# Comparative Analysis of Indonesia Gross Split PSC with Fiscal Terms of Several Southeast Asian Countries

# (Analisis Perbandingan PSC Gross Split Indonesia Dengan Fiscal Term Beberapa Negara Asia Tenggara)

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#### Abstract

The implementation of the Gross Split PSC in the upstream oil and gas industry in Indonesia has been running since 2017 with the hope of being able to accelerate the decision-making process and increase attractiveness for oil and gas investors. This study is to analyze the implementation of Indonesia Gross Split PSC compared to other fiscal terms in Southeast Asia region from an economics perspective. The comparisons reviewed are between Indonesia Gross Split PSC and the following fiscal terms: Indonesia Cost Recovery PSC, Malaysia R/C PSC, Thailand Concession, and Vietnam PSC. Fields used as input for analysis are producing oil fields with small-scale recoverable reserves according to RF-2005 / SPE, namely Block X (early production fields) and Block Y (terminated fields). From economics calculations and comparisons, sensitivity and profitability characteristics, specifically applied to the field conditions under review, it is concluded that Indonesia Gross Split PSC has an economics level indicator that is better than PSC Indonesia Cost Recovery when compared to Malaysian R/C PSC, Thailand Concession and Vietnam PSC.

Keywords: Economics, Fiscal Terms, Oil, Production Fields, Gross Split PSC

#### Sari

Penerapan PSC Gross Split Indonesia pada industri hulu migas di Indonesia telah berjalan sejak 2017 dengan harapan mampu mempercepat proses pengambilan keputusan dan meningkatkan daya tarik bagi investor migas. Penelitian ini untuk menganalisis penerapan PSC Gross Split Indonesia dibandingkan dengan fiscal term lain di Asia Tenggara dari sisi keekonomiannya. Perbandingan yang ditinjau adalah antara PSC Gross Split Indonesia dengan fiscal term berikut: PSC Cost Recovery Indonesia, PSC R/C Malaysia, Konsesi Thailand, dan PSC Vietnam. Lapangan yang dijadikan input analisis adalah lapangan minyak dengan recoverable reserve skala kecil menurut RF-2005/SPE, yaitu lapangan produksi Blok X (lapangan early production) dan Blok Y (lapangan terminasi). Dari perhitungan dan perbandingan keekonomian, sensitifitas serta sifat profitabilitasnya, khusus diterapkan pada kondisi lapangan yang ditinjau, diperoleh kesimpulan bahwa PSC Gross Split Indonesia telah memperbaiki indikator keekonomian dibandingkan dengan PSC Cost Recovery Indonesia ketika dibandingkan dengan PSC R/C Malaysia, Konsesi Thailand dan PSC Vietnam..

Kata-kata kunci: fiscal term, keekonomian, lapangan produksi, minyak, PSC Gross Split

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#### I. INTRODUCTION

The petroleum fiscal regime of a country is a set of laws, regulations and agreements which governs the economical benefits derived from petroleum exploration and production [3].

In an effort to increase domestic production, Indonesia faces a number of challenges related to the fiscal term : the risks and costs of exploration, low oil prices, regional competition, uncertainty of the business climate, high tax rates, revenue sharing and FTP determined by a certain amount and applies under any circumstances [1, 2, 4, 8, 9].

In response to these challenges and conditions, Indonesia imposed a gross split PSC through eISSN: 2614-0268 Minister of Energy and Mineral Resources Regulation No.8 of 2017 dated January 13, 2017 concerning Gross Split Production Sharing Contracts [6].

After the new regulation is applied, oil and gas business actors need to evaluate Indonesia's new position in the eyes of their business portfolio. After the new rules come into effect, oil and gas business actors need to evaluate Indonesia's new position in terms of their business portfolio. This research was conducted to answer and analyze the attractiveness of Indonesia's fiscal term economic indicators by comparing the PSC Gross Split to the PSC Cost Recovery fiscal term and other fiscal pISSN: 2615-3653 terms in the Southeast Asia region : Malaysia, Thailand, and Vietnam. The country of review was chosen because it has remaining reserves equal to 86.35% and oil and gas production levels equivalent to 83.35% of the Southeast Asia region [10-13].

