The Economic Assessment of Conventional vs Gross Split Scheme for Anonymous Production Sharing Contract

Zilva Boaz

***Abstract*—**The research is to perform economic assessment between conventional versus gross split scheme as mandated thru Regulation 52/2017 for Production Sharing Contract ("PSC") in Indonesia who is at the production stage; in this case Anonymous PSC. The objective is to give recommendations for Anonymous PSC to decide what concept will result the best outcome for Contractor. The research performed financial, SWOT analysis and 5 Forces of Porter. The simulation uses components of cost recovery, variable and progressive components to give pros and cons so that Anonymous PSC could consider whether it is economics to extend the business in Indonesia or not. Financial calculations are performed with assumptions should Contractors still implements the conventional or changes to gross split until the contract ends in 2028. The result using WACC 8.39% shows that both concepts are feasible. However, conventional scheme would be more beneficial for Contractor (oil project: IRR 19.1%, NPV MMUSD 24.5; gas project: IRR 22.3%, NPV MMUSD 297.5), since cost deduction performed after the sharing profit. Therefore, it is recommended to continue using conventional scheme until 2028. Extension will be considered by performing the economics & revisiting the contract.

***Keywords*—**conventional, economics, gross split, production sharing contract, contractors cooperation contract.

I. Introduction

Oil & gas plays an important role in every industry, thus, it is highly crucial for Government of Indonesia ("GoI") to protect their natural resources, oil & gas in particular, in which it is guided under the Constitution of the Republic of Indonesia 1945 Art. 33 paragraph 1-3. In accordance to that, GoI released the Regulation number 44/1960 – that marked the Contract of Work ("CoW") which set the management concept of oil & gas industry into the mineral & mining (under GoI control & supervision); and economic right (under Contractor's). Later on, GoI promulgated the Regulation number 8/1971 that acknowledged the Production Sharing Contract concept ("PSC"). The PSC has dynamically transformed from 1st to the 3rd generation of PSC in 1988 until now (applicable for the ongoing existing PSCs). However the production or profit sharing under the existing PSC is concerned to be changed where Ministry of Energy and Mineral Resources ("MEMR") released the Regulation 8/2017 – amended by Regulation 52/2017 on August 29, 2017; in regards with the Gross Split PSC. The intention is to optimize the efficiency and effectiveness of production or profit sharing of oil & gas under PSC, by eliminating the cost recovery concept. The new scheme shall be applied for the new extension of PSC, while the ongoing PSCs can choose the conventional or change to gross split.

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Anonymous PSC Profile

The Anonymous PSC covers a number of oil and gas fields in the Natuna Sea. Wise Company has been the operator (with 75% participating interest) of the offshore contract since 2016 which covers 11,155 square kilometers with water depths of 250–320 feet / 76.2–97.536 meter. Overall Wise now operates the facilities with 1 FPSO, 1 FSO, 4 central processing platforms, 7 wellhead platforms, 4 producing subsea fields, and offshore support vessels which support 3 producing oil fields and 16 natural gas fields in various stages of development. The oil has been produced since 1979, and peaked in the mid-1990s. Net daily production during 2015 averaged 5,000 barrels of liquids and 66 MMcf of natural gas.

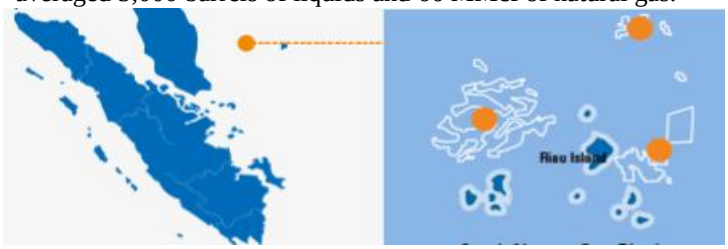
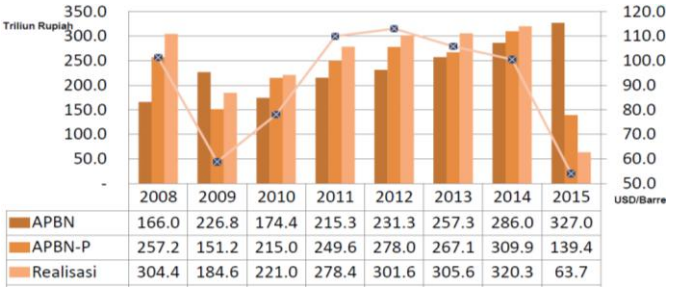


