OIL PRICES: AN ATTEMPT OF EXPLANATION[*]

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It has been almost two years since the oil producing countries grouped within OPEC* decided to raise substantially the reference price (posted price) of their oil as well as their revenues per barrel produced. It was the first time in their long petroleum history that these countries were *unilaterally* taking such an important decision.

Since that time international petroleum industry is commanded by the "OPEC-pricing system" which replaced the old system. One will remember that in the old system it was the oil companies that controlled the level of prices and the production according to their own plans and interests.

It may be affirmed that there was a certain concertation established between the companies and the producer countries after the formation of the OPEC in 1960. However, we must admit that this concertation was directed, not to say "dominated", by the companies. Since the beginning of 1970's the situation seems to be changed: the control of the fondamental variables of the industry is taken by the governments of the oil producing countries.

It is this change, rather than the increase of prices which was a consequence of it, that must be given attention and that must be explained.

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* Organization of Petroleum Exporting Countries

In order to avoid endless discussions on the very nature of the OPEC, I will admit that this organization which seeks to defend the common interests of the producer countries limit the free play of market forces without necessarily putting an end to it.

In fact, when an "organized competition" governs the most important sectors of the international economic activity, it seems to me a little peculiar to see such storms and such question marks to which OPEC gave rise. Also, the fact that the history of today's industrialized countries, and that of the oil industry in particular, can be summarized as the history of agreements that have limited the realm of free competition casts many doubts on the value and relevance of all these discussions. On the contrary, perhaps the most important point of all this contreversy is the novelty of this phenomenon of economic "united front" among a group of under-developed countries and the value of this example for other Third-World raw material producers.(1)

At this point, two questions rise into view. The first one is: how can we explain, if not justify, the considerable gap between what we call "the technical costs" of production estimated as being equal to 10¢ per barrel for the Arabian reference crude (The Arabian Light, 34^{o} API) and the current price of approximately $10/bbl.

The second question may be formulated in the following manner: how and for which reasons the OPEC, this supranational organization that exists since 1960, was satisfied, in the beginning, with a role of fiscal revendicator (often a rather non-influential one) beside the companies and why did it change this role, especially since October 1973, to become the unique "decider" of the price level.

To answer to these questions is, in a way, to bring forward an explication to the increase of prices through a study of the nature, objectives and evolution of the new system.

I- ECONOMIC DEVELOPMENT AND ENERGY INDEPENDANCE

It seems to me that there are two factors to be studied for a realistic comprehension of the actual system of oil prices. One of them is the will of the producer countries to recuperate the total control and administration of their natural resources to accelerate their economic development: this is the objective of *economic sovereignty*. The other factor is the decision taken by the oil consuming nations, especially by the United States, first to diminish and then to put an end to their dependance on a product (the oil) and on the countries that produce the product in question (the OPEC countries): it is the objective of *energy independance*.

These two objective phenomena affected, evidently without cancelling the importance of economic factors, the actual and anticipated supply and demand of oil and, consequently, the level of prices. Thus, the desire for energy independance of the consumer nations increases with the development of the national sovereignty of the producer countries. Inversely, the investments made to assure energy independance incite the producer countries to increase the price of their oil following their anticipations concerning the future conjoncture where they will face not only a much less inelastic demand for oil, but also a "protected" supply of substitutes. A strategy which would consist of lowering the oil prices in order to oppose or to postpone the investments in substitutes could have been envisaged if these investment decisions had not been a function of a political objective, the energy self-sufficiency, which is determined *a priori* according to motives and criteria beyond the simple cost-benefit calculations of an individual entrepreneur.

1. *For the producing countries*, the will of controlling directly their most important, if not unique, economic resource is a result of their becoming conscious of two fondamental realities:

A) The first one is that the petroleum, although it is abundant for the moment, is a resource which is always more demanded and is progressively exhaustible. These two reasons render this resource more and more scare and, consequently, more and more expensive. Even if we admit that substitutes exist, they can not be compared with the petroleum given the actual

technological structure and the fewer possibilities of deriving end products from them. Moreover, the prices of these substitutes are either much higher than that of the oil or they are very difficult to determine given the various technological constraints and unknowns concerning the production of these resources. The numbers that are mentioned one or two years ago for the extraction costs of the tar sands and the shale now belong to the past and today it is very difficult to make forecasts on the subject.

B) The second reality that the producer countries ended up by discovering follows a simple but fondamental observation. The last fifteen years showed them that a cumulative and self-sustained economic growth is not compatible with the mentality and the means of a property owner ("rentier"). They also realized that one has to go beyond the simple measurements of development in terms of *revenue per capita*; what is important and vital in the long run is to transfer into their economies the maximum possible of the value added by the successive transformations of the crude oil. Now, there is no doubt that up to now the enormous benefits of the revalorization of the crude went directly to the industrialized economies. It is somehow one of the factors that made it possible for the latter to attain the exceptional rates of growth whereas the oil producing countries stayed handicapped by an economy of mono-production.

2. *For the United-States*, the most important consumer country, there are two factors at the basis of the will of energy independance:

A) The first one is essentially political. In fact, this country refuse to accept the necessity of a reorganization of the international power structure to render it more compatible with the requirements of new physical and economical realities. It is this refusal which constitutes the fondements of the famous Project Independance which is not very logical from the point of view of economics although it is not alltogether irrelevant politically.