This research is to answer the question: what is the profile of the upstream oil and gas sector of each country and how the fiscal term position of Indonesia Gross Split PSC is compared with the fiscal term Indoensia Cost Recovery PSC, Malaysia R/C PSC, Thailand Concession and Vietnam PSC in terms of economic indicators including sensitivity, range of %GT and %CT and the nature of the probability.

The fields are small oil production bloks based on Russian Ministry of Naturral Resources. 2005 criteria, with condition as given in Table 1 [7].

# II. METHOD

Work flow is shown in Figure 1. The work procedures are as follows:

- 1. Compiling profiles of the upstream sectors of Indonesia, Malaysia, Thailand and Vietnam to find out the upstream sector figure and the details of the applicable fiscal term rules (Tables 2 and 3).
- 2. Arranging the fiscal term calculation model refers to the fiscal formula in each country in the Microsoft Excel format, including completing the parameters needed to be able to calculate the economy.
- 3. Compile economic input data including but not limited to production profile, capital expenditure, and operating costs.
- 4. Perform economic calculations for each block using countries fiscal terms at the following sensitivity levels: a. oil prices: \$ 50, \$ 75, \$ 100; b. operating costs: -20%, 0, + 20%; c. oil production: 90%, 100%, 110%.
- 5. Comparing the results of economic calculations (NPV, IRR, POT), sensitivity analysis, range %GT & %CT, and the nature of profitability analysis.

## **III. RESULTS AND DISCUSSION**

The review countries turned out to have a ratio of remaining proven reserves of oil divided by oil production are under 10 years, with Vietnam (6.9 years) in the most vulnerable position to the sustainability of domestic oil production, followed by Indonesia (8.3 years), Thailand (8.5 years) and Malaysia (8.5 years). 8.9 years). While in terms of gas, all review countries have proven gas reserves divided by gas production over 10 years with Thailand (12.3 years) having the lowest ratio, followed by Malaysia (12.4 years), Indonesia (17.9 years), and followed by Vietnam (33.7 years).

All countries faced the same challenges, how to

be able to increase investment by attracting investors, promoting exploration and the challenges of managing existing mature fields, as given in Table 4. Simulation results using Block X with cumulative production of 16.2 MMBO is given in Table 5. Based on the results, several statements can be made as follows:

- 1. The economic level of NPV, IRR and MARR (>12%), the order of attractiveness for investments is: Thailand Concession, Indonesia Gross Split PSC, Indonesian Cost Recovery PSC, Malaysia PSC, and Vietnam PSC.
- 2. Vietnam PSC is most sensitive to changes in oil prices, and changes in production costs in terms of NPV and IRR while the Thailand Concession and Indonesian Cost Recovery PSC in terms of POT. In terms of sensitivity to fluctuating levels of oil production, the Vietnam PSC is the most sensitive in terms of NPV, while the Indonesian PSC is most affected from the IRR side, and Thailand Concession is the most sensitive in term of POT (Table 6).
- 3. The range of %GT and %CT, the Indonesia Gross Split PSC give maximum of 24.19% %CT compared to Indonesia Cost Recovery PSC with maximum of 10.32%. The biggest opportunity for %CT is in the Thailand Concession which can reach 28.60%, while the Malaysia R/C PSC is at a maximum level of 14.64% and the Vietnam PSC is 11.76% (Figure 2).
- 4. In terms of profitability in terms of% CT, Indonesia's Gross Split PSC, Thailand Concession, Indonesia's PSC Cost Recovery, Vietnam PSC are progressive while Malaysia's PSC R / C is regressive (Figure 3).

The simulation results for Block Y with cumulative production of 11.6 MMBO are given in Table 7. Based on the results, several statements can be made as follows:

- 1. The economic level of NPV, IRR and MARR (>12%), the order of attraction for investments is: Indonesian Gross Split PSC, Indonesia Cost Recovery PSC, Malaysian PSC and Vietnam PSC. While the Thailand Concession may not as the investment choice even though the NPV value is the greatest but the IRR is below MARR.
- 2. Vietnam PSC from the NPV is most sensitive to changes in oil prices and the Thailand Concession is most sensitive from the IRR and the Indonesian Cost Recovery PSC from the POT. The Vietnam PSC is the most sensitive to changes in production costs in terms of NPV, IRR and POT. In terms of sensitivity to fluctuations in oil production, Vietnam PSC is the most sensitive in NPV and POT, Indonesian

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Cost Recovery PSC is most affected in IRR (Table 8).