Fig. 1: Anonymous PSC working area

Business issue

Based on the report from Directorate General of Budget under Ministry of Finance (2015), that oil & gas sector has been the major contribution where it had increasingly contributed from IDR184.6 trillion or almost 22% (2009) to IDR320.3 trillion or 21% (2014) to the Government from the total revenue. However, oil & gas sector declined in year 2015 to IDR63.7 trillion (YTD Q3) due to the decline of Indonesian Crude Price ("ICP") and production. Should they are still poor; the national income will follow their pattern. The production shortfall was due to the major oilfields in Indonesia has come under the mature category (95%), as well as the lack of exploration activities.



	2008	2009	2010	2011	2012	2013	2014	2015
APBN	166.0	226.8	174.4	215.3	231.3	257.3	286.0	327.0
APBN-P	257.2	151.2	215.0	249.6	278.0	267.1	309.9	139.4
Realisasi	304.4	184.6	221.0	278.4	301.6	305.6	320.3	63.7

Fig. 2: National income from oil & gas sector, source www.kemenkeu.go.id

The implementation of new scheme will impact to investors decision in oil & gas sector, esp. in exploration phase with high investment, risk and uncertainty of proven oil & gas. The existing PSCs will consider to extending the contract or not. Should they do not, the PSC termination will create less production and productivity, high unemployment as such. In the future, this sector will be no longer a major contribution for the national revenue. Gross Split regulation becomes a major concern for the investors and gives significant impact to the contribution of economy and development growth. Several research questions to be assessed are:

1. What are the pros & cons of conventional and gross split scheme implementation for Contractor?
2. What are the financial outcomes from both schemes for Anonymous PSC – the Contractor side?
3. Which scheme will perform the most profitable outcome for Anonymous PSC – the Contractor?

Objective

The research's objective is to perform the economic assessment thru business valuation on Anonymous PSC by comparing the PSC scheme between conventional and gross split in generating the pros & cons as well as the financial outcomes as recommendations for Anonymous PSC.

A. Business Issue Exploration

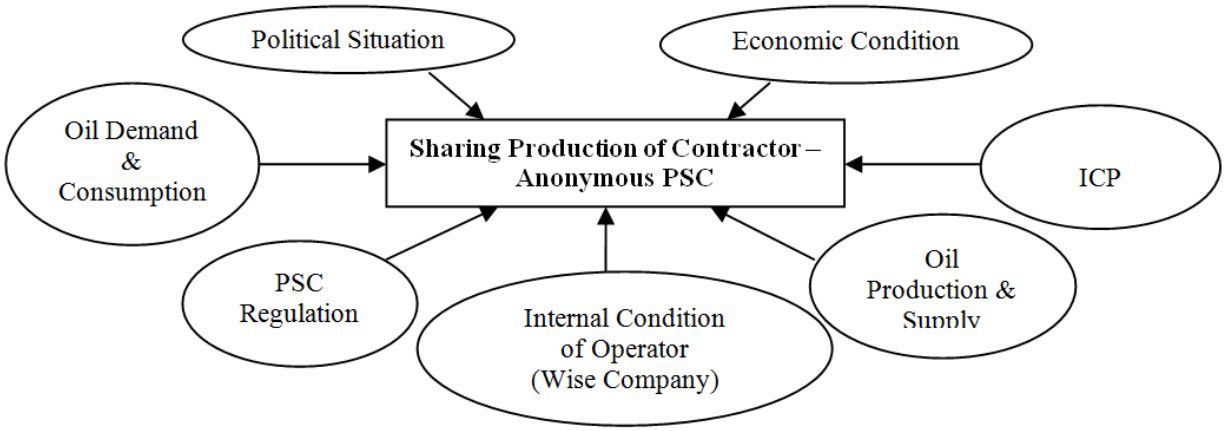


Fig. 3: Conceptual framework

Macro Analysis

- Political situation

The national political situation truly influences the oil & gas business sector.

- Economic Condition

All PSCs are targeted by the Government to contribute to the national revenue. Specific targets underlined on the State Budget which is translated under approved annual WP&B by SKKMIGAS.

