

Total in Angola: partial transparency raises questions

I- Introduction to the Petroleum fiscal regime in Angola

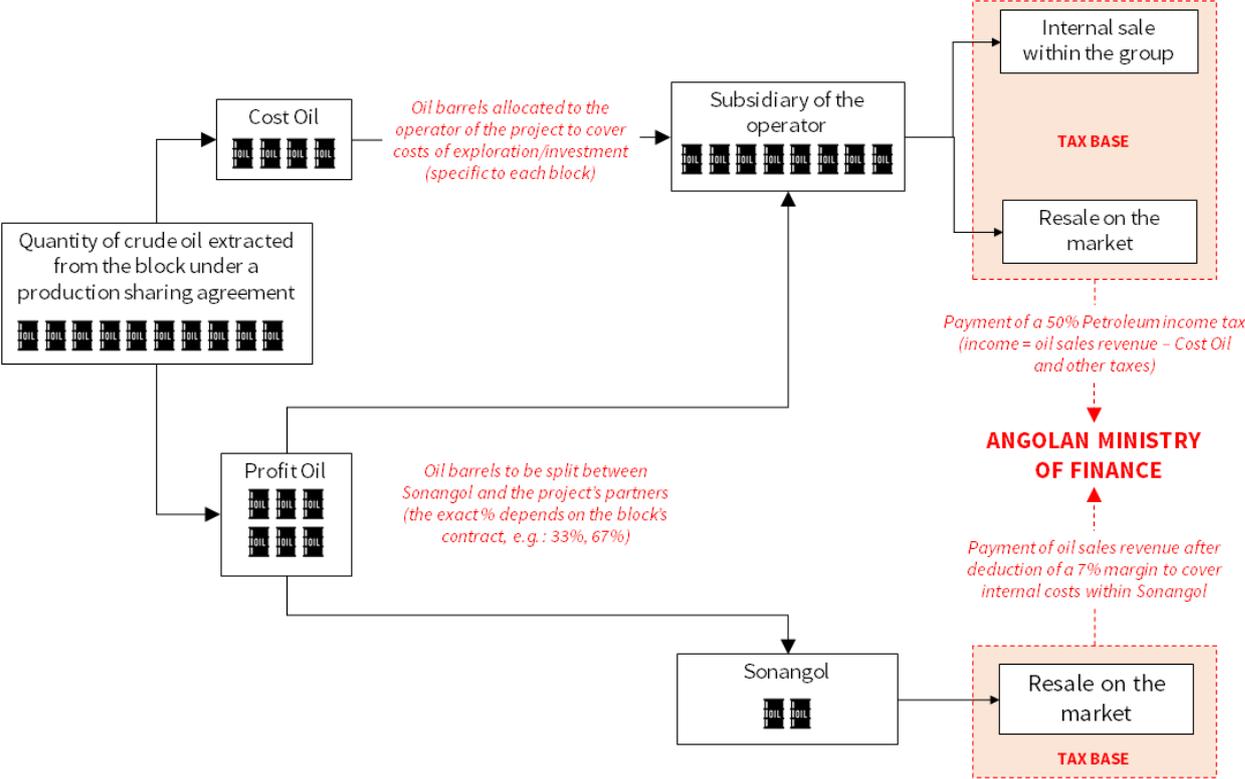


Illustration 1 - Angolan tax regime for a Production Sharing Agreement with an international oil company (IOC) – the same system would be used for a PSA with several IOCs in proportion to their respective share. Source: Le Basic

Law number 13/04 from December 2004 on Petroleum activities is designed with the four following taxes:

1. A Petroleum production tax levied on the amount of crude oil or natural gas extracted. When oil companies operate under a production sharing agreement, this tax is paid in kind - in barrels of oil extracted. The Petroleum production tax is paid quarterly to Sonangol. The national oil company is authorized to sale the oil on the market. This tax represents Sonangol’s share of the « Profit oil » which is split between the project’s partners, after the deduction of the « Cost oil » allocated to the operator of the project to cover the costs of exploration or investment.

2. A Petroleum income tax levied on the revenues of the oil companies from the sale of crude oil or natural gas. When oil companies operate under a production sharing agreement, the tax rate is equivalent to 50%.

3. A surface fee levied on the size of the contractual area with a 300€/km² rate.

4. Revenues paid by oil companies to Sonangol are taxed at a 90% rate by the Angolan government.

This case study analyzes the payments related to Block 17 in Angola – the largest block in the country. Total is the operator of the block, meaning that the company is physically operating the area. It owns the majority share of the joint-venture of Block 17 with a 40% stake while Statoil owns 23.33%, Exxon 20%, and BP 16.67%.