In a certain sense, the United States endorse the principle according to which political independance is a direct fonction of economic independance. We do not need to underline the gap that lies between this principle and the economic optimality. However, there is nothing to prevent a given collectivity or a state to prefer, and to chose, a situation of optimum power which renders it necessary to make certain concessions or to sacrifice the immediate welfare of the individuals. If we deny the existence of such a possibility, it becomes difficult to explain the behavior of the United States in the past few years. Evidently, we may criticize the opportunity or the relevance of such an objective. But once the choice is made, the question is to apply the most efficient means to realize it. Now, it is evident that the Project Independance can not be accomplished unless the need to bring on a certain increase in the international oil prices is admitted.

In fact, it was in the end of 60's, much before the "revolt" of the producer countries, that the American government realized that a "à la

When it is put in these terms, for the American government Project Independance was never a problem of choice between two objectives: dependance and independance. It was rather a problem of choice between various means to attain, rapidly and efficiently, an objective which was determined by purely political criteria. It is the reason that accounts for the inflexibility of the American government concerning the objective of independance whereas its position in the choice of means was rather flexible.

B) These purely political objectives were strengthered by a series of economic ones the most important of which is the strengthering of the American position within the OECD. In fact, since 1950 the American position was constantly weakening relative to that of the Japan and Europe. This trend is confirmed by the evolution of the part of the United States in the cumulative GDP of the OECD countries: this percentage which was 61% in 1950 became 54.6% in 1960 and 48.2% in 1970. It will be 41.2% in 1980 according to projections made by taking 1970 as the base year. If May 1973 is taken as the base, it will be 36.1% in 1980. For the Japan, these percentages are, respectively, 2.5%, 4.6%, 9.7% and 14.2% (see table I). Definitively what is lost by the United States is gained by Europe and Japan. It is a sufficient reason to lead the United States to deal seriously with the problem.

However, the rise of Japan and Europe contains a weak point which constitutes an Achilles' heel for these two allies. It is their strong dependance on the imported oil (90% for Japan and 60 - 80% for Europe).

In this situation, a higher price for the oil imported by Europe and Japan would not be incompatible with the American interests. This would tend to decrease the competitivity of the European and Japanese products and would present an obstacle to bilateral negociations between a united Europe and the OPEC. Here the essential thing is to avoid a situation in which the United States would be alone to face the oil producing countries especially in their period of transition to a total energy independance. The creation of the IEA and the strategy defended ardently by Mr. Kissinger can be accounted for by this factor.

It is mostly this strategy which constitutes the stumbling block in the relations between the United States and the France. The actual american policy consists of persuading the Europeans and the Japanese that their interests are identical with those of the Americans and, consequently, the best way to defend them is to form a common front in which the United States would take position so as to counterbalance the growing power of the OPEC.

This short term policy is accompanied by another policy of middle and long term which goes beyond the organization of the confrontation with

the producer countries: this policy has to do with the transformation of the dependance of the Europe and Japan on the OPEC to a dependance on the United States. There are at least two reasons for which this transformation is highly probable. Firstly, the substitutes for petroleum (coal, shale, nuclear) are much more abundant, thus much less costly to develop, in the United States then they are in Europe and in Japan. Secondly, these latter countries are incapable, especially with the haemorrhage of foreign exchange reserves caused by the increasing value of oil imports, to invest considerable sums to attain the energetic self-sufficiency in the next 15 years.

An important point of the American strategy was elaborated by taking into consideration the following facts: 1) the incapacity of the Europe to adopt a common energetic policy; 2) the continuation of the dominant decisional and operational position of the big American companies on the European markets; 3) the continuation of the role played by the OPEC as a revendicative organization beside the companies but not as a substitute to them-The events confirmed only the first two previsions because the OPEC, as we shall see later on, went much beyond the limits set by the American strategies.

Before passing to the interpretation of the recent events in the light of these two objectives, it would be useful to start with an examination of the nature of the oil prices and markets.

II- NATURE OF OIL PRICES AND MARKETS

A close observation of the oil market would reveal the existence of a central phenomenon which can constitute a starting point for all careful analysis of this sector: it is the gap between the current price of the crude oil and the technical cost of production.

Even if we admit that this gap was always there, it is evident that it augmented considerably in the last few years and this augmentation served to increase the revenues of the oil exporting countries.

The point to be underlined is the considerable difference between a given increase of the consumer prices following an increase of the taxes in the consumer countries and a price increase following a rise in the export prices. In the first case which was generalized till now, the increase in prices manifests itself in an internal redistribution of revenue affecting indirectly the balance of payments whereas in the second case the result is an international redistribution of income. In both cases the gap is there but the consequences are different. In fact, Table II shows that in 1963, for example, there is an important gap between the cost of production and the consumer price. The new element that we observe since the end of 1973 and the beginning of 1974 is the increase, in absolute value and in percentage, of the part of the producer countries.

Thus, it is important to keep in mind that the real reason of the actual atmosphere is not the increased prices but the manner in which this increase took place and the fact that it has to do with a transfer of income from industrialized countries to a group of under-developed countries.(2) It is the very presence of these two factors that causes worries and creates problems. In fact, ever since the moment when this transfer is found excessive, intolerable and non-manaqable, its legitimity is questioned and criticized.

In this situation, how can we explain the qap between prices and costs? What are the criteria to be used for its determination? What are the forces that influence the two variables that fix its boundaries?

