



ISSN: 0975-833X

## RESEARCH ARTICLE

# EMPERICAL EVALUATION OF THE MARITIME INDUSTRY'S IMPACT ON THE NIGERIAN ECONOMY

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### ARTICLE INFO

#### Article History:

Received 10<sup>th</sup> March, 2013  
Received in revised form  
22<sup>nd</sup> April, 2013  
Accepted 18<sup>th</sup> May, 2013  
Published online 15<sup>th</sup> June, 2013

#### Key words:

Cabotage, Cargo, Economy, Financing  
Maritime, Port, Throughput, Vessel.

### ABSTRACT

This study carried out an assessment of the role of NIMASA in the development of Nigerian Maritime industry and the impact of shipping on the Nigerian economy on the other hand. Major emphasis was laid on the relationship between the number of vessels registered by NIMASA per period and the corresponding revenue generated. With a collection of port vessel registration and the corresponding revenue accrued, a regression model was developed to investigate the relationship between Gross Domestic Product (GDP) of Nigeria and other economic variables such as cargo throughput (from the shipping sub-sector of the maritime industry), the balance of payment and exchange rate to reveal the rate of Naira – Dollar denomination within a 12 year study period. The results of the analysis reveals that even though the maritime sector exhibits great potentials of contributing immensely to the growth of the maritime industry and the Nigeria economy; it is suggested that NIMASA should intensify efforts in capacity building and maritime financing in order to create room for optimal implementation of the cabotage.

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## 1.0 INTRODUCTION

Greater efficiency in Transport has been pursued recently in many countries by changing the structure and institutional framework of the industry. These changes have been introduced by such measures as privatization and deregulation so that the role of government, Federal governments in particular will be reduced significantly. The Maritime industry has been subject to similar development. However, in most third world countries like Nigeria changes in maritime and port policies have been modest. The countries in which the policy changes have been greatest are those in which national policies exerted strong influence on port performance. The United Kingdom and New Zealand are well known examples. In recent times, the policies of government are seemingly moving in ways, consistent with a more competitive market structure. In many countries, public ownership, subsidization and some levels of central planning are still common in the maritime industry. However, the varied arrangement for the ownership and administration of ports and maritime operations gave raise to questions about the appropriateness of existing government policies. In the light of the above argument, there emerged two decades ago, the National Shipping Policy otherwise known as Decree No.10 of 1987 which came into force in 1988, establishing the then National Maritime Authority(NMA). The origin of the National Shipping Policy could be traced down to the United Nations Conference on Trade and Development (UNCTAD) code of conduct (40:40:20), adopted in 1975 and entered into force in 1983. Since its inception, the then National Maritime Authority had created a laudable impact on the maritime industry, which in turn has a big role to play in national economic development. Nigeria has a highly productive open sea with abundant and diverse maritime resources. However, Nigeria has not been able to maximize the advantage of these natural resources. Rather, she has in the last half a century, witnessed a chequered history in the development of her maritime industry and shipping to be precise. Earlier than the period 1959, the maritime industry of Nigeria was exclusively owned, managed and controlled by her colonial master and its international maritime

business allies. Essentially, the cyclic theory of port oscillation is manifest in port concentration and diffusion, which could be attributed to the then trend in cargo through put of the country's port. This situation was not peculiar to Nigeria alone as many other African countries also found it extremely difficult to take part in the maritime business of their country. The ports were managed by these foreigners who handled exclusively the import and export cargo. Therefore the benefits that should accrue to a country in the management of her maritime industry went to the foreigners. Today, the shipment of cargo into and out of Nigeria mostly depends on foreign shipping lines. More so, in spite of the "National Shipping Policy", Nigeria faces a crisis of extinction from her maritime industry. Perhaps, the country needs to know what it is losing to be able to adequately address this problem. Maybe, the passage of the coastal and inland shipping Act, 2003 by the National Assembly seems to mark a new beginning in the shipping and maritime administration in Nigeria. The rebirth of National Maritime Authority (NMA) to Nigerian Maritime administration and Safety Agency (NIMASA) should create room for efficiency in the maritime sector while the cabotage regime is expected to increase to a reasonable extent, indigenous participation in maritime business. Based this problem discussed so far, this paper aims at appraising the contributions of NIMASA to the development of Nigerian Maritime industry and to ascertain if there exist any significant relationship between the number of ships registered by NIMASA and the revenue accrued to the government.

