Greener Journal of Business and Management Studies
Vol. 12(1), pp. 30-37, 2024
ISSN: 2276-7827

https://gjournals.org/GJMBS

Performance Evaluation of Public and Private Marine Terminals in Nigeria under Fuel Subsidy Regimes.

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ARTICLE INFO

Article No.: *022324027*
***Type*:** *Research*
Full Text: *PDF, PHP, HTML, EPUB, MP3*

Accepted: *29/02/2024*
Published: *13/03/2024*

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Keywords: *Data Envelopmental Analysis, Fuel Subsidy Reforms, Marine Terminals*

ABSTRACT

Fuel scarcity has remained persistent in the Nigeria polity even as a net exporter of petroleum. This challenge has been subjected to various policy reforms by different administration to curb the menace in Nigeria as both privately and publicly managed marine terminal operators are constantly retooling to mitigate fuel scarcity and implement the fuel subsidy reforms of government. The aim of this study is to evaluate and compare the relative performance of 3 publicly and 3 privately managed marine terminals in the execution of RPEA and DSDP reforms of government over the period of 2012 to 2020. Data Envelopmental analysis model was adopted to analyse their relative efficiencies over time. The result revealed that the 3 publicly managed maritime terminals were efficient once respectively under OPA/RPEA (Jonathan's tenure) while the publicly-managed maritime terminals were efficient both during OPA/RPEA (Jonathan's tenure) and DSDP (Buhari's tenure). The study shows that the privately managed marine terminals performed more efficiently in the process of fuel availability in Nigeria.

1. INTRODUCTION

The policy implementation exercise of the Nigeria government is often adjudged cumbersome and subject to bureaucratic nuances. This has made the operational efficiency of such policies implementation by government agencies subject to serious questioning. The administration and policy direction of the petroleum and energy sectors in Nigeria have been piloted by successive governments without cogent improvement in the area of mitigating the challenge of perennial fuel scarcity and fuel price hike in Nigeria. The fuel subsidy scheme has remained a hot conduit of corruption since the 1970s. It has remained a lucrative scheme for successive administrations because of its socio political and economic importance to the country.

However, the argument amongst the professionals concerning the efficient implementation of government policies is said to be best left in the hands of the private sector but subject to monitoring and regulation by the public sector. Since the advent of the fuel subsidy regimes, it is observed that both private and public sector petroleum marketing firms are involved in the supply and distribution of petrol in Nigeria. Petroleum industry is a capital intensive, highly volatile and competitive industry that operates with the objective of continuous improvement of the supply chain for the purposes of sales and profit maximisation.

The policy reforms and strong control of the petroleum sector have compelled the operators to efficiently strive in the implementation of these government policies since the industry is subject to price fluctuations.

In this study, there is the need to empirically establish the performance of publicly managed marine terminals and the privately managed marine terminals in the implementation of the fuel supply and distribution drive of government under the fuel subsidy reforms in Nigeria.

Hence, the study tends to evaluate and compare the relative performance of 3 publicly-managed marine terminals and 3 privately-managed marine terminal within the same geographical location to ascertain how efficiently they have implemented the supply and distribution of petrol in Nigeria.

Given, the unique petrol supply system as practiced in Nigeria, the marine terminals and ports have enjoyed a pride of place in the supply and distribution of petrol in Nigeria. The pride of place is as a result of the gross infrastructural decays of the standard fuel distribution networks hence causing the overburdening of nodes of transportation system such as vessels, marine terminals /ports, tank farms, Bulk Road Vehicles, etc. which have led to huge patronage and its associated costs such as transactional costs, delays, externalities costs etc. which finally translates to the cost of petrol in Nigeria. For instance, the patronage of foreign long range and medium range vessels for the transportation of petroleum, patronage of tank farms, liquid bulk jetties and Bulk Road Vehicles remains good examples for pollution. The husbandry of poorly maintained and usage of poor-quality equipment and crafts in the distribution of petrol, basically because of poor enforcement of standards on the transportation system is the order of the day as the demand for transportation system and its attendant revenue generation is so huge that maintenance culture as stipulated by the international organizations is ill executed or not executed at all due to transactional profits and poor regulatory enforcement in Nigeria.

