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## Benefits of Entrepreneurial Capacity Development in the Maritime Industry in Nigeria

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### **Abstract:**

*The study examined the Benefits of Entrepreneurial capacity development in maritime industry in Nigeria. The objective of the study was to x-ray the potentials of entrepreneurial capacity development in the Nigeria maritime industry. The study used secondary data obtained from the Central Bank of Nigeria, Nigeria ports authority annual publications and the national bureau of statistics, using unit root test and ordinary least square regression (OLS) test techniques at the 5% level of significance to test the effect of the independent variables such as entrepreneurial capacity development, foreign direct investments, capital stock average deposit, inflation, exchange rate and capital expenditure on the dependent variable, Gross domestic product (GDP) of the maritime sector. The result show positive and significant effect of the independent variables on the dependent variable and we thus conclude that the listed independent variables have significant and positive effect on the gross domestic product of Nigeria. This study therefore recommends amongst othersthe exercise of effective government controls in securing the productivity of the Nigeria maritime industry, appropriate management skill development in the sector and ensure adequate accountability measures in its revenue collections to boost the country's foreign exchange earnings and in addition, develop a proper framework for legislature, infrastructural development, technological and technical transfer and human resource development.*

**Keyword:** Maritime industry, entrepreneurial business, cargo reservation, transportation, haulage

### **1. Background of Study**

The Nigerian situation is a triangle of paradoxes. The Nigerian natural maritime endowment base is vast and extensive, with a coastline of over 800kms, and Exclusive Economic Zone of over 200 nautical miles, has the potential to accelerate Nigeria's economic development beyond its oil revenue. (Afolabi, 2015) The inland waterways resource is equally vast, in fact reputed to be one of the longest in the world; and estimated at nearly 3,000kms, comprising over 50 rivers, big and small that can strongly support a vibrant intra-continental and intra-regional trade. Her location on the coastline corridors of the Gulf of Guinea and the Bight of Benin, with 8 of her 36 states having littoral status, coupled with her vast population, placed her to be a major stakeholder and the player in the emerging intra-regional maritime industry and to build indigenous capacity for her entrepreneur to control the regional economy.

In fact, for the purpose of understanding properly the impact of the maritime industry on the Nigerian entrepreneur and her economy, it is necessary at this stage to attempt a definition of the Maritime Cabotage as it relates to Nigeria. Cabotage according to Nweze (2006) is a nautical term from Spanish, denoting strictly, navigation from cape along the coast without going out into the open sea. In international, Cabotage is identified with coastal trade so that it means navigating and traveling along the coast between the ports thereof (Black's Law Dictionary, 6<sup>th</sup> Edition: 202). According to Afolabi (2015) maritime infrastructure has played and continues to play a significant role in the growth performance and efficiency level of seaports of littoral countries across the world. Where development of maritime infrastructure has followed a rational, well-coordinated and harmonized path, growth and development of seaports received a big boost. Examples are Singapore, Belgium and the United States of America.

Conversely, where the growth of maritime infrastructure has not followed a distinctly rational and coordinated path, growth and development of seaports and IPSO factor, their nation's economic development has stunted. Example can be found in most African countries and other low developing countries in other parts of the world. The maritime infrastructure elements available to interested entrepreneur are many and varied. This is because, the maritime industry in Nigeria is extremely heterogeneous and yet unlocked. It is necessary therefore considering the potential of the industry to make it a remarkably attractive investment destination for prospective investors.

#### *1.1. Statement of Problems*

The maritime industry is international in nature and is acknowledged to be a very dynamic component in the socio-economic configuration of any given maritime nation. This paper is aimed at having a comprehensive report which critically reviewed the issues concerning the maritime industry as regards to its impact on the Nigerian entrepreneurial opportunities for growth. Therefore, the basic questions that will agitate the mind of the researcher include the following;

- What has been the trend and pattern of the maritime industry in Nigeria?
- What are the causes of the trends in the industry?
- What has been the effect of maritime trade on economic growth in Nigeria?

Previous work in the maritime did not expose the economic potentials of the maritime industry and its attractiveness to would be entrepreneurs which serve as a gap this study intends to cover. The research is therefore expected to assist the Nigeria Maritime Administration and Safety Agency (NIMASA), the entrepreneurs and other government agencies as well as stakeholders in carrying out their statutory functions including its promotional and regulatory rules and measures designed to facilitate the development stance and the growth of the nation's maritime industry.