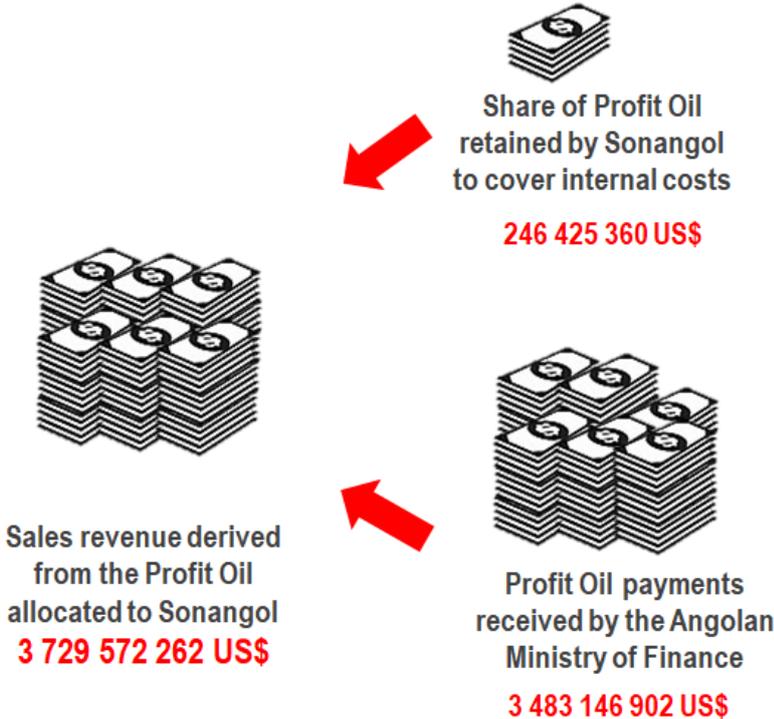
As an operator, Total distributes the oil barrels produced from Block 17 to Sonangol on one hand, and to the joint-venture partners on the other hand, in proportion to their respective shares. Total also pays all taxes to Angolan authorities on behalf of this joint-venture.

This case study focuses on the Profit oil payments to Sonangol which represent 70% of the payments for Block 17.

II- Comparing Total’s payment statements with Angolan revenue statements

The analysis compares the payments declared by Total to the Angolan government in 2016 to those disclosed by the Angolan authorities. The following methodology was used:

1. Using Sonangol’s financial statements to find out the operational margin levied by Sonangol on Profit oil for Block 17.
2. Using the annual oil revenues per blocks disclosed by the Angolan Ministry of Finance to find out what the Profit Oil received by the Ministry of Finance for Block 17 is. Add the operational margin levied by Sonangol to obtain the overall Profit oil levied for Block 17.
3. Using Total’s payments to governments disclosure to calculate the overall Profit oil paid by Total on behalf of the joint-venture for Block 17.
4. Comparison of the two amounts.



1. According to law number 13/13 of March 7th 2013 Sonangol has a right to levy a fraction of the revenues derived of the sales of oil received through the Profit oil to cover its operational costs. This fraction cannot exceed 7% of the barrels valued at a reference market price set by the Angola in the Annual Budget. Law number 23/14 of December 31st 2014 set the market price to USD 81 per barrel from January to March 2015; and law 3/15 from April 9th 2015 set the market price to USD 40 per barrel for the rest of the year 2015.

Sonangol's financial statements (page 30 of Relatório e Contas 2015 Consolidado) detail the number of barrels of oil received quarterly by the national oil company for the Profit Oil paid for Block 17.

Using both the number of barrels, the reference price and the 7% operational margin levied by Sonangol, we can calculate the amount levied quarterly by Sonangol on the Profit oil paid by oil companies on Block 17 using the following formula:

Margin (quarter n) = number of barrels of Profit oil (quarter n) * reference market price (quarter n) * 7%

Period of time	Profit oil declared by Sonangol (barrels)	Reference price (USD/barrel)	Margin (%)	Sonangol Margin (USD)
1 st quarter 2015	17 307 000	81	7%	98 130 690
2 nd quarter 2015	17 606 128	40	7%	49 297 158
3 rd quarter 2015	26 059 437	40	7%	72 966 424
4 th quarter 2015	9 296 817	40	7%	26 031 088
Year 2015	70 269 382			246 425 360

In 2015, Sonangol levied **USD 246 425 360** on the sales of the barrels of oil pursuant to Profit oil of Block 17.