**To further achieve these stated objectives, the following research questions were put forward:**

- Are NIMASA's contributions to the development of Nigeria Maritime industry significant?
- Is there any significant relationship between the number of ships registered by NIMASA and their corresponding revenue generated?

**With the following questions asked, there was need for the formulation of two hypothesis which were:**

- NIMASA has no significant contribution to the development of Nigeria Maritime industry.

- There is no existing significant relationship between the number of ships registered and revenue generated in Nigeria.

## 2.0 Brief History of Nigerian Maritime Industry

Since 1959, shortly before independence, Nigeria established the Nigerian National Shipping Lines (NNSL) and at the inception, purchased two second – hand COMBO vessels for its operations. By 1967, the vessels in the fleet of NNSL increased, and additional fifteen (15) shipping companies had been established by indigenous entrepreneurs with the assistance of government. This was possible due to certain development in global maritime industry. Apparently displeased by the dominance of developed countries in the maritime industry of developing countries, created a forum in order to break the monopoly. The creation of United Nations Conference on Trade and Development (UNCTAD) in 1965 provided ample opportunity for the fight against total domination and an international forum for discussion and policy formulation by all shipping companies, ship owners, shippers, shipping administrations and port authorities. At the UNCTAD meeting in New Delhi, India in 1968, it was decided that all affected countries should establish institutions which could defend and promote effectively their economic interest in shipping, thus Ivory Coast established the National shippers council in 1969, and was followed by the Ministerial conference of West and Central African states of Maritime (MINCOMAR) in 1975. With the introduction of UNCTAD's Code of conduct for conference liners which stipulated the 40:40:20 share of cargos Nigeria also established the Nigeria shippers council by Decree No. 13 of 1978 and charged the body with the responsibility of organizing the Nigerian Shippers and shipping activities in Nigeria. To effect fully the agreement of the UNCTAD's code, the government through Decree No 10 of 1987 established the National Maritime Authority which was to implement the country's shipping policy in line with United Nations Conference on Trade and Development's (UNCTAD) conventions. The implication of the foregoing is the rapid growth of the country's shipping business. By 1987 the fleet in the Nigerian National Shipping Line (NNSL) business rose to twenty seven (27) vessels. Unfortunately, and for the many reasons there was a gradual decline in the vessel acquisition. As at 1997, there were total of one hundred and twenty two (122) registered shipping companies in Nigeria, during which period the NNSL got liquidated and a new company UNITY LINE was established.

Most shipping companies in Nigeria today cannot boast of their own vessels and they have to depend on vessel charter to move their allocated cargoes. This has several implications as the dominance intended to be corrected remained strong. For instance, of the six thousand and eight one (6,081) ships that called to Nigerian Ports between 1977/78 and 1979/80 only ten percent (10%) was indigenous and this carried only eleven percent (11%) of the total nine percent (9%) of the total freight revenues. Of the N 1.66 billion paid by Nigeria per year from 1971 to 1991, National Carriers earned only two hundred and forty Million Naira (N240m) representing a mere 14.4% of the total earnings from maritime services (Badejo,2007). Ironically, Nigeria was responsible for sixty eight percent (68%) of the total trade of West and central African sub region. This trend, however, is not unique to Nigeria in spite of UNCTAD's aim to encourage greater participation in shipping. Up to 1983, the developed countries controlled eighty percent (80%) of the world shipping. The socialist countries which controlled 7.4% of world export and 40% of the world trade had only thirteen percent. (13%). Even today, the developed market economy countries and the major open registry continued to be the dominant group in the world merchant fleet. As noted by the Review of Maritime Transport in 1991, these countries, which combined tonnage of 467.2 million, accounted for 68.3% of the world fleet. Countries of central and eastern Europe and socialize Asia owned 6% and 3.2% respectively of the world's merchant. The developing countries increased their fleet to 144.3 million dead weight tonnage (dwt); but their share in the total world fleet decreased to 21.1%. Almost 72.5% of this fleet was concentrated in only ten developing countries and Nigeria is not one