### 1.2. Significance of the Study

The findings of this paper will likely set in motion further research studies into the Nigerian Maritime Cabotage and its impact on the nation's economy and/or as an interventionist in the boosting of the Nigerian entrepreneurial activities. In fact, it is expected that with the passage of the Cabotage Act and the Cabotage Act and establishment of the Nigerian Maritime University (NMU) at Okerenkoko, a new world of opportunities for business ventures in the maritime Cabotage sector have emerged. To this end, the maritime experts, regulators and entrepreneurs alike have to rob minds together to provide insight into how to utilize the opportunities in the maritime industry.

### 1.3. Scope of the Study

The scope of the study will be limited to the impact of the benefit Nigeria Maritime Cabotage on the nation's economy and entrepreneurial opportunities. There are also limitations in the area of data collection, as most useful data needed for the study were classified and treated as confidential and permission has to be sought before they are released. However, it might be noted that frantic efforts were made to ensure that useful information were eventually collected to enhance an objective conclusion of the study.

## 2. Review of Related Literature

Cabotage is a nautical term from Spanish, denoting strictly navigation from cape to cape along coastal without going out into the open sea. In international law, Cabotage is identified with Coastal trade so that it means navigating and traveling along the coast between the ports thereof (Black's Law Dictionary 6<sup>th</sup> Edition: 202). According to Kuwmi (2007) before the advent of containerization most general cargo was shipped in loose form. This involved each item being packed and stowed into the ocean liner. This was a highly labour-intensive activity, expensive and difficult to execute. It also exposed cargo to the risk of damage or pilferage. As a result ships spend two thirds trading life in ports and cargo handling costs had escalated to more than one-third of the total costs of the ship-owner. Liner shipping was headed for bankruptcy and the need to find an urgent solution became imperatives. The introduction of containerization in mid-1970's change everything and launched liner shipping into a revolution that continues to shape the industry.

According to Addico (2000), the economic status of any shipping operation will be determined by the relative levels of costs (capital and operating) and revenues. The demand and freight rates, which determine revenues, are presently at severely increased level in all shipping sectors. Igberi (2013) believed that perhaps, unlike any other country, the maritime industry on a global level provides a horde of opportunities for investment. First and foremost it has served to stimulate import and export trade by way of providing surface transport through which goods are moved by sea on a massive scale. According to Lazokoroji (2013), maritime business has helped the process of diversification of Nigeria's and has continued to provide employment opportunities to Nigeria's as crew staff, mariners and dock workers in addition to various practitioners among which are freight forwarders. In fact, for as long as it existed, the Nigerian National Shipping Line (NNSL) not only provides employment to Nigerians but also as pool or training ground for majority of master mariners and other experienced professional people in Nigeria's maritime sector until today.

The need for adequate training and re-training of personnel for the industry also culminated in the establishment of Maritime Academy of Nigeria (MAN) at Oron and most recently the establishment of the Nigeria Maritime University, Okerenkoko in Delta State. It has also led to the training of seafarers outside the country by states government in Nigeria maritime transport also generates the much needed foreign exchange to the Nigerian economy. This is in form of ship repairs, levies, taxes and ports fees and charges among others. The Niger dock for example though has not been known to have built an ocean-going vessel, but has been meaningfully engaged in the repairs and maintenance of ships and the construction of ferry boats all of which constitute an integral part of maritime transport. This is besides the official policy of the Nigeria Administrative and Safety Agency to collect levy on the gross freight from any vessel that calls at the Nigerian ports for export and import purposes.

Since 1958 when oil was discovered in commercial quantity at Oloibiri, Nigeria's Oil terminal such as Bonny, Escravos and Forcados have continued to play host to all takers of various profile and sizes. Crude oil has since displaced agriculture as Nigeria's economic mainstay and according to Babarrade (2006) have accounted, for about 85% of Nigeria's total export. Even though crude oil export has served to boost Nigeria's external reserves and buoyed the economy, the total exclusion of Nigeria's indigenous carriers from this lucrative trade has been a subject of heated debate between the maritime practitioners and the federal government. Igberi (2013) revealed that Nigeria losses about \$800,000,000.00 (Eight Hundred Million US Dollars) annually as a result of non-involvement of indigenous carriers of crude oil. Even Cabotage activities involving movement of shore oil prospecting and drilling equipment are still controlled by foreigners thereby denying Nigeria maritime sector and the federal government a lot of accruable revenue.

