

Economic Watch

Mexico

Oil production sharing: a forecast of additional public revenues through 2018

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Economic Analysis

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Arnulfo Rodríguez
arnulfo.rodriguez@bbva.com

- Assuming that oil production gradually increases up to 500 thousand additional barrels a day through 2018 and this new output gushes under production-sharing contracts, public revenues would increase by USD \$22.156 billion during the period 2015-2018 with private oil companies incurring all investment costs.
- These results are derived from a production-sharing contract with the following features: i) an average price of USD \$100 per one barrel of the Mexican oil blend; ii) 0% royalties; iii) oil for cost recovery of one third of gross production after royalties; iv) equal distribution of profit oil, and; v) an income tax rate of 30%. Additionally, it was assumed that the incremental oil production would be 200 thousand, 300 thousand, 400 thousand and 500 thousand barrels a day in 2015, 2016, 2017 and 2018, respectively.
- Based on the above assumptions, the cash flows would be distributed as follows: 65% for the government and 35% for private oil companies. Furthermore, the absolute value of these flows for both parties could increase if, *ceteris paribus*, the income tax rate fell to 20% and royalties were 10% of gross production.
- Given the difficulties involved in extracting oil from either non-conventional deposits or deep water, the assignment of these contracts must abide by operational efficiency criteria in order to bolster government revenues; for example, if the oil for cost recovery were to be reduced to 10% of gross production after royalties, revenues would then increase by USD \$29,911 billion during the period 2015-2018.
- Production-sharing agreements, unlike profit-sharing contracts, could be more attractive for risk-taking by private oil companies since the former ones provide commercial flexibility and exclusive control of operational costs. The government would therefore have to define which projects to execute under one type of contract or the other, also considering its interest in moving along the learning curve with regard to extracting difficult-to-access oil such as that in shale deposits and deep-water.
- Finally, if production-sharing contracts are approved, it is important to ensure that both fiscal incentives and sliding scales (for the profit oil distribution) are utilized to promote the strategic development of the oil sector as opposed to maximizing oil revenues.

Production-sharing contracts

Although the federal government's energy reform proposal seeks to overhaul the political constitution in order to allow private participation in the exploration and extraction of hydrocarbons through profit-sharing contracts, it has recently been mentioned that this incursion by private agents could also take place through production-sharing contracts.¹ From the standpoint of private oil companies, the latter contracts are more attractive than the former ones as they offer commercial flexibility and exclusive control of their operational costs. Furthermore, the implementation of production-sharing contracts would be faster as they would not be subject to approval by a joint board of directors as in the case of profit-sharing contracts. These features are the key to attracting private investment since the economic rent from the extraction of hydrocarbons has as a precedent that 90% of exploration projects end up being unsuccessful.²

Bindemann (1999) defines a production-sharing contract as follows: i) the government or its oil company and a contractor (a company or a consortium of private oil companies) are the parties entering into the contract; ii) the contractor bears the exploration risk alone, and generally undertakes the project by itself once the commercial discovery has occurred; iii) regardless of the profitability of the project, the contractor pays royalties (in cash or in kind) to the government once production has begun; iv) the contractor recovers some of its costs with a percentage of gross production after royalties;³ v) the remaining production - known as profit oil - is distributed according to the portions agreed by both parties; and vi) finally, the contractor pays the corresponding income taxes on its profit oil's share.

In order to understand the revenue implications for the government when entering into production-sharing contracts, a numerical exercise was done, assuming the following:

1. The average price of a barrel for the Mexican oil blend is set to USD \$100.
2. No royalties are charged.
3. The oil for cost recovery (OFCR) is one third of gross production after royalties.
4. The profit oil is distributed in equal parts or 50/50.
5. Income tax rate (ITR) is 30%.

To determine the sensitivity of public revenues, some of the aforementioned assumptions were modified and the results are shown in the following table:

¹ See the article "Mexico oil reform could go beyond profit-sharing contracts -lawmakers," Dave Graham and Miguel Gutierrez, Reuters, November 5, 2013.

² Johnston (1994) points out that in view of this situation the oil industry's profit margins must be sufficiently wide.

³ Generally, the percentage of oil for cost recovery increases as its extraction becomes more difficult. Bindemann (1999) indicates that most contracts specify a limit of 50% of gross production after royalties for cost recovery.

Table 1

Composition of cash flows from the sale of an oil barrel under various production-sharing contracts (USD)

Contract	Royalties	Taxes	Profit oil to government	Cash flows to government	Profit oil to private company	Net cash flows to company	Government's share in cash flows (%)	Company's share in cash flows (%)
Baseline case	0	10	33.3	43.3	33.3	23.3	65	35
10% royalties	10	9	30	49	30	21	70	30
10% royalties, 50% OFCR	10	6.8	22.5	39.3	22.5	15.8	71.4	28.6
20% ITR	0	6.7	33.3	40.0	33.3	26.7	60	40
40% ITR	0	13.3	33.3	46.7	33.3	20	70	30
20% ITR, 10% royalties	10	6	30	46	30	24	65.7	34.3
40% ITR, 10% royalties	10	12	30	52	30	18	74.3	25.7
40/60 profit oil	0	12	26.7	38.7	40	28	58	42
10% OFCR	0	13.5	45	58.5	45	31.5	65	35
20% OFCR	0	12	40	52	40	28	65	35
50% OFCR	0	7.5	25	32.5	25	17.5	65	35