A) "The just price"

For some people, the explanation is simple: the actual price has nothing to do with the scarcity of the resource defined by the evolution of the rate of exhaustion of proved reserves and the costs of production. Moreover, it has nothing to do even with the anticipated scarcity since until 1980 - and for some until 1985-1990 - the productive capacity will always exceed the predicted demand. A long series of assumptions, statistiques and scenarios that are too long to be presented here are put forward to support this argument.

The most important conclusion of this sort of analysis is that the actual prices are the consequence of a monopoly of producers that seeks to maximize the discounted profits. According to the advocates of this argument the interest of the consumer countries lies in the break-up of the OPEC which would bring about a certain market structure in which the minimum avarage cost and the price would be identical in the long run.(3) So the "just price" will be realized and the resource will be managed in a more efficient way.

On the basis of such arguments a famous prediction was proposed in the beginning of 1960's. According to this prediction, the price of crude oil should *tend* towards a dollar per barrel in a competitive market.(4) Recently, another simple model arrived at a conclusion according to which in a competitive market the price should not exceed two dollars per barrel: each price that goes beyond this limit should be considered as a monopoly rent.(5)

While the first prediction is based on a detailed analysis of the secular evolution of the production costs of crude oil, the second is limited to a series of assumptions following a simple model. According to this model, a price of $8.00 is accepted to be the price of the substitutes for the equivalent of one barrel of petroleum in a future market with a time horizon of 30 years: the actual price of petroleum should be equal to the discounted value of these $8.00 given a discount rate of 5%. In other words,

if, in a competitive market, the discounted price of a substitute to be delivered after thirty years is equal to $8.00, the actual price of oil must not exceet $2.00.(6) So, this latter price would increase gradually to be equal to $8.00 after thirty years when oil will leave its place to its substitutes.

Although we appreciate the arguments that support these theses, we can not refrain to feel a little uncomfortable since the predictions following these arguments are never confirmed by the realities.

The reason for this is that the competitive markets, although the ideal structures to realize the efficient allocation of resources, simply do not take into consideration the objectives such as energy indepandance, national sovereignty, not only transmitted but constructed development etc... Now, it is a fact that these objectives dominate the oil industry and characterize its profile and physionomy.

By their nature, such objectives are not only obstacles to the emergence of a competitive market but they constitute a series of costly irrationalities with regard to the "pure" economic theory. In fact, we know that this theory is based on the interdependance of nations, the international division of labor according to the principle of comparative advantages and the assumption that the world is an integrated entity and

not what it is in reality: a multitude of nations with their own political goals which are supposed to represent the common desires of each collectivity.

The error committed by the authors who preconize the reestablishment, or rather the creation, of a competitive market or who analyse the oil industry with the help of the postulates of such a market is a consequence of their refusal to take into consideration the reality of the goals we have just mentioned. It is for the same reason that their predictions concerning the level of prices, although they never come true, are, in a sense, very solid ones. In fact, even when the actual price is ten times more than the famous one dollar, nobody can prove the error of the prediction since a real competitive market has never existed in the international oil industry.

Inspite of the ingenuity of the efforts made to prove us that in the system governed by the companies there was a "massive" competition whereas in the system dominated by the OPEC the producer countries chose the comfortable tranquility of the monopolies, we can cast doubts on the validity of this argument simply by analysing the evolution of the oil prices during the decade 1960-1970. All through this period the prices were stable in current dollars, thus deteriorating in constant dollars, while the demand was increasing at a rate close to 7.5%. Although it is

true that there was an excess capacity (consequence of the new discoveries, especially in Libya) and technological progress in the extraction process had decreased the costs of production, it is equally true that a delibarete policy of low prices, consequence of a form of oligopolistic competition between the oil companies accentuated and even exaggareted the relative decrease of the price of this energy resource.(7)

But if we accept to take into consideration the extra-economic goals (and I do not see why an economist must reject them if they explain correctly the consensus of consumer-voters), we must assign them a cost.

It is in this sense that we can say that the oil prices are *also* political prices: they reflect not only the costs of the struggle carried on by the economic agents against nature (economic aspect) but also of the struggle between the agents themselves (political aspect). In the case of oil, if we postulate that the consumer countries want to achieve their energy independance, it would be normal for them to pay the necessary price to attain this goal.

In order not to believe that we find ourselves in a *sui generis* situation, we must remember that the determination of a price in an imperfect market is always more-or-less influenced by extra-economic factors. This influence is quite important in the case of oil prices, so their analysis, as we shall observe right away, is very complex.

B) "Prices and Costs"

Once we accept to take into consideration the costs to be taken for the realization of extra-economic objectives, we observe that an explication in terms of "monopoly rents" is quite insufficient. In fact, the costs that are purely economic are accompanied by the "costs of independance" and the "costs of development".

1. Economic Costs.

From a purely economic point of view, it is not correct to talk about the "production" of crude oil while what is in question is the appropriation of a non-renewable resource for the sake of its immediate usage, that is, its final destruction since there is no possibility of recycling.

If we consider the oil in the ground as a fixed stock, it becomes clear that the more it is consumed today, the less we shall have in the future everything else being equal. So the rational entrepreneur would compare the present value of profits that he hopes to make from the future sales (for each period in the future) with the profits to be made from the similar sales in the present. Thus, the current marginal revenue must cover not only the marginal costs of the factors used for the production of a barrel of oil (technical cost) but also a user cost inherent to all exhaustible resources.(8)

In the case of oil, the supply is not only fixed in the long run such as the land, but it is also exhaustible and non-renewable. So it is necessary to remunerate not only this exhaustible charactere but also the cost of the incertitute which all the investments that seek to extend the limits of supply in the short and the middle run bear. More definitively, the user cost is a function of the anticipations on the future prices: the higher the anticipated future prices, the higher is the user cost and vice-versa.

