International Journal of Technology 14(2) 246-256 (2023)
Received December 2021 / Revised January 2022 / Accepted February 2022

International Journal of Technology

Comparison of Gross Split Production Sharing Contract and Taxation Aspects for Economic Incentives in Indonesia

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Abstract. The objective of this study is to evaluate the comparison of economic incentives from the aspect of production sharing contract gross split, and taxation, especially to determine the balance of incentives that the government can provide either in taxation or additional discretion splits to contractors in the Alfa working area, which is an oil and gas operational work area located in Kalimantan. The method used in this study is a quantitative method, by performing calculations using a gross split profit sharing scheme to observe the economic comparison of Alfa working area without discretion, with additional discretion and a combination of tax percentages, with various combinations, it provides 25 (twenty-five) scenarios for economic calculations to the Alfa working area. Based on the economic calculation in Alfa's work area, the profitability index (PI) value is 1.09, where this value shows the minimum economic value of the contractor. Based on these scenarios, an economic analysis was obtained with a combination of indirect tax 0-100% and additional discretion split of 0-100%. According to the study's results, if the additional discretion incentive was less than 50%, the contractor's NPV value was negative. On the other hand, 75% discretion was given with indirect tax between 0-50%, and 100% discretion was offered. Through scenario simulation calculation with a PI target of 1.09, the optimum result was obtained with a balanced incentive amount at 50% indirect tax and an additional 92% split discretion.

Keywords: Discretion; Gross split; Incentives; Indirect tax; Profitability index

1. Introduction

Indonesia's upstream oil and gas industry is still one of the drivers of the national economy. Oil and gas have an important role in modern industry, and the demand for oil and gas is closely related to economic development (Cheng *et al.,* 2018). Indonesia's oil reserves and declining oil production is the focus of the Indonesian government, which aims to quickly change and accelerate the use of a mixed-energy policy (Bawono and Kusrini, 2017). Therefore the government continues to strive to create an attractive investment climate to achieve the petroleum production target of 1 million barrels per day

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doi: 10.14716/ijtech.v14i2.5441

and 12 billion cubic feet per day of natural gas (BSCFD) by 2030. Investors say that oil and gas sector investment in Indonesia is less attractive. Some publications such as IHS Markit, Wood Mackenzie, Fraser, and others mention that Indonesia's upstream fiscal attractiveness rating is relatively low compared to other countries (BUMI, 2021). Indonesia is currently making advances related to the investment climate in the field of oil and gas, where other countries are also increasing their attractiveness, Radical investment climate improvements can help to attract oil and gas investors. To achieve the oil and gas production target by 2030, all parties need joint efforts. Currently, investors are given the option to choose the form of the production sharing contract (PSC), including gross split PSC or cost recovery PSC. There are several incentives provided by the government, in the Cost recovery Production Sharing Contract (PSC), the government provides DMO (Domestic Market Obligation) Holiday rewards, Investment credit, and accelerated depreciation. In the gross split PSC, the government provides an adjustment to the number of profit sharing, incentives for the use of state property based on field economic considerations, exemptions from VAT related to the import and delivery of certain strategic taxable goods (including LNG), and elimination of the provision on utilization fees for exterminated state-owned goods

Production sharing contracts in Indonesia continue to develop according to regulatory changes and the times, Indonesia has implemented the PSC cost recovery system since 1965 and has passed through three generations. Since 2017 the government has issued a new model of the PSC scheme through Ministerial Regulation No. 8/2017 about Gross Split Production Sharing Contracts. Since the implementation of this gross split scheme, 16 oil and gas areas have used the system (Directorate General of Oil and Gas, 2018). In the gross split scheme, this cost recovery component is eliminated and secure government revenue (Daniel, 2017), because the split calculation scheme between the government and the contractor is determined at first (base split), there are also variable and progressive components and additional components for contractor revenue sharing, the discretion of the Minister of Energy and Mineral Resources to improve the economic level of upstream oil and gas projects. With this discretion, the policy will encourage contractors to drill more wells. So that the potential of finding new oil reserves will be higher, which benefits contractors and the government without changing the oil split in government regulations (Giranza and Bergmann, 2018). Gross split PSC has similar characteristics to a royalty scheme, which has been successful elsewhere in the world (Roach and Dunstan, 2018).