of them. Thus disparity between developing country cargo generation and fleet ownership remains apparent. According to Maritime Educator (1997) ship owners in thirty five countries controlled more than 93.9% of the world merchant fleet in 1991. Ship-owners of the leading countries of Greece, Japan, United States and Norway controlled 46.41% and the ten most important countries controlled 69.14%. African countries are responsible for only 5.2%, fleet of National carries in West and Central African Sub regions were few, ill-equipped and inadequate even to cope with their share of 40%. In Nigeria, of the 2,739 ships with net registered tonnage of 47.4 million that entered the country in 1985 less than 10% were national carries. By 1990, this did not improve as only 3% of the registered tonnage of 13.3 million was freights by national carriers. The vessels in the fleet of the national carriers gradually reduced and Nigeria has not been able to carry its own share of 40% approved by UNCTAD.

## 3.0 METHODOLOGY

Data require for this study is collected from secondary sources. This includes various publications of NIMASA, NPA publications, particularly NPA annual report and handbook, Central Bank of Nigeria Publications; other secondary sources include the internet, academic journals and magazines. After data was collected, it was analyzed using regression which is a statistical tool which helps to predict one variable from the other variable(s) on the basis of assumed nature of relationship between them. The variables being predicted is usually referred to as the dependent variable, because its value depends on the value of other variables. Hence, the dependent variable is a function of the independent variable. This is represented mathematically as:

$$Y = b_0 + b_1X_1 + b_2X_2 \dots\dots b_nX_n + \mu$$

Where Y is the dependent variable

X is the independent variable(s)

For the purpose of the first set of analysis Y represents Gross Registered Tonnage.

X represents Number of vessels

$b_0$  is a constant represented mathematically as:

$$b_0 = \frac{\sum X^2 \sum Y^2 - (\sum X)(\sum Y)}{n \sum X^2 - (\sum Y)^2}$$

$b_n$  is a parameter represented mathematically as :

$$b_n = \frac{n \sum XY - \sum X \sum Y}{n \sum X^2 - (\sum X)^2}$$

Correlation analysis was also utilized to determine the degree of existing relationship between two or more variable. Two variables may have a positive correlation, a negative correlation, or they may be uncorrelated. This implies that correlated. This implies that correlation coefficient is a measure of the degree of convariability of the variable X and Y. the values that the correlation coefficient, may assume, range from - 1 to + 1. when  $r = 1$ , it implies that there is perfect positive correlation between X and Y; when r is negative, X and Y move in opposite directions. If  $r = -1$ , there exists a perfect negative correlation between X and Y. when r is zero, then the two variables are uncorrelated. The mathematical representation of the above statements is as follows:

$$r_{xy} = \frac{\sum X_i y_i}{\sqrt{\sum X_i^2} \sqrt{\sum Y_i^2}} = 1, \text{ perfect, positive correlation}$$

$$r_{xy} = \frac{\sum X_i y_i}{\sqrt{\sum X_i^2} \sqrt{\sum Y_i^2}} = -1, \text{ perfect, negative correlation}$$

$$r_{xy} = \frac{\sum X_i y_i}{\sqrt{\sum X_i^2} \sqrt{\sum Y_i^2}} = 0, \text{ no correlate}$$

#### 4.0 Data analysis

Several techniques are adopted firstly to measure the relationship between the number of vessels (that entered within Nigerian maritime jurisdiction) and their gross registered tonnage (their revenue earning capacity) from the period 2004 and 2005. Secondly, to measure the relationship between the gross Domestic Products (GDP) and other economic variables such as cargo throughput, Balance of payment and exchange rate, for the period 1993 to 2004, in order to measure the extent of maritime industry's contribution to the economic growth and development of Nigeria.

#### 4.1 Regression analysis of the relationship between number of vessel and their gross registered tonnage for conventional ports

Conventional ports in this context refer to all ports having berthing and cargo handling facilities as well as carry out routine functions of a port but exclude crude oil terminals. They include the ports of Apapa, container terminal, Tin-Can Island, RoRo, Warri, Port Harcourt, Onne and Calabar.

significance to the gross registered tonnage. The positive relationship between GRT and the number of vessels implies that as the number of ship call increases, gross registered tonnage increased as well as the revenue generated to the ship registry of NIMASA and thus to the government of Nigeria.