So, there are two points to be kept in mind: a) the existence of a user cost in addition to the differential rents between the producers at any given moment, and; b) the fact that this cost and this rent do not disappear in the middle run even in a competitive market even if we suppose that they disappear in the very long run.

Although the principle of user cost is accepted, its quantification creates a most difficult problem. In fact, if this cost is determined by the future prices, it is impossible to know these latter in the absence of the future markets which would sanction the anticipations (or the speculations) of the producers.

The use of the interest rate prevaling in the private sector to solve this problem (the method used in the model that I mentioned above) is not alltogether justified to the extent that this rate is not necessarily

equal to the social discount rate. So, government intervention becomes necessary to define a "royalty" on each barrel produced representing a social property right on the future utility lost by the present extraction of the resource.(9)

In this situation, it is clear that the royalty is nothing but an approximation of the user cost by the public authorities. In the last analysis, the determination of the royalty, although it is also influenced by the actual and foreseeable situation of the markets, reflects a political and deliberate decision determined by the importance given to the future value of the resource.

In more concrete terms, at any given moment market price must cover not only the technical costs but also a royalty which, by assumption, is considered to be equal to the user cost. On the other hand, when we know that the technical costs in North Sea vary (without royalty) between $4.50 and $10.48 per barrel according to the width of the wells, the price of the OPEC-oil can not be considered neither as excessive nor as being the consequence of a monopoly. In fact, we know that even in a competitive market the prices are determined by the production cost of the marginal well whose exploitation is necessary to balance the supply and demand.

The problem consist of the following question: to attain this equilibrium position, must we explore and drill the wells under such

difficult and burdensome conditions that prevail in Alaska, in the North Sea, in short, in the non-OPEC regions?

2. *The Cost of Independance.*

In order to answer this question, we do not need to prove that the world reserves are still plethoric and can totally satisfy the consumption for the next 30 or 40 years. The important point is not the global size and volume of the world reserves, but their localisation and the position of the consuming countries in the face of the phenomenon of uniqual distribution of oil deposits throughout the world.

If, in fact, this distribution has not fundamentally changed during the last two decades, the position of the consuming countries - essentially the U.S. - towards what is today called the OPEC oil has been completely transformed.

Five years ago, nobody was making any distinction between safe and unsafe oil. But since the emergence and the extension of the control by the producing countries over their natural resources, this distinction entered the international oil scene as a constantly repeated theme.

Whether this dinstinction is founded or not is beyond my analysis, I am only observing it and drawing the consequences on the costs it implies.

In this sense, the difference of cost between an inexpensive but unsafe oil and an expensive but safe one constitutes the independance of security cost of supplies. And it is perfectly normal that the consuming countries accept to take this cost and pay more for their oil during the entire period of transition towards their energy independance.

It is evident that the founding of a world-scale competitive market would finally make disappear that "quasi-rent" for the inexpensive oil but, at the same time, the objective of independance as well. There again, the very interest of the consuming countries requires the preservation of a high and stable price in order to make profitable and protect the investments in non-OPEC regions or in substitutes. The argument according to which these investments can gradually materialize, following a progressive increase in oil prices, is not convincing, given that the principal characteristics of these investments are their indivisibility and enormity, which does not tally at all with the marginal calculation. In these conditions, a competitive market following the destruction of OPEC would introduce a permanent instability of prices and would prevent any possibility of rational calculation of middle and long term investments.

3. *The Cost of Development.*

Since we accept the objective of producing countries to develop and diversify their economies, it becomes necessary to inquire on the international environment in which this operation will be realized.

If the markets of technology, machinery, alimentation and industrial raw materials are cartellized to 75%, it is evident that the oil producing countries will never realize their economic development by facing these markets separately. To propose to these countries, in the name of the international economic optimality, the founding of a competitive oil market and the dislocation of their "common front" when the oligopolistic competition and sometimes the monopole are the rules of the market of products manufactured and sold by the industrialized countries is really at the limit of hypocrisy.

In this way, the supplementary cost that these countries should pay for because of the imperfection in other markets justifies by large the increase in oil prices. The question is therefore not to try to know whether OPEC is a cartel or not; the question is to know whether the underdeveloped countries can hope to get out of the situation without trying to form cartels of raw materials which would moderate ever so little the earnestness of the cartels that they face.

It is by taking into account these three types of costs that on can understand better not only the interest of the consuming and producing countries in a certain increase in prices, but also the very foundation of the solutions proposed to determine the periodical level of these prices. The floor price, the indexation of the oil prices on the prices of a "basket" of 20 or 30 industrial and agricultural products or

the fixation of the oil price at the level of the costs of substitutes: all these propositions come out directly from the taking into account of the costs that we have examined.

III- EVOLUTION OF THE PRICE SYSTEM.

Even though the U.S., the companies and the producing countries agreed on the necessity of an increase in prices, their opinions, were, on the contrary, widely different on the fixation of the level of this increase. By going too far and, above all, too fast on the way of increasing prices and the way of sharing the "rent", the OPEC drew the attention on the contradictions among the objectives of these agents.

A) The price level.

