

Measuring Financial Performance of National Oil and Gas Companies in Southeast Asia

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Since the Industrial Revolution, oil and natural gas have played an instrumental role in economic transformation and mobility in everyday life for the majority of the world's population. However, since mid of 2014, oil prices have dropped almost 50% and this has an impact on the performance of national oil and gas companies (NOCs). This study aims to measure the financial performances of two NOCs in Southeast Asia; Pertamina in Indonesia and Petronas in Malaysia. The data was collected from the audited financial reports of both NOCs for the period 2011 – 2016. The research methodology used was financial ratio analysis, which was classified into profitability, liquidity, activity, and solvency ratios. A comparison with industry benchmarks and Data Envelopment Analysis (DEA) was used to confirm the financial performance and the performance efficiency of related firms. The result shows that Petronas has achieved better financial performance compared to Pertamina. Confirmation uses comparisons with industry benchmarks, revealing that both NOCs overall financial performance were above industry benchmark. However, confirmation using DEA, shows that the most superior performance efficiency is in Pertamina, followed by Petronas. The authors believe that the findings will be helpful for managers who continuously attempt to explore opportunities to provide a higher return.

Key words: *Data Envelopment Analysis, Financial Ratios, National Oil & Gas Company, Oil & Gas Industry.*



Introduction

Indonesia's economy has experienced steady growth emerging from the Asian financial crisis of 1997-1999, averaging stable 5 – 6 % annual growth rate, and the strength of the country's economy was formerly based on its considerable oil and gas exports (Tharakan, 2015). Since the Industrial Revolution, oil and natural gas have played an instrumental role in economic transformation and mobility in everyday life for the majority of the world's population. However, in mid-2014, oil prices began to decrease and by December 2014, the price of benchmark crude oil, both Brent and West Texas Intermediate (WTI), reached their lowest since 2009. At the end of 2014, Brent and WTI had declined by almost 50% from the beginning of the year. The oil price continued to weaken in 2015 and started to pick up in 2016.

The greatest impacts of the oil price decrease were felt by upstream companies which were directly involved in the exploration and production of crude oil. Downstream companies, which are involved with refining and distributing the finished products including gasoline and diesel fuel, did not tend to be hit as hard, neither were integrated companies, although they were impacted to some extent by oil price drop. Balanced by its upstream and downstream operations, an integrated company often is less concerned with price volatility. The business of an integrated company could essentially hedge its profits against market downturns (Hayes, 2015).

The National Oil Company (NOC) plays a main role as the custodian of hydrocarbon resource development and energy security. An NOC is an oil company fully or in the majority owned by a government. The NOC was questioned as to whether its performance had been challenged by the low oil price environment, since mid-2014. This study aims to measure the financial performances of two NOCs in Southeast Asia, Pertamina of Indonesia and Petronas of Malaysia for 2011-2016. This study also aims to confirm the financial performance of the NOCs within the industry benchmark and their performance efficiency by using Data Envelopment Analysis (DEA).

Literature Review

Development of Oil and Gas Industry in Asean

The historical records of Southeastern Asian oil started in 1883, when a Dutch planter A.J. Zijiker commenced the drilling of the now-well known Telega Tela oil well in Northern Sumatra. It was from this well that Royal Dutch Shell was formed (Morrow, 1975:34). During the period from the 1950s through to the 1970s, Southeast Asian governments established NOCs to develop their country's oil reserves and also promote economic and social development (Tordo et al, 2011:17). Pertamina proposed the establishment of an ASEAN Council on Petroleum (ASCOPE), as an instrument for regional cooperation in all aspects of



the petroleum industry among member countries of the ASEAN in June 1975. ASCOPE was established in October 1975 by five founding members: Indonesia, Malaysia, the Philippines, Singapore, and Thailand. Brunei Darussalam joined in 1985, Vietnam in 1996, Cambodia and Myanmar in 2001, and Laos in 2006.

PT Pertamina (Persero) (Pertamina) is a fully integrated national oil, gas and geothermal company, wholly-owned by the Government with headquarters in Jakarta, Indonesia. Pertamina are engaged in a broad spectrum of upstream and downstream oil, gas, geothermal, petrochemical and other energy operations. Pertamina lines of business are organized into upstream and downstream sectors in accordance with Indonesian oil, gas and geothermal regulations. In the upstream sector, Pertamina engages in: exploration - the search for oil, gas and geothermal energy; development - the drilling and bringing into production of wells in addition to the discovery of wells in a field; and production and supply of crude oil, natural gas and geothermal energy in Indonesia and internationally.

