

Essay on Oil Rent and its Distribution

Henry Delgado A. - henrydelgado1@sbcglobal.net

Economic Analyst - Oil Planner

October – 2008

Much has been speculated and argued about the Oil business, the implied conflicting forces, possible trends, and alternative sources and so on. The accessory issues are numerous, very interesting, and very complex. This analysis focuses on one of the key issues of the business from an economic point of view which has deep implications for the current and future of the oil business: it is the Oil Rent and how it is distributed.

Revenue - Economic Concept

In economic terms, the rent is defined as the production surplus after recovering the costs of the production factors. A refinement of the concept is the Quasi-Revenue concept which refers to the sole recovery of the opportunity costs of reproducible production factors, i.e. Labor and Capital. These costs are not other than the opportunity costs or remuneration that these factors would receive if they were deployed in other economic activity¹. It should be mentioned that there is a third production factor which we purposely excluded- "*the Earth*". And the reason to isolate it is that this factor has distinctive characteristics that make it unique: 1) Unlike the other two factors, it is not easily "relocatable" from an economic activity to another; 2) Typically, in extractive industries this factor cannot be reproduced, and has a finite life which is inversely proportional to the rate of exploitation. In short, it is not possible to calculate its opportunity cost with certainty. The paradox is that is this factor the one that enables the mere existence of the Oil Rent.

Due to the supply and demand dynamics in open markets, the Rents are often not permanent in time, instead they tend to respond to ever-changing factors like the positioning and differentiation between bidders in the market. This type of Rent is known as ***Differential Rent***

Similarly, when the industry in question presents entry barriers to new suppliers, or particular conditions exist that imply a comparative advantage of a producer or a small group of producers (compared to the size of the consumer group), a new type of Rent emerges which is the ***Monopolistic or Oligopolistic Rent***, this one is derived from the monopolistic /oligopolistic power rather than from differentiation².

In the case of the oil activities, both types of Rents actually coexist:

- a) Oligopolistic revenue resulting from the entry barrier for other competitors to freely exploit the oil in a specific location - in this case the barriers are long-term exploration/production contracts, and
- b) The differential Rent associated with cost structure advantages (different oil types and locations regularly imply large production costs differences).

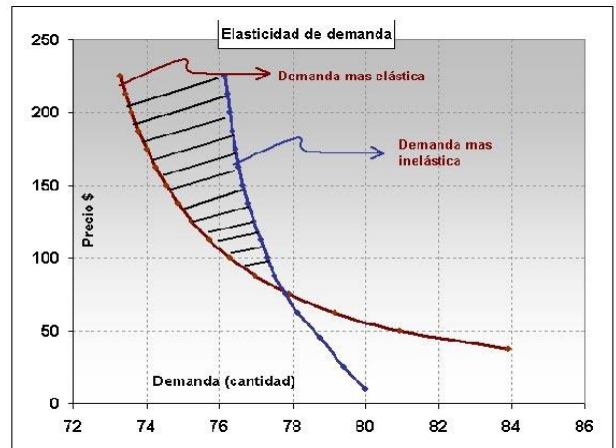
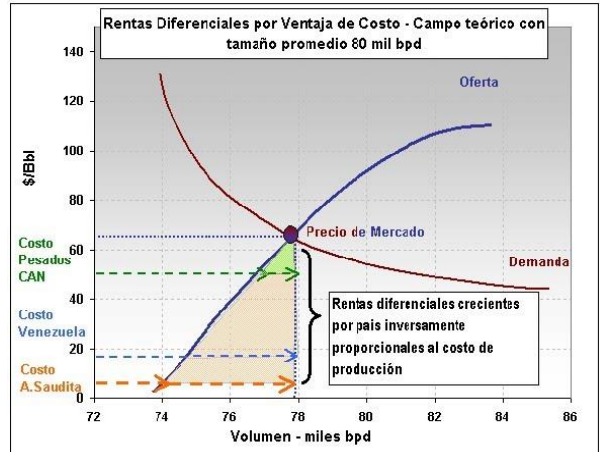
¹F. Monaldi, Programa de Gerencia Petrolera IESA (IESA Oil Management Program),, Caracas, 2005.