Micro Analysis

- PSC regulation

PSC agreement will determine the percentage of sharing production or profit between GoI and Contractor. Below is the sharing percentage between conventional and gross split scheme:

TABLE I:
SHARING PRODUCTION PERCENTAGE OF ANONYMOUS PSC

Product	Sharing Production Percentage of Anonymous PSC			
	Conventional		Gross Split*	
	GoI	Contractor	GoI	Contractor
OIL	71.1538%	28.8462%	57%	43%
GAS	32.6923%	67.3077%	52%	48%

- ICP

The higher the ICP rate, the higher the gross production. As the gross production generates the gross sales, thus the more the gross production/sales will generate more sharing production/profit.

- Oil production & supply

The supply has negative correlation with the oil price. The high the supply, the low price will be, and the other way around.

- Oil demand & consumption

The high the demand, the high price will be, and the other way around. In conclusion, the oil demand has positive correlation with the sharing production/profit of Contractor.

- Internal condition of Wise Company

The SWOT Analysis of Wise is elaborated as follows:

TABLE II:
SWOT ANALYSIS ON WISE COMPANY

Strength	**Weakness**
- Operator of Anonymous PSC - Production phase - High daily capacity of 19,279 bpod of oil & condensate, and 195.7 mcf of natural gas (2016) - PSC Expiry date in 2028 - High skilled national resources & experts, good brand image	- High investment on the technology and human resources - High risk should the reserves are not proven - Other PSCs are on the exploration phase which require more capital injection - Future market size
Opportunity	**Threat**
- Gross Split scheme to apply once the PSC has expired - Economic condition in Indonesia to support the investment opportunity - High sharing percentage, production and profit for implementing Cost Recovery PSC	- ICP fluctuation - Political situation in Indonesia (upcoming national election in 2019) - Non cost recovery = high sunk cost Strict government regulation for the procurement/tender, projects, etc.

B. Five Forces of Porter Analysis

The elaboration 5 Porter Analysis for Anonymous PSC can be described as follows:

- The treat of new entrants (Low): Since industry demands high investment (technology and capital) and high risk as well.
- The power of suppliers (Low): The Indonesian oil sector with reference to the power of suppliers follows the general trend present in the oil and gas industry: a balanced relation between suppliers and oil companies. The suppliers however do not have many alternative buyers.
- The power of buyers (Direct Buyers Medium – Final Buyers Low): The individual purchaser of refined products has low bargaining powers.
- The threat of substitutes (Low/Medium): In the future the needs for the alternative will be high especially renewable ones (geothermal, etc). However, currently they are limited and not sufficient to fulfill market needs.
- Rivalry among the existing competitors (High): Following considerations: 1) Many competitors (263 PSCs on March 2017); 2) Industry growth is slow (esp. in 2013/2014 due to the decline of ICP); 3) High exit barriers; 4) Rivals; esp. from the international major oil & gas companies with high commitment to the business well managed, already engaged with the buyers for long term contract.

