EVALUATING HYDROCARBON EXPLORATION AND EXTRACTION CONTRACTS IN MEXICO, 2015-2017

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Abstract

An estimation is made of the way oil revenue and production volume are distributed between the State and the contractor, in accordance with the provisions of the contracts awarded. First, contractual modalities, the tax system, and the bidding mechanism are described. Then, the physical and economic distribution of production is analyzed. It is concluded that the State receives an average of 72.4% of the revenue when the contractor is efficient, as opposed to 56.6% when the contractor is inefficient. The State receives no production from licensing and in shared production contracts with inefficient costs, the State recovers 30% of revenue.

Keywords: exploration contracts; production contracts; hydrocarbons; bidding rounds; oil revenue.

INTRODUCTION

Mexico freed up the exploration and extraction of hydrocarbons in December 2013, ending PEMEX’s exclusivity which lasted for 75 years. The Constitutional reform came with the government’s promise that the state will receive all the oil rents, and that the nation will retain ownership of the oil and gas in the subsoil (Presidencia de la República, n.d.). Another benefit of unique importance was the strengthening of the nation’s energy security with the entry of new operators to increase production.

The reform established a new organizational and regulatory model in the energy supply chains. In the field of upstream oil activities, the resources, reserves, and oilfields were divided into two: those that PEMEX would retain and those to be offered up to domestic and foreign investors through public international bids called Rondas del Estado (Rounds for the state).

In July 2015 and January 2018, eight calls for bids were carried out, four in round one and four in round two, in which 120 maritime and terrestrial areas were auctioned off. The maritime areas include shallow, deep, and ultra-deep-water areas in the Gulf of Mexico. From the total number of offered, 15 shared production contracts were awarded along with 73 licensing contracts, for a total of 88 contracts (CNH, 2018).

The main objective of this investigation consists of estimating the sale and volume of production which corresponds to the State according to the contracts. This approach can be explained by the fact that “the stance of the State in reaction to the participation of private capital in the exploration and production of oil should above all we a question of business, not ideology” (Boue, 2013). It is the business carried out by the state in its role as landowner “when it demands compensation for assets in the form of royalties, production rights, and other encumbrances on oil and gas extraction in exchange for land exploitation of its hydrocarbon resources” (Boue, 2013).

For the sake of consistency, I adopted the definition of rent as used by the Mexican authorities, that is the difference between the sale price and the cost of production, which coincides with that used by the oil industry and by international organizations thanks to its easy estimation (Bolt et al., 2002, p. 8). However analyzing the accuracy of this definition in light of economic theory goes beyond the objectives of this investigation.

This article is divided into three parts. In the first we describe the fiscal regime, the grounds for bids and the selection criteria. In the second section, we will present the results of round one and two. In the third we estimate the distribution of rent and production when the contractor is inefficient.

2. CONTRACTS, FISCAL REGIME AND BIDS

In accordance with the new legal framework, the nation shall assume responsibility for carrying out the activities of exploration and extraction of hydrocarbons with the aim of acquiring income for the state. These activities are considered strategic and exclusive, and are carried out via direct assign-ments to companies of the state or via contracts awarded to domestic and foreign companies which have been the subject of a competitive selection process. The Constitution leaves an opening making it possible for the authorities responsible for the sector to use any kind of contract and it explicitly mentions those related to licensing contracts, shared production or earnings contracts, and service con-tracts; the only thing not allowed is the use of concessions.

The ministries of energy and revenue establish technical and fiscal guidelines for the design of both contracts and the grounds for bids. The Ministry of energy decides the contractual areas to offer as well as the type of contract. The law mandates that said contract type maximize the nation’s income. Meanwhile, the Ministry of Revenue determines the variables for selection and the parameters under which the bidders must tender their bids. The National Hydrocarbon Commission (CNH) carries out the bidding process and signs the contract with those selected. There are technical, operative, and financial pre-selection stages to verify that the interested corporations have sufficient experience and skills for the jobs.