For the U.S., given the increasing disequilibrium of their oil balance on one hand, and, their objective of self-sufficiency in the long term on the other (both problems being of course interrelated), the increase should permit, in the middle term, to equalize the international prices with the internal ones. This equalization would permit: 1) the abolishment of the quotas for the importation of the foreign oil without any risk of seeing the internal production decline and at the same time to assure the necessary supplies in the transition period, and; 2) a "tolerable" disequilibrium of the commercial balance, given that the increase

being general, its effects on the commercial partners of the U.S. would even be more important because of their higher degree of energy dependance. The period of 5 years mentioned in the Teheran agreement would be used for the *gradual* realization of this policy. Once this equalization obtained, the international prices would evolve according to american prices and the latter according to the marginal cost of the substitutes. In short, the question was to apply the opposite policy to the one followed in Europe at the time of "competition" between the coal and the oil. At that time, it was difficult for Europe not to sacrifice its coal (and its energy independance), given the important gap existing between the price of the coal and the price of oil (a substitute which already existed and was not needed to be subsidized by a voluntarist price policy. In the present case, what should be done was to raise the price of oil sufficiently but gradually in order to make competitive other internal sources of energy.

For the producing countries, one should underline, the fact that no criterion for the determination of the level of prices in the long term could, up to now, never make consensus among them. The increase in December 1973 was, in fact, a compromise between two tendencies inside OPEC. This compromise was materialized with the help of the political situation prevailing in the Middle-East.

In fact, the Algeria-Iran group, in spite of some considerable ideological divergences, were supporting the thesis of aligning

the oil prices directly on the costs of substitutes, therefore, a quiet systematic policy of increase. Faced with the concrete difficulty created by the periodic calculation of these costs, the Shah of Iran porposed to fix the oil prices on the basis of an avarage revisable price index of fifteen or sixteen industrial and alimentary products imported by the oil producing countries. The motives of this "pro-increase" thesis were: 1) a low reserve/production ratio for Algeria and, to a certain extent, for Iran that incited the adoption of a short-term policy (restriction of the production and maximization of unit revenues), and; 2) the enormous capital needs of this group of countries given the demographic pressures and their ambitious development projects. The emergence of substitutes after ten years does not constitute a problem for these countries because their oil reserves would either be exhausted before that or they would be used for the ever-increasing domestic needs brought forward by the industrialization and by the development of petrochemistry.

The Saudi Arabia - Emirats group manifestly had other constraints and other objectives. Faced with the abundance of reserves and more and more threatening eventuality of substitute products, it was normal for this group to adopt a policy of income maximization by increasing its production. For the companies, the principal goal was to make sufficient profits from the OPEC-oil to be able to finance the research and the exploration (of oil and of other products) in the regions more secure than the Arab Middle-East.

The October War took place in this background. The psychological climate was favorable for a united action to decide the level of prices. The decision of reducing the Arab production and the embargo organized against the United States and Holland led to higher prices of oil sold by auction even before they affected the supply level. In addition to this, the increased oil prices took the form of a ripost against the Americain policy even though the Iran was seeking to dissociate the oil from politics trying, at the same time, to profit from this atmosphere to bring forward its thesis concerning the prices.

Neither the Saudi Minister Yamini's proposition ($7.00/bbl for the Arabian Light) nor the proposition of the Iran ($10./bbl which was the price level reached for the oil sold by auction) was not accepted in December 1974. A price of compromise (almost the average of two propositions), $11.65/bbl, was accepted with the possibility of revision in every three months. The Saudi Arabia had to accept this decision not only to preserve the cohesion of OPEC,but especially for political reasons that prevented it to be the instigator of a systematic decrease of prices.

B) The distribution of the "rent".

Perhaps more important than the increased prices is the evolution of the distribution of the rent between the host countries and the companies. In fact, since the Teheran agreement (15 February, 1971) two

successive phases took place in the oil scene. The first phase was the convergence of the interests of the United States and the companies (*Majors*) with these of the OPEC in spite of the outward appearance. This phase covers the period 1971-1973. A the end of 1973, and especially in the beginning of 1974, the divergence of interests started to manifest themselves becauses of the severe modifications introduced by the OPEC countries in the legal structure of the oil industry.

Table III provides a synthetic presentation of this evolution. One would observe that during the period 1971-1973, even though the increase of lost government revenues is greater than the increase in company "profits", there is a substantial rise in the benefits of the companies that passed from $0.59/bbl to $1.61/bbl, that is, an increase of more than one dollar in almost two years.

It is at the moment when the lost countries obtained a participation of 60% in 1974 that the company benefits started to fall. To analyse the measures applied by the OPEC against the companies, it is necessary to see rapidly the nature of the rent and its distribution.

As long as the host countries did not know the real price of crude oil, it was impossible for them to determine the gap between technical costs of production (supposed to be known) and this price. Now, the rent is equal to this gap. In reality, this ignorance of the real price

is valid for all the governments in question: the governments of the producer countries as well as those of the consumer nations. The practice of "between-subsidiaries-prices" often used by the companies and the limited scope of the "free market" rendered it impossible to have a clear idea on the real prices of transactions. To get to know this price, it was necessary to be able to sell sufficient quantities of oil outside the circuit created by the companies. Once the sale price is known, it was easy to determine the magnitude of the "rent" and it was very tempting to appropriate a great portion, if not the whole, of it at the expense of the companies. On the other hand, the oil market being a sellers' market since 1971, the governments did not see why they should accept to share it more or less equally with the companies.