C. SWOT Analysis

Fig. 4: Conventional PSC SWOT analysis

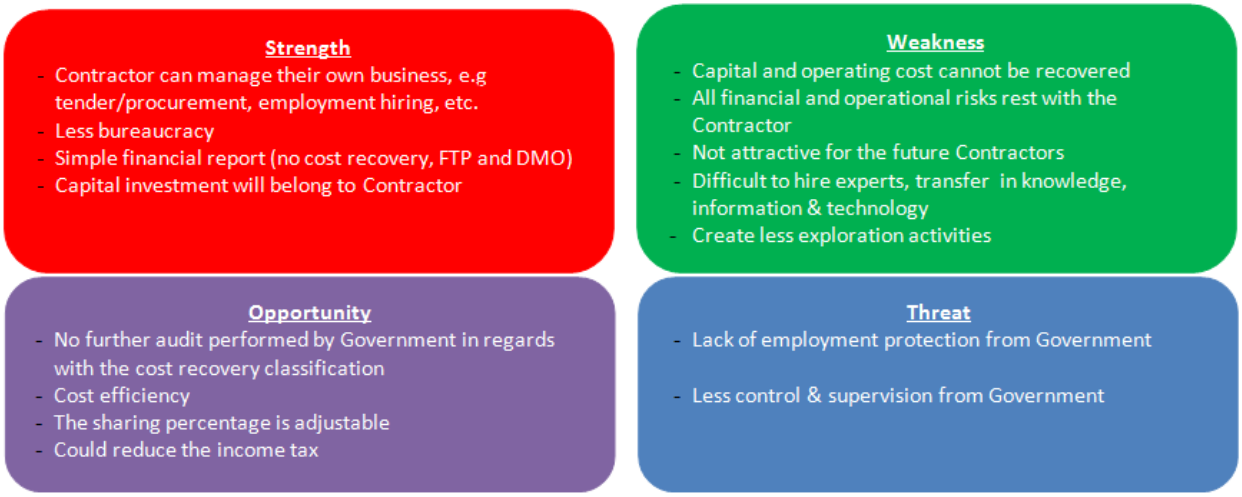


Fig. 5: Gross split PSC SWOT analysis

D. Financial simulations between Conventional vs Gross Split PSC at Anonymous PSC

The flow of sharing production or profit of Anonymous PSC with conventional scheme can be illustrated under below simple figures.