The fiscal regime for the contracts is established in the Ley de Ingresos sobre Hidrocarburos (Hydrocarbon Income Law). The encumbrances are referred to as “compensations in favor of the state” and are received by the Fondo Mexicano del Petróleo (Mexican Oil Fund). Table 1 illustrates the direct tax components. Payments made to the State in the licenses are the following: signing bonus; contractual quota for the exploratory stage; royalties; the “compensation”; tax on the activity of exploration and extraction of hydrocarbons, as well as income tax (ISR). The “compensation” or additional royalty is calculated as a percentage of the contractual value of the hydrocarbons as the companies proposed at the moment of bidding; the contract has provisions for an adjustments mechanism to let additional royalties increase and to halt increasing the profitability of the company in the case of extraordinary circumstances. The compensation in favor of the contractor is the onerous transmission of hydrocarbons extracted from the subsoil.
In the shared production contracts, the compensation in favor of the State includes a contractual quota for the exploratory stage; royalties; and a percentage of operational profits (OP). Tax on the activity of exploration and extraction of hydrocarbons as well as income tax (ISR). The compensation in favor of the contractor is the recovering of costs and the remaining OP. The compensations are paid in kind, that is, by production; when these are in favor of the State the hydrocarbons are turned over to the State’s distributor which in turn hands over the products of its sale to the Mexican Oil Fund. The percent of the OP in favor of the State is subject to an adjustment mechanism to temper the profitability of the company when the price of oil or production rises significantly. The recovery of these costs is subject to a limit established by the Ministry of Revenue.

Both for licenses and shared production contracts, the contractual quota for the exploratory stage is calculated based on the size of the contracted area and the time that has passed since the signing of the contract. The tax on exploration and extraction of hydrocarbons, which is also based on the square kilometers of the contracted area, differentiates between the stages of exploration and extraction.

The royalties are determined for each type of hydrocarbon by applying the corresponding contractual value rate for each product. The royalty for crude oil equals 7.5% if the price is less than $48 US per barrel. If the price is greater, the formula 
\[(0.125 \times \text{contractual oil price}) – 1.5\]% is applied. The royalty for associated gas is equal to the contractual price of natural gas divided by 100. For non-associated natural gas, the royalty is 0 if the price is less than or equal to $5 US per million BTU (British Thermal Unit); or for a price between $5 and $5.5 US, they use the formula \[(\text{natural gas contractual price} – 5) \times 60.5\]%.

For condensates, the royalty is 5% if the contractual price of the condensate is lower than $60 US per barrel and, for higher prices, they use the formula \[(0.125 \times \text{contractual price}) – 2.5\]%.

The sum of the payments that the State receives, expressed as a percentage of the cash flow generated in an oilfield or a contracted area, is known in the oil industry as government take (Khell, 1995) and is a better indicator of why a contract is appealing (Luo and Yan, 2010, p. 758). This concept, the State’s part in oil rent or simply the State’s part, does not form part of Mexican legislation, though the authorities use it in public statements and calculations. Included in the payments that the state receives is ISR as it is a fiscal resource in terms of cash flow and an accounting practice (Johnston, 1994, and Johnston et al., 2008).

The bidding process starts with a call for bids from the CNH, which includes the publish-ing of the rules for the bids, the contract type, prerequisites for qualification, geographical and geological characteristics of the areas being auctioned off, as well as a timeline of the process. Some days later the SHCP puts out an official communiqué indicating the minimum value of the selection variables for each area being bid upon, which in general are the supplementary investments, the additional royalty in the case of licenses and the OP for the state in shared production contracts. In recent bids, they have included a payment to act as a sort of tie breaker.
It is important to note that the legal framework neither defines nor uses the concept of oil rents. The term appears in government documents which define it as the difference between the income from the sale of hydrocarbons and the cost of extraction (Presidencia de la República, n.d.). This definition is generally used in interviews and statements, and above all in situations where high public functionaries assure that all oil rents will be received by the State (Excélsior, 2014; Jiménez-Espriú, 2013 and 2014). The press releases issued by the authorities in charge of bids also assert that the law, contracts, and selection criteria all guarantee that the State shall receive the oil rents (SHCP, 2015b, 2015c, 2016, 2017a, 2017b and 2018).

3. ESTIMATES OF THE STATE’S SHARE OF INCOME

In Table 2 are the results of the first two rounds of bidding according to official statements. In round one the state’s share of income reached between 74% and 83% in the first call for bids, between 80% to 90% in the second, and 48% and 76% in the fourth. In the third call for bids, the authorities opted for publishing the state’s share of the gross income, which reached between 18% and 93%. The government’s expected or average share of profits in the second round reached 85.3% with a maximum of 88.3%; in the third call for bids the average was 63%; in the fourth the average reached 59.8% with a maximum of 66.1%. In round two the state’s share of profits was a little higher than during the first round.