In the downstream sector, Pertamina carries out refining, marketing, distribution and trading of crude oil, natural gas, refined fuel products and petrochemical and other non-fuel products such as green coke, including products for retail, industrial and aviation uses. Pertamina is also mandated by the Government to distribute subsidized fuel, LPG and CNG in Indonesia and to assist in its efforts to encourage the use of LPG as a substitute for kerosene in Indonesian households based on the kerosene conversion program and to encourage the use of CNG as an alternative to fuel. For the fiscal years ending December 31, 2014, 2015 and 2016, Pertamina consolidated sales and other operating revenue of USD69.99 billion, US\$41.76 billion and US\$37.49 billion, respectively. For the fiscal years ending December 31, 2014, 2015 and 2016, Pertamina had income for the year of US\$1.44 billion, US\$1.42 billion and US\$3.15 billion (Pertamina Annual Report, 2014-2016) respectively.

Petroleum Nasional Berhad (Petronas) is a fully integrated oil and gas company engaged in a broad spectrum of upstream and downstream oil and gas, LNG and petrochemical operations, wholly-owned by the Government of Malaysia. The Petroleum Development Act of 1974, vests in Petronas the “entire ownership in, and the exclusive rights, powers, liberties and privileges of exploring, exploiting, winning and obtaining petroleum whether onshore or offshore of Malaysia.” Petronas upstream business includes the exploration, development and production of crude oil and natural gas in Malaysia and overseas; including unconventional resources, the liquefaction, sale and trading of LNG domestically and internationally and the sale of natural gas products in Malaysia and selected international markets.

Downstream business includes refining and marketing petroleum products, manufacturing and selling petrochemical products, and trading crude oil, petroleum products and petrochemical products. The downstream segment also includes infrastructure such as that used in the processing and transmission of natural gas and LNG regasification, power production and other

utilities and technical and engineering services for Petronas own operations. Petronas corporate and other businesses primarily consists of its interest in MISC Berhad, a leading international maritime company in Malaysia with a primary focus on energy transportation and logistics including that used in the transportation of LNG, crude oil, petroleum products and petrochemical products in support of Petronas own marketing and trading activities. For the years ended December 31, 2014, 2015 and 2016, Petronas had consolidated revenues of USD100.3 billion, USD62.9 billion and USD49.45 billion, and consolidated net profit of USD11.3 billion, USD3.35 billion and USD4.09 billion, respectively (Petronas Annual Report, 2014-2016).

Previous Research in Financial Ratio Analysis and Oil Price

There are two methods to measure financial performances which are accounting and market measurement. Many researchers prefer to use accounting measurement (Waddock and Graves 1997; Cochran and Wood 1984), rather than market measurement (Alexander and Buchholz, 1978; Vance, S. C., 1975), and some of them adopt both methods (McGuire, J. B., Sundgren, A., Schneeweis, T., 1988). There are few differences between accounting and market measurement method. In accounting, a company uses the historical aspects to measure their financial performance (McGuire, Schneeweis, & Hill, 1988) and this contains a bias which leads to managerial manipulation. On the other hand, market measurement method is straight forward, focuses on performance and represents the ability of a company to generate future income (McGuire, J. B., A. Sundgren, and T. Schneeweis, 1988).

Financial ratio is very useful to measure the performance of small business and it can be used to predict their failure (Edmister, 1972). Although accounting data in financial statements is subject to manipulation and hindsight, this is the only detailed information available in a company's overall activities (Sinkey, 2002). Furthermore, they are the only source of information for evaluating management's potential to generate satisfactory returns in the future (Mabwe Kumbirai, Robert Webb, 2010). According to Megaladevi (2015); Zhang, & Zhao, (2017), financial ratio is a good evaluation method to measure company performance and companies generally use this method to compare their performance with other competitors.