Several researchers have also conducted many studies by comparing PSC Cost recovery and PSC gross split. Research conducted by Buhori, Rokhim, and Wibowo (2018) shows that PSC cost recovery is more attractive to contractors, In other research, the results show that this gross split system provides higher cash flow results for contractors (Jumiati and Sismartono, 2018). An interesting research result was reported by Daniel (2017), which showed that using the gross split PSC system would be better without indirect tax. This research was conducted in the Alfa working area. The Alfa working area received an extension production sharing contract gross split scheme, the minimum economic indicator that must be achieved by the contractor is from the value of profitability index is 1.09. The use of this profitability index indicator is due to the very volatile cash flow conditions from Alfa working area is always positive so the IRR value is inaccurate. The Novelty of this paper is to find a balance of the number of incentives that can divide between taxation and discretion.

2. Methods

Economic calculations Alfa Working area uses the Gross Split PSC scheme (Regulation MEMR No.8, 2017). Table 1, details the gross split PSC regulates.

Table 1 Variable and Progressive Components in Gross Split PSC

I. Base Split	
Oil	
Government	57%
Contractor	43%
Gas	
Government	52%
Contractor	48%

II. Progressive Component			
Parameter	Split (%)	Parameter	Split (%)
Oil Price (US$/barrel)		**Oil & Gas Cum. Production (MMBOE)**	
(85-ICP) x 0.25		<30	10
Gas Price (US$/MMBTU		30≤x<60	9
<7	(7 - Gas price) x 2.5	60≤x<90	8
7-10	0	90≤x<125	6
>10	(10 - Gas price) x 2.5	125≤x<175	4
		≥175	0

III. Variable Component					
Parameter	Split (%)	Parameter	Split (%)	Parameter	Split (%)
Block Status		**Support Infrastructure**		**H_2S (ppm)**	
POD I	5.0	Well Developed	0	<100	0
POD II	3.0	New Frontier Offshore	2	100≤x<1000	1
No POD	0.0	New Frontier Onshore	4	1000≤x<2000	2
Field Location (*h=m)		**Reservoir Condition**		2000≤x<3000	3
Onshore	0.0	Conventional	0	3000≤x<4000	4
Offshore (0<h≤20)	8.0	Non-Conventional	16	x≥4000	5
Offshore (20<h≤50)	10.0	**CO_2 (%)**		**Local Content (%)**	
Offshore (50<h≤150)	12.0	<5	0	<30	0
Offshore (150<h≤1000)	14.0	5≤x<10	0.5	30≤x<50	2
Offshore (h>1000)	16.0	10≤x<20	1	50≤x<70	3
Reservoir Depth (m)		20≤x<40	1.5	70≤x<100	4
≤2500	0.0	40≤x<60	2	**Production Phase**	
>2500	1.0	x≥60	4	Primary	0
Oil Specific gravity (API)				Secondary	6
<25	1			Tertiary	10
≥25	0				

The split on this gross split can be adjusted based on 13 (thirteen) components consisting of 10 (ten) variable components and 3 (three) progressive components (Regulation MEMR No.8, 2017), this component can be seen in Table 1. Based on the Minister of Energy and Mineral Resources Regulation No. 52/2017, in the economic calculation of the Gross Split PSC in a working area, the Minister of Energy and Mineral Resources and the Minister of Finance can provide incentive approval by adding a percentage of split to the contractor.

2.1. Project Economy

The decision-making process to determine the value of a long-term investment in a project requires a techno-economic analysis and should be based on the maximum return on equity of the investment (Wicaksono, Arshad, and Sihombing, 2018). This study uses NPV, PI, and POT to determine the economics of a project.