Table 2. Official Results from Round 1 and 2.

<table>
<thead>
<tr>
<th>Bid Type</th>
<th>Date</th>
<th>Contracts awarded</th>
<th>Type</th>
<th>Range of the state’s share of profits (%)</th>
<th>Expected States of profits (%</th>
<th>Expected investment (SMM US)</th>
<th>Guaranteed investment (SMM US)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1.1 Shallow water exploration</td>
<td>Jul. 15, 2015</td>
<td>2</td>
<td>SPC</td>
<td>74 - 83</td>
<td>nd</td>
<td>2,870</td>
<td>151</td>
</tr>
<tr>
<td>R1.2 Shallow water exploration</td>
<td>Sep. 30, 2015</td>
<td>3</td>
<td>SPC</td>
<td>82 - 90</td>
<td>85.3 (max 88.3)</td>
<td>3,248</td>
<td>600</td>
</tr>
<tr>
<td>R1.3 Land exploration</td>
<td>Dec. 15, 2015</td>
<td>25</td>
<td>License</td>
<td>nd</td>
<td>nd</td>
<td>1,044</td>
<td>623</td>
</tr>
<tr>
<td>R1.4 Deep water</td>
<td>Dec. 5, 2016</td>
<td>8</td>
<td>License</td>
<td>40 - 76</td>
<td>59.8 (66.1 max)</td>
<td>34,353</td>
<td>344</td>
</tr>
<tr>
<td>R2.1 Shallow water exploration</td>
<td>Jan. 19, 2017</td>
<td>10</td>
<td>SPC</td>
<td>20 - 75</td>
<td>77.4 (83.9 max)</td>
<td>8,193</td>
<td>309</td>
</tr>
<tr>
<td>R2.2 Land exploration</td>
<td>Jul. 14, 2017</td>
<td>7</td>
<td>License</td>
<td>41 - 86</td>
<td>75.0 (82.0 max)</td>
<td>1,100</td>
<td>169</td>
</tr>
<tr>
<td>R2.3 Land exploration</td>
<td>Jul. 14, 2017</td>
<td>14</td>
<td>License</td>
<td>42 - 90</td>
<td>75.0 (82.0 max)</td>
<td>964</td>
<td>279</td>
</tr>
<tr>
<td>R2.4 Deep water</td>
<td>Jan. 31, 2018</td>
<td>19</td>
<td>License</td>
<td>53 - 74</td>
<td>64.7 (67.2 max)</td>
<td>92,794</td>
<td>1,387</td>
</tr>
<tr>
<td>Round 1 and 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>83% License</td>
<td>88</td>
<td>20 - 90</td>
<td>72.4 (77.5 max)</td>
<td>144,566</td>
<td>3,662</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: 1. Includes royalties, contractual amounts for the exploration stage, tax on hydrocarbon extraction and extraction and ISR. 2. In the R1.3 bids, the State’s share of gross income reaches 63% on average, with a maximum of 93.3%; in the R2.3 bids, the state’s share of profits reached 85.3% (max 88.3%). 3. The government’s expected or average share of profits in the second round reached 85.3% with a maximum of 88.3%; in the third call for bids the average was 63%; in the fourth the average reached 59.8% with a maximum of 66.1%. In round two the state’s share of profits was a little higher than during the first round.

The concept of profits used by the authorities is not to be found in the hydrocarbon income law. Nevertheless, the breakdown of income, costs and compensations allows one to verify that said profit is equal to the difference between the value of hydrocarbons and the cost of production, in other words the oil rents as defined in documents and official statements. It is easy to prove with an example: in the case of round 1.1 where the winning bidder for blocks 2 and 7 offered 56% and 69% of OPS; the Mexican authorities conclude that the State’s share in said bid reaches between 74% and 86% for block 2 and between 83% and 80% for blocks 7 (SHCP et al., 2015a). Table 3 reproduces these results by applying the contractual and fiscal rules to a barrel of oil in a scenario where the prices are $50 per barrel and $100 per barrel; the method for the calculation includes the concepts of profit and government take used by the authorities; the calculations are consistent with the official results and allow us to conclude that profits and oil rents are synonymous.
In a recent press release on the benefits of the energy reform, the Presidency of the Mexican Republic pointed out that:

we opened the sector to participation from the private sector so that […] private capital […] can dedicate itself to the exploration and eventually the exploitation. Of the oil rents […] which will eventually be received when these explorations are successful, […] a good part will be for the Mexican State. The amount of the rent that the State will have is about 65% […] (Presidencia de la República, 2018, p. 15).