Source: BBVA Research

The table above shows that in the baseline case the government would make USD \$43.3 on each oil barrel sold at USD \$100, whereas the private company would make USD \$23.3. These flows are equivalent to a share of 65% and 35% of the total project's cash flows, respectively. The same table shows three types of contracts whose cash flows for both parties would be greater than in the baseline case: a) 20% ITR, 10% royalties; b) 10% OFCR; and c) 20% OFCR. Although private oil companies are generally reluctant to make payments of royalties, arguing that they are only tax-deductible and not considered tax credits in their countries of origin, the combination of a lower income tax rate offset by the collection of royalties could ultimately prove to be a win-win situation for both sides.⁴ The results for the 10% and 20% oil for cost recovery cases to some extent highlight the fact that government revenues would be reinforced when production-sharing contracts are assigned under operational efficiency criteria.

By using the results from Table 1, a forecast of additional public revenues was made by assuming that oil production were to increase by 200 thousand, 300 thousand, 400 thousand and 500 thousand barrels a day in 2015, 2016, 2017 and 2018, respectively. In this way the target oil production of 3 million barrels a day in 2018 would be met, a contemplated goal in the federal government's energy reform proposal. The foreseen additional public revenues are shown in the following table:

⁴ The company's decision to object to paying royalties is discussed in the article "The Oil and Gas Sector Revenue Sharing," October 11, 2011, available at <http://www.endofcrudeoil.com/2011/10/oil-and-gas-sector-revenue-sharing.html#ixzz2kGIUn00>

Table 2

Additional public revenues under various production-sharing contracts (millions of USD and percentage share of oil production in 2012)

	2015		2016		2017		2018		2015-2018	
	Revenues	Share (%)	Revenues	Share (%)	Revenues	Share (%)	Revenues	Share (%)	Revenues	Share (%)
Baseline case	3163.3	3.3	4758.0	5.0	6326.7	6.7	7908.3	8.3	22156.3	23.3
10% royalties	3577.0	3.8	5380.2	5.7	7154.0	7.5	8942.5	9.4	25053.7	26.4
10% royalties, 50% OFCR	2865.3	3.0	4309.7	4.5	5730.5	6.0	7163.1	7.5	20068.5	21.1
20% ITR	2920.0	3.1	4392.0	4.6	5840.0	6.2	7300.0	7.7	20452.0	21.5
40% ITR	3406.7	3.6	5124.0	5.4	6813.3	7.2	8516.7	9.0	23860.7	25.1
20% ITR, 10% royalties	3358.0	3.5	5050.8	5.3	6716.0	7.1	8395.0	8.8	23519.8	24.8
40% ITR, 10% royalties	3796.0	4.0	5709.6	6.0	7592.0	8.0	9490.0	10.0	26587.6	28.0
40/60 profit oil	2822.7	3.0	4245.6	4.5	5645.3	5.9	7056.7	7.4	19770.3	20.8
10% OFCR	4270.5	4.5	6423.3	6.8	8541.0	9.0	10676.3	11.2	29911.1	31.5
20% OFCR	3796.0	4.0	5709.6	6.0	7592.0	8.0	9490.0	10.0	26587.6	28.0
50% OFCR	2372.5	2.5	3568.5	3.8	4745.0	5.0	5931.3	6.2	16617.3	17.5

Source: BBVA Research with data from SIE

The table above shows that, under the baseline case assumptions, public revenues would increase by USD \$22.156 billion during the period 2015-2018. In other words, these additional revenues would represent 23.3% of the oil production in 2012. Moreover, if the oil for cost recovery were to be reduced to 10% of gross production after royalties, those revenues would increase by USD \$29.911 billion during such period or 31.5% in terms of the oil production in 2012.

Conclusions

The exploration and lower profit margins for difficult-to-access oil such as that in shale deposits, residual zones and deep water involve relatively greater risks for oil companies. The federal government's energy reform proposal implicitly recognizes that the era of easy-to-extract oil is coming to an end, and contemplates constitutional changes to allow private participation in the exploration and production of hydrocarbons. In such proposal was announced that private sector participation would take place through profit-sharing contracts.

However, other contract types such as production-sharing agreements could be relatively more attractive for private oil companies. From their point of view, the lack of commercial flexibility, the risks of sharing operational costs and the need for approval by a joint board of directors put profit-sharing contracts at a clear disadvantage. The government would therefore have to define which projects to execute under one type of contract or the other, also considering its interest in moving along the learning curve associated with extracting difficult-to-access oil such as that in shale deposits and deep-water.

It is important to point out that if production-sharing contracts are approved, their success and contribution to national economic growth will depend on the degree to which fiscal incentives and sliding scales (for sharing the profit oil) are utilized to promote the strategic development of the oil sector as opposed to maximizing oil revenues.

References

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