However, there are limited resources which evaluate the financial performance of the Oil and Gas Company in Indonesia. According to Hasiholan, Daryanto (2018) Gas State Owned Company (PGN) has achieved good financial health condition levels for the period of 2013-2017. Iskakov and Yilmaz (2015) investigated the financial performance of four major Oil and Gas Companies and found that three of them have a high level of satisfaction and Exxon Mobil was the outstanding one. According to Andika et al. (2014), there is a significant difference in the performance of the oil and gas industry in Indonesia between ROA, ROE, current ratio, and quick ratio in the period before and after the global crisis. The financial performance of

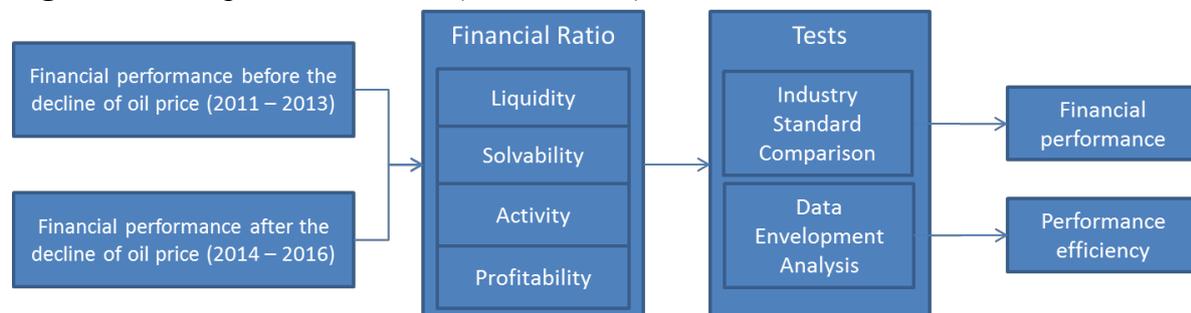
Pertamina for 2011-2015 was good, although there was a decline in production which forced the government to import more oil (Daryanto, Nurfadilah 2018).

In terms of oil price, the oil and gas industry has experienced dramatic volatility globally (Frederer (1996), Beike et al. (2010), Anzuini et al. (2012). The oil price in the global market declined sharply from US\$145 per barrel in mid 2008 to approximately US\$40 per barrel at the end of 2008 (PriceWater House Cooper, 2016). The research found that from the point of view of oil investors, the oil business is not attractive unless the oil prices increase significantly and the cost of financing and operating lowers (Daryanto & Primadona, 2018). According to Rohimat (2016), there are many countries which rely on oil revenue and end up falling and collapse. The biggest company in the world, Schlumberger dismissed approximately 34,000 staff positions in 2014 and 10,000 in 2016. Petronas Malaysia dismissed 1,000 employees in 2016. In Indonesia, Chevron terminated their contracts in East Kalimantan after 50 years of operation and dismissed approximately 1,500 employees due to a decline in efficiency.

Methodology

Figure 1 shows the conceptual framework of the study.

Figure 1. Conceptual Framework (Author, 2018)



Financial ratios are a useful way of expressing relationships between financial accounts and expected relationships from one point in time to another (Anthony et al, 2011). The ratios were categorized into liquidity (current ratio, quick ratio and cash ratio), solvency (debt to equity, debt to assets and interest coverage ratio), activity (inventory turnover, account receivable, fixed asset turnover, total asset turnover), and profitability (return on asset, return on equity, gross profit margin, and net profit), as shown in Table 1. Data Envelopment Analysis (DEA) was used to measure the efficiency performance of both NOCs. According to Hazarika (2015); Zhang, (2017), fluctuating oil prices significantly affect the assets turnover ratio of British Petroleum, Royal Dutch Shell and Petro China.

Industry benchmark data was obtained from Bloomberg Professional Services. Bloomberg Intelligence is Bloomberg's research arm on the Bloomberg Terminal. Data used as industry

benchmark is Bloomberg Intelligence of Global Integrated Oils Valuations Peer, consists of financial and operational data from 18 global integrated oil and gas companies. Data Envelopment Analysis (DEA) models are widely used as a tool for evaluation of efficiency, performance or productivity of homogenous decision making units (DMUs), for example: units that produce several identical or equivalent effects. These effects can be denoted as the outputs of the DMUs. Positive outputs of the unit are such as that their higher values lead (assuming that other characteristics are unchanged) to higher performance of the unit. The model of an input oriented DEA model is used to find how to reduce the inputs of non-efficient units in order to reach the efficient frontier. Similarly, it is possible to formulate an output oriented model.