2. The Angolan Ministry of Finance publishes oil revenues per block and taxes (Petroleum Production Tax, Petroleum Income Tax, Profit oil also called "*Concessionaire receipts* » etc.) both monthly and annually in a document called « Avaliação do Comportamento de Receita Petrolífera Anual ».

In the annual summary of 2015 on Block 17, the total Profit Oil received by the Angolan Ministry of Finance published on page 12 amounts to 415.422.248.575 Kwanzas. As neither Total nor the Angolan ministry of Finance have shared the official exchange rate used for dollars and kwanzas, we used the average exchange rate from the OANDA website (www.oanda.com), which is based on the average buying and selling rates for each currency. In 2015, the average exchange rate was USD 1 = 119.2663589 Kwanzas.

With this conversion rate, we can calculate the value of the Profit oil received by the Ministry of Finance for Block 17 in 2015 in dollars:

Profit Oil received by the Ministry of Finance for Block 17 (2015) = 415 422 248 575 Kwanzas / 119,2663589 = **USD 3 483 146 902**

By adding the operational margin levied by Sonangol, we can obtain an estimate amount of Profit oil paid by international oil companies to Sonangol for Block 17 in 2015:

Profit Oil received by Sonangol (2015) = USD 3 483 146 902 + USD 246 425 360 = **USD 3 729 572 262**

3. Total's 2015 payments to governments disclosure features the amount paid by the company to Angola per block and category of payment (including production entitlements which corresponds to Profit oil). Total's disclosure for 2015 features a payment amounting to USD 1 535 173 000 in Profit oil for Block 17.

Total's disclosure includes no contextual information which would help understand how this amount has been calculated. During an interview with the authors of the report, Total management explained that payments are disclosed in proportion to the company's share. Conversely, the Profit oil payment disclosed for Block 17 corresponds to Total's 40% stake in the block.

With this piece of information, it is possible to find out how much the joint-venture of oil companies paid in Profit Oil for Block 17 in 2015:

Profit Oil of Block 17 (2015) = USD 1 535 173 000 / 40% = **USD 3 837 932 500**

4. The amount disclosed by the Angolan authorities differs from the one in Total's disclosure by more than USD 100 million:

Difference = USD 3 837 932 500 - USD 3 729 572 262 = **USD 108 360 238**

Several hypothesis can explain this gap:

1. The number of oil barrels declared by Sonangol may differ from the number included by Total in its disclosure to calculate the Profit oil paid for Block 17 in 2015.
2. The reference price per barrel disclosed by Sonangol may differ from the one used by Total to value its Profit oil payment for Block 17 in its disclosure

II- Investigating the first hypothesis: a difference in the number of barrels of oil declared as Profit oil for Block 17 in 2015

We used the following methodology:

1. Using Sonangol's 2015 financial statements, we could calculate the number of barrels of oil paid in kind by companies for the Profit oil of Block 17
 2. Using both data disclosed by the Angolan Ministry of Finance and Total's 2015 payments to governments disclosure, we could calculate the number of barrels paid in kind by companies for the Profit oil of Block 17.
 3. Comparison of the two estimates
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1. Sonangol's 2015 financial statements feature the number of barrels received by the National oil company as Profit oil per block: 70 269 382 barrels.

We calculated Total's share of this payment in kind proportionally to the company's stake in the joint-venture, i.e. 40%:

$$\begin{aligned}\text{Share of Profit oil from Total (Volume)} &= 40\% * \text{Profit Oil received in 2015 by Sonangol} \\ &= 40\% * 70\,269\,382 \text{ barrels} \\ &= \mathbf{28\,107\,753 \text{ barrels}}\end{aligned}$$

2. Total's 2015 payments to governments disclosure features a Profit oil payment to Angola for Block 17 amounting to USD 1 535 173 000, that is 40% of the overall payment. As Total only discloses the value of payment in kind without the number of barrels associated with the payment, nor the reference price used to calculate the value of the payment in kind, we use the reference price disclosed by Angolan authorities to value the Profit oil payment of international oil companies on Block 17 in 2015:

Share of Profit oil from Total (in volume) = Amount of Profit oil declared by Total / Reference price of Angolan Ministry of Finance

Since 2004, the Angolan authorities made it mandatory for Sonangol and oil companies to declare to both the Ministry of Finance and the Ministry of Energy an *ex ante* estimate and an *ex post* statement of the price of barrels of oil from each blocks. Both Ministries used this data to together calculate the market price of oil from each block. This price is then used to value Sonangol's Profit oil. Since 2015, only the Ministry of Finance has been publishing this reference price for each block in its monthly and annual Statements of Petroleum revenues in a document entitled *Exportações e Receitas de Petróleo Consolidado*.