In the year 2005, the relationship between GRT and number of vessel is depicted in the regression model below:

$$GRT = -1.634 + 0.0198N + \mu$$

The  $R^2$  computation gives a value of 0.4982 which implies that the degree of explanation of the number of vessels in the gross registered tonnage is 49.82%. This is significant at 0.05% level which means that when the points are plotted on a line graph, almost 50% of the points will enter into the line. The relationship further reveals that GRT increases as number of vessels increases and vice versa. The standard errors test for the model reveal the relationship between GRT and number of vessels for 2004 and 2005 indicates that in the models,

**Table 4.1 Ship call statistics and gross registered tonnage**

Port/Terminal	No of Vessels		% Change	Gross Registered Tonnage (Million)		% change
	2004	2005		2004	2005	
Apapa	891	955	7.18	13	13	0
Container Terminal	485	396	18.35	8	6	25
Tin-Can Island	504	495	1.79	5	5	0
Ro-Ro	192	176	8.33	3	3	0
Warri	298	361	-21.14	2	3	-50
Port-Harcourt	409	398	2.69	6	6	0
Onne	614	635	-3.42	23	22	4.35
Calabar	213	276	-29.58	1	2	-1.
Total	3,606	3,692	-2.38	61	60	-1.64

**Table 4.2. Gross domestic product as a function of cargo throughout balances of payment and exchange rate**

Year	Inward Cargo	Outward Cargo	GDP	E.R	BOP
1993	12897955	5739047	693623.4	22.0511	13615.9
1994	9579969	4281879	907875.4	21.8861	-7194.9
1995	9289971	3983082	1951884.8	21.8861	15325.1
1996	10224300	5251001	2787288.7	21.8861	-183952.6
1997	11213624	5369181	2906624.9	21.8861	251593.1
1998	14286864	5038854	2836814.2	21.8861	36961
1999	15751331	6481605	3440204.1	92.6934	152361
2000	19230426	9702384	4866280	102.1052	-453399.7
2001	24668791	11271901	5526204.9	111.9433	-56531.9
2002	25206380	11780861	6398907.7	120.9702	330792.5
2003	18325000	660537000	6255470	129.3565	27595.1
2004	18576000	607759000	6665040	133.5004	-1266546.5

Source: Central Bank of Nigeria (CBN)

#### 4.1.1 DISCUSSION OF RESULT

The table shows a one year growth rate of number of vessels and gross registered tonnage of the conventional ports between 2004 and 2005. The table further reveals the decline in the total number of ship calls and registered tonnage at the rate of 2.3% and 1.64% respectively. Container terminal recorded the highest number of ship call with increasing rate of 18.35% while Calabar ports recorded the least growth with a decline of about 30% in 2004 and 100% in 2005. The regression results show that the gross registered tonnage vessels is related with number of vessels that called at the conventional ports in 2004, mathematically as:

$$Y = -0.378 + 0.0919X + \mu$$

Where Y represents GRT and X represents Number of vessels, N.

Then,

$$GRT = 0.378 + 0.092N + \mu$$

The  $R^2$  computation gives a value of 0.514 which implies that the number of vessels that called at the conventional ports is 51.4%

$GRT = -0.378 + 0.192N$ ; and  $GRT = -1.634 + 0.0198N$ , standard error (SE) is greater than one half of the parameter estimate  $b_0$ , i.e.  $SE > \frac{1}{2} b_0$

In this case, we accept the null hypothesis (i.e. Hypothesis II) that there exists significant positive relationship between the number of ships registered and generated revenue. Hence we reject the alternative hypothesis that the variables have negative relationship.

The analysis goes further to prove the efficiency of hypothesis I, that NIMASA have significant contribution to the development of Nigeria maritime to the development of Nigeria maritime industry. From the related literature reviewed and the analysis, we therefore, reject the null hypothesis that NIMASA have no significant contribution to the development of Nigeria maritime industry.