Even though we must accept that the whole strategy of the OPEC was inspired by this reasoning, we must also admit that the starting point of this strategy was the agreement of Teheran. In reality, it is now known to every body that the companies went to Teheran not to dispute nor even to negociate, but to sign since the Project Independance of the United States was already formulated and its success depended on the level of oil prices. In the face of the favorable attitude of the companies and the public and private declarations of the American officials in favor of higher prices, the producer countries started to ask themselves if it was not the right time to go further. They did not fail to do that in

Geneva, in January 1972, by requiring, and obtaining, a compensation for the first devaluation of dollar. Then, a system of indexing the oil prices on the variations of the most important OECD currencies was established.

Moreover, the companies had to accept to reinvest in the host countries a "limited but satisfactory" portion of their profits. It is this point more than anything else that will later constitute the core of the conflict between the countries and the companies and will lead to the rupture of the solidarity between the two parties. In fact, the companies agreed with the increase in prices (as they still do) and they were glad that this increase was imposed by the producer countries (which permitted them to appear innocent to public opinion). The real problem was the modification of the distribution of the rent and its consequences. In fact, an increase of prices with a rather modest portion of it going to the OPEC states would enable the companies to invest in other regions and even in other every resources without creating the famous problem of the surplus of petro-dollars. On the contrary, a price increase which led to a massive distribution of revenue in favor of oil countries and to a decrease of the company rents (one consequence being a condition of the other) brought about all the problems with which we are familiar today.

Now, the decisions taken by the OPEC since 1973 had to lead to this consequence. Thus, the adoption of the principle of the integral sovereignty of each nation on its natural resources gave way to:

1- The control of the companies either by way of participation or by nationalization and the constitution of important national companies in a way as to guarantee the total control of supply by the producer nations.

2- An unilateral determination of all the economic variables by the OPEC: posted prices, realized prices, levels and modalities of the fiscality which permitted an almost integral appropriation of the "rent" by the producer countries.

IV- CONCLUSION: THE FLOOR PRICE.

In the light of the preceeding discussion, we can now conclude the analysis of the oil price question with the notion of floor price. In fact, after a year of sometimes reconciling, often threatening but always ambigious official declarations, the United States formulated, in a clear and precise fashion, their position concerning the level of prices and their desirable evolution. This late response was motivated not only by the lapse of time which was necessary to obtain the results of the studies on the Project Independance but also by the preparation of the consumer front. After a voluminous document on Project Independance was

deposed in November 1974 and after the International Energy Agency became a rather efficient organization of concertation, the events began to take place in a more accelerated rythme.

In regard to the American proposition we can register the following preliminary conclusions:

A) The idea of a floor price in itself shows that the United States are not at all interested in the break-up of the OPEC and the establishment of a competitive market. In fact, the weak probability of an eventual division between the producer nations can only lead to a price a little lower than $7.00/bbl, the price suggested by Mr. Kissinger. However, such an eventuality is not favorable to the United States because it would delay the realization of their principal project. Consequently, it is absolutely certain that this country will not try to eliminate the producers' cartel unless it decides to leave aside the Project of Independance.

B) On the contrary, the United States will support the position of the Saudi Arabia within OPEC. In fact, it is significant that this "magic" number of $7./bbl was already proposed by Mr. Yamani in December 1973 as being the most reasonable price. Now it is adopted by Mr. Kissinger. The identical points of view of these two countries is easy to see when one knows that a "moderate" price is a condition of the long term plan of the Saudi Arabia as well as that of the revised project of

the Americans. We must note that the future oil situation will be a fonction of the behaviour and the politics of these two poles: United States and Saudi Arabia.(11) It is a fact that the economic and financial interests of these poles are convergent. So, it would be reasonable to wait for the domination of the Saudi thesis within OPEC and that of the American position among the consumer nations. Only obstacle to this new "Americano - Saudi" order can be the modification of the political situation in the Middle East. If no significant progress is realized in 1975, it is highly probable that the Saudi Arabia will be pushed towards a position similar to that of the Algeria. This position is not consistent with its interests but given the pressure that would be exerced by other Arab States, it would be impossible for the Saudi Arabia to act independently in spite of the importance of its oil reserves relative to those of the other producers (table IV).

C) Even if it is true that the most adequate price for the rapid realization of the self-sufficiency plan is, in principle, the one that covers the costs of alternate products, the losses due to such a price are higher than the expected beneficial effects. In fact, such a price will not only diminish the competitivity of Europe and Japan, but will bring a prolonged recession which will have very disadvantageous political consequences for the whole western world. Whence the acceptance by the U.S. of a modified version of their project implying a delay in the

realization even at a price of accepting a moderate increase in prices. The admitted principle is that it is imperative to diminish, as soon as possible, the american importation of the "uncertain Middle-East oil" by turning to Canadian and Venezuelian oil and to some extent, if the political situation is favorable, to the Saudi oil.

D) According to recent estimations, there is an important gap between the costs of alternative products and the actual price of oil ($10.24/bbl). These costs calculated for the amounts equivalent to a barrel of oil are: $12./bbl for the tar sands of Arthabaska; $4.-5. for nuclear energy; $10. for the shale; $10. for the oil and gas of the North Sea. These costs, that are considered as being the minimum costs excluding the royalties and the taxes, are calculated according to a rate of profitability of 15 - 20% on the investments.(12) In this situation, it is not surprising to observe the somewhat hostile reaction of companies towards the floor price of $7. According to them, this price must be fixed at approximately $11./bbl FOP the Golfe (the second assumption of the Project Independance) and must be modified progressively according to the rate of inflation.