Taking into consideration the official information of the state’s share of the income which came from the seven calls for bids, it turns out that the winning companies offered to leave the State an average 72.4% of the oil rents. The estimate is based on the offers made by the competing companies in order to be awarded the areas they are interested in. The actual payments for the concepts of compensation and taxes will occur many years later under different technical and economic conditions than those set forth in the bids. Even though there is a signed contract, it is not uncommon for the taxation system to change at the request of one or both parties in order to reflect actual production costs and the behavior of oil prices.

4. DISTRIBUTION OF RENT AND PRODUCTION WHEN THE CONTRACTOR IS INEFFICIENT

The official estimate for the distribution of profits assumes that the contractor is efficient and production costs are low. This raises the question “how would distribution change if the contractor is purposefully inefficient and turned to gold plating in order to keep for themselves the large bag of lucre that the government put on the table for the purpose of recovering costs? To illustrate the scenario, we use characteristics from Rounds 1.1 and 2.4 (see Table 4 which has results for the shared production contract in Round 1.1).
The base established by the SHCP implies leaving the inefficient contractor with 55.9% of all rent and the state with 44.1%; the winning bids elevate the State's share to 50 and 55%, which is below the 74% expected from an efficient operator; the conclusion is unavoidable: a contractor's inefficiency has a high cost for the State.

In the case of licenses in round 2.4, the contractor's inefficiency impacts the adjustment mechanism for the royalty and the payment of ISR: the high costs make the first inoperable and leaves the ISR to be paid at zero. The base established by the SHCP implies sacrificing almost two thirds of the oil rent but the winning bids raise the take of State to 61.5% on average (see Table 5). Depending on the contract, the tax base for ISR becomes zero when the efficient production costs (40 USD/bbl in deep water) grow in a range which goes from 22% to 46% as a result of inefficiency and of gold plating.
In the two examples chosen — a shared production contract in shallow waters and licenses in deep waters — the price and cost scenario establish an oil rent level of 30 USD/bbl. This trait shared by both examples allows one to observe, in quantitative terms, that a contractor's inefficiency has a lesser impact on the State's income in the case of licenses when compared to shared production contracts.

It was a foreseeable result in said production contracts from the moment that the cost intervened twice in calculating the State's income; whereas in the case of licensing it only affects the calculation of the ISR.

The strict control of costs during the operation of contracts is crucial for the State to receive the expected benefits.17

Following the same procedure as in the two previous examples, we analyzed the eight calls for bids to have a complete picture of the real or simulated impact that the contractor's inefficiency has.

The inefficient scenario is created by taking into account how the change in costs renders ineffective the adjustment mechanism for royalties and the payment of ISR on licenses ineffective on the one hand, and the adjustment mechanism for operating profits and the payment of ISR on shared production contracts on the other.

The numbers displayed in Table 6 show that the rent for the State lies in the range of 20% to 88%, with an average of 56.5%. This is far from the 72.4% expected from efficient contractors (see Table 2).
Thanks to the distribution of molecules (hydrocarbon production), the results are notoriously unfavorable for the State: it has access to 15 of 88 awarded contracts; in the case of licenses, all the production goes through the hands of contractors and in the case of shared production contracts they only receive on average 30% of the extracted hydrocarbons. The terms for physical distribution of oil and natural gas allow one to conclude that the first two rounds of oil contracts will contribute little to improving the country’s energy security, in addition to the fact that contractors are not legally, contractually, or fiscally obligated to channel a percentage of production through the domestic market.