Maritime transport however, has provided opportunity for inland waterway transport, coastal and high sea trading and has also made it possible for Nigerians to develop the skill for fish and shrimps trawling enterprise. In a word, maritime transport has engendered employment for sizeable number of Nigerians in various maritime related occupations. One essential tool for building maritime infrastructure and thereby grow the national economy is the promotion of strategic alliances and partnership with principal stakeholders. The primary reason for this is that investment in modern maritime infrastructure requires money and lots of it, not mere pennies, and not just as a one-off expenses, but something you do frequently. This perhaps may be the secret behind the successful transformation of the maritime sector and the port industry of the leading 16 largest economies of the world, making their maritime industry such a dominant contributor to the growth, of their national economies and propelling remarkable improvements in the quality of life, welfare and prosperity of their population.

Unfortunately, this is one area where the Nigeria business climate is disappointingly dismal. It is a matter for regret that corporate maritime Nigeria sets little store by partnership and alliances. It is in fact morbidly suspicious of it, and would if it has the chance rather avoid it with passion altogether. According to Afolabi (2015), the average Nigerian business psyche in all sectors of the economy, including the maritime believes strongly and tenaciously, in a total low percent ownership of any business. Even though all available indices point to the contrary, the average Nigerian business man or woman would prefer to go on a business strictly all alone. Why is this so? Why would one insist on individually owning a small vessel, when 20 or 30 can meaningfully pool resources and acquire a modern mega ship that can effectively corner a larger market share and place the business in a better position to challenge the long time dominance of foreign-owned vessels in our coastal waters, thus allowing fresh breath of life into Cabotage.

To record giant milestone in the transformation of maritime infrastructure development and ensure its sustainability and meaningful contribution to the nation's economy, government's political will and support is not only desirable, it is an absolute moral necessity. As any notable maritime business investor will readily confess, investing in the Nigerian maritime infrastructure development takes special guts, not just because of its notorious unpredictability but for the simple fact, it has a long gestation period and a short –barrel prospect for early returns on investment. It is a business one will hardly want to engage in with short-term facility or on multiple-digit interest conditionalities. According to Asoluka (2003), this is why measures like guaranteed incentives, availability of short or medium-term tax holidays, provision of statutory protection from multiple taxations and other anti-business extortionist policies by government and its agencies whether at federal, state or local council levels, will go a long way to boost investor confidence, leading to a jump in the creation of wealth, employment opportunities and reduction of poverty among the generality of the citizenry.

Akpa (200), opined that in today's emerging new global port order, the cutting edge in profitable maritime transport business belongs only to port and terminals that are iconically competitive, user-friendly, cost efficient and that set much premium on attaining goals of dynamism, innovativeness and the power of adaptability to the continual global changes in the operation maritime environment. According to Kareem (2005) nature has kindly bestowed on Nigeria vast resources of a long coastline and even longer in land waterways, thus making us, at least theoretically, a maritime nation. But we need to go beyond this. We need to realize that one is not necessarily a monk, just because we live in a monastery. We must take measures on them, including Nigerian –flagged vessels, with hope for effective participation in deep ocean-going international trade in the foreseeable future.

### **3. Theoretical Framework and Methodology**

This paper focuses on the benefits of entrepreneurial capacity development in the maritime industry in Nigeria. The scope therefore covered the Nigeria Cabotage trade and no attempt is made to extend the area of study to other countries of the world.

#### *3.1. Sources of Data*

The study employs mainly secondary sources data as collected from the following specific offices and sources, like Central Bank of Nigeria (CBN), Statistical Bulletin, Annual Reports, Statement of Accounts, Economic and Financial Review and Research Seminar Papers. Others are National Bureau for statistics, published articles, magazines and newspaper.