- 3. The range of% GT and% CT, the Indonesia Gross Split PSC give maximum of 11.62% better %CT compared to Indonesia Cost Recovery PSC at 7.63%. The biggest opportunity for CT% is in the Thailand Concession, which can reach 18.75%, while the Malaysian R/C PSC is at a maximum of 9.53% and Vietnam PSC is 8.42% (Figure 4).
- 4. From the profitability nature of the fiscal term economic model, the result same as Blok X result (Figure 5).

# **IV. CONCLUSIONS**

Based on the discussion presented above, several conclusion obtained as follows:

- 1. Indonesia, Malaysia, Thailand and Vietnam have oil reserves/production ratios less than 10 years, while gas reserves / production ratios are over 10 years. All face the challenge of promoting exploration to find new potentials in both the mature and the frontier areas, as well as the challenges of dealing with existing mature fields.
- 2. From calculations and economic comparisons, sensitivity and profitability characteristics, specifically applied to the field conditions under review, it is concluded that Indonesia's Gross Split PSC has improved economic indicators compared to Indonesia's PSC Cost Recovery so that Indonesia Gross Split PSC has a better economic level indicator of Indonesia Cost Recovery PSC when compared to Malaysia R/C PSC, Thailand Concession and Vietnam PSC.

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Parameter	Block X	Block Y
Production Phase	Early Production	Mature Field (Termination)
Location	Onshore	Onshore
Production Stages	Primary Recovery	Primary Recovery
API Gravity	34 – 35	34.5 - 37.4
Sunk Cost	\$18 million	-
Signature Bonus	\$ 1 million	\$ 5 million
Program	Drill 13 wells (1,200 m)	Drill 17 wells (2,600-3,000 m)
OOIP	35 – 64 MMBO	214 MMBO
<b>Recovered Reserves</b>	-	62.12 MMBO
Plan of Cum. Production	16.2 MMBO	11.6 MMBO
Capex	\$ 141 million	\$193 million
Opex	\$ 325 million	\$ 279 million

Table 1.	Blocks Th	e Condition	of Blocks	X and Y



Figure 1. Research Procedure

Parameter	PSC Cost Recovery	PSC Gross Split	PSC R/C Malaysia
Gross Revenue	Production x Oil Price	Production x Oil Price	Production x Oil Price
FTP/Royalty	20% of Gross Revenue, Shareable	N/A	20% of Gross Revenue, Shareable
Invesment Credit	N/A	N/A	N/A
Cost	Cost to recover = Opex + Depreciation + Non Capital + Unrecovered Cost of previous year	Opex + Depreciation + Non Capital	Cost to recover = Opex + Depreciation + Non Capital + Unrecovered Cost of previous year
Cost Recovery Ceiling	N/A	N/A	Sliding scale (Revenue/Cost) from 30% up to 70%
Operating Expenditure (Opex)	Fixed and variable operating cost	Fixed and variable operating cost	Fixed and variable operating cost
Depreciation	Capital investment depreciation, DDB 5 years (applied to calculate the cost recovery of tangible capex)	Capital investment depreciation, DDB 5 years (applied as deductable expense for income tax purpose)	Capital investment depreciation, 50% in the 1st year and 10% per year after (applied to calculate the cost recovery of tangible capex)
Unrecovered Cost (UC)	If cost to recover > recovered cost, unrecovered cost = cost to recover - recovered cost	N/A	If cost to recover > recovered cost, unrecovered cost = cost to recover - recovered cost
Recovered Cost	If gross revenue after FTP and Investment credit>Cost to recover, then recovered Cost = Cost to recover, if not, recovered cost = gros revenue after FTP and Investment credit	N/A	If factored gross revenue after Royalti>Cost to recover, then Recovered Cost = factored Gross Revenue after Royalti
Equity to be split	Gross revenue after FTP, Investment credit and recovered cost	N/A	Gross Revenue after Royalty and recovered cost
Contractor Share	%share contractor of ETS and FTP	% share contractor of Gross Revenue	% Share Contractor of ETS (Sliding scale (Revenue/Cost) from 30% up to 70%)
Government Share	1 – contractor share	1 – contractor share	1 – contractor share
Net DMO	25% x Prod x % share contractor x (1-DMO fee) x oil price	DMO based o market price	
Contractor Taxable Income	Contractor Share after DMO	Contractor Share - Cost	Contractor share after research cess, export duty, supplementary payment
Goernment Tax	% tax of contractor taxable income (40%)	% tax of contractor taxable income (40%)	% tax of contractor taxable income (38%)
Net Contractor share (Contractor take)	Contractor taxable income-government tax	Contractor taxable income-government tax	Contractor taxable income-government tax
Total contractor Income	Net contractor share+investment credit	Net contractor share	Net contractor share + Recovered Cost
Expenditure	Capital + Non capital + Operating cost	Capital + Non capital + Operating cost	Capital + Non capital + Operating cost
Contractor Cash flow	Total contractor income-Expenditure	Total contractor income-Expenditure-Tax	Total contractor income-Expenditure
Government Take	Government Share+FTP Got+ Net DMO+Government Tax	Government Share+ Net DMO + Government Tax	Consist of Petronas (a) and Govt take (b): a) Petronas Profit Oil+research cess+Supplementary payment b) Royalty+Government Tax + Export Duty