5. CONCLUSIONS

This investigation proposed to evaluate the performance of 88 hydrocarbon exploration and extraction contracts awarded in the first two rounds of bids. The main focus was on the distribution of rent and production resulting from the terms offered by the Mexican authorities in the eight calls for bids. The new constitutional framework mandates that the state choose the type of contract and the types of compensations which will maximize the nation’s income in order to get the greatest benefit and development in the long run, which is what makes this investigation pertinent and relevant. At the end of this analysis we concluded that:

1. Oil rents and profits are two words used by the Mexican authorities to refer to the same thing: the difference between the price of oil and the production costs. Mexico does not recover 100% of the oil rent, but rather a fraction which depends on the fiscal offering of each bidder. The results are consistent with the nature of the oil contracts whose main objective for an oil company is access to the natural resource and associated rents.

2. In the eight calls for bids that were carried out by January 2018, the State’s take lay somewhere in the range from 20% to 98% with an average of 72.4%, including ISR. The final estimate supposes that the contractor will be efficient and will pay the totality of taxes which it promised to during the bidding process.

3. When the contractor is inefficient and costs are fiscally recoverable, it distances itself from the minimum cost and the State’s average take decreases. Estimates place it on average as far as 56.5% in the eight calls for bids. When the costs increase, physical income shrinks as the adjustment mechanism for the fiscal burden is not applied. Income taxes are not paid as the majority of that which is extracted in shared production contracts is destined to recover the costs. For the State to receive the expected rent will require institutional strength experience and wisdom in order to rigorously and effectively control the contractor’s costs it is willing to recognize. Without these attributes, it is not possible to comply with the constitutional mandate of maximizing the nation’s income.

4. The governmental preference for licenses has the advantage of providing certainty and immediacy to the tax collection as it is based on royalties. The disadvantage is that all production stays in the hands of the operator, with no obligation of supplying the domestic market. In the case of energy security, these shared production contracts are better as part of that which is extracted stays in the country; nevertheless, that which is received by the State in the three calls for bids barely reaches 30% of that extracted when the contractor is inefficient. The contracts in their current form contribute only marginally to the nation’s energy security.
According to the oil regime theories of Mommer (2003), Mexico replaced the proprietorial hydrocarbon regime for a non proprietorial one, or by bringing an end to the transition process which had begun in the 1990s (Vargas and Morales, 2011, pp. 53-56).

The secondary legislation was issued in August 2014, in which the hydrocarbons law and the hydrocarbons income law stand out.

According to the national hydrocarbons commission, in the middle of May 2018 there were three more bids corresponding to around three, with the total of 81 areas on offer. Nine of these are nonconventional resources whose exploration will be carried out via fracking.

It would be more correct to talk about the price of production instead of the cost of production (Bartra, 2013, p. 119).

Comparing the rent of oil and natural gas with the GDP, the World Bank (2018) face value of production at an international price minus the cost of production directly from the wellhead using unitary production costs estimated by country.

For example, CEPAL (ECLAC) defines pure economic rent as the difference between the value of production at an international price and the production cost directly at the wellhead or the mine. This includes the opportunity cost of the capital invested in the extraction operation (Acquatella et al., 2013, p. 17).

This means that the State transferred to the contractor all ownership rights on the product, as long as it finds itself up to date with its payments.

The operating profits in shared production contracts are equal to the contractual value of hydrocarbons minus the royalties and recoverable costs.

The law permits that the costs, expenses and investments which have not been paid in the corresponding period due in said period be transferred to subsequent periods.

This tax incorporates the Fondo para Entidades Federativas y Municipios Productores de Hidrocarburos (Fund for Federal Entities and Municipal Producers of Hydrocarbons) under the rules of the Mexican Internal Revenue Service (SAT).

Some companies which participated in round 1.3 did not show up to sign the contract, possibly because the fiscal burden was too high (up to 92% of the gross income) and did not allow them to cover the costs. Since then the SHCP has placed an upper limit on the bids.

The maximum is reached when the adjustment mechanism is applied according to appendix 3 of the contract.

Translated from the original Spanish.

When the limit of cost recovery is reduced, it increases exposure to the risk of operational inefficiency.

The question carries over whether the Mexican institutions are sufficiently prepared to carry out this task in the context of extreme information asymmetry, and if they have the strength to withstand pressure from both operators (who are almost always reluctant to share their accounts, justify expenses, or make their accounting transparent), and political powers inclined to fiscal evasion when it comes to foreign investments.