In 2015, the annual statement published by the Ministry of Finance discloses a reference price used for Block 17 of USD 51.91 per barrel. Using this reference price, we can calculate the number of barrels corresponding to the value of Profit oil disclosed by Total for Block 17 in 2015, proportionally to the company's share in the joint-venture:

$$\text{Share of Profit oil from Total (in volume)} = 1\,535\,173\,000 / 51.91 = \mathbf{29\,573\,743 \text{ barrels}}$$

3. There's a difference between the number disclosed by Sonangol and the number calculated on Total's payment and the official reference price:
Gap = 29 573 743 barrels - 28 107 753 barrels = **1 465 990 barrels**

III- Investigating the second hypothesis: a difference in the barrels of oil's value used to calculate the Profit oil

We used the following methodology:

1. Using the 2015 annual accounts published by Total's subsidiary Total E&P Angola which is the subsidiary managing most of the oil from Block 17 together with Sonangol's 2015 financial statements, we calculate the reference price used by Total's subsidiary to value the barrels of oil from Block 17 in 2015.
 2. Comparing this reference price to the one published by the Ministry of Finance in 2015
 3. Understanding the rationale and working out potential tax losses
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1. Total operates Block 17 through two subsidiaries: Total E&P Angola and Total M'bridge respectively owning 35% and 5% in the overall 40% stake of Total in the joint-venture. Total E&P Angola is registered in France. The financial accounts published at the *Registre du Commerce et des Sociétés* (accessible for a small fee) indicate that the subsidiary manages only barrels of oil extracted from Block 17.¹

Moreover, Sonangol's 2015 financial statements disclose the following elements:

- The number of barrels produced on Block 17 in 2015: 253 78 153 barrels
- The number of barrels received as Profit oil for Block 17 in 2015: 70 269 382 barrels

Based on the number of barrels declared by Sonangol and the 35% stake of Total E&P Angola in the Block, we can calculate the number of barrels received by Total E&P Angola from Block 17 and sold back on the market in 2015, using the following methodology:

¹ Total E&P Angola, Rapport Annuel – année 2015, Greffe du Tribunal de Commerce de Nanterre : dépôt N°37426 en date du 28/09/2016