2.1.1. Net Present Value (NPV) is the discrepancy between the value of cash inflows and the value of cash outflows for a period. NPV is usually used as a capital allocation to analyze the benefits of a project to execute. In addition, NPV is a direct measure of profitability and provides an overview of how the contractor's cash flow will be affected by each project (Sajjad *et al.,* 2021). Generally, a positive NPV value will be profitable, while projects with a negative NPV value will result in losses (Peterson and Fabozzi, 2002). NPV can be calculated using the formula 1 below:

$$\mathrm{NPV} = \sum_{t=1}^{N} \frac{\mathrm{Rt}}{(1+\mathrm{i})^{t}} \quad (1)$$

Where: N = Number of periods, t = time of cash flow being measured, I = cost of capital, and Rt = cash flow at time t.

2.1.2. Profitability Index This method calculates the comparison between the value of net cash flows that will come with the value of the current investment. The profitability index can be calculated using formula 2 below:

$$\mathrm{PI} = \frac{\sum_{t=1}^{n} \frac{\mathrm{CFt}}{(1+k)^{t}}}{\mathrm{IO}} \quad (2)$$

Where: CF=Annual cash inflow, IO=Total investment, n=project age, and k=capital interest rate. The Profitability Index must be greater than one to be considered feasible. The larger the profitability index, the more feasible the investment (Peterson and Fabozzi, 2002).

2.1.3. Pay Out Time (POT) or payback period is the time required to recover the initial cost of a project. This POT is a parameter that indicates the year in which the Cumulative Cash Flow is equal to 0 (Pramadika and Satiyawara, 2018). POT can be calculated using the formula 3 below:

$$PP = \frac{IO}{\sum CF} \quad (3)$$

Where: IO=Initial investment and CF=Cash inflow

Based on research conducted by (Lyukevich *et al.,* 2020), evaluating the project's economic risk can use an algorithm method that is faster with accurate results. This is very important because the calculation of techno-economic analysis, evaluation of economic risk is needed to assess risk factors in developing a project. In addition, mitigation can be made from the risks that have been determined so that the project implementation is under the plan.

2.2. Executive summary of Alfa working area

Alfa working area is in Kalimantan and its location is onshore, where this working area is already in the exploitation stage. Alfa working area using a gross split scheme. The reserves from the Alfa working area are up to the technical limit based on the reserve status report 31.12.2020 for oil and condensate 2P is 18 MMSTB, and for Associated Gas and Non-Associated Gas 2P is 70 BSCBSChe cumulative oil and gas production is 267.51 MMBOE. A peak production rate in 2027, which is 18.89 MMBOE, can be seen in Figure 1.

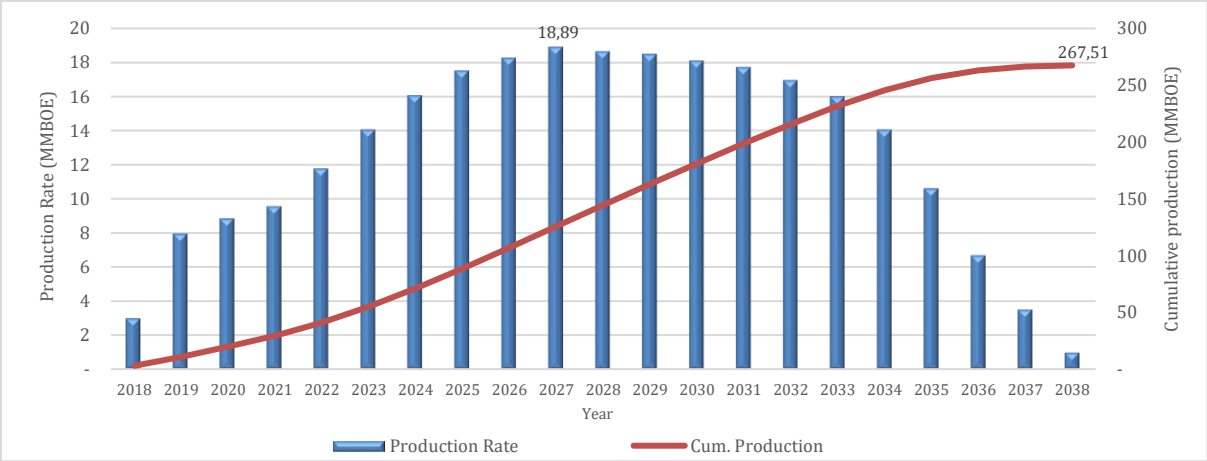

Figure 1 Alfa working area oil gas production profile

2.3. Scenario for calculating the economics of incentives and taxation

In this study, various economic calculations will run with 25 (twenty-five) incentive scenarios from discretion and tax to find the maximum economic value can be seen in Figure 2.