With a price of $11./bbl, the United States would import only 3.3 millions bbl/d in 1985 at a cost of 13 billion dollars. With a price of $7/bbl, the importations in 1985 would be 12.4 million b/d at the cost of 31 billion dollars.

In the face of these two alternatives, the recent studies (Shell, Brookings, ets...) put forward a major constraint for the American economic system in addition to the assumptions already made by the IEA: this constraint has to do with the degree of federal government intervention to the oil industry and the energy sector in general. If the alternative of $7./bbl is chosen, the government must interfere not only to control and to regulate but also to participate to the investments. The revenues coming from import taxes which will reach 30 billion dollars according to the plans of President Ford will be used to help the industries that have difficulties.

The double control (of the consumer and producer countries) of the oil activities can make us think that the way is open for bilateral agreements. In reality there is nothing more incertain than that. As long as the oil producing countries stay grouped within the OPEC and the consumer nations within the IEA, the oil industry tend more and more towards a position of bilateral monopoly in which the United States and Saudi Arabia will have a much contested but nevertheless determinant role. In order to be viable, the solution to this problem must take into consideration the respective objectives of all groups. Perhaps it is for the first time that the industrialized countries and obliged to consider a group of under-developed countries as adversaries taking part in the economic game. This fact, in itself, justifies the call for a "new international economic order".

TABLE I: SHARES OF THE DIFFERENT COUNTRIES

(past evolution and trend before the energy crisis)

G.D.P. %	1950	1960	1970	1980	
				parity 70	parity May 73
United-States	61.0	54.6	48.2	41.2	36.1
Canada	3.5	4.0	3.7	3.6	3.3
France	6.1	6.6	7.2	8.0	8.5
Belgium and Luxembourg	1.5	1.3	1.3	1.3	1.4
Germany (F.R.)	4.9	7.6	9.1	9.7	11.7
Italy	3.6	3.8	4.5	4.7	4.7
Holland	1.1	1.2	1.5	1.5	1.6
British Islands	8.1	7.9	6.1	6.8	6.1
Scandinavian Countries	2.9	3.1	3.3	3.3	3.4
Alpine Countries	1.5	1.6	1.7	1.3	1.5
Meridional Europe	3.3	3.7	3.7	4.4	4.4
Japan	2.5	4.6	9.7	14.2	17.3
Total O.E.C.D.	100.0	100.0	100.0	100.0	100.0

Source: "La crise de l'énergie et le nouvel équilibre mondial 1974-1980" - Centre Français du Commerce Extérieur, June 1974, p. 17

TABLE II: DECOMPOSITION OF THE PRICE OF A BARREL OF OIL PRODUCED IN THE OPEC COUNTRIES AND COMMERCIALIZED IN EUROPEAN MARKETS

Constitutive elements of the price	1963	%	1971	%	1972	%	4th trimester 1973	%	first trimester 1974	%
Cost of Production	0.15	1	0.20	2	0.20	2	0.25	2	0.25	1
Taxes paid to the oil-producing countries	1.00	9	1.60	13	1.70	13	3.70	23	7.85	37
Tanker rates	0.60	5	0.70	6	0.60	5	1.00	6	0.85	4
Refining	0.50	5	0.55	5	0.60	5	0.70	4	0.75	4
Distribution charges and the benefits of the societies	3.00	27	4.00	32	4.10	32	4.70	20	5.30	25
Taxes paid to the government of oil consuming countries	5.75	53	5.10	42	5.40	43	5.65	36	6.00	29
Average sale price	11.00	100	12.35	100	12.60	100	16.00	100	21.00	100

Source: SONATRACH, cited in: "Mémoire présenté par l'Algérie à la conférence des Souverains et Chefs d'Etat des pays membres de l'OPEP" - Alger, March 1975, p. 204

TABLE III: DISTRIBUTION OF THE RENT BETWEEN THE COMPANIES AND THE STATES

in the production level - (1971-75)

	1971		1972	1973				1974					1975
	Jan.	15 feb.	20 jan.	1 jan.	1 june	1 oct.	16 oct.	1 jan.	1 june	1 july.	1 oct.	1 nov.	1 jan.
1. Posted Price	1.800	2.180	2.479	2.591	2.898	3.001	5.119	11.651	11.651	11.651	11.651	11.251	11.251
2. State's Share	0.989	1.261	1.448	1.516	1.702	1.770	3.048	9.31	9.37	9.42	9.75	10.12	10.12
3. Technical Costs	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
4. Costs Including Taxes (2-3)	1.089	1.361	1.548	1.616	1.802	1.870	3.148	9.41	9.47	9.52	9.85	10.22	10.22
5. Transaction price (93% of 1)	1.67	2.03	2.30	2.41	2.69	2.80	4.76	10.83	10.83	10.83	10.83	10.46	10.46
6. Company "profits" (5-4)	0.58	0.67	0.75	0.79	0.89	0.93	1.61	1.42	1.35	1.31	0.98	0.24	0.24

Source: The calculations are made on the basis of the data concerning the posted prices and the share of the state given in the Petroleum Economist, Feb. 1975, p. 72.

Notes: 1. We held constant the cost of production although it is estimated as being equal to $0.12/bbl from the beginning of 1974 on.

2. Starting with 1 January 1974, share of the state is equal to the weighted average of 60% participation crude and 40% concession crude.