The petrol price hike and the perennial fuel scarcity have elicited public outcry on the authenticity of the payment of fuel subsidy claims, while also querying the effect of marine terminal operator's contributions to the persistent fuel scarcity and price hike in Nigeria.

The study is geared towards empirically exposing the better performing group of marine terminals saddled with the supply and distribution of petrol from the Niger delta region of Nigeria. Hence the evaluation of the relative efficiency of 6 marine terminals comprising 3 privately managed and 3 publicly managed, operational in the Niger delta region of Nigeria.

The concept of Performance is fundamental to every business, for the sake of measurement of internal performance or progress and also to monitor the performance of the competitors and also business regulators. Performance internal interest is also to measure achievements against set goals and objectives. Seaports are complex businesses with huge investments as inputs resources with expected benefits as output resources which should be proven to give return on investment for purposes of sustainable development. To evaluate the benefits after such investment in seaports is termed performance measurement. However, the evaluation of these systems – marine terminal operations compels stakeholders and policy makers to take decisions to increase productivity or efficiency. This has led to academic interest in seaport performance measures. Hence, this paper will assess the relative efficiencies of the six marine terminals from 2012 to 2020 using the Data Envelopment Analysis (DEA). The result of this research will aid the policy makers, investors and port operators on the different ways to improve system efficiency while also increasing system patronage as individual elements or as a total system. This article is categorized into 4 sections: section 1 is the Introduction, Review of Literature, section 2 is Methodology and Data Presentation, section 3 Results and Discussion of Findings and section 4 is Conclusions and Recommendation.

Background Information

Maritime transportation as a major channel of international trade has been subjected to deliberate efforts to improving the efficiency of the sector. The maritime industry is a vital and strategic sector in every country's economy. According to UNCTAD (2009),

international sea borne trade, from 1980 to 2008 witnessed an increase of over 120%. According to Umang et al. (2011), this increase was possible due to the steady growth in world population, rapid industrialization, and the depletion of local resources, road congestion, increase in the need for better living standard and elimination of trade barriers. He also claimed that since the beginning of the decade, dry bulk, liquid bulk and containerized cargo have registered an impressive tonnage increase of 52%, 48% and 154% respectively. In this period of high globalized production and consumption driven by increase in world population with limited available resources, there is a growing need for efficient and productive supply chain management which cannot be, without the high efficiency of seaports-marine terminals that serves as the interface between the marine and hinterland leagues. The fluidity of movement of goods and services within region aids increase in socio-economic development of such region. This is made possible based on the performance of the seaports. According to Emeghara and Ndikom (2012) they reiterated that ship and port relationship is like that of a master/servant relationship. A port is likened to be an enterprise established to provide quality service to her masters/customers to survive economically. This is because shippers as well as ship owners demand efficient service from port operators for continual patronage. Nigeria is endowed with marine domain with estuaries hosting harbors, ports and jetties. However, it is vital to note that the deliberate distribution of vessel traffic in accordance to final consumer's location reduces acute traffic congestions in some ports. Considerably, the importance of ports in the economic life of any nation cannot be over emphasized. According to former Managing Director NPA Hadiza Bala Usman in her opening remark in NPA as reported in (NPA handbook 2018/2019), she posits that the critical role of the port in national economic and social development derives from its significance as the cheapest mode of moving large cargoes from one point to the other. This assertion is not for liquid bulk that is actually supposed to enjoy the cheapest and fastest transportation mode of pipeline transportation in the deliveries of petroleum products. The lack of the functionality of the pipeline transport in Nigeria have led to the increase in demand for port services by vessels which includes tanker vessels, BRVs, etc. hence, this condition has made these ports and marine terminals operate as cartels with little or no competition within the Nigerian geographical space. The lack of tangible, convincing and concerted effort of the Nigerian government to repair the pipelines, the refineries and mitigate the fuel scarcity and price hike have also emboldened the grip of the petrol supply chain operators on Nigerian without recurse to ameliorating the price hike of the product.

The study will attempt to appraise the relative performance of 6 marine terminals for refined petroleum, comprising of 3 government managed and 3 privately managed marine terminals in Nigeria subject to the fuel subsidy reforms under the administrations of former presidents Goodluck Jonathan and Muhammadu Buhari.