#### 4.2 Interpretation of correlation analysis of variable for 2004/2005

In 2004 for the conventional ports, number of vessel has a positive correlation of 0.0717 at 0.01 level of significance with their gross registered tonnage and 0.886 at 0.005 level of significance Gross

Registered Tonnage on the other hand, is correlated with number of vessels with a value of 0.993 at 0.005 level of significance. For crude oil; terminals, GRT has a positive correlation with number of vessels with a value of 0.05 levels and 0.01 level of significance. In 2005, for the conventional ports, number of vessels has a positive correlation of 0.886 at 0.05 levels and no correlation at 0.01 level of significance. Gross Registered tonnage on the other hand, correlates with number of vessels with 0.993 at 0.05 level of significance and no correlation at 0.01 level of significance. For crude oil terminal number of vessels has a positive correlation of 0.975 and 0.940 at 0.05 level of significance with gross registered tonnage while the latter is correlated with the former with the following values: 0.955, 0.962 and 0.977 at 0.05 level of significance.

#### 4.2.1 DISCUSSION OF RESULTS

The table above represents the time series for the relationship between Gross Domestic Product (GDP), Cargo throughput (inward & outward) Exchange rate (E.R) and Balance of payment (BOP), for a study period of 12 years from 1993 to 2004. The Exchange Rate column reveals a slight improvement in Naira – Dollar from 1993 to 1994 which remained constant till 1998 and there after it degenerate as it increased from 1999 to 2004. The table further reveals a positive balance of payment for the years 1993, 1995, 1998, 1999, 2002, 2003 where as adverse (negative) balance of payment was recorded in the years 1994, 1996, 1997, 2000, 2001 and 2004.

#### 4.2.2 Interpretation of regression analysis for gross domestic product, cargo through put, balance of payment and exchange rate

The regression results show that Gross Domestic Products is related with inward cargo, outward cargo, balance of payment and exchange rate in the following equation:

$$Y = -425393 + 0.181X_1 + 0.002X_2 - 0.540X_3 + 15323.213X_4$$

Where Y represents GDP

$X_1$  represents inward cargo,  $C_i$

$X_2$  represents outward cargo,  $C_o$

$X_3$  represents Balance of Payment,  $B_p$

$X_4$  represents Exchange Rate,  $E_x$

Then:

$$GDP = -425393 + 0.181C_i + 0.002C_o - 0.540 B_p + 15323.213E_x$$

The  $R^2$  computation gives a value of 0.892 which implies that the degree of explanation of  $C_i$ ,  $C_o$ ,  $B_p$  and  $E_x$  in GDP is highly significant given 89.2% at 0.05 levels. This implies that if the points are plotted on a line graph, almost all will fit into the line.

Further interpretation of the model reveals that cargo and through Exchange Rate throughput have positive effect on GDP while Balance of Payment has negative effect on Gross Domestic Product.

The standard error test for the model reveal that  $S.E > \frac{1}{2} b_0$

That is,  $871163.5716 > \frac{1}{2} (-425393)$

This implies that the relationship is not statistically significant and thus we accept the null hypothesis that the degree of contribution to the GDP by the maritime sector is not statistically significant (Hypothesis III) and that the key roles of NIMASA are not yet significantly felt in the maritime sector (Hypothesis IV). Therefore, we reject the alternative hypothesis that the degree of contribution to the GDP by the maritime sector is statistically significant and that the key roles of NIMASA are significantly felt in the sector.

#### 4.4 Summary of Major Findings

The results of analysis reveal that there is a positive relationship between the number of ships registered by NIMASA and the generated revenue arising from that. Also GRT and number registered vessels correlated positively. The reviewed literature buttressed the point and identified areas where NIMASA's significant roles are most felt in the maritime industry, especially in regulatory and operational functions. More so, we found out that even though NIMASA makes significant impact on the economy of Nigeria, this is revealed by the economic relationship between GDP, shipping activities, balance of payment and exchange rate.