SUM OF CRUDE OIL EXTRACTED FROM BLOCK 17 (2015) : 253 778 153 barrels

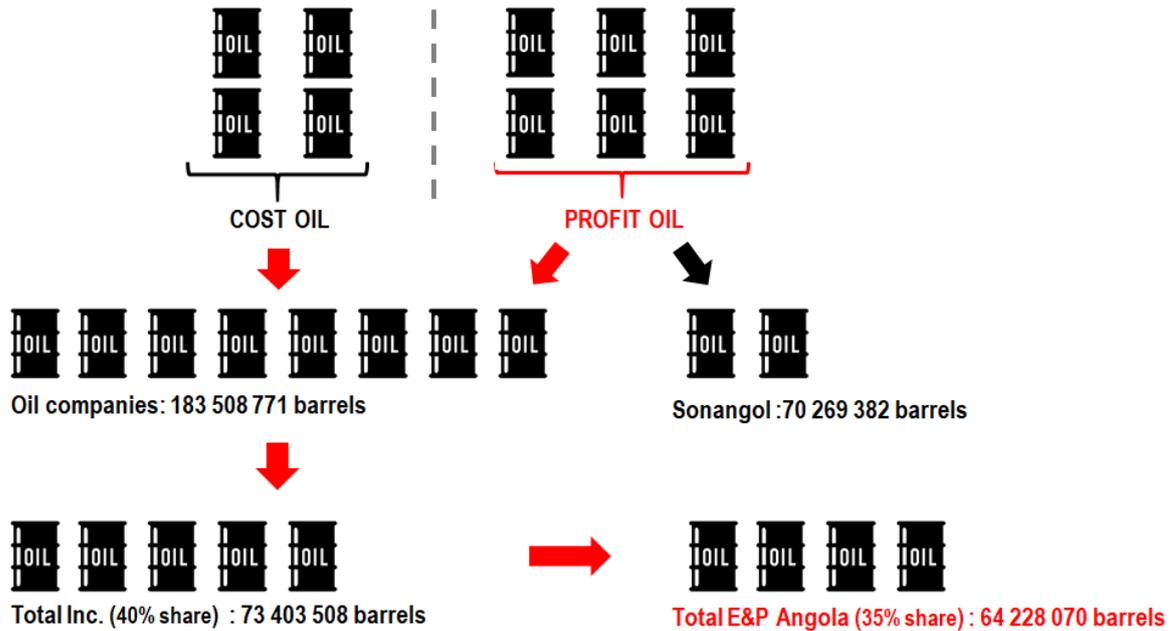


Illustration n°2: Estimate of the number of barrels sold by Total E&P Angola in 2015 (source: BASIC)

We obtain the estimate of then number of barrels sold by Total E&P Angola in 2015: 64 228 070 barrels.

The 2015 annual accounts of the subsidiary also discloses the annual revenues of the Total E&P Angola subsidiary, which only sells barrels of oil from Block 17: 2 835 251 049 euros

As the annual accounts do not feature the conversion rate, we used the average exchange rate disclosed on the OANDA website (www.oanda.com), which based on the average buying and selling rates for each currency. In 2015, the average exchange rate was EUR 1 = USD 1.11006129

Using this conversion rate, we can calculate the revenues of Total E&P Angola in dollars for 2015: USD 3 147 302 430.

By dividing the declared revenues of Total E&P Angola on the number of barrels of oil sold by the subsidiary, we can calculate the reference price used by Total to value the barrels of oil of Block 17

The price of oil from Block 17 according to Total = $\text{USD } 3\,147\,302\,430 / 64\,228\,070 \text{ barrels} = \text{USD } 49.00 \text{ per barrel.}$

2. Total's calculated reference price is different from the official reference price disclosed by the Angolan Ministry of Finance for valuing barrels of oil from Block 17 in 2015: USD 51.91 per barrel disclosed in the annual statement of revenues, in a document entitled *Exportações e Receitas de Petróleo Consolidado*. Total's reference price is therefore 5% lower than the official price of the Angolan authorities
3. This raises a number of questions as to why the reference price is lower. One potential explanation relates to the corporate structure of Total. The annual accounts from Total E&P

Angola indicate that all the barrels of oil from Block 17 are sold to another subsidiary of Total: TOTSA Trading, the trading arm of the company, located in Switzerland.

The corporate structure of Total raises question about potential profit shifting strategies: by undervaluing the price of the oil sold between its Angolan subsidiary and its Swiss subsidiary, Total could pay less taxes in Angola where the Petroleum income tax rate is 50% - shifting its profit to Switzerland where taxes are lower.

If the barrels of oil from Block 17 had been valued at the official price disclosed by the Angolan Ministry of Finance by Total, USD 51.91 per barrel instead of USD 49 per barrel, the gross production revenues of the subsidiaries would be substantially higher than those declared by Total E&P Angola:

Gross Production Revenues with Angolan Ref Price = 64 228 070 barrels * USD 51.91/barrel = USD 3 334 079 113

It would have meant additional revenues for Total E&P Angola:

Additional revenues with Angolan Ref price= USD 3 334 079 113 - USD 3 147 302 430 US\$ = USD 186 776 683 US\$

As the Petroleum income tax rate is 50% (as stipulated in law 13/04 from December 2004), if Total had valued the oil barrels from Block 17 at USD 51.91 per barrel, the French company would have had to pay additional taxes amounting to:

Additional taxes = 50% * USD 186 776 683= **USD 93 388 342**

The corporate structure organization of Total around the management of oil extracted from Block 17 may have enabled Total to artificially shift profit from Angola to Switzerland and save more than USD 93 million dollars in taxes.

Areva: transparency in a minefield

I - How to calculate the amount of royalty fees paid by Somair?