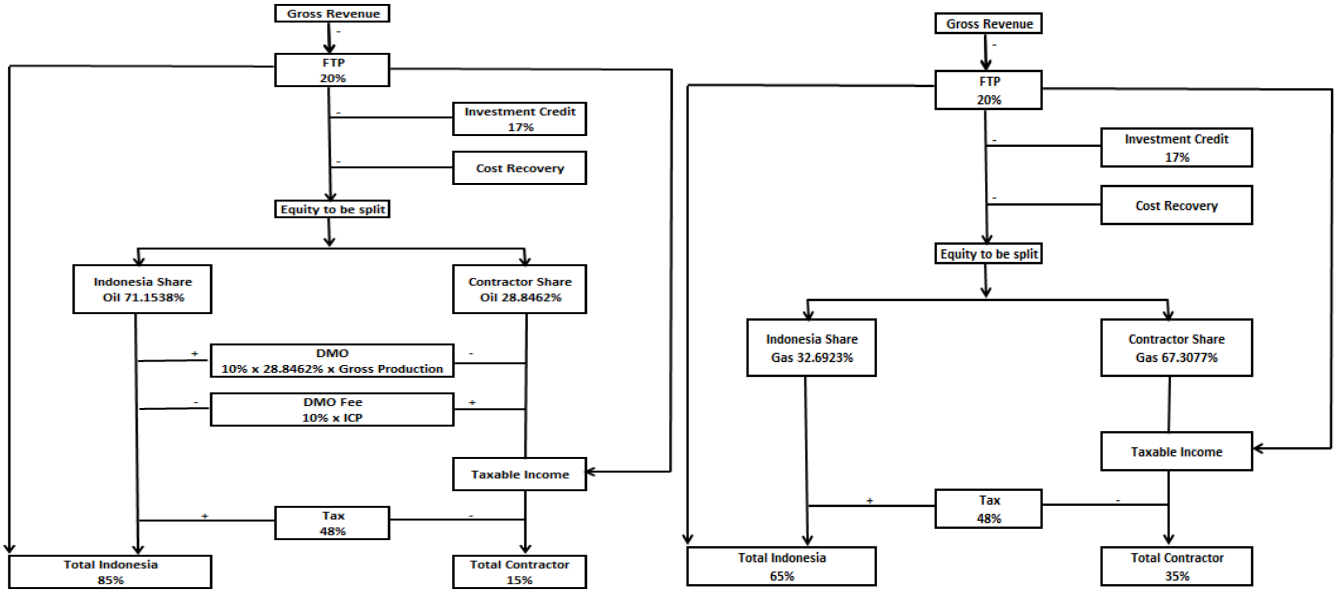


Fig. 6: Oil and gas sharing production/profit for Anonymous PSC – conventional

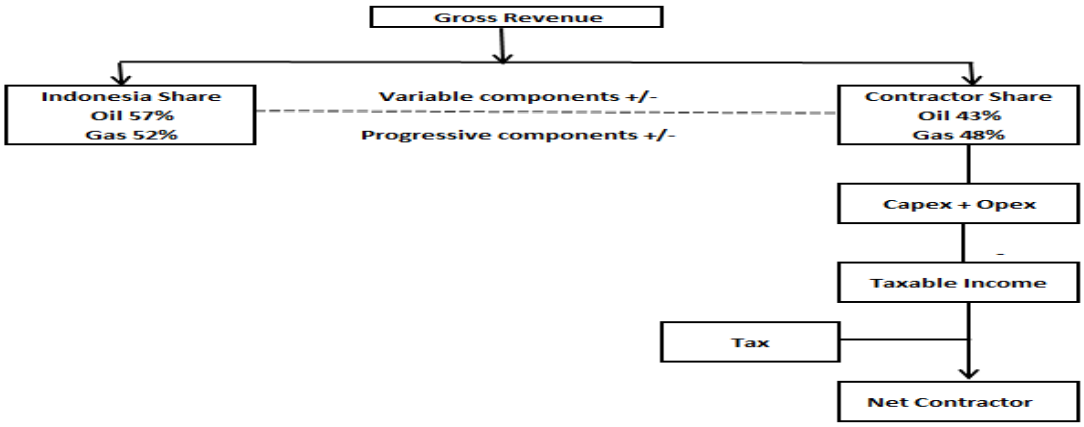


Fig. 7: Sharing production/profit for Anonymous PSC – gross split

For Anonymous PSC, the gross split components can be determined as follows (applicable for year 2017, while the following year will be adjusted based on the changes of each component, if any):

TABLE III:
VARIABLE AND PROGRESSIVE COMPONENTS OF ANONYMOUS PSC

No	Variable Components	Observations	Split Adjustment (%)
1	POD status	No POD amendment	0
2	Field location	Offshore (76.2 – 97.536 meter)	12
3	Reservoir depth	<=2500	0
4	Infrastructure availability	Well developed	0
5	Reservoir type	Conventional	0
6	Carbon dioxide content	5<=x<10	0.5
7	Hydrogen sulfide content	<100	0
8	Oil specific gravity	>=25	1
9	Domestic component level on the development field phase	30%<=x<50%	2
10	Production phase	Secondary	6
No	**Progressive Components**	**Observations**	**Split Adjustment (%)**
1	Oil price	US$ 48/Bbl (2017 revised WP&B)	9.25
2	Natural gas production	US$ 7/MMBTU	0
3	Oil & gas cumulative production	>= 175 MMBOE	0

It generates the sharing percentage between GoI and Contractor as follows.

TABLE IV:
SIMULATION BETWEEN CONVENTIONAL VS GROSS SPLIT PSC (VARIABLE & PROGRESSIVE COMPONENTS)

Sharing Production Percentage – Anonymous PSC	Crude Oil		Natural Gas	
	Existing PSC (Cost Recovery)	Gross Split PSC	Existing PSC (Cost Recovery)	Gross Split PSC
Government	71.1538%	27%	32.6923%	36%
Contractor	28.8462%	73%	67.3077%	64%

- **Financial simulation using NPV and IRR**

The discount rate is calculated using formula of Weighted Average Cost of Capital ("WACC")

$$WACC = K_e \times W_e + K_d \times (1 - T) \times W_d$$

The calculation of Cost of Equity (Ke) is performed using Capital Asset Pricing Model ("CAPM") which consists of Risk-Free Rate of Return (Rf) using 2017 SBI rate of 5.90%. To determine the risk premium (Expected Return of the Market "Rm" - Rf) using Damodaran analysis from NYU Stern; which is 8.82% for Indonesia while Beta of Asset (ß) us from infinancials.com is 1.20.

*Ke = Rf + ß * (Rm-Rf)*
Ke = 5.90% + 1.20 (8.82%)
Ke = 16.48%

The calculation of Cost of Debt (Kd) is based on the market value of Company's debt, weighted rate to the total debt, local currency depreciation to USD as well as interest rate of each debts. Thus, the depreciation would be 3.25%, forward currency IDR 13,763 and Kd of Wise Company 8.76%.