According to Adetayo Olaniyi Adeniran (2018), fuel is a major factor amongst other factor that affects or influences the costs of transportation and its rate in Nigeria which also translates to the cost of goods and services.

The policy factor of government on the fuel consumption through fuel subsidy reforms is also a veritable factor that could impact transport system's economic performance. The execution of these reforms was for the purposes of providing consistent fuel to the low-income earners in all nooks and crannies of Nigeria. This policy has strategically made the port a key custodian of the distribution process of petrol in Nigeria because they oversee the husbandry of all vessels calling into Nigerian ports while also generating revenue through port charges to government from this exercise. Adetayo Olaniyi Adeniran (2018), further buttresses the assertion that fuel subsidy is a factor that affect transportation costs and its rates which serves as a derived demand for ports services. According to Adeniran and Yusuf 2016) the port is one of the important elements in transportation system amongst other elements such as infrastructure, vehicles, terminals and operations. The marine terminals/ports as a node of interest in the execution of the distribution of the subsidized fuel in this study cannot be over emphasized. The port factor is a very vital cost factor that influences the cost of goods and services in Nigeria.

According to Jean, Claude and Brian (2006), transportation costs are monetary measures of both fixed and variable costs of the transport provider expended in the provisions of transportation services to a person or organization.

They went further to explain transportation rate as the price paid by the transport user for the transportation services rendered to such individual or firm. This is actually the price paid for the conveyance of passenger and or goods to an agreed destination at a particular time. These rates are actually influenced by transportation cost as influenced by location/geography, type of product conveyed, economies of scale or carrying capacity of the craft in use, fuel for equipment or transport modes, infrastructure conditions, and trade imbalance. Therefore, fuel subsidy is actually supposed to impact on the costs and fares for transportation of which the port and marine terminals are part of the system. (Adetayo Olaniyi Adeniran 2018)

There is availability of Port performance and operational efficiency studies on ports vis -a-viz marine terminal operations and there are also researches that measure efficiency of ports or marine terminal operations using Data Envelopmental Analysis DEA (Chansu Lim, Jongsu Lee (2020); Brooks, M.R., Schelinck, T. and Pallis, A.A. (2011); Magdiel A. Agüero-Tobar, Marcela C. González-Araya, Rosa G. González-Ramírez (2022) Snezana Radukic, Milan Veselinovic, and Ivana Marjanovic (2023)). For the Nigerian seaport efficiency evaluation, extensive studies have been conducted

using DEA and other analytical models Nze, Obiageli N. et. al (2021); Kenneth E. Ndubuisi and Nwoloziri Chinyeaka Nwokodi (2020); Geraldine Okeudo (2015); Nwanosike, F., Tipi, N.S. and Warnock- Smith, D. (2012), Donatus E. Onwuegbuchunam et al (2020); Ugboma Ogochukwu and Oyesiku Kayode (2021) etc.

However this study is centered in the evaluation of marine terminals performance in Nigeria subject to fuel subsidy reforms. It is geared towards unveiling the performance contribution of the marine terminal operators in the supply and distribution of petrol thereby striving to ameliorate fuel scarcity challenge. It will reveal the comparative performances of the publicly managed marine terminals and the privately managed marine terminals during the fuel subsidy reform periods under consideration.

2. METHODOLOGY

Data for this study were all secondary data gotten from the individual marine terminals, government agencies like NPA, NMDPRA, etc under study in Nigeria. In this study the marine terminals names were all codenamed. The dataset covers the period of 9 years. The data were collated and analysed for the benefit using DEA.

Data Envelopment Analysis (DEA)

Data Envelopment Analysis (DEA) is increasingly one of the popular tools to measure performance for transit firms with multiple variables. DEA reduces complex and multi-objective problem of performance measurement to a single number. Here, DEA is applied in a transit system -the marine terminal which is major supply chain infrastructure.

Data Envelopment Analysis is a non-parametric model for measuring the efficiency of Decision-Making Units (DMU) with multiple inputs and or multiple outputs. Charnes et al., (1978) first introduced the DEA as a multi-factor productivity analysis module for measuring the relative efficiencies of DMUs. The DEA analysis shows how inputs and output have to be changed in order to maximize the efficiency levels of the target DMU. DEA is used in this study because of its suitability in analyzing supply chain performance of marine terminal operations and their improvement. The proposed model involves the following problem of linear programming.