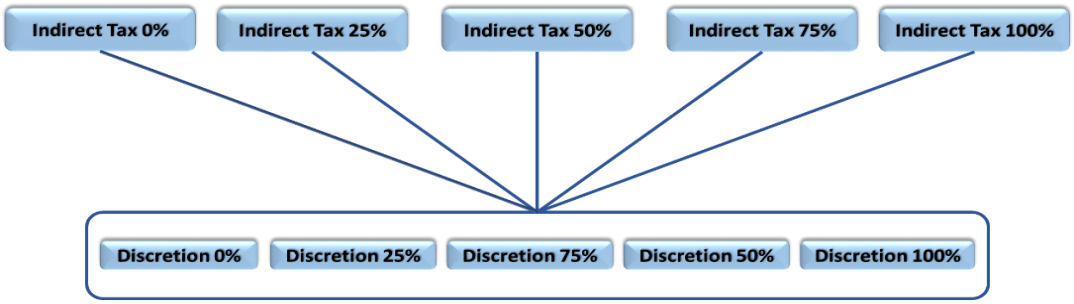

Figure 2 Scenario calculating the economics of incentives and taxation

The percentage of discretion used is the greater percentage split obtained from the results of the economic calculation of the Alfa working area, and for percentage indirect tax is the percentage of VAT dan LBT. Tax revenue is an important source for sustainable development, which increases the country's ability to generate its tax revenue (Victorova *et al.,* 2020). However, to improve the oil and gas investment climate and contractors can develop alfa working areas, then the provision of tax incentives is necessary. It follows that if there are no incentives, the Alfa working area is not developed, and of course, the government will not receive revenue from this oil and gas sector. Besides, the 25 scenarios above, this study also simulates calculation scenarios with a target PI of 1.09 and using an indirect tax 0-100%, to find the optimum value of discretion.

3. Results and Discussion

3.1. Fiscal terms for the Alfa working area

Before running economic calculations, it is necessary to determine the distribution of split for the Alfa working area between the government and the contractor formerly using the gross split PSC scheme, according to the MEMR Regulation. Details of the base split based on a base split contractor in Table 1 for oil 43% and gas 48%, variable component, and progressive split based on the condition for the Alfa working area, as shown in Table 2.

Table 2 Fiscal terms Alfa working area

Component Splits	Status	Contractor Split	
		Gas	Oil
I. Base Split		48%	43%
II. Variable Split			
Block Status	No POD	0%	0%
Field location	Onshore	0%	0%
Reservoir depth (m)	> 2500	1%	1%
Infrastructure	Well Developed	0%	0%
Reservoir Condition	Conventional	0%	0%
CO_2 (%)	40 < x < 60	2%	2%
H_2S (ppm)	< 100	0%	0%
Specific Gravity of oil (API)	>25	0%	0%
Local Content (%)	50 ≤ x < 70	3%	3%
Production Phase	Primary	0%	0%
III. Progressive Split			
Cumulative production	<30 MMBOE	10%	10%
Oil/gas price	US$/bbl. US$/MMBtu	5%	12%
Total contractor Split		69%	71%
Government split		31%	29%

Based on the determination of the alfa working area split, the total results for the contractor split for gas are 69% and for oil 71%, while the revenue sharing for the government is 31% for oil and 29% for gas.

3.2. Alfa working area development costs

Calculating development costs in the Alfa working area requires data and estimates of capital expenditure costs (CAPEX), and operation and maintenance costs (OPEX). In the gross split PSC, the contractor must be as efficient as possible to execute activities to improve the contractor's profits. Therefore, CAPEX and OPEX efficiency are needed, one of which is optimizing development drilling activities. In drilling activities, it is necessary to formulate the best and optimal drilling fluid to get the minimum cost (Kusrini *et al.*, 2018; Kusrini *et al.*, 2020).