#### 5.0 Conclusion

From the research, it is obvious that NIMASA have the potential to contribute immensely to the growth and development of Nigeria. Maritime industry on one hand, and greater contributions which is yet to manifest significantly in the national economy, on the other hand since the maritime industry has been proven to exhibit great potentials, NIMASA should intensify efforts in efficiency in the maritime industry through strict adherence to the legal framework and their implementation. Having identified that finance is a major obstacle to shipping operation in Nigeria, the cabotage regime particularly; the Cabotage Vessel Financing Fund (CVFF) and Ship Acquisition and Ship building fund (SASBF) will be a great encouragement to indigenous participation in the coastal trade. Since the maritime industry has been proven to exhibit great potentials, NIMASA should intensify efforts in capacity building, maritime finance and encourage indigenous participation in the maritime industry. The bottlenecks surrounding the cabotage regime should be wiped out as soon as possible in order to reap the full benefits derived from inland and coastal trade. The indigenous operations should avoid being used by foreign operators who capitalize on the advantage to sabotage the objectives of the cabotage. This is most prevalent in the oil exploration and carriage where foreign investors use indigenous politicians to break through the waiver optimal benefit.

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**APPENDIX**

**Regression**

**Variables Entered/Removed**

Model	Variables Entered	Variables removed	Method
1	Cargo throughput		Enter

a. All requested variables entered.  
b. Dependent variables Gross Domestic Product.

**Model Summary**

Model	R	R squared	Adjusted R square	Std error of the estimate
1	.614 <sup>a</sup>	.377	.314	1754850.68

a. Predictors: (Constant), Cargo throughput

**ANOVA<sup>B</sup>**

Model	Sum of squares	df	Mean square	F	Sig
1 regression	1.86 E + 13	1	1.86 1E143	6.044	.034 <sup>a</sup>
Residual	4.94E+13	11	3.080E142		
Total					

a. Predictors: (Constant), Cargo throughput  
b. Dependent variables Gross Domestic Product

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients B	Std Error	Standardized Coefficient Beta	.1	Sig
1	3096492	575850.4	.614	5.377	.000
(Constant).	.005	.002		2.459	.034

a. Dependent variables Gross Domestic Product

**Regression**

**Variables Entered/Removed**

Model	Variables Entered	Variables removed	Method
1	er <sup>a</sup>		Enter

a. All requested variables entered b. Dependent variables: Outward Cargo  
Model Summary

Model	R	R squared	Adjusted R square	Std Error of the Estimate
1	.596 <sup>a</sup>	.356	.291	205764188

a. Predictors: (Constant), er

**ANOVA<sup>B</sup>**

Model	Sum of squares	df	Mean square	F	Sig
1 Regression	2.34E+17	1	2.338E+17	5.523	.041 <sup>a</sup>
Residual	4.23E+17	10	4.234E+16		
Total	6.57E+17	11			

a. Predictors: (Constant), er  
b. Dependent variable: Outward Cargo

**Coefficients<sup>a</sup>**

Model	Unstandardised Coefficients B	Std Error	Standardized Coefficient Beta	.1	Sig
1	-8.9E+07	1.0E+08	.596	-8.57	.412
(Constant).	2926373	1245218		2.350	.041

a. Dependent variable: Outward Cargo

**Regression**

**Variables Entered/Removed**

Model	Variables Entered	Variables Removed	Method
1	bop <sup>a</sup>		Enter

a. All requested variables entered.  
b. Dependent variables Cargo Throughput.

**Model Summary**

Model	R	R squared	Adjusted R square	Std Error of the Estimate
1	.519 <sup>a</sup>	.270	.197	220323115

a. Predictors: (Constant), bop

**ANOVA<sup>b</sup>**

Model	Sum of squares	Df	Mean square	F	Sig
2 Regression	1.79E+17	1	1.792E+17	3.691	.084 <sup>a</sup>
Residual	4.85E+17	10	4.854E+16		
Total	6.65E+17	11			

a. Predictors: (Constant), Bop  
b. Dependent variable: Cargo throughput.

**Coefficients<sup>a</sup>**

Model	Unstandardised Coefficients B	Std Error	Standardized Coefficient Beta	.1	Sig
1	8.4E+07	6.7E+08	.519	1.250	.240
(Constant).	-313.705	163.294		-1.921	.084

a. Dependent variables: Cargo Throughput.

**Regression**

**Variables entered/removed**

Model	Variables Entered	Variables Removed	Method
1	er, bop, Outward Cargo, Inward Cargo		Enter

a. All requested variables entered.  
b. Dependent variables: Gross Domestic Product.

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