986 was the due to Saudi Arabia decision to left the role of the swing producer.

Dahl and Yucel (1991) tested the swing producer model and that Saudi Arabia production level does not have any relationship with the level of output of others. Saudi Arabia is acting as a swing producer to prevent sharp price drops by cutting production rapidly in response to declining prices.

2.2 Dominant producer

Smith in his work in 2008 examines: the OPEC goal is to set the price. Kaufman et al (2008) results indicate that higher prices have a positive effect on production of Saudi Arabia. In their work Saudi Arabia did not showed the sharing behavior so it leads to conclusion that Saudi Arabia is a dominant firm. As it is quoted in Al- Qahtani (2008) it is found that the best model that explains the oil price in period 1974 to 1978 is dominant firm model. He believed that Saudi Arabia dominated the residual demand and through adjusting their production level they determine oil price on world market. Saudi Arabia has name of the dominant producer because of its large oil reserves and excess capacity production.

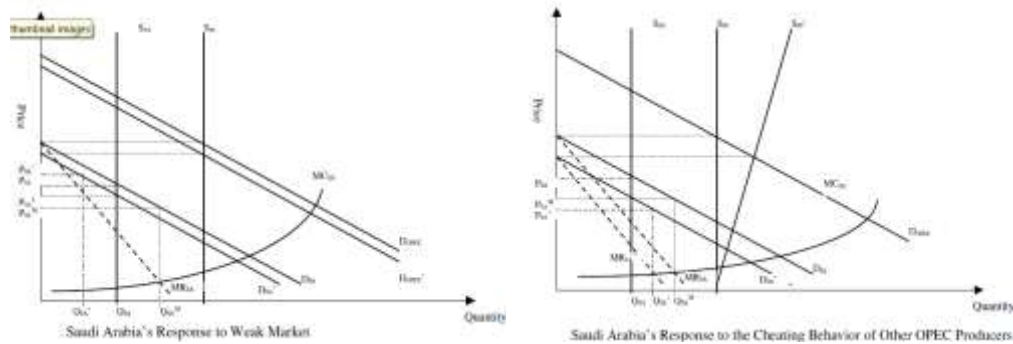


Figure 1: Saudi Arabia Responses

Griffin and Teece 1982 explains OPEC as the dominant producer with Saudi Arabia that acts as swing producer that is able to absorb the fluctuations in demand and supply. As quoted Saudi Arabia is the swing producer or the balancing wheel absorbing demand and supply fluctuation in order to keep stable monopoly price. They found that price level and level of stability in OPEC mostly depends on how Saudi Arabia satisfies its own needs, then on the cartel behavior. Saudi Arabia chose the combination which maximizes its wealth by taking into consideration the reaction of others. Griffin 1994 shows that Saudi Arabia production depends on the production of others, with Saudi Arabia as the market leader which varies production inversely to the competitive output including the rest of OPEC.

2.3 Tif – for –Tat Strategy

Saudi Arabia adopted the strategy tit-for-tat in order to punish cheating by other members of OPEC. Griffin and Neilson (1994) show in their work that in oil period of 1985 to 1986 the Saudi Arabia adopted tit –for –tat strategy that benefits to all members of cartels and established the production disciplines among them. Later Saudi Arabia was forced adopted tit-for-tat strategy to keep its market share because of the cheating by others. Results from Dibooglu 2007 shows that there is significant influence of cheating in the OPEC on the real price of oil. Again in period 87-90 Saudi Arabia production oscillated slightly around the quota level and after increase in the cheating by other members Saudi Arabia in 1988 start to aggressively increase production and to cheat in order to match the level of the cheating by other members of cartel. This was the adoption of the tit-for-tat strategy because each

member of OPEC, including the Saudi Arabia exceeded the assigned quotas and Saudi Arabia kept its market share.

The strategy adopted by OPEC should be Pareto efficiency. The Saudi Arabia adopted the tit-for-tat strategy as long as the others production deviate from assigned quotas, and produces according to the Cournot best-response function for the remainder of the game if the other exceeds given level. All members produce according to their their Cournot best response functions. It is equilibrium in which Arabia plays tit-for-tat strategy and earns the profit. The strategy depends on behavior of others. They found that there is strong evidence that cheating by members of OPEC has significant influence on the real price of oil, which leads to conclusion that quota system is not effective. During the period of its membership Saudi Arabia was leader in the oil market. It has this role because of its position regarding production and reserves of oil. OPEC's success was probably due to willingness of its largest member; Saudi Arabia, to act unilaterally to keep oil prices high. When one of the smaller members increased its output of oil, Saudi Arabia reduced their own in compensation. This was not altruism on Saudi Arabia part; rather, it arose from the logic of situation. The Saudi Arabia position is example of game theory model called Dominant Pig. Here Saudi Arabia is in the position of big pig. Both Saudi Arabia and the smaller producers knew that OPEC would collapse unless the Saudi Arabia limited their own production; and the smaller producers took advantage of this, getting a free ride on the Saudi Arabia efforts. Saudi Arabia captured for itself a large enough share of the benefits of the high prices that it rationally willing to bear a disproportionate share of the cost of maintaining the cartel. (McMillan 1992).

3. CONCLUSION

It is hard to distinguish which kind of cartel OPEC is. As in each cartel in OPEC there is also cheating behavior by its members. OPEC must be able to detect and to punish cheaters. Each of the members are dependent on the oil production and it is in their interest to maximize output. OPEC is as organization as cartel, but it has almost monopoly power, because all other oil market participants depend on the decision of the OPEC.

Saudi Arabia plays important role in OPEC. The role of the Saudi Arabia is to be medium which balance the production of the OPEC. Saudi Arabia is producer that actually influences the price indirectly, because if the Saudi Arabia cheats it would increase the output by whole OPEC and it would lead to the decrease in the price. Change in behavior of Saudi Arabia would shake equilibrium in the oil market, prices would decline etc. In order to prevent the oil shocks it would be better if the production is split among the all members, without making production of oil dependent on the only one producer. Position of Saudi Arabia is very plausible for its own interest, but if the interest of Saudi Arabia clash with interest of other members of OPEC it would bring negative consequences on the oil market, because Saudi Arabia in order to protect itself could make decision that would make all participants worse

off. It could lead to the increase in prices so it would hurt others, especially customers. Each member has the incentive to cheat. When one cheat, all others want the same and it leads to worse condition, production increased, price decline as well as there is decrease in the revenue. Each market should have force that will keep balance and stable equilibrium, and it is done by swing and dominant producer which is strong enough to provide support to others and brings benefits to everyone.

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