² F. Monaldi, Programa de Gerencia Petrolera IESA (IESA Oil Management Program),, Caracas, 2005.

Extremes of this latter type of revenue are observed by comparing the marginal cost of a barrel of light sweet crude oil produced in Saudi Arabia (3 to 5 dollars per barrel) versus the marginal barrel of unconventional heavy crude oil extracted from bituminous sands in Canada (between 50 and 70 dollars per barrel).

It is worth mentioning that for economic decisions regarding continuity of oil operations the "sunk costs" are not taken into account. Sunk costs are those costs of elements which are non-reusable in another exploitation location, such as access to oil and gas or licenses and entry bonds, or costs of production facilities which are very specific to the field. The reason again is that these investments do not have opportunity cost or a reinvestment alternative.

One factor that encourages the presence of Rents in the oil industry is the fact that oil demand in the short and medium term is relatively inelastic, meaning that the amounts or volumes demanded in the market are relatively constant and not sensitive to price increases (again in the short- or medium term and within reasonable ranges, therefore the use of the qualifier "relatively"). - See chart Elasticity of Demand.



To whom do oil Rents belong, how are they managed and what are the potential conflicts?

After reviewing the basic concept of Rents, one immediate question is to whom does it belong? The default final owner of the rights and duties resulting from those hydrocarbons in the subsoil of a given field will depend on the country in which the field in question is located and its legal system. Simplifying the legal technicalities and focusing exclusively on the economic aspects, in practice, there are two types of systems regarding ownership of subsoil hydrocarbons:

- a) The system in which mineral rights are an integral part of the land surface and belong to the owner of that land - this system is legally known as the system of **Annexation or Accession** and comes originally from the Saxon common law. This system has been disappearing over time due to the implicit estate tax revenues lost opportunity that it implies. Today is applied in very few countries (practically only in U.S. and England - excluding seabed resources)
- b) The other system is the one that confers ownership and rights resulting from the oil in the subsoil to the nation in which it is found (the final legal beneficiaries are all citizens of that country). In this

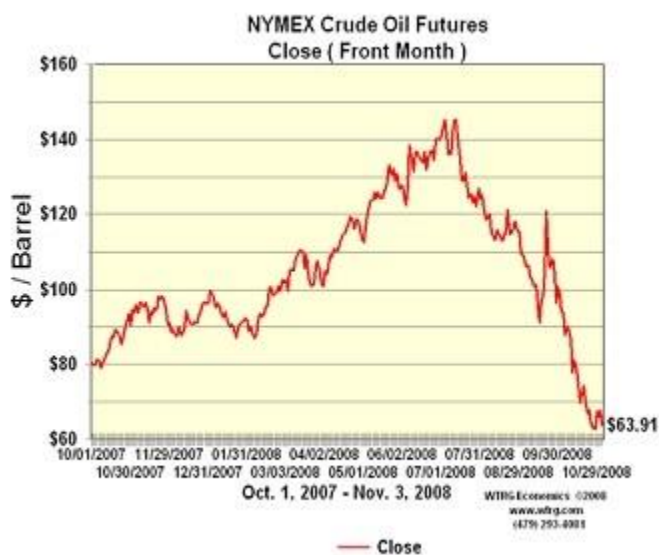
system, depending on the Constitution and regulatory framework, the host nation normally designs the policies governing the exploration and exploitation. Particular attention is paid to the Rents distribution, where the country population is (or is intended to be) the final beneficiary. Also, the way that private investors participate in the business, if they do, is deployed as part of the national oil policy. This system was originally known as the **Royalty system**, and originates in Roman law code.