# Table 2. Indonesia and Malaysia Fiscal Term [5, 10 - 13]



Figure 2. Blok X – Range %GT and % CT

Table 3.	Thailand and	l Vietnam	Fiscal	Term	[10 -	13]
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Parameter	PSC Vietnam	Konsensi Thailand
Gross Revenue	Production x Oil Price	Production x Oil Price
FTP/Royalty	Royalty determined slidings scale, from 10% to 29% depend on production rate	<ul><li>a) Royalty determined slidings scale. From 5% to 15% depend on production rate</li><li>b) Area rental set at 200000 bath/sq meter per annum</li></ul>
Invesment Credit	N/A	N/A
Cost	Cost to recover = Opex + Depreciation + Non Capital + Unrecovered Cost of previous year	Opex + Depreciation + Non Capital
Cost Recovery Ceiling	Between 35-50% in standard area or 70% for frontier area	N/A
Operating Expenditure (Opex)	Fixed and Variable Operating Cost	Fixed and Variable Operating Cost
Depreciation	Capital investment depreciation, 5 years straight lines basis (applied to calculate the cost recovery of tangible capex)	N/A
Unrecovered Cost (UC)	If cost to recover > recovered cost, unrecovered cost = cost to recover - recovered cost	N/A
Recovered Cost	If factored gross revenue after Royalty > Cost to recover, then recovered Cost = Cost to recover, if not, recovered cost = factored gros revenue after royalty	N/A
Equity to be split	Gross revenue after Royalty and recovered cost	N/A
Contractor Share	% share contractor of ETS and FTP	% Share Contractor of Gross Revenue
Government Share	1 – contractor share	1 – contractor share
Net DMO	N/A	N/A, but under Petroleum Act, should the government determine required contractor to supply domestic need
Contractor Taxable Income	Contractor Share	Contractor share - cost
Goernment Tax	% tax of contractor taxable income (50%)	% tax of contractor taxable income (50%)
Net Contractor share (Contractor take)	Contractor taxable income-government tax	Contractor taxable income-government tax
Total contractor Income	Net contractor share+ Recovered Cost	Net contractor share
Expenditure	Capital + Non capital + Operating cost	Capital + Non capital + Operating cost
Contractor Cash flow	Total contractor income-Expenditure	Total contractor income-Expenditure-Tax
Government Take	Government Share+Royalty+Government Tax	Government Share+Government Tax + Production Bonus

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Table 4.	Country	Overview	[10 -	13]
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Country	Indonesia	Malaysia	Thailand	Vietnam
Population	273 million	32 million	69 million	97 million
Capital	Jakarta	Kuala Lumpur	Bangkok	Hanoi
Oil Remaining Reserve	2.13 billion barrels	1.93 billion barrels	0.44 billion barrels	0.44 billion barrels
Oil Production	700 thousand b/d	591 thousand b/d	700 thousand b/d	700 thousand b/d
R/P Oil	8.3 years	8.9 years	8.3 years	8.3 years
Gas Remaining Reserves	41.19 tcf	28.01 tcf	41.19 tcf	41.19 tcf
Gas Production	6.31 bcf/d	6.19 bcf/d	6.31 bcf/d	6.31 bcf/d
R/P Gas	17.9 years	12.4 years	12.3 years	33.7 years