We used the following methodology:

1. Using Somair's 2015 financial statements included in Areva's 2015 registration document to calculate the applicable royalty rate.
 2. Using the price formula published in the Strategic Partnership Agreement to calculate the extraction price of uranium
 3. Calculating Somair gross production revenues thanks to the extraction price of uranium and the production volume contained in Somair's 2015 financial statements. Deducting the amount of royalties paid based on the applicable royalty rate.
 4. Comparison with the amount disclosed by Areva
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1. According to article 84 of the 2006 mining code in Niger, the royalty rate applicable is based on the net profit margin, calculated by dividing operating income to operating revenues. Depending on the net profit margin, the royalty rate will be:
 - a. 5.5% if the net profit margin is below 20%
 - b. 9% if the net profit margin is between 20% and 50%
 - c. 12% if the net profit margin is above 50%

As Somair is only involved in mining activities, the information featured in its financial statements can be understood as related to its operational activities. In particular, Areva discloses the income and revenues of the mine, page 223 of its registration document:

$$\begin{aligned}\text{Net Profit Margin} &= (\text{Income} / \text{Revenues}) * 100 \\ &= (5/197) * 100 \\ &= 2.5\%\end{aligned}$$

The net profit margin is below 20%, the applicable royalty rate is therefore 5.5%

2. Article 3 of the Strategic Partnership Agreement discloses the following formula to calculate the 2015 extraction price of uranium for Somair and Cominak mines:

$$\text{Price}(n) = (50\% * SP_{n-1} + 50\% * LT_{n-1}) * 2.5998$$

Where:

- Price (n) corresponds to the Niger price for a year n, expressed in €/kgU
- SP_{n-1} corresponds to the average uranium spot price in \$/lb U3O8 as published by Ux and Tradetech for year n-1 and converted in €/lb according to the average €//\$ conversion rate in year n-1
- LT_{n-1} corresponds to the average uranium long-term price in \$/lb U3O8 as published by Ux and Tradetech for year n-1 and converted in €/lb according to the average €//\$ conversion rate in year n-1
- 2.5998 corresponds to the conversion rate between pounds (lbs) and kilos (kgs)

Canadian company Cameco, one of Areva's competitor on the uranium market, republishes spot and long-term uranium prices as published by independent market consultants Ux and Tradetech (<https://www.cameco.com/invest/markets/uranium-price>). For 2015, according to these sources, the average uranium spot price was 33.21\$/lb and the average uranium long-term price was 46.46\$/lb.

As Areva did not disclosed the dollar/euro exchange rate used for its transactions, we used the annual exchange rate disclosed by the World Bank in 2014 ($n-1$), that is USD 1 = EUR 0.7569.

Using all of this data, we can calculate the 2015 extraction price for Somaïr:

$$\text{Price (n)} = (50\% * SP_{n-1} + 50\% * LT_{n-1}) * 2.5998$$

$$\text{Price (\$)} = (50\% * 33.21 + 50\% * 46.46) * 2.5998$$

$$\text{Price (\$)} = 39.83 * 2.5998 = 103.56\$/\text{kgU}$$

$$\text{Price (€)} = 103.56 * 0.7569 \text{ Prix (€)} = \mathbf{78.38\text{€}/\text{kgU}}$$

The extraction price for uranium extracted for Somaïr in 2015 was **78.38€**

3. The exact figure for the revenues generated by uranium production can be obtained by multiplying the volume of uranium produced by Somaïr (in tons, disclosed by Areva on page 54 of registration document) by the price (in €/tons – where one ton is 1000 kgU).

$$\begin{aligned} \text{Operating revenues (€)} &= 2509 * (78.38 * 1000) \\ &= 196\ 666\ 871\text{€} \end{aligned}$$

As calculated above, the applicable royalty rate is 5.5% of the market value of uranium (i.e. the revenues derived from selling uranium).

$$\begin{aligned} \text{Royalty fees (€)} &= 5.5\% * 196\ 66\ 871 \\ &= 10\ 816\ 678\ \text{€} \end{aligned}$$

4. Areva discloses its payments to Niger in the local currency (Francs CFA, or XOF). There is a fixed exchange rate between euros and CFA francs, which is equal to EUR 1 = XOF 655.957. We used this to calculate the royalty fees in CFA francs and compared it to the amount disclosed by Areva

$$\begin{aligned} \text{Royalty fees (XOF)} &= 10\ 816\ 678 * 655.957 \\ &= 7\ 095\ 275\ 588\ \text{XOF} \end{aligned}$$

There is a slight gap of 305 330 XOF (**that is 465€**) with the amount that we calculated. We can assume that this gap is due to a different or more exact \$/€ exchange rate used by Areva.

$$\text{Gap} = 7095\ 275\ 588 - 7\ 094\ 970\ 527 = \mathbf{305\ 330\ XOF.}$$

II- How to calculate the impact of indexing extraction prices to market prices?