Input-oriented Primal (BCCp-I)
Min Zo=Θ-ϵ.1μ s+- ϵ.1μ s-
Θ, λ, s+, s-,
s.t. Yλ - s+
ΘXo - Xλ-s+
1μ λ≥1
λ, s+, s-≥ 0

Input-Oriented BCC Dual (BCCd-I)
Max Wo = μTYo + ụo
μ,v
s.t. VTXo = 1
μTY - VTX + ụo 1μ ≤ 0
- μT ≤ - ϵ.1μ
- VT≤ - ϵ.1μ

DEA as developed by Charnes et al., (1978) explain that suppose we have a set of n peers DMUs which produces multiple output vector Y by using observed multiple input vector X respectively.

Where,
X= input vector used in the DMUs.
Y= output vector produced by DMUs.
Ε=is a constant non- Archimedean (infinitesimal of the order of 10-6) that ensures no input or output is given a zero weight
s+ and s- are the slack vectors for output and input respectively
Θ=represents the proportional reduction of the input in relation to the amount of the projected input. The optimal value of λ forms a composite unit outperforming the DMU under analysis and providing targets for this DMU to identify sources of its inefficiency. This model is known as input-oriented BCC, the initial being in recognition of its formulators (Banker et al 1984)

Then the production possibility set will be defined as follows in relation to this study:
Thus:
F = {(Y, X)/X can produce Y}
(As cited by Po- Kyung and Prabir De 2004)

Where in this study:
n = B-Terminal, POTerminal, NCTerminal, NoWTerminal, WTerminal and ROTerminal.
Y= Official Pump Price, Daily Swap Import, Number of Supply Vendors, Port Channel Approach draft, Port/Jetty Draft, Berth Distance from FWB, Ship Max Length Overall, Shore Tank Capacity, Annual Subsidy Payment.
X= Berth Rent, Bulk Road Vehicle Traffic, Cargo Dues, Cargo Throughput, Environmental Protection Levy, Fire Coverage, Ship Dues, Ship GRT, Ship Traffic, Value Added Tax,

They were collated from the boarding team records, terminal records, and shipping agents' records. These parameters include vessel calls, cargo throughputs, BRVs calls, cargo dues, ship dues, environmental protection levy, fire coverage, GRT- Ship size, VAT, Berth rent, etc. all associated with ship- cargo marine terminal operations as supervised by NPA. Other secondary data gotten from relevant literature were official petrol pump price, annual subsidy payment, number of supply vendors (oil exporters), and Direct swap imports (quantity consumed) as cited in price gap approach -(Koplow 2009; Foo, N., H. H. Lean, and R. Salim. 2020), International Energy Agency (IEA), International Institute for Sustainable Development (IISD), PWC reports. Defined government sources in Nigeria and various websites disclosed some specific

information regarding official petrol pump prices, and number of supply vendors, annual subsidy payment and daily swap import (quantity consumed). Other parameters adopted for this study were suggested from literature reviews of materials on data envelopmental analysis applications in port efficiency studies, NPA Tariff yearbook and the world port tariff- port pricing UNCTAD 1975

According to Cooper et al (2004), the performance of a DMU is efficient if and only if it is not possible to improve any input or output without worsening any other input or output, while the performance of a DMU is inefficient if and only if it is possible to improve some input or output without worsening some other input and output. (Pareto-Koopmans Definition of Efficiency)

Hence, DEA model is a linear programming model applied on the input-output variables to empirically or quantitatively estimate the technical and scale efficiency of the refined petroleum oil terminal jetties. These will determine the level of inefficiency plus the input/output slack that would have been needed to perfect or improve the systems efficiency.

The research has a restricted study population because of the nature of the industry studied and also the scope of the study. The study population is basically the boarding team of tanker vessels which consists of Cargo inspectors, Shipping agents, Department of Petroleum Resources (DPR) staff, Petroleum Product Pricing Regulatory Agency (PPPRA) staff, Nigerian Ports Authority (NPA)Traffic and marketing department staff, Terminal Loading master, Company Shipping manager and Supply and Distribution manager.