# Table 5. Block X Economic Calculation Results

Economic Calc. Results	Ina PSC CR	Ina GS PSC	Malaysia PSC	Thailand Cons	Vietnam PSC
Total Investment (\$)	141,747,919	141,747,919	141,747,919	141,747,919	141,747,919
Total Expenditure (\$)	499,0082,919	499,0082,919	499,0082,919	577,332,518	499,0082,919
Contractor NPV@10% (\$)	20,969,543	42,021,743	15,210,548	61,917,546	6,308,146
% GT	50.18%	40.71%	50.08%	30.60%	49.29%
Internal Rate of Return (%)	18.73%	19.34%	15.00%	23.64%	11.45%
PIR, fraction	1.10	1.38	1.07	1.55	1.03
Pay Out Time, year	5.59	7.51	7.31	6.18	12.11
Govt NPV@0% (\$)	611,256,956	495,951,895	610,076,271	372,727,978	600,447,415
Unrecovered Cost	-	-	7.154.169	2.897.918	1.000.000

### Tabel 6. Blok X - Sensitivity

## Oil price sensitivity

Fiscal Term		NPV			IRR			РОТ	
	\$50	\$100	Interval	\$50	\$100	Interval	\$50	\$100	Interval
Ina PSC CR	-166.78%	102.65%	269.42%	-67.44%	55.97%	123.41%	-134.30%	31.09%	165.39%
Ina GS PSC	-127.42%	92.62%	220.04%	-61.33%	52.06%	113.39%	-85.82%	30.78%	116.60%
Malaysia PSC	-148.77%	126.23%	275.00%	-46.37%	46.59%	92.96%	-90.60%	24.52%	115.12%
Thailand Cons	-116.09%	106.23%	222.32%	-66.02%	77.59%	143.61%	-125.46%	46.30%	171.76%
Vietnam PSC	-924.42%	568.29%	1492.71%	-127.46%	93.43%	220.89%	100.00%	50.80%	-49.20%

Opex sensitivity

Figoal Tarm		NPV			IRR			РОТ	
Fiscal Term	\$ (2.00)	\$ 2.00	Interval	\$ (2.00)	\$ 2.00	Interval	\$ (2.00)	\$ 2.00	Interval
Ina PSC CR	20.85%	-25.41%	46.26%	12.48%	-14.69%	27.17%	5.57%	-10.08%	15.65%
Ina GS PSC	35.80%	-36.64%	72.44%	19.04%	-18.21%	37.25%	16.80%	-44.16%	60.95%
Malaysia PSC	30.36%	2.00%	28.37%	15.72%	-0.75%	16.46%	16.02%	-6.35%	22.37%
Thailand Cons	19.68%	-19.94%	39.62%	12.32%	-12.19%	24.51%	9.31%	-18.23%	27.54%
Vietnam PSC	151.98%	-166.27%	<mark>318.25%</mark>	21.87%	-19.93%	41.79%	10.26%	-12.02%	22.28%

Production level sensitivity

Ficeal Torm	NPV				IRR			РОТ		
riscai Terini	90%	100%	Interval	90%	100%	Interval	90%	100%	Interval	
Ina PSC CR	-27.46%	24.09%	51.55%	-14.92%	13.69%	28.61%	-7.40%	6.03%	13.42%	
Ina GS PSC	-26.24%	25.84%	52.08%	-13.14%	13.59%	26.73%	-15.01%	12.41%	27.42%	
Malaysia PSC	-11.50%	47.36%	58.86%	-3.99%	19.05%	23.04%	-5.89%	14.16%	20.05%	
Thailand Cons	-24.17%	20.57%	44.74%	-14.18%	13.53%	27.71%	-20.44%	10.08%	30.53%	
Vietnam PSC	-106.17%	106.05%	<mark>212.22%</mark>	-13.15%	13.67%	26.82%	-7.47%	5.40%	12.87%	