Table 1: Financial Ratios

	Numerator	Denominator
Current Ratio	Current assets	Current liabilities
Quick Ratio	Cash + short-term marketable investments + receivables	Current liabilities
Cash Ratio	Cash + short-term marketable investments	Current liabilities
Debt to Equity Ratio	Total debt	Total shareholders' equity
Debt to Assets Ratio	Total debt	Total assets
Interest Coverage Ratio	EBIT	Interest payments
Debt to Equity Ratio	Total debt	Total shareholders' equity
Debt to Assets Ratio	Total debt	Total assets
Interest Coverage Ratio	EBIT	Interest payments
Return on Assets	Net income	Average total assets
Return on Equity	Net income	Average total equity
Gross Profit Margin	Gross profit	Revenue
Net Profit Margin	Net income	Revenue

Source: Robinson et al (2008)

Results and Discussions

Based on liquidity analysis using the figures in Table 2, both NOCs presented good results toward their current ratios. Both companies achieved indexes above one, which indicates the ability of covering short term liabilities when they are due. Petronas had the highest ratio, with a six year average of 2.66, followed by Pertamina with a six year average of 1.60. However, Petronas current ratio has deteriorated across a six year period as their cash balance declined from USD50.7 billion in 2011 to USD29.2 billion in 2016. On the other hand, Pertamina

current ratio is improving. Pertamina managed to improve its cash balance and reduced current liabilities over the period from 2015 and 2016.

Quick ratio analysis reveals that Pertamina face illiquid position on a six year average result of 0.95. However, the figures shown that Pertamina quick ratio improving across the six year period. Petronas quick ratio presented relatively stable figures, with the six year average of 2.36. Cash ratio analysis also reveals Pertamina illiquid condition across the six year period. Even though Pertamina has been able to increase its cash balance, it was not enough to cover short term liabilities when due. Pertamina cash ratio six year average was 0.38. Petronas had a stable cash ratio with a six year average of 1.78. Historical cash ratio showed that across the six year period from 2011 to 2016, Petronas' performance was excellent compared to the other two NOCs.

Comparison to industry benchmark reveals that both NOCs liquidity ratio were above the benchmark. Compared to the six year average industry benchmark of 1.25, the current ratio of Petronas was twice as high at 2.66. This was followed by Pertamina with a six year average of 1.60. A quick ratio comparison with the industry benchmark discovered that Petronas was better than Pertamina, with a six year average of 2.36 and 0.95. The industry benchmark yielded at 0.7 times.

Table 2: Liquidity Ratio Analysis (Authors, 2018)

Liquidity	2011	2012	2013	2014	2015	2016	Average
Current Ratio							
Industry Standard	1.2	1.3	1.3	1.3	1.2	1.2	1.25
Pertamina	1.38	1.56	1.47	1.49	1.68	2.00	1.60
Petronas	3.42	2.40	2.27	2.70	2.58	2.56	2.66
Quick Ratio							
Industry Standard	0.60	0.80	0.70	0.80	0.60	0.70	0.70
Pertamina	0.74	0.86	0.87	0.90	1.03	1.29	0.95
Petronas	2.59	2.21	2.09	2.51	2.40	2.38	2.36
Cash Ratio							
Industry Standard	0.20	0.30	0.30	0.30	0.30	0.40	0.30
Pertamina	0.28	0.33	0.31	0.29	0.40	0.68	0.38
Petronas	2.10	1.67	1.51	1.84	1.78	1.76	1.78

As per the other liquidity ratio, both NOCs cash ratio was above the industry benchmark. Petronas had the highest six year average cash ratio of 1.78 compared to the industry benchmark of 0.30. Pertamina which had the lowest six year average result of 0.38. Based on Table 3 below, solvency or debt analysis reveals that Petronas had the most outstanding result. Debt to equity and debt to assets ratio of Petronas were at a six year average of 0.15 and 0.09 respectively. The proportion of Petronas interest bearing debt was quite minor compared to its equity. The total assets of Petronas were around 9% of Petronas's debt which gave indication that only 9% of company assets were funded by debt.