The data analysis is applied to the six (6) selected marine terminal operators in the Niger Delta region of Nigeria namely: B-Terminal, POTerminal, NCTerminal, NoWTerminal, WTerminal and ROTerminal. These marine terminals were selected basically because they have been in cargo operations under different subsidy regimes and governments. These terminals have been in cargo operations on or before 2012 and are still operational till date. The selected terminals are operational in 3 out of the 4 Nigerian ports authority pilotage districts of Nigeria.

3. RESULTS AND DISCUSSION

Table 1. Technical Efficiencies result of the selected Marine Terminals from 2012-2020 using DEA under Output Oriented Model

DMU Name	TEvrs	RTS	Inputs Slack								
			NSV	DSI	OPP	JD	PCA	PDF	STC	MLOA	ASP
BJ2012	0.77	DRS	1.6	67165.2	20.2	1.7	2.6	11.3	29289100.3	43.0	2.0
BJ2013	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BJ2014	0.97	IRC	0.2	8234.5	2.2	0.2	0.3	1.2	3142342.0	4.6	0.2
BJ2015	0.60	DRS	1.2	178470.3	34.8	2.9	4.5	19.4	50501835.4	74.1	1.4
BJ2016	0.53	DRS	12.6	199400.3	67.6	3.4	5.1	22.4	58138228.4	85.3	0.4
BJ2017	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BJ2018	0.52	DRS	16.2	210615.6	69.1	3.4	5.2	22.9	59463171.3	87.2	1.9
BJ2019	0.69	DRS	11.2	152810.2	58.1	2.2	3.4	15.0	38996288.5	57.2	1.6
BJ2020	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PJ2012	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PJ2013	0.51	DRS	3.4	143226.4	41.9	4.5	5.4	23.4	427080867.6	89.1	4.0
PJ2014	0.78	DRS	1.5	71849.4	18.9	2.0	2.4	10.5	192680086.5	40.2	1.6
PJ2015	0.66	DRS	1.0	151906.5	29.6	3.2	3.8	16.5	302073548.1	63.0	1.2
PJ2016	0.31	DRS	18.5	293561.3	99.5	6.3	7.5	32.9	601491945.8	125.5	0.6
PJ2017	0.22	DRS	30.3	303637.0	112.6	7.1	8.5	37.3	681008852.1	142.1	0.4
PJ2018	0.63	DRS	12.4	161671.9	53.0	3.4	4.0	17.6	320765027.0	66.9	1.4
PJ2019	0.53	DRS	16.9	229234.0	87.2	4.3	5.2	22.5	411097673.3	85.8	2.4
PJ2020	0.47	DRS	18.6	266059.5	99.0	4.9	5.9	25.5	466581107.2	97.4	0.5
NWJ2012	0.60	DRS	2.8	113240.6	34.0	2.8	2.5	19.8	17094951.1	73.6	3.4
NWJ2013	0.78	DRS	1.6	65187.8	19.1	1.6	1.4	11.1	9575525.4	41.2	1.8
NWJ2014	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NWJ2015	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NWJ2016	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NWJ2017	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NWJ2018	0.75	DRS	8.5	110663.7	36.3	1.8	1.6	12.5	10815996.5	46.6	1.0
NWJ2019	0.83	DRS	6.3	85401.9	32.5	1.2	1.1	8.7	7544704.2	32.5	0.9
NWJ2020	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NJ2012	0.58	DRS	3.0	121271.7	36.4	2.8	2.7	21.2	22246829.7	65.7	3.6
NJ2013	0.40	DRS	4.2	175036.4	51.2	3.9	3.8	29.8	31244077.8	92.3	4.9
NJ2014	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NJ2015	0.44	DRS	1.7	246249.1	48.0	3.6	3.6	27.9	29313184.8	86.6	1.9

Table 1 cont: Technical Efficiencies of the selected Marine Terminals from 2012-2020 DEA under Output Oriented Constant Return to Scale Model