Economic Calc. Result	Ina PSC CR	Ina GS PSC	Malaysia PSC	Thailand Cons.	Vietnam PSC
Total Investment (\$)	192,639,630	192,639,630	192,639,630	192,639,630	192,639,630
Total Expenditure (\$)	471,517,682	471,517,682	471,517,682	648,877,682	471,517,682
Contractor NPV@10% (\$)	26,212,962	35,949,474	20,000,096	51,918,412	6,785,335
%GT	39.01%	37.28%	39.71%	20.17%	42.15%
Internal Rate of Return (%)	86.95%	-	37.47%	-5.42%	15.56%
PIR, fraction	1.10	1.24	1.07	1.37	1.03
Pay Out Time, year	4.16	-	5.15	-	5.63
Govt NPV@0% (\$)	339,994,502	323,427,571	346,068,603	175,538,049	367,295,677
Unrecovered Cost	-	-	3,320,841	50,809,858	73,592,036

Table 7. Blok X Economic Calculation Results



Figure 3. Block X – Nature of Profitability



Figure 4. Blok Y - Range %GT and % CT

### Tabel 8. Blok Y - Sensitifity

Oil price sensitivity									
Fiscal Term	NPV			IRR			РОТ		
	\$50	\$100	Interval	\$50	\$100	Interval	\$50	\$100	Interval
Ina PSC CR	-107.72%	93.90%	201.62%	-92.09%	72.51%	164.59%	-446.23%	100.00%	546.23%
Ina GS PSC	-230.72%	187.36%	418.08%	-100.00%	166.67%	266.67%	#DIV/0!	#DIV/0!	#DIV/0!
Malaysia PSC	-203.72%	78.28%	281.95%	-100.00%	64.45%	164.45%	100.00%	33.20%	133.20%
Thailand Cons	-167.91%	256.84%	424.76%	2,668.57%	-383.65%	3,052.22%	#DIV/0!	#DIV/0!	#DIV/0!
Vietnam PSC	-1387.32%	595.63%	1,982.95%	-324.87%	207.73%	532.60%	100.00%	30.81%	130.81%

Opex sensitivity									
Fiscal Term		NPV			IRR			РОТ	
	\$ (2.00)	\$ 2.00	Interval	\$ (2.00)	\$ 2.00	Interval	\$ (2.00)	\$ 2.00	Interval
Ina PSC CR	18.03%	-18.11%	36.14%	71.59%	-31.29%	102.88%	16.49%	-6.45%	22.94%
Ina GS PSC	52.52%	-52.60%	105.12%	33.33%	-68.78%	102.12%	#DIV/0!	#DIV/0!	#DIV/0!
Malaysia	19.37%	-33.34%	52.71%	5.91%	-34.59%	40.51%	11.28%	-8.48%	19.77%
PSC									
Thailand	43.12%	-34.42%	77.54%	50.37%	-59.13%	109.50%	#DIV/0!	#DIV/0!	#DIV/0!
Cons									
Vietnam PSC	235.64%	-448.92%	<mark>684.56%</mark>	68.86%	-273.98%	<mark>342.84%</mark>	13.75%	100.00%	<mark>113.75%</mark>

Production level sensitivity

Fiscal Term -	NPV			IRR			РОТ		
	90%	100%	Interval	90%	100%	Interval	90%	100%	Interval
Ina PSC CR	-19.20%	19.15%	38.36%	-32.74%	79.92%	<mark>112.66%</mark>	-6.88%	18.42%	25.30%
Ina GS PSC	-29.98%	29.95%	59.93%	-39.17%	33.33%	72.50%	#DIV/0!	#DIV/0!	#DIV/0!
Malaysia PSC	-33.41%	37.95%	71.36%	-32.14%	73.32%	105.47%	-9.63%	12.60%	22.24%
Thailand Cons	-26.07%	54.99%	81.06%	-30.56%	64.21%	94.77%	#DIV/0!	#DIV/0!	#DIV/0!
Vietnam PSC	-173.20%	161.67%	<mark>334.87%</mark>	-57.15%	52.54%	109.69%	-51.24%	12.18%	<mark>63.42%</mark>