We used the following methodology:

1. Calculating Somair's theoretical revenues with the 2013 extraction price
 2. Deducting the applicable royalty rate and paid royalty fees
 3. Comparing the theoretical amount to the amount actually paid by Areva in 2015
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1. Before 2014, the extraction price was negotiated periodically between Areva and Niger. In 2013, the extraction price applied to uranium from Somair was 73 000 XOF/kgU. EUR 1 = XOF 655.957

$$\begin{aligned}\text{Extraction Price 2013 (€)} &= 73\,000 / 655.957 \\ &= 111.29\text{€/kgU}\end{aligned}$$

Using Somair's 2015 production figures (2,509 tons, as disclosed by Areva p.54 of the 2015 registration document) we can calculate the theoretical revenues of Somair, if the extraction price had remained unchanged:

$$\begin{aligned}\text{Somair Theoretical Revenues (€)} &= 2509 * (111.29 * 1000) \\ &= 279\,226\,610\text{ €}\end{aligned}$$

2. To calculate the applicable royalty rate, we need to divide Somair's theoretical income by the theoretical operating turnover. To do that, we need to find out what Somair's operating costs in 2015 were, in order to deduct them from the theoretical revenues to obtain the theoretical income. We can assume that costs are unchanged as only the price of extraction is different.

We can deduct Somair's 2015 operating costs from Somair's income and turnover disclosed by Areva in its 2015 registration document:

$$\begin{aligned}\text{Operating costs} &= \text{Actual Operating Revenues} - \text{Actual Operating Income} \\ \text{Operating costs (m€)} &= 197 - 5 \\ &= 192\text{m€}\end{aligned}$$

To calculate the theoretical operating income, we round up Somair's theoretical revenues to 279m€:

$$\begin{aligned}\text{Theoretical operating income (m€)} &= 279 - 192 \\ &= 87\text{m€}\end{aligned}$$

We now have all the elements to calculate the net profit margin to determine what the applicable royalty rate would be:

$$\begin{aligned}\text{Net profit margin} &= \text{Theoretical Operating Income} / \text{Theoretical Operating Revenues} \\ &= (87/279) * 100 \\ &= 31.2\%\end{aligned}$$

With a net profit margin between 20% and 50%, the applicable royalty rate would have been 9% of the operating revenues.

- The royalty fees would have corresponded to 9% of the theoretical revenues
 Theoretical Royalty Fees (€) = 9%*279 226 610
 = 25 130 395 €

With an extraction price of 111.29€/kgU, the royalty fees paid by Areva for Somaïr would have reached 25.1 m€. A significant gap of **more than 14.3 million euros** compared to the actual royalty fees paid in 2015:

$$\text{Gap} = 25\,130\,395 - 10\,816\,678 = \mathbf{14\,313\,717\text{€}}$$

III- How to calculate the export prices of uranium?

We used the UN database of export trade statistics [UN Comtrade](#) to access Nigerien uranium export figures, disclosed in USD.

- Using data disclosed on UN Comtrade, calculate the average Nigerien uranium export price in 2015 and the average uranium export price of Nigerien uranium to France for the same year.
 - Using both prices, calculating the price of export of Nigerien export to all countries but France in 2015.
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- The UN Comtrade database disclosed the XOF/USD exchange rate for uranium exports from Niger in 2015, at XOF 1 = USD 0.001682. The EUR/XOF exchange rate is fixed, at EUR 1 = 655.957 XOF. We used these figures to calculate the average USD/EUR exchange rate for uranium exports from Niger in 2015.

$$\begin{aligned} \text{XOF } 1 &= \text{USD } 0.001682 \\ \text{XOF } 655.957 &= \text{USD } (0.001682 * 655.957) \\ \text{XOF } 655.957 &= \text{USD } 1.103319674 \\ \text{EUR } 1 &= \text{USD } 1.103320 \\ \text{USD } 1 &= \text{EUR } (1/1.103320) \\ \text{USD } 1 &= \text{EUR } 0.906355 \end{aligned}$$

UN Comtrade discloses volumes (in tons) and overall value (in dollars) of uranium exports from Niger in 2015 both globally (4443 tons valued at USD 401 793 000) and exports to France specifically (3314 tons valued at USD 287 725 000). We calculated the average price in €/kgU for both global exports and exports to France

$$\begin{aligned} \text{Global Exports } (\$) &= 401\,793\,000 / 443\,000 \\ &= 90.43 \text{ \$/kgU} \\ \text{Global Exports } (\text{€}) &= 90.43 * 0.906355 \\ &= \mathbf{81.96\text{€/kgU}} \end{aligned}$$

$$\begin{aligned} \text{Exports to France } (\$) &= 287\,725\,000 / 3314\,000 \\ &= 86.82\$ \\ \text{Exports to France } (\text{€}) &= 86.82 * 0.906355 \\ &= \mathbf{78.69\text{€/kgU}} \end{aligned}$$