#### *3.2. Sectoral Modeling of the Benefits of Entrepreneurial Capacity Development of Maritime Sector*

The study of the benefits of entrepreneurial capacity development of maritime sector on economic growth is more or less like any other sectoral impact analysis. However, one major difference that comes with the consideration of the maritime sector is the fact that the maritime sector may have linkages with other sectors of the economy besides contributing directly to economic growth. While authors like Lin et al. (1999), Henrichsmeyer and Witzke (2000), Rolfe et al. (2011) develop input-output method in analysis sectoral impact, the amount and nature of data involved usually turn out to be the constraints that stand in the way of research in that manner. Hence we consider in a narrative manner, but tressed with a mathematical summary, the impact of the maritime sector on economic growth in Nigeria.

Assuming that we have just two sectors of the economy, the maritime sector and all other sectors and that the maritime sector produces output  $Q_1$  with the inputs: capital from domestic sources, capital from international sources and domestic labour  $k_1$ ,  $k_2$  and  $l_1$  respectively. With these definitions, maritime sector is faced with the production of output given its constraints and hence to obtain the maximum output permissible given the costrelations we have the following problem:

$$MAX(Q_1): Q_2 = Af(k_1, k_2, l_1) \text{ where } f(\tau k_2, \tau k_2, \tau l_1) = \tau f(k_1, k_2, l_1) \quad (1)$$

Subject to the constraint:

$$C_1 = p_{k_1} k_1 + p_{k_2} k_2 + p_{l_1} l_1 \quad (2)$$

On obtaining the optimal value of output corresponding to the cost constraint we have:

$$Q_1 = Q_1(A, p_{k_1}, p_{k_2}, p_{l_1}, Q_1) \quad (3)$$

$$\text{Where } \frac{\delta Q_1}{\delta p_{k_1}} < 0; \frac{\delta Q_1}{\delta p_{k_2}} < 0; \frac{\delta Q_1}{\delta p_{l_1}} < 0; \frac{\delta Q_1}{\delta C_1} < 0; \frac{\delta Q_1}{\delta A} > 0.$$

And from this equation we obtain the cost function which is an inverse function of function represented in the equation (4):

$$C_1 = C_1(A, p_{k_1}, p_{k_2}, p_{l_1}, Q_1) \quad (4)$$

$$\text{Where } \frac{\delta C_1}{\delta p_{k_1}} > 0; \frac{\delta C_1}{\delta p_{k_2}} > 0; \frac{\delta C_1}{\delta p_{l_1}} > 0; \frac{\delta C_1}{\delta C_1} > 0; \frac{\delta C_1}{\delta A} < 0.$$

On assuming that the objective of the maritime sector is to maximize profits at the market price 'p' then the unconstrained optimization problem becomes:

$$MAX(\pi_1 = p \cdot Q_1 - C_1(A, p_{k_1}, p_{k_2}, p_{l_1}, Q_1)) \quad (5)$$

And on obtaining the critical value(s) of  $Q_1$  we have:

$$Q_1 = Q_1(A, p_{k_1}, p_{k_2}, p_{l_1}, p) \quad (6)$$

$$\text{Where } \frac{\delta Q_1}{\delta p_{k_1}} < 0; \frac{\delta Q_1}{\delta p_{k_2}} < 0; \frac{\delta Q_1}{\delta p_{l_1}} < 0; \frac{\delta Q_1}{\delta p} > 0; \frac{\delta Q_1}{\delta A} > 0.$$

However for the case of other sectors, we assume that the presence of linkages from the maritime sector to other sectors of the economy which makes a portion of the output of the maritime sector output come into the production function  $Q_2$  and cost relation  $C_2$  of the other sectors as an input. Hence for the other sectors of the economy combined the profit maximization problem is:

$$MAX(Q_2): Q_2 = Af(q_1, k_3, l_2) \quad (7)$$

Subject to the constraint

$$C_2 = p_{q_1} q_1 + p_{k_3} k_3 + p_{l_2} l_2$$

And on solving the above for its critical values and obtaining the maximum output obtainable given the constraint function we have:

$$Q_2 = Q_2(A, p_{q_1}, p_{k_3}, p_{l_2}, C_2) \quad (9)$$

and on obtaining the cost function which the inverse of the equation (9) we have:

$$C_2 = C_2(A, p_{q_1}, p_{k_3}, p_{l_2}, Q_2) \quad (10)$$

$$\text{Where } \frac{\delta C_2}{\delta p_{q_1}} > 0; \frac{\delta C_2}{\delta p_{k_3}} > 0; \frac{\delta C_2}{\delta p_{l_2}} > 0; \frac{\delta C_2}{\delta Q_2} > 0; \frac{\delta C_2}{\delta A} > 0.$$