Table 3: Solvency Ratio Analysis (Authors, 2018)

Solvency	2011	2012	2013	2014	2015	2016	Average
Debt to Equity							
Industry Standard	0.38	0.37	0.40	0.42	0.40	0.47	0.41
Pertamina	0.52	0.64	0.87	0.94	0.70	0.50	0.70
Petronas	0.18	0.13	0.12	0.10	0.15	0.18	0.15
Debt to Assets							
Industry Standard	0.30	0.28	0.29	0.30	0.31	0.33	0.30
Pertamina	0.19	0.24	0.30	0.35	0.30	0.23	0.27
Petronas	0.11	0.08	0.08	0.07	0.10	0.11	0.09
Interest Coverage Ratio							
Industry Standard	14.30	9.60	9.70	7.20	0.10	2.3	7.20
Pertamina	19.83	15.15	10.65	6.24	4.53	7.86	10.71
Petronas	39.95	29.90	33.25	28.25	10.03	9.22	25.10

Pertamina had an average six year debt to equity and debt to assets ratio of 0.70 and 0.27 respectively. With respect to the need for funding the capital expenditure, in 2011 Pertamina issued USD1.5 billion Global Bond and until 2014, Pertamina had issued around USD8.70 billion which caused the Pertamina debt to equity increase to 0.70. However, by 2015 and 2016, Pertamina managed to reduce its debt as a result of bond buy back and repayment in short term loans. Debt to assets figures showed that around 27% of Pertamina assets were funded by external fund or debt.

Consistent with the result of debt to equity and debt to assets ratio, interest coverage ratio also revealed that Petronas had an outstanding result with the six year average ratio result of 9.22, Petronas's earnings before tax could cover their interest expenses by approximately 25%. Pertamina came second with Earnings Before Interest and Taxes (EBIT) covering around 11 times of their interest expense. Both NOCs showed a similar result for the period 2014 to 2016, the earnings of those companies were influenced by the decrease of oil price, thus their ratio result were also lowered.

In comparison with the industry benchmark, debt to equity ratio and debt to asset in the six year average of Petronas were higher than Pertamina. Petronas's debt to equity six year average figure was 0.15, compared to the industry benchmark of 0.41. In contrast to Petronas, Pertamina's debt to equity ratio was much lower than the industry standard, six year average debt to equity of Pertamina amounted to 0.7. NOC's Debt to assets ratio compared with the industry standard have shown that both entities numbers were higher than the industry standard. Petronas had the highest ratio of 0.09, followed by Pertamina with a slightly higher ratio of 0.27, compared to the industry standard of 0.30. Interest coverage ratio comparisons have a different result, both Petronas at 25.1 and Pertamina at 10.71 were above the industry benchmark of 7.2.

Analysis for the short term activity turnover based on Table 4 below showed that Petronas was better than Pertamina. Petronas managed to turn over their inventories around 13 times on a six year average. Historical figures showed that Petronas's inventory turnover was quite stable across a six year period. Pertamina had the lowest inventory turnover of around 7 times, even compared to industry standard, due to the business process of Pertamina. Pertamina had a mandate to secure energy security through distributing Public Service Obligation (PSO) fuel, such as subsidized fuel and LPG. Thus, its crude inventories were refined to produce oil products to be distributed across Indonesia.

Compared to the industry benchmark, Petronas achieved the highest result of the six year average of inventory turnover. Petronas managed to achieve 13.34 times the industry benchmark of 8.82, whereas Pertamina was below the benchmark with a six year average of 7.24. Pertamina achieved the highest account receivables turnover of around 9 times and Petronas at around 6 times on a six year average. Both NOCs have shown a decline on receivables turnover in relation to the decline of oil price which affect the revenue of those companies. Account receivables ratio analysis reveals that Pertamina have the highest result compared to Petronas. The Pertamina six year average of receivables ratio yielded at 8.93, the highest, compared to Petronas at 6.35. However, both NOC's six year average of account receivables ratio were lower than the industry benchmark at 11.58 times.

For long term activity analysis, fixed asset and total asset turnover was used to measure company ability to generate revenue. Pertamina had the highest fixed asset turnover of a six years average of 3.46. Petronas came in at the lowest with a six year average of 1.13. Higher turnover indicated that Pertamina used its fixed asset more efficiently to generate revenue. However, as oil price declined, both NOCs experienced the same conditions of declining fixed asset turnover. Fixed asset ratio comparison to the industry benchmark show that Pertamina was the highest compared to Petronas and the industry benchmark. Pertamina's six year average of fixed asset turnover yielded at 3.46 times, while Petronas yielded at 1.13 times, which was lower than industry standard of 1.48 times.