This capital expenditure cost (CAPEX) includes drilling costs, facilities, and costs for G&G Study and seismic, so the total cost of CAPEX is MMUS$ 4,490.8. This cost needs to execute all the long-term plan work programs in the Alfa working area, with detailed annual costs, as shown in Figure 3.

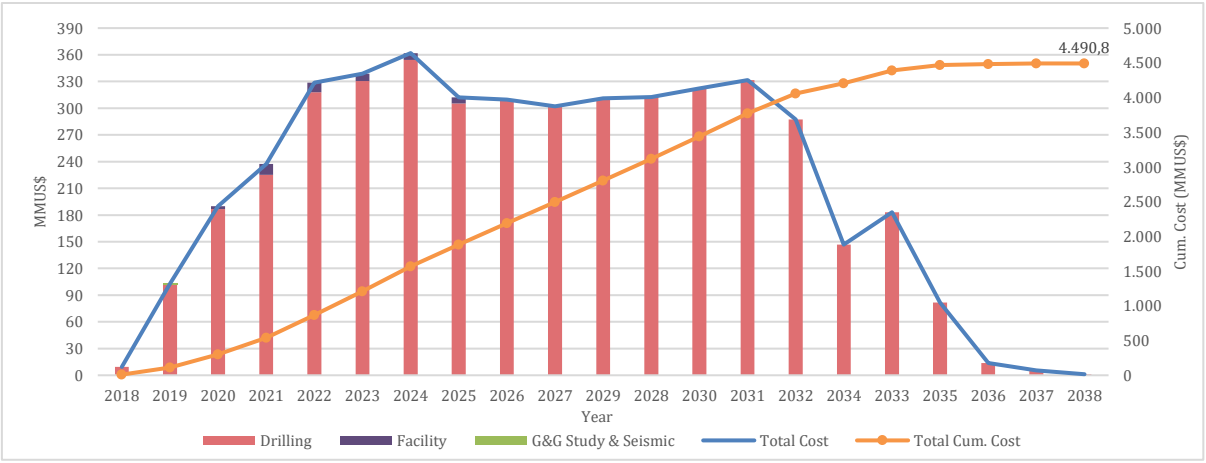

Figure 3 Detail of Alfa working area capital expenditure cost

The operating and maintenance costs (OPEX) consist of Abandonment and Site Restoration (ASR) costs, asset rental costs, and land and building tax (LBT) costs. For this operating cost, the VAT charge on production operating costs is 10% based on Law No. 42 of 2009, and LBT the assumption of a tax rate of 0.5%, a sales value of the taxable object (SVTO) of 40%, and a tax coefficient is 10.04. Thus, the total cost of OPEX is MMUS$ 3,940.5, for detailed annual cost as shown in Figure 4.