However at the market price 'P' for other sectors of the economy and with the above cost function we obtain the unconstrained profit maximization problem below:

$$MAX(\pi_2): \pi_2 = p \cdot Q_2 - C_2(p_{q_1}, p_{k_3}, p_{l_2}, Q_2) \quad (11)$$

The critical value(s) of  $Q_2$  that maximizes the profit function is:

$$Q_2 = Q_2(p_{q_1}, p_{k_3}, p_{l_2}, p) \quad (12)$$

$$\text{Where } \frac{\delta Q_2}{\delta p_{q_1}} < 0; \frac{\delta Q_2}{\delta p_{k_3}} < 0; \frac{\delta Q_2}{\delta p_{l_2}} < 0; \frac{\delta Q_2}{\delta p} < 0; \frac{\delta Q_2}{\delta A} > 0.$$

The total output in the economy is hence given as:

$$Q = Q_1 + Q_2 \quad (13)$$

$$\text{Where } \frac{\delta Q}{\delta p_{q_1}} < 0; \frac{\delta Q}{\delta p_{k_3}} < 0; \frac{\delta Q}{\delta p_{l_2}} < 0; \frac{\delta Q}{\delta p_{k_1}} < 0; \frac{\delta Q}{\delta p_{k_2}} < 0; \frac{\delta Q}{\delta p_{l_1}} < 0; \frac{\delta Q}{\delta p} > \frac{\delta Q}{\delta P} > 0; \frac{\delta Q}{\delta A} > 0$$

On combining the equations (12) and (13) we obtain the models which provide the basis for the estimation of the impact of the maritime sector on economic growth.

$$Q_2 = Q_2(p_{q_1}, p_{k_3}, p_{l_2}, p) \quad (14)$$

$$Q = Q(p_{k_1}, p_{k_2}, p_{l_1}, p, p_{q_1}, p_{k_3}, p_{l_2}, p) \quad (15)$$

From the model equations (12) and (13) we find that the benefits of the entrepreneurial capacity development of the maritime sector on growth is felt via the price of intermediate sales to the other sectors of the economy as a result of the linkages from the maritime sector to the other sectors of the economy. Hence if maritime services are produced significantly given the level of demand there is the tendency for a decline in the price of maritime services and hence the output of other sectors which have significant linkages with the maritime sector would expand and grow the economy as a whole.

### 3.3. Research Method and Model Specification

Quite a number of structural models exist as can be found in Gujarati (2005) and Brooks (2008) but for the purpose of this study we adopt the application of the ordinary least squares estimation of the equations in the model and the seemingly unrelated regressions model as discussed in Brooks (2008). The equations in the model that we seek to estimate are such that the regress and are expressed in terms of exogenous variables and hence we could assert that the model equations are in their reduced form and this makes the application of the ordinary least squares method of

estimation on the individual equations one possible method of determining the parameters of the model while keeping with the best unbiased linear estimators condition as spelt out in econometric texts like Rubinfeld and Pindyck (1991). However there is the tendency for the application of the ordinary least squares method of estimation to fall short of expectations and result in a model specification bias where the parameter estimated would not be in line with the expected best unbiased linear estimator properties and this occurs when there's contemporaneous correlation between the stochastic disturbance terms of the individual equations in the model equations and this calls for the Zellner (1962) seemingly unrelated regressions technique which uses a weighted average technique in adjusting the variance-covariance matrix of the vector of stochastic disturbance terms to correct for the problem of contemporaneous correlation between the disturbance terms. The use of the semethods, in estimating the econometric model for this study, will necessitate the tests for exogeneity of the regressors of the model equations being employed to ascertain that the use of the ordinary least squares method and the seemingly unrelated regression method are justified (indicating that the model being estimated does not violate the assumption that the regressors are truly not related to the stochastic disturbance terms (Gujarati, 2005) and to carry out this test we employ the Hausmann test for simultaneity as described in Brooks, (2006). In addition to the Hausmann test for simultaneity we shall also be considering other diagnostic tests to ensure that the parameters estimated from the model are efficient and unbiased and these diagnostic tests include: Jacque-Beratest for normality, the White test for heteroscedasticity, Breusch-Godfrey test for serial correlation, examination of the variance-covariance matrix of the vector of error terms and the Ramsey RESET which tests for model specification bias.