This second system is the most common in the world, and has evolved significantly over the second half of the twentieth century in terms of the variety of legal forms for contracting private participation in oil economic activity, including: Royalties, Contracts for profit or production sharing, Service contracts, Joint ventures, etc.

With all these contractual frameworks, the state, as designated administrator of national resources seeks to establish the basic rules of operation for the oil industry via concessions. These rules of operation among others include: Delineation of the lots of land or exploration blocks, Risks terms and schedules of exploration, infrastructure investments, asset management /operation, end of concession assets decommissioning, environmental Responsibility, Social Responsibility, Abandonment of wells, Costs, Prices, Earnings, Taxes, etc.

However, in this type of system it is up to the state to play the role of administrator of the resources, and its primary objective will be to maximize the value (for purposes of this Rent analysis) in the long run for the benefit of its population, i.e. there is a similar relationship to the trust in which the administration is transferred but the ultimate benefits belong to the grantor.

This is where the regulatory conflict or natural tension arises from oil contracts between governments and investors, especially in periods of high price volatility as those we are currently experiencing. (In less than four months - from July to October 2008, the Brent crude price has reached highs and lows of 143 and 63 dollars per barrel respectively - equivalent to a 78% variation from the mean value.)



The above conflict is then derived from the fact that this industry has the potential to generate significant value for its participants—very price sensitive - and in most cases, long-term concession contracts provide value-sharing mechanisms that do not adapt fast and flexibly enough to prices swings. As a result, very often the original value sharing proportions accepted between Investors, Host governments and Stakeholders at a Project initiation, is lost or dramatically shifted to one part or the other. *It is very common to see cases in which, whether private*

participants do not recover their investments (due to long periods of exposure to low prices) or inversely they obtain "more than reasonable" value gains due to unexpected periods of high prices not sufficiently taxed.

Regulatory Conflict Extremes

In view of the above explained conflict, the state should handle very carefully its regulatory role to prevent either of the following two extremes:

1. Regulatory Expropriation

It occurs when there is excessive leverage in the government power and the resulting rules framework is so onerous, that prevent the recovery of costs or the generation of reasonable risk adjusted long term gains, as normal in this business. In this case, divestment and Investors retreat might occur as a natural result in the industry.

2. Regulatory Capture

Situation in which the state succumbs to pressure from interest groups, and consequently grants more than reasonable regulatory benefits to the investors or private stakeholders to the detriment of the general population (the ultimate "beneficiary" by definition in the systems of royalties). This will cause in the medium term high costs of political representativeness.^[3]

The diagram below identifies the different incentives, trade-offs, and risks of the oil business for the three fundamental incumbents arising from possible polarities in the distribution of revenue by regulatory frameworks and contracts:

	Investor	State	Population
Regulatory Expropriation (The State takes advantage by leveraging National Sovereignty)	<p>Benefits: None. Investor is captured by long-term contract at a disadvantage (Hostage of their "sunken costs" and potential penalties). The entrepreneur will seek to continue to produce while quasi-Rents can be captured.</p> <p>Risks: The steady unfavorable sharing of the value may go so far as to prevent the recovery of marginal costs; then the entrepreneur will suspend operations and charge off the balance of investment.</p>	<p>Benefits: Extracting additional revenue that generates more resources. Could be used to benefit the community which would translate into political capital for the government</p> <p>Risks: In the medium term, regulatory credibility with investors erodes and makes future calls to private investment for projects in the country potentially more difficult.</p>	<p>Benefits: Possibility of capturing additional value if the state fulfills its fiduciary role. Potential better welfare of the community</p> <p>Risks: There is a risk that governments will not allow the transfer of additional resources to the economy and the general public, leading to "hypertrophic" or corrupt governments.</p>