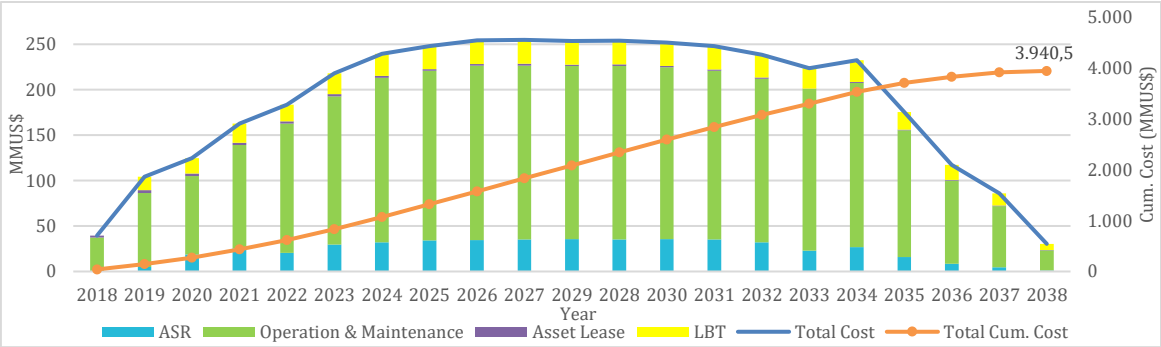

Figure 4 Detail of Alfa working area operation expenditures

3.3. Economy Alfa working area

From the results of economic calculations using the fiscal term of Alfa working area where the number of splits has been determined, the contractor's NPV is positive, with discretion 26%, the value of the profitability index (PI) is 1.09, meaning the PI value more than one which is the minimum value for the contractor to be able to develop the working area and pay out time is 8 years. From this calculation, revenue from contractors is MMUS$ 647, and government revenue is MMUS$ 2,899, as shown in Table 3.

Table 3 Alfa working area economic calculation

Parameter	Unit	Fiscal Term Alfa Working Area
Contractor gas split	%	69%
Contractor oil split	%	71%
Discretion	%	26%
WAP Gas	S$/MMBtu	6
WAP Oil	US$/bbl	59
Gross Revenue	MMUS$	10,766
Total CAPEX	MMUS$	4,491
Total OPEX	MMUS$	3,941
Contractor Profitability:		
Contractor Net Operating Profit	MMUS$	647
(% Gross Revenue)		6.68%
Total Contractor Net Cash Flow	MMUS$	600.64
(% Gross Revenue)		6.20%
Contractor NPV	MMUS$	173
Profitability Index		1.09
Pay Out Time	Years	8.4
Government Profitability:		
Government Take	MMUS$	1,632
(% Gross Revenue)		15%
Indirect Tax (VAT, LBT & Asset Lease)	MMUS$	1,268
(% Gross Rev)		12%
Government Take includes Ind Tax	MMUS$	2,899
(% Gross Revenue)		27%

3.4. Calculation of Profitability Index from 2017-2020 POD Data with Economic Data of Alfa Working Area

To see the equity of the incentives provided by the government in the Alfa working area, a comparison of the profitability index data against POD data that has received approval from 2017 to 2020, as shown in Figure 5 below.

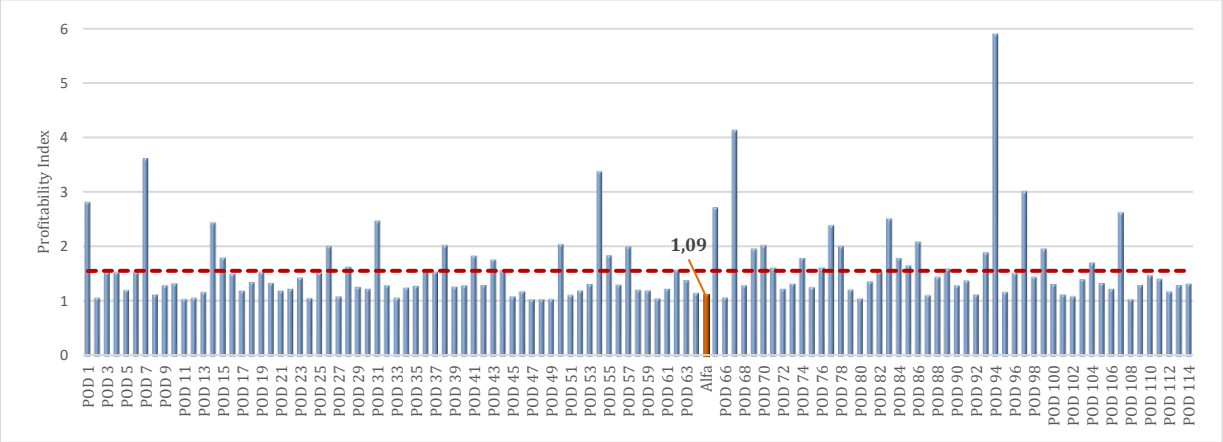

Figure 5 Comparison of PI Data POD 2017 – 2020 with PI Alfa working area

Based on the POD data shows that the average PI from POD data is 1.55, which means that the results for the economic calculation of the Alfa working area, where the PI is 1.09, results in reasonable incentives for the Alfa working area. However, it is below the average value when compared to the data for each PI POD, the PI value of 1.09, according to the contractor, is sufficient to develop the Alfa working area.