Table 4: Activity Ratio Analysis (Authors, 2018)

Activity	2011	2012	2013	2014	2015	2016	Average
Total Assets Turn Over							
Industry Standard	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Pertamina	1.93	1.87	1.44	1.40	0.92	0.79	1.390
Petronas	0.53	0.61	0.63	0.64	0.43	0.36	0.53
Inventory Turnover							
Industry Standard	8.70	8.40	9.30	9.90	9.30	7.30	8.82
Pertamina	8.47	7.65	7.10	7.85	6.27	6.13	7.24
Petronas	12.64	13.92	13.57	15.07	13.15	11.73	13.34
Acc. Receivable Turnover							
Industry Standard	11.00	11.10	11.70	12.50	12.10	11.10	11.58
Pertamina	13.45	10.64	8.46	7.93	6.05	7.02	8.93
Petronas	7.07	7.28	6.85	6.90	5.21	4.77	6.35
Fixed Asset Turnover							
Industry Standard	2.00	1.90	1.80	1.40	1.00	0.80	1.48
Pertamina	5.42	4.98	3.99	3.20	1.72	1.46	3.46
Petronas	1.18	1.37	1.36	1.35	0.86	0.67	1.13

With slightly different results than fixed asset turnover, total assets turnover ratio analysis results revealed that Pertamina was somewhat higher than Petronas. A six year average of Pertamina total assets turnover was at around 1.390 times, compared to Petronas average result of 0.53 times. However, both NOCs had a similar trend of decreasing turnovers due to the decrease of oil price from 2014. Pertamina achieved a higher six year average of total assets turnover compared to Petronas and the industry benchmark. Pertamina achieved a six year average of total assets turnover at 1.390 times, higher than Petronas at 0.53 times, which was less than the industry standard at 1.0 times.

Profitability assessment based on Table 5 below shows that Petronas achieved the highest average ratio compared to Pertamina, except for return on equity (ROE). On a six year average, Petronas's Return on assets (ROA) reached 7.54 percent, and was followed by Pertamina in the six year period of 5.52 percent. Return of equity (ROE) analysis showed that Pertamina reached the highest result on six year average of 14.7 percent, followed by Petronas with an average of 10.9 percent. As the oil price declined, all companies underwent a similar weakening ROA and ROE in the period of 2014 and 2015. However, Pertamina had a significant increase on ROA and ROE in the period of 2016. The implementation of new fuel policy in Indonesia, increased the net income of Pertamina, as the fuel price had significant impact on revenue while cost of goods sold was quite low.

Gross profit margin and net profit margin analysis reveal that Petronas achieved an outstanding result, on a six year average of 34.5 percent and 13.5 percent respectively. Pertamina followed with six year average gross profit margin of around 13 percent and net profit margin of 4.3

percent. Although Petronas achieved the highest six year average of gross profit margin ratio, historical figures reveal that from the period of 2011 to 2013, it was declining suggesting that while Petronas revenue increase, cost of goods sold also increased quite significantly.

Return on assets analysis revealed that Petronas achieved the highest six year average result compared to Pertamina and industry standard. Petronas yielded six year average return of assets at 7.5 percent, followed by Pertamina at 5.5 percent, whereas the industry standard averaged at 4.3 percent. Return on equity analysis revealed different result, six year average return on equity of Pertamina was higher than Petronas. However, both NOCs achieved above the industry standard at a six year average of 9.8 percent, while Pertamina achieved 14.7 percent, Petronas at 10.9 percent of six year ROE.

Gross profit and net profit margins of Petronas were higher than Pertamina, and the industry standard. Petronas' six year average of gross profit and net profit margins were at around 35 percent and 14 percent respectively. Pertamina's six year average resulted in 13 percent of gross profit margin and 4.3 percent of net profit margin. While the industry standard was at 10.3 percent and 4 percent respectively. In this research, input variables divided into three groups of liquidity, solvency, and activity ratios while output variables were placed in a single group of profitability ratio. This weighting approach was adapted from a study by Tehrani et al. (2012), which used a questionnaire to determine input and output variables in the DEA model and also the weight of input and output variables.