TABLE V:
COST OF DEBT AND WACC OF WISE COMPANY, SOURCE: WISE COMPANY

In USD

	Rate	Total Debt	Weighted	Weighted Rate
BANK LOANS				
- Bank I	5,00%	140.000.000	15,14%	0,76%
- Bank II	5,00%	180.925.000	19,56%	0,98%
- Bank III	5,00%	16.000.000	1,73%	0,09%
BONDS				
Dollar	6,05%	17.849.627	1,93%	0,12%
Rupiah	11,80%	498.779.232	53,94%	6,36%
SGD	5,90%	71.198.859	7,70%	0,45%
TOTAL		924.752.718	100,00%	8,76%

US interest rate	1,25%
Indonesia interest rate	4,50%
Currency depreciation - Rupiah to Dollar	3,25%
1USD to Rupiah	13.330
Forward Currency	13.763

Cost of Equity	16,48%
Cost of Debt	8,76%
Debt Ratio	81,6%
Equity Ratio	18,4%
Tax	25%
WACC	**8.39%**

II. BUSINESS SOLUTION

Having elaborated both schemes using SWOT Analysis, the pros & cons from each scheme as follows:

TABLE VI:
CONVENTIONAL PSC PROS AND CONS

Pros	Cons
1. Capital and operating cost can be recovered 2. Risk both financial and operation are borne by both GoI and Contractor 3. Sharing profit is shared between GoI and Contractor with certain percentage as stipulated on the PSC Agreement 4. More control & supervision by the Government	1. Long approval and bureaucracy for the projects 2. Delay in permit, delay in project, less economics 3. Strict government audit in regards with cost recovery 4. Complex reports to Government

TABLE VII:
GROSS SPLIT PSC PROS AND CONS

Pros	Cons
1. Contractor could manage their own business 2. Less bureaucracy 3. Capital investment belongs to Contractor 4. Simple financial and other reports 5. Cost efficiency	1. Capital and operating cost cannot be recovered 2. Risk both financial and operational are borne by Contractor only 3. Create less exploration activities 4. Difficulty in transfer knowledge and technology

Both schemes truly perform their own pros and cons in a different way. In summary, the direct comparison of pros & cons of the concepts are defined:

TABLE VIII:
LIST PROS AND CONS BETWEEN CONVENTIONAL VS GROSS SPLIT PSC

Item	Conventional PSC	Gross Split PSC
1. Cost Recovery	√	–
2. Sharing risk	√	–
3. Less bureaucracy	–	√
4. Cost efficiency	–	√
5. Capital investment ownership	–	√
6. More control and supervision from government	√	–
7. Exploration activities	√	–
8. More potential productions	√	–
9. Transfer knowledge and advanced technology	√	–
10. Less complexity in government audits and regulations	–	√
11. Contractor authority to manage the business	–	√
12. Simple financial and other reports to government	–	√
13. Home office overhead is subject to cost recovery	√	–

The table above shows less risk and a bit effort should Contractor using the conventional scheme. While in contrary, using the gross split PSC will create less effort but high risk for the Contractor. The alternatives given will be further analyzed to determine the implications.

A. Financial Outcome between Conventional Vs Gross Split PSC

The projections of cost and production both oil & gas in Anonymous PSC are shown below:

TABLE IX:
COST AND PRODUCTION PROJECTION – OIL AND GAS

Year	Investment (MMUS$)		Opex	Production
	Capital	Non Capital	US$/Bbl	mbblpd
0	-	65		
1	11	21	9	19
2	19	23	9	20
3	32	21	9	23
4	30	20	9	20
5	38	19	9	14
6	26	18	9	10
7	23	9	9	9
8	10	8	9	5
9	7	7	9	3
10	-	-	9	3
11	-	-	9	3
12	-	-	9	3
Total	197	209		133

Year	Investment (MMUS$)		Opex	Production
	Capital	Non Capital	US$/MCF	MMSCFD
0	0	339		
1	55	105	0,45	178
2	96	113	0,45	154
3	158	104	0,45	175
4	152	99	0,45	187
5	153	74	0,45	134
6	104	70	0,45	124
7	182	74	0,45	161
8	84	65	0,45	213
9	57	56	0,45	180
10	0	0	0,45	150
11	0	0	0,45	136
12	0	0	0,45	126
Total	1.040	1.097		1.918

Based on the data and tables given, the economics calculation of Anonymous PSC with financial outcome of NPV and IRR Contactors would result as follows:

TABLE X:
FINANCIAL OUTCOME OF ANONYMOUS PSC USING CONVENTIONAL VS GROSS SPLIT PSC

Indicator		Conventional PSC		Gross Split PSC	
		Oil	Gas	Oil	Gas
IRR Contractor	%	19,1%	22,3%	17,8%	11,9%
Total Contractor	%	15,0%	35,0%	43,0%	48,0%
Contractor NPV	MMUS$	24,5	297,5	12,2	80,5
Contractor Total Take	MMUS$	1.696,3	3.189,6	1.767,8	3.580,6
Contractor Net Share	MMUS$	129,5	1.076,7	104,5	763,2
Government NPV	MMUS$	535,3	1.172,9	471,7	1.007,2
Government Total Take	MMUS$	733,9	1.999,6	662,4	1.608,7

The table above shows the consistent results; that overall (cumulative of oil & gas product) for conventional scheme result the greater sharing profit in IRR, NPV and net share for both oil & gas to Contractor compare to gross split scheme. Should the situation is aligned with projection, it will be more profitable in oil project for Contractor using conventional scheme than gross split scheme. In gas project, both concepts are profitable as they generate high and positive NPV. Taking conventional concept will be more profitable after all. In addition, there are several factors that influence those financial outcomes which are oil & gas production, oil & gas price, sharing percentage and tax.

B. Analysis of Business Solution Alternative

To ensure the alternative chosen is the best, the research also performs the Kepner–Tregoe approach:

TABLE XI:
DECISION ANALYSIS OF CONVENTION VS GROSS SPLIT

MUST Align with PSC agreement and other existing regulations	Conventional G			Gross Split G		
WANTS	Y			N		
- More exploration activities	Y			Y		
- High profit	Y			M		
- More production (as a result from successful exploration)	N			Y		
- Cost efficiency	N			Y		
- Less bureaucracy	M			Y		
- Less exposure & audits finding	Y			N		
- High transfer knowledge & advanced technology	Y			M		
- Control, supervision & protection from Government (SKKMIGAS as such)						
Weight: Yes (10), Medium (50), No (90)	Rank	Weight	Total	Rank	Weight	Total
Ranking:						
1. More exploration activities	1	10	10	2	90	180
2. High profit	1	10	10	2	90	180
3. More production	1	10	10	2	50	100
4. Cost efficiency	2	90	180	1	10	10
5. Less bureaucracy	2	90	180	1	10	10
6. High transfer knowledge & advanced technology	1	10	10	2	90	180
7. Less exposure & audit findings	2	50	100	1	10	10
8. Control, supervision & protection from Government	1	10	10	2	50	100
GRAND TOTAL			**510**			**770**

Note: Go (G), Not Go (NG), Yes (Y), Medium (M), and No (N)

Based on the approach, basically both schemes fulfill the "must-have" attribute in which the concepts do not conflict with the regulation. The result shows that conventional scheme generates less score (510) compared to gross split (770), thus it indicates that the conventional PSC could be considered and recommended as the most optimum solution than the gross split (with regards to the condition and circumstances of the Anonymous PSC and oil & gas industry).

In conclusion, the research recommends that Wise Company to use the conventional scheme until 2028. The future event or potential problem implications as anticipations from the implemented concept shall be taken in to attention for Anonymous PSC as follows:

TABLE XII:
POTENTIAL PROBLEM ANALYSIS ("PPA") OF CONVENTIONAL PSC

Future Event	Consequences	Probable Causes
Keep using conventional PSC scheme until expiry date in 2028.	- High bureaucracy. - Less cost efficiency. - High exposure & audit findings.	- Long approval & bureaucracy for the projects. - Delay in permit & project, less economics. - Strict government audit in regards with cost recovery.

Preventive Actions	Contingent Actions
- Professional approaches with the Regulator/ Authority by maintaining good relationship with them, attending invitation of external meetings and regulation socialization, being cooperative and responsive, participating in the events, submitting the requests (reports, documents) in time, and so on. - Comply with the procedures & regulations: • Internal procedures • Government regulations	To deal with high bureaucracy, exposure & audit findings: - Conduct peer audit across function. - Perform internal audit in regular To deal with less cost efficiency: - Restructure the effective organization, less hierarchy, utilize and empower the existing human resources. - Reduce the overhead cost

In the future, Contractor could later on consider to extend the contract or not by revisiting the term and condition of the new contract with Government as well as performing the economics simulation since the regulation shall be dynamic over the time.

III. Acknowledgements

The author would like to acknowledge the friends and family who supports throughout the completion of the journal.

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