	Investor	State	Population
Regulatory Capture (The pressure of interest groups tilts the balance toward the entrepreneur who gets too favorable terms of revenue)	<p>Benefits: The Entrepreneur captures additional revenue that can reach significant magnitudes if sustained over time. This leads to more rapid investment returns that result in financial capacity for growth.</p> <p>Risks: regulatory capture is not sustainable in the long run for the Investor. This creates a negative perception in communities and local governments that feel "cheated". This will hamper the entry of these entrepreneurs into new contracts or projects.</p>	<p>Benefits: Directly, none. Indirectly, in the medium term, it could improve the perception of the investment climate in the country.</p> <p>Risks: It generates substantial costs of political representativeness. It also may alter the quality of investors towards economic groups mostly with a short-term view.</p>	<p>Benefits: In the short term employment level could increase, however the sustainability of this is in doubt.</p> <p>Risks: Being non-renewable natural resources, there is the risk of impoverishment of the country and stagnation of the country's professional workforce (lack of Sustainable development)</p>

Current oil business - 2008 - Key figures and reflection

The exhibit shown in this section, helps to illustrate the dramatic power changes occurred during the last 4 decades (after the OPEC inception) between Oil rich countries represented in the table by the NOCs and the international operators noted as IOCs.

	NOCs	IOCs	Total
number of active rigs 2007	1074	2100	3174
% active Rigs - 2007	34%	66%	100%
Proved Oil Reserves - MM Bbls - 2007	1,143,990	60,210	1,204,200
% Proved Oil Reserves - 2007	95%	5%	100%
Daily average Production rate - mln boepd - 2007	57.9	13.6	71.5
% Production - share 2007	81%	19%	100%
Proved Oil Reserves - MM Bbls - 1970	385,000	165,000	550,000
% Proved Oil Reserves - 1970	30%	70%	100%
Daily average Production rate - mln boepd - 1970	37.7	7.7	45.4
% Production - share 1970	83%	17%	100%
Average number of Production years in Reserves - 2007	54	12	46
Average number of Production years in Reserves - 1970	28	59	33

Source: 2007 OPEC Statistic annual report and EIA annual statistic series - website

During that period, both IOCs and NOCs increased their production in healthy percentages (NOCs ~ 53% and PO = 77%). However, from the reserves standpoint, the IOCs noticeably lost ground when going from 70% of the total world reserves – and a reserves / production ratio of 59 years to a much lower 5% of global volume with a reserves / production ratio of only 12 years. Obviously, the lost ground was occupied by NOCs.

Undoubtedly the main implication of this repositioning phenomenon is longevity in the business, i.e. in practical terms, during that period, IOCs lost more than 40 years of longevity in operation in reserves versus its initial position.

On the other hand, despite having only 5% of the world's reserves; IOCs currently employ 66% of the exploration drilling assets; it is also inferable that the faster exploration of the portfolio and exploitation of reserves will accelerate the risk of longevity loss of in the business for the IOCs.

Conclusion

Looking ahead and back to the subject of the Oil Rent, IOCs face now more than ever the pressure to improve efficiency, reduce costs, and accelerate technological differentiation to maintain profitability and ensure their permanence (*license to operate*) in a tightening environment for the Rents distribution, both for existing and emerging Projects. *The high price scenarios tend to exacerbate the nationalistic approach of oil rich countries to manage their host role.*

On the other hand, NOCs and governments face the increasing challenge that conventional oil reserves, which are the easiest and most economic to produce, are disappearing rapidly in relative terms. In this scenario, countries will see the need to develop and exploit unconventional oil and gas resources whose risks, complexities and dimensions are beyond their comfort levels. And here is where the key technological, financial, and management factors that the private investor could provide are crucial

Once more, this will require building alliances where the long Term win-win attitude is the overarching guiding principle. Of particular importance is the quality of the regulatory frameworks with balanced and flexible value considerations that allows the host countries to avoid the Expropriation or Regulatory capture.

References:

[1], [2], [3] F. Monaldi, O&G Management Program - IESA, Caracas, 2005.

[4] 2007 OPEC Statistic annual report and EIA annual statistic series - website