However, based on the discretion previously given by the government, the percentage is currently very high. Therefore, the government wishes to see the discretion value lowered to below 26%. So, a re-evaluation is carried out regarding the additional amount of the split given. So that in this study an analysis of the number of incentives provided is not only from the portion of the Ministry of Energy and Mineral Resources but also from tax, along with indirect tax exemptions (VAT and LBT), which includes a combination scenario of a predetermined percentage that has been set upon in the beginning.

3.5. Economic calculation with discretion and taxation scenario

From the results of the economic calculations of 25 scenarios, it will get the profitability index and NPV value, as shown in Figures 6 and 7. Based on the calculation using formula 1, results in 25 (twenty-five) economic scenarios. Based on Figure 6, the contractor's NPV is negative if discretion is below 75%.

The economic viability of a project other than the NPV value can also be seen from the PI value using formula 2. The PI value is below one if the discretion is below 75%. The PI value in Figure 7 will exceed the minimum value of 1.09 if the contractor gets a tax incentive of 0-75%. At a later stage for pay out time (POT) which was calculated using Formula 3, if NPV is negative, POT is zero. If a value of 75% discretion applies, then the POT is 8 to 18 years.

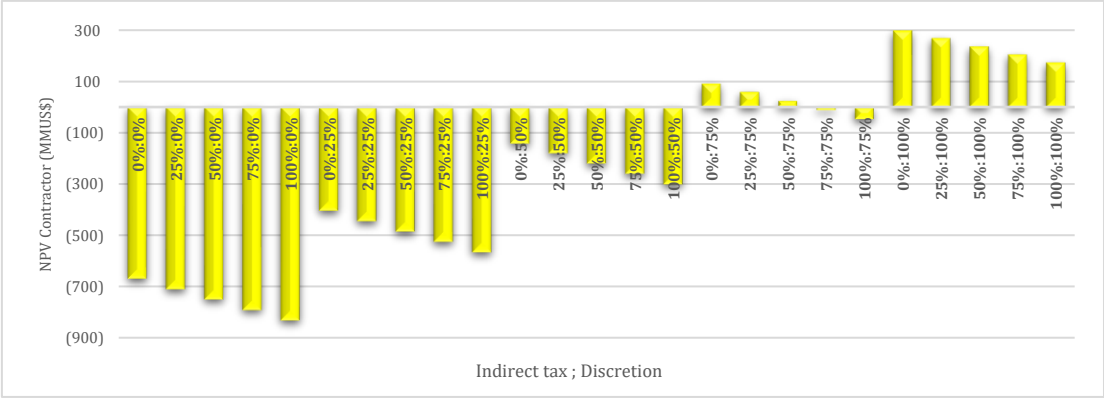

Figure 6 Comparison of NPV contractor for the case of 25 scenarios

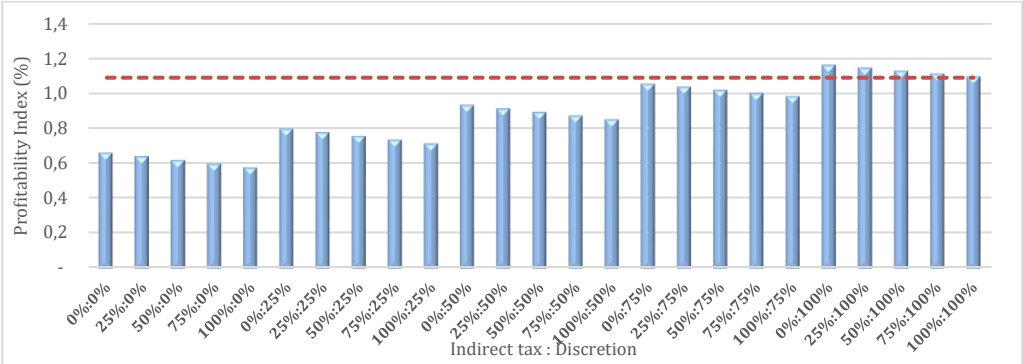

Figure 7 Comparison of profitability Index of 25 economic scenarios

For the balance of the incentive portion between the additional split discretion given by the Ministry of Energy and Mineral Resources and the indirect tax incentive provided by the ministry of finance, a calculation simulation with a target PI value of 1.09, as shown in Table 4.