The econometric model we seek to estimate to capture the benefits of entrepreneurial capacity development of the maritime sector on the industrial sector and the entire economy is given as:

$$LGDP = \rho_0 + \rho_1 TREN D + \rho_2 LM GDPs + \rho_3 LFDI + \rho_4 LCA + \rho_5 MDEFd + \rho_6 ADEPr + \rho_7 TRGDPPr + \rho_8 NEER + \rho_9 CPI + \rho_{10} GOVGDP + \mu_1 \quad (16)$$

$$LINGDP = \rho_0 + \rho_1 TREN D + \rho_2 LM GDPs + \rho_3 LFDI + \rho_4 LCA + \rho_5 MDEFd + \rho_6 ADEPr + \rho_7 TRGDPPr + \rho_8 NEER + \rho_9 CPI + \rho_{10} GOVGDP + \mu_1 \quad (17)$$

Where:

Variables	Definition of variables	Represent
LGDP:	Natural log. Transformation of the gross domestic product	Represent economic growth
LINDGDP:	Natural log. Transformation of the ratio of industrial output to the gross domestic product	Represent industrial output growth
TREND:	Captures the growth in the gross domestic product accounted for by technical progress	Represent entrepreneurial capacity development
LFDI	Is the natural log transformation of the foreign direct investment	Represent capital account section of the balance of payment
LCA	Is the natural log transformation of the gross capital formation	Represent capital stock
MDEFD:	Implicit deflator of the maritime sector	Represent the price of maritime services
ADEPR:	Average deposit rate	Represent financial services
TRGDP:	Ratio of total trade to the gross domestic product	Represent the current account section of the balance of payment
NEER:	Nominal effective exchange rate	Represent macroeconomic stability
CPI:	Consumer price index	Represent the general price level
GOVGDP:	Ratio of government spending to the gross domestic product	Represent the impact of fiscal policies

Table 1

The major limitation facing the method of research adopted in this study is the shortage of data. While some of the time series data available span 1960–2010 some other time series variables span 1980–2010 and since there is little or nothing that can be done to remedy the situation—like providing data for the years between 1960 and 1980—we decide to carry out our analysis based on the time frame 1980–2010 and this may engender the problem of near singularity of the data matrix involved in estimating the regression equations in the model. Also this problem bars us from using more data involving methods like the three stage least squares which may also help in correcting the problem of contemporaneous correlation which is expected to be the case in the model specified earlier.

#### 4. Data Analysis and Interpretation

This section focuses on the analysis and interpretation of the data collected mainly through secondary sources. Hence, the emphasis here is to estimate, analyze and interpret the model as already formulated in chapter three of the paper. As already stated, we need to note that only secondary source data were employed in carrying out the test.

#### 4.1. Model Estimation and Diagnostic Tests

We begin estimating with the ordinary least squares method and hence assuming that the two equations to not have their stochastic components highly correlated to warrant the use of the seemingly unrelated regression approach to correct for contemporaneous correlation of the residuals  $\mu_1$  and  $\mu_2$ . In addition we seek a parsimonious model that would be devoid of redundant variables while enabling us to check for the sensitivity of the results to model changes. The ordinary least square estimation of the model equations (17) and (18) is given below:

Variable	OLS Output (Full Model)				OLS Output (Adjusted Model)				OLS Output (Further Adjusted Model)			
	LGDP	Prob	LIND	Prob	LGDP	Prob	LIND	Prob	LGDP	Prob	LIND	Prob
C	5.683	0.000	3.054	0.133	6.052	0.000	4.856	0.000	6.193	0.000	4.963	0.000
TREND	0.142	0.001	0.152	0.013	0.114	0.000	0.128	0.000	0.130	0.000	0.140	0.000
LMGDPS	- 83.156	0.252	-58.53	0.593	- 63.295	0.226	- 72.517	0.358	3.271	0.907	- 21.667	0.598
LCA	0.196	0.026	0.320	0.017	0.125	0.004	0.171	0.008	0.136	0.002	0.179	0.005
LFDI	0.346	0.010	0.371	0.064	0.344	0.000	0.272	0.037	0.287	0.001	0.229	0.046
MDEFD	-0.001	0.813	-0.003	0.522	0.002	0.266	0.001	0.746	0.003	0.153	0.001	0.612
ADEPR	-0.016	0.318	-0.016	0.527	-	-	-	-	-	-	-	-
TRGDPR	0.887	0.004	1.728	0.000	1.006	0.000	1.999	0.000	0.977	0.000	1.976	0.000
NEER	0.002	0.088	0.002	0.262	0.002	0.136	0.001	0.448	-	-	-	-
CPI	-0.003	0.322	-0.005	0.253	-	-	-	-	-	-	-	-
GOVGDP	-0.058	0.967	-1.560	0.463	-	-	-	-	-	-	-	-
C	5.683	0.000	3.054	0.048	6.052	0.000	4.856	0.000	6.193	0.000	4.963	0.000
TREND	0.142	0.000	0.152	0.002	0.114	0.000	0.128	0.000	0.130	0.000	0.140	0.000
LMGDPS	- 83.156	0.152	-58.530	0.503	- 63.295	0.159	- 72.517	0.284	3.271	0.894	- 21.667	0.547
LCA	0.196	0.006	0.320	0.003	0.125	0.001	0.171	0.002	0.136	0.000	0.179	0.001
LFDI	0.346	0.002	0.371	0.021	0.344	0.000	0.272	0.016	0.287	0.000	0.229	0.024
MDEFD	-0.001	0.766	-0.003	0.421	0.002	0.195	0.001	0.705	0.003	0.130	0.001	0.563
ADEPR	-0.016	0.211	-0.016	0.428	-	-	-	-	-	-	-	-
TRGDPR	0.887	0.000	1.728	0.000	1.006	0.000	1.999	0.000	0.977	0.000	1.976	0.000
NEER	0.002	0.034	0.002	0.160	0.002	0.083	0.001	0.376	-	-	-	-
CPI	-0.003	0.215	-0.005	0.153	-	-	-	-	-	-	-	-
GOVGDP	-0.058	0.958	-1.560	0.358	-	-	-	-	-	-	-	-
DIAGNOSTICS												
R-squared	0.998	0.995	0.997	0.994	0.997	0.994						
D. W Test	2.269	2.508	2.403	2.547	2.127	2.412						
Augmented												
Dickey Fuller test	0.000	0.000	0.000	0.000	0.000	0.000						

Table 2: Ordinary Least Square and Seemingly Unrelated Regression Estimation Results

Source: Author Using Regression Output Available in the Appendix

The OLS estimation output above shows the share of maritime output in the gross domestic product and the implicit price deflator of the maritime sector having statistically insignificant impact on both economic growth and industrialization as evident from the regression coefficients C (3); C (6); C (14) and C (17) and contrary to our expectations the share of maritime output in the gross domestic product has a negative impact on both growth and industrialization. This confirms the graphical characteristics of the share of the maritime output in the gross domestic product vis-à-vis the gross domestic product and the industrial output. This negative relationship may be the result of years of neglect which the maritime sector has witnessed from 1983 when the decline in the contribution of the sector to the gross domestic product began to decline. This result would also imply that the maritime sector may have very weak linkages with the other sectors of the economy and more interesting is the somewhat insensitivity of the regression coefficients C (3); C (6); C (14) and C (17) of the maritime variables in the two equations to the changes made in the model. With the removal of redundant variables: average weighted deposit rate (ADEPR), nominal effective exchange rate (NEER), ratio of total trade to the gross domestic product (TRGDPR) and the ratio of government spending to the gross domestic product (GOVGDP) in succession we find that the regression coefficients C(3); C(6); C(14) and C(17) of the share of maritime output in the gross domestic product (LMGDPS) and the implicit deflator of the water transport sector (MDEFD) in both equations are all statistically insignificant but with the adjustment of the model for redundant variable we find that the negative impact of the maritime sector variables recorded in the first two versions of the model equations were reversed in the last version of