Table 5: Profitability Ratio Analysis (Authors, 2018)

Profitability	2011	2012	2013	2014	2015	2016	Average
Return on Assets							
Industry Standard	7.40%	5.70%	5.20%	4.10%	2.20%	1.40%	4.33%
Pertamina	6.87%	7.28%	6.20%	2.89%	3.12%	6.79%	5.52%
Petronas	11.64%	10.45%	10.66%	7.17%	2.29%	3.00%	7.54%
Return on Equity							
Industry Standard	16.70%	13.60%	10.50%	9.30%	4.70%	3.80%	9.77%
Pertamina	19.27%	19.39%	18.85%	8.01%	7.42%	15.15%	14.68%
Petronas	17.57%	15.31%	15.26%	10.00%	3.20%	4.28%	10.94%
Gross Profit Margin							
Industry Standard	14.00%	13.00%	13.00%	13.00%	6.00%	3.00%	10.33%
Pertamina	10.98%	9.78%	9.84%	9.50%	14.30%	23.41%	12.97%
Petronas	43.36%	37.04%	35.46%	34.25%	28.66%	28.16%	34.49%
Net Profit Margin							
Industry Standard	3.00%	3.00%	4.00%	6.00%	3.00%	5.00%	4.00%
Pertamina	3.57%	3.89%	4.31%	2.07%	3.40%	8.63%	4.31%
Petronas	22.05%	17.14%	17.05%	11.25%	5.31%	8.27%	13.51%

This research utilized Charnes, Cooper, Rhodes (CCR) model with input orientation. The CCR model assumes Constant Returns to Scale (CRS). The calculation model was adopted from Abubakar et al. (2016) and used to measure financial performance of International Oil Companies (IOCs) and assess performance improvement. DEA calculations were performed using DEA-Excel Solver 2014 as developed by Jablonský (2014). The DEA calculation results for the period of 2011-2016; for Pertamina were 1 respectively; while for Petronas they were 1 for 2011-2014, and 0.900 for 2014, and 0.601 for 2016. The calculation reveals that, Petronas performance efficiency was declining in 2015 and 2016. Pertamina was still efficient in their performance.

Limitation

This study adds to the literature about financial performance in the real working world. In the near future, it is suggested that research be conducted with many companies from the oil and gas industry to get more generalized results. Since the focus is on one industry, it is worthwhile to explore it on a wider scale and find out if different companies yield the same result. In addition, the study only focuses on financial aspects and it is suggested that other aspects such as operation and administration be measured.

Conclusion and Recommendation

Compared to Pertamina, Petronas had shown outstanding results with regard to liquidity, solvency, and profitability ratios. However, Petronas had a lower activity ratio. Comparisons to the industry benchmark show that overall financial performance of both NOCs were above the benchmark. DEA calculation revealed that, Petronas performance efficiency was declining in 2015 and 2016 and Pertamina was still efficient in its performance. The decline of oil price in 2014 affected the performance efficiency of both NOCs, however, the impacts were various. Although Pertamina and Petronas revenues decreased after the decline of oil price in mid of 2014, by around 49% and 35% respectively by the end of 2016, their net income showed a different result, despite their respective efforts to reduce costs and capital expenditure. Pertamina net income was increasing by 117%, conversely Petronas net income remained low at 59% by the end of 2016. The impact was influenced by the segmentation of their business, domestic demand, and also regulatory environment of those nations.

Petronas' revenue was mostly contributed to from upstream business by almost 55% and the rest was from downstream business. This explains the downward trend of historical profitability ratios in the period from 2014-2016. The oil price put pressure on the profitability of upstream business and the downstream business could not support overall profitability. On the regulatory aspect, the pressure on Petronas to manage the entire ownership of Malaysian upstream business, effected the long term activity ratios, these ratios being total assets and fixed assets turnover, as the value of assets are represented as the entire upstream assets of



Malaysia. On the other hand, Pertamina revenue was mostly contributed to from downstream business. Around 90% of Pertamina revenue was generated from downstream business, which became beneficial in the low oil price environment. Supported by domestic demand of fuel and the enactment of a new fuel policy in Indonesia, Pertamina managed to increase its profitability. The new fuel policy, which regulates fuel price and the reduction of subsidized fuel, ensured Pertamina improvement on liquidity and profitability in the period of 2014 to 2016.

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