Table 4 Summary of calculation simulation scenario

Parameter	Unit	Indirect Tax: Discretion			
		0%: 85%	25%:88%	50%:92%	75%:96%
Gross Revenue	MUS$	10,766	10,766	10,766	10,766
Total CAPEX	MMUS$	4,491	4,491	4,491	4,491
Total OPEX	MMUS$	3,514	3,621	3,727	3,834
Contractor Profitability:					
Contractor Net Operating Profit	MMUS$	643	643	642	646
(% Gross Rev)		6.64%	6.64%	6.63%	6.67%
Total Contractor Net Cash Flow	MMUS$	606	604	600	602
(% Gross Rev)		6.26%	6.23%	6.19%	6.21%
Contractor NPV	MMUS$	173.11	172.82	172	173.44
Profitability Index	%		1.09	1.09	1.09
Pay Out Time	Years	8.24	8.26	8.27	8.28
Government Profitability:					
Government Take	MMUS$	2,057	1,952	1,848	1,738
(% Gross Rev)		19.11%	18.13%	17.17%	16.15%
Indirect Tax (VAT, LBT & Asset Lease)	MMUS$	262	513	765	1,016
(% Gross Rev)		2.43%	4.77%	7.10%	9.44%
Gov. Take includes Indirect Tax	MMUS$	2,319	2,465	2,613	2,754
(% Gross Rev)		21.54%	22.90%	24.27%	25.59%

Based on the calculation of the simulation scenario with a target of 1.09, the results indicate that there are two comparisons of indirect tax and discretion with large

government revenues, in a ratio of 50%:92% and 75%:96%. At a ratio of 75%:96%, the discretion value is 24.9%, where this value is still close to the initial discretion value of 26%. Thus, the government wants to calculate the economics of the Alfa working area to achieve a balance between the number of taxes and discretion. The optimum result is in a ratio of 50%:92%, with a discretion of 23.9%. Similar to the results of research conducted by Daniel (2017), it is emphasized that a gross split PSC is more attractive than cost recovery PSC if there is no indirect tax, but PP 79/2010 has regulated indirect taxes. The Government's effort in the Alfa working area by evaluating the balance between tax and discretion is that contractors get appropriate incentives to continue the development of this work area.

4. Conclusions

The economic analysis of the Alfa working area uses the gross split PSC with an additional split discretion of 26%, the PI value is 1.09 which is the contractor's minimum economic value. From the approval of the previous economic calculation of the development of the working area or field, the discretion value of 26% can be optimized. The results of the optimization calculation for the government include an indirect tax of MMUS$ 2,613. Based on economic calculations in the Alfa working area with various scenarios, it can be resumed that with a tax incentive of 0-100%, the additional discretion split cannot be below 20%. From the evaluation results in the Alfa working area, it can be seen that consolidation is needed between the Ministry of Finance and the Ministry of Energy and Mineral Resources to ensure oil and gas incentives for contractors. In this study, the tax incentives used in the scenario are only limited to VAT and LBT. Suggestions for further research can be an assessment of other incentives that can be provided by the government such as the exemption from the use of state property, exemptions from import duties for goods used for petroleum operation purposes, accelerated depreciation, and other incentives. This research can be used as a reference to the government for calculating the balance of incentives in the Alfa working area to obtain optimum results.

Acknowledgments

Dr. Eny Kusrini is thankful to Kemendikbudristek for Penelitian Dasar Unggulan Perguruan Tinggi (PDUPT) Grant No.: NKB-995/UN2.RST/HKP.05.00/2022, and special task force for Upstream Oil and Gas Business Activities Republic of Indonesia for the financial support for this work. Authors also thank to Prof. Lee D. Wilson from Department of Chemistry, University of Saskatchewan, Canada for the correction on some part of this paper.

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