DMU Name	TEvrs	RTS	Input Slacks								
			NSV	DSI	OPP	JD	PCA	PDF	STC	MLOA	ASP
NJ2016	0.21	DRS	21.4	338984.9	114.8	5.1	5.1	39.6	41577990.4	122.8	0.7
NJ2017	0.20	DRS	31.1	311421.6	115.5	5.2	5.1	39.8	41811796.9	123.5	0.4
NJ2018	0.26	DRS	25.3	329181.4	108.0	4.8	4.8	37.2	39096682.4	115.4	2.9
NJ2019	0.37	DRS	22.8	309770.0	117.8	4.1	4.1	31.7	33255030.9	98.2	3.2
NJ2020	0.29	DRS	24.9	355949.2	132.4	4.6	4.6	35.6	37367013.7	110.3	0.7
RJ2012	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RJ2013	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RJ2014	0.96	IRS	0.3	12661.0	3.3	0.3	0.2	2.0	1897607.9	7.1	0.3
RJ2015	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RJ2016	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RJ2017	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RJ2018	0.73	DRS	9.1	118302.9	38.8	1.8	1.6	13.9	13118108.5	49.0	1.0
RJ2019	0.77	DRS	8.2	111705.6	42.5	1.5	1.3	11.9	11196033.1	41.8	1.2
RJ2020	0.84	DRS	5.5	79270.3	29.5	1.1	0.9	8.2	7769305.5	29.0	0.2
WJ2012	0.41	DRS	4.1	168594.2	50.7	5.9	3.5	30.6	110435815.1	107.8	5.0
WJ2013	0.12	DRS	6.1	258101.5	75.5	8.8	5.2	45.6	164508513.7	160.6	7.3
WJ2014	0.32	DRS	4.8	223915.9	58.9	6.8	4.0	35.6	128353958.1	125.3	5.0
WJ2015	0.59	DRS	1.2	181549.9	35.4	4.1	2.4	21.4	77169007.4	75.3	1.4
WJ2016	1.00	CRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WJ2017	0.05	DRS	37.0	370449.5	137.4	9.5	5.6	49.3	177597824.8	173.4	0.4
WJ2018	0.13	DRS	29.7	385834.5	126.6	8.7	5.2	45.4	163630469.8	159.7	3.4
WJ2019	0.22	DRS	28.1	381454.0	145.1	7.8	4.6	40.6	146224050.3	142.8	4.0
WJ2020	0.28	DRS	25.2	360374.9	134.0	7.2	4.3	37.5	135086972.8	131.9	0.7

Table 1 shows the DEA under Output Oriented Constant Return to Scale Model results on the technical efficiencies of the selected Marine Terminals for the years under consideration.

The result discloses that there is constant return to scale in 2012 for POTerminal, in 2014 for NCTerminal and in 2016 for WTerminals. It also showed constant return to scale in 2013, 2017 and 2020 for BTerminals. The result further revealed constant return to scale for NoWTerminal in 2014, 2015, 2016, 2017 and 2020. RTerminal, in 2012, 2013, 2015, 2016 and 2017.

4. CONCLUSION AND RECOMMENDATION

The study is on the Performance Evaluation of Public and Private Marine Terminals in Nigeria under fuel subsidy regimes. In executing this study, data were gotten from NPA, NMDPRA, etc. DEA was adopted in the analysis of the data. It was empirically inferred that there was a total of 16 efficiencies within the 9 years under review.

A closer look however, shows that each of the 3 publicly managed terminals was efficient ones during the study period under review. This was mainly during the RPEA reform time of the administration of former President Goodluck Jonathan. A more cursory look at the result, further disclosed that the 3 privately managed marine terminals had more efficient performances than the publicly managed marine terminals within the same years under consideration. The privately managed marine terminals had a total of 13 efficient performances which covered the periods of RPEA and DSDP reforms of both Jonathan and Buhari administrations as against 3 efficient performances by the 3 publicly managed marine terminals.

This result goes to show that the privately managed marine terminal operators implemented government fuel subsidy reforms more efficiently than the publicly managed marine terminal operators. In other words, the effort to distribute petrol to the populace to avert fuel scarcity was more efficiently executed by the privately managed marine terminal operators than the

publicly managed marine terminal operators during the fuel subsidy reforms,

It is therefore recommended that the government collaborates with the marine terminal operators / practitioners in policy formulation, execution and ICT integration in the product supply chain to further avert fuel scarcity challenges.

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Cite this Article: Ndubuisi, KE; Ndikom, OB; Nze, I; Nwokedi, TC (2024). Performance Evaluation of Public and Private Marine Terminals in Nigeria under Fuel Subsidy Regimes. *Greener Journal of Business and Management Studies*, 12(1): 30-37.