3. We made the assumption that the transaction prices are equal to 93% of the posted prices.

TABLE IV: DISTRIBUTION OF THE PRODUCTION WITHIN OPEC

	(1)	Production (1,000b/d) (2)		(3)		(4)		(5)	(6)		(7)	(8)	(9)
	Reserves year 1/1/74	1973		1974		MAY 1975		Number years of reserves: 1/3	Capacity of production 1975		4/6	Variation of the production 1,000 b/d	
	(10^9b.)	b/d	%	b/d	%	b/d	%		b/d	%		75-73	75-74
Abu Dhabi	21,500	1,146	3.8	1,750	5.6	1,406	5.4	34	1,920	5.1	73.2	+ 260	- 344
Algeria	7,640	1,070	3.5	889	2.8	900	3.4	24	1,100	2.9	81.8	- 170	+ 11
Saudi Arabia	132,000	7,335	24.3	8,400	26.8	6,991	26.8	43	10,300	27.1	67.9	- 344	- 1,409
Dubai	2,500	165	0.5	232	0.7	269	1.0	29	270	0.7	99.6	+ 104	+ 37
Iraq	31,500	1,964	6.5	1,829	5.8	2,371	9.1	47	2,600	6.9	91.1	+ 407	+ 542
Kowait	64,000	2,753	9.1	2,600	8.3	1,925	7.4	67	3,800	10.0	50.6	- 828	- 675
Libya	25,500	2,176	7.2	1,700	5.4	1,136	4.4	41	3,000	7.9	37.8	- 1,040	- 564
Qatar	6,500	570	1.9	546	1.7	471	1.8	33	650	1.7	72.4	- 99	- 75
Sharjah	1,500	0	-	50	0.2	35	0.1	83	45	0.1	77.7	+ 35	- 15
Arab Countries	292,640	17,179	56.9	17,996	57.5	15,504	59.4	45	23,685	62.4	65.5	- 1,675	- 2,492
Ecuador	5,675	209	0.7	232	0.7	143	0.5	67	255	0.7	56.0	- 66	- 89
Gabon	1,500	151	0.5	182	0.6	210	0.8	23	210	0.5	100.	+ 59	+ 28
Indonesia	10,500	1,338	4.4	1,457	4.6	1,200	4.6	20	1,500	3.9	80.0	- 138	- 257
Iran	66,000	5,861	19.4	6,128	19.5	5,094	19.5	30	6,500	17.1	78.3	- 767	- 1,034
Nigeria	20,000	2,048	6.8	2,300	7.3	1,557	5.9	24	2,500	6.6	62.2	- 491	- 743
Venezuela	14,000	3,366	11.1	3,025	9.7	2,395	9.2	13	3,300	8.7	72.6	- 971	- 630
OPEC	410,315	30,152	100.	31,320	100.	26,103	100.	36	37,950	100.	68.8	- 4,049	- 5,217

Sources: Oil and Gas Journal - 30 december 1974. Worldwide Issue:

American Petroleum Association: Annual Statistical Review, sept. 1974.

Petroleum Intelligence Weekly, 30 june 1975, p. 11.

NOTES AND REFERENCES

(1) On this subject see the special issue of the Foreign Policy: "One, two... many OPEC's" - No: 14, 1974. Also, Antoine AYOUB: "Le Contrôle Economique par un groupe de pays sous-développés de leurs richesses naturelles: l'exemple de la strategie de l'OPEP" in col. "Choix" CORI, No. 5, 1974, pp. 106 - 122.

(2) One of the most recent estimations of this transfer is that of W.J. LEVY: "Future OPEC Accumulation of Oil Money: A New Look at a Critical Problem" see the summary in the Petroleum Economist, August 1975, pp. 282 - 284.

(3) The most eminent representative of this thesis is M.A. ADELMAN who brought forward, in various writings, most elaborate arguments to defend his point of view. For a summary, see his "The World Oil Market" in The Energy Question, volume I, ed. by Erickson and Waverman, University of Toronto Press, 1974. We also refered ourselves to: R.L. GORDON: "Mythology and Reality in Energy Policy" in Energy Policy, September 1974.
R. SOLOW: "The Economics of Resources and Resources of Economics", The American Economic Review, May 1974 - H.S. HOUTHAKKER: "Policy Issues in the International Economy of the 1970's", American Economic Review, May 1974.

(4) M.A. ADELMAN: "Les Prix Pétroliers à long terme, 1953-1971", Revue de l'Institut Français du Pétrole, XVIII, No. 12, December 1963, p. 1844.

(5) Ch. STOFFAES: "Pétrole, cynisme et théorie des jeux", Contrepoint, No. 16, 1975, pp. 9 - 25.

(6) In fact, the model can be summarized by the following discount formula: Actual price of oil = $\$8./(1.05)^{30}$.

(7) L. DUPRIEZ & F. PRADES: "Les précédents de la crise énergétique", Revue d'Economie Politique, No. 2, 1975, pp. 172 - 173.

(8) P. DAVIDSON, L.H. FALK, H.S. LEE: "Oil: its time allocation and Project Independance", Brookings Papers on Economic Activity, No. 2, 1974.

(9) W.D. SCHULZE: "The Optimal Use of Non-Renewable Resources: The Theory of Extraction", Journal of Environmental Economics and Management, No. 1, 1974.

(10) Petroleum Economist, August 1975, p. 297.

(11) One of these recent declarations of Mr. Yamani is his opposition to the increase of 35% at the end of September 1975, see MEES, August 15, 1975.

(12) Middle East Economic Survey, (MEES), February 7, 1975.