According to UN statistics, France is the main destination of Niger's uranium exports. As we calculated above, the average export price to France is lower than the average global price. We use a weighted average to calculate the average price of exports to all the world but France with the two following steps:

- a. Determine the exact share of uranium exports to France in value

$$\text{Share Fr (\%)} = (287\,725\,000 / 401\,793\,000) * 100 = \mathbf{71.61\%}$$

$$\text{Share OTHERS (\%)} = 100 - 71.61 = 28.39\%$$

- b. Calculate the weighted average:

$$\text{Global Price} = (\text{Share FR} * \text{Price FR}) + (\text{Share OTHERS} * \text{Price OTHERS})$$

$$81.96 = (0.7161 * 78.69) + (0.2839 * \text{Price OTHERS})$$

$$81.96 = 56.3499 + (0.2839 * \text{Price OTHERS})$$

$$81.96 - 56.3499 = 0.2839 * \text{Price OTHERS}$$

$$25.6101 = 0.2839 * \text{Price OTHERS}$$

$$\text{Price OTHERS} = 25.6101 / 0.2839$$

$$\mathbf{\text{Price OTHERS} = 90.21\text{€}/\text{kgU}}$$

In 2015, the average price of uranium exports to all destinations except for France was 90.21€/kgU.

IV- Who exports uranium from Niger to France?

In 2015, 3314 tons of uranium were exported from Niger to France. As Areva's closest conversion plants are located in France, where the company is headquartered, we assumed that all uranium lifted by Areva as part of its respective shares in Somaïr and Cominak is exported to France. But that's not enough to cover 3314 tons.

According to Areva's 2015 registration document, Areva's share of uranium extracted (which is proportionate to Areva's share in the mine) was 1591 and 546 tons respectively for Somaïr and Cominak. That equals to 2137 tons of uranium, or less than 65% of the overall uranium exports to France.

At least 1177 tons of uranium were exported by other players on the Nigerien uranium market, by the Nigerien public company Sopamin, and by private actors such as ENUSA and OURD. As the export data per company is not publicly available, uranium exports from Niger per company is not available.

V- Risk assessment scenarios: how much is Niger losing out to Areva?

We can assume that the difference between the export prices and the extraction prices are taxable income, subject to the 30% tax of the Nigerien *Impôts Sur les Bénéfices*:

1. Scenario 1: Uranium exported by Areva is valued at the same price as other players on Niger's uranium market, at 90.21€/kgU:

Margin per KgU = $90.21 - 78.38 = 11.83$ that is, an 11 830€ margin per ton exported. With 3314 tons exported.

Taxable income = $11\,830 * 3314 = 39\,204\,620\text{€}$

Taxes = $39\,204\,620 * 0.3 = 11\,761\,386\text{€}$

2. Scenario 2: Uranium exported by Areva is valued on average long-term prices disclosed by independent market consultants, as they truly reflect Areva's economic model, according to data disclosed by Ux and Tradetech for 2015 – 109€/kgU:

Margin per KgU = $109 - 78.38 = 30.62$, that is a 30 620€ margin per ton exported. With 3314 tons exported.

Taxable income = $30\,620 * 3314 = 101\,474\,680\text{€}$

Taxes = $101\,474\,680 * 0.3 = 30\,442\,404\text{€}$

VI- Relation to Niger's health budget figures in 2015

In 2015, Niger's budget accounted for more than 1 700 billion francs CFA (equivalent to roughly 2.6bn euros). According to Niger's health statistics report in 2015, the 2015 health budget, as shown on page 25, amounted to roughly 112 billion CFA francs, or more precisely, CFA francs 112 311 202 410 , which is equivalent to 171 217 324€).

We compare the scenarios listed above to the 2015 health budget in Niger:

Scenario 1: 11 761 286€ shortfall

$S1 = (11\,761\,286 / 171\,217\,324) * 100$

$S1 = 0,078$

$S1 = 7.8\%$ corresponding to 8% of the health budget

Scenario 2: 30 442 404€ shortfall

$S2 = (30\,442\,404 / 171\,217\,324) * 100$

$S2 = 0,177$

$S2 = 17.7\%$ corresponding to 18% of the health budget