the model equations. The diagnostic tests applied on the two model equations in all three versions of the model shows the presence of high overall statistical significance as seen from the R-squared value which is above 90% for both model equations and model versions and with the adjustments made to the model as well as the constancy in the statistical significance of the maritime sector variables and the high level of individual statistical significance of the regression coefficients, we observe a very low level of multicollinearity despite the very low availability of data. The problem of autocorrelation is detected with the modified d-statistic presented in Gujarati (2005) and since all the d-statistic values are greater than two we shall test for the presence of negative autocorrelation using the statistic  $4 - d_t$  and on obtaining the values of  $d_t$  from the Durbin-Watson tables for 30 values of observation and 10, 8 and 7 regressors excluding the intercept term for the three versions of the model we find that the computed d-statistic values do not exceed the critical values of  $4 - d_t$  and hence the threat of negative autocorrelation is absent. The Jacque Bera test for normality probability values are presented and they are all not significant in rejecting the null hypothesis that the residuals of the regression equations are normal and finally the augmented Dickey Fuller test probability values are presented to ensure that the high R-squared values are not indicative of a spurious regression and from the results we find that the probability values reject at the 5% level the null hypothesis that the residuals have a unit root and hence each equation estimated above are in a long run relationship and not spurious. However due to the observation that the natural logarithmic transformations of the gross domestic product and the industrial output have similar graphical characteristics we investigate the possibility of a contemporaneous correlation between the residuals of the model equations across versions and from our estimation of the residual correlation matrix we find that the residuals are highly positively correlated but fortunately the residuals do not vary with time and this rules out the problem of heteroscedasticity in each of the model equations across versions and these is evident in the table below:

Residual Correlation Matrix			
Variables	Trend	LGDP residuals	LIND residuals
Trend	1.00	$2.76 \times 10^{-12}$	$1.71 \times 10^{-14}$ (1.0000)
LGDP residuals	$2.76 \times 10^{-12}$ (1.0000)	1.00	0.877767 (0.0000)
LIND residuals	$1.71 \times 10^{-14}$ (1.0000)	0.877767 (0.0000)	1.00

Table 3: Test for Contemporaneous Correlation  
Source: Author E-Views Computation

The presence of high positive contemporaneous correlation would necessitate the use of the seemingly unrelated regression approach to correct the standard errors and hence p-values to ensure that we do not underestimate or overestimate the regression significance of the individual regression variables. From the table 1 above, we find the seemingly unrelated regression output and from the results we find that the share of the maritime sector in the gross domestic product has a negative impact on growth in the first two model version but in the last it became positive but nevertheless statistically insignificant. The implicit deflator representing the maritime sector had a positive impact on growth and industrialization as expected from theory but once again we find these regression coefficients to be statistically insignificant. Thus the coefficient significance did not change despite the removal of redundant variables and the use of a different method of estimation. This informs us of the lack of substance in the maritime sector which has failed to impact on growth or industrialization in the Nigerian economy.

## 5. Conclusion

The economic implications of our findings above are quite explicit enough and do not require any complex reasoning. In all three versions of the model estimated, we find the maritime sector doing poorly in explaining growth and industrialization in the Nigerian economy. This means that contrary to our expectations the maritime sector has very weak linkages with the industrial sector and this portends very serious adverse consequences for growth and development in Nigeria. The implicit price deflator for the maritime sector is also seen not to affect growth and this signifies the relative insignificance of the sector in its contribution to growth and other relevant macroeconomic objectives. This calls for a total revamping of the maritime sector to make it more contributory to the objectives of growth and development in the Nigerian economy via the enhancement of its linkages with other sectors of the economy.

### 5.1. Recommendations

The findings of this study therefore, bring to the limelight the need for the following recommendations:

- With the perceived weak institutional setting, there is therefore the need to improve the institutional setting in order to boost entrepreneurial contribution to the maritime industry in particular and economy as a whole. Even though maritime industry has been found to contribute positively to the economy generally, whether in terms of contribution to gross domestic product, average deposit rate, ration of total trade in the gross domestic product and nominal effective exchange rate, one is tempted to say that more contributions would have been recorded with strong institutional setting.
- Similarly, the poor transparency and corruption that appear to be endemic in our country call for concerted effort to make for an improved domestic entrepreneurial performance.
- It has also been observed that information is grossly inadequate in the maritime industry to attract would be investors. Hence, the need to improve the market information, especially in the areas of reporting and disclosure standards can hardly be overemphasized. For instance, it appears disturbing that there seems to be very wide

gaps between what the Nigeria's actual receipts and targets is from the maritime industry. At best, this portends or lends further credence to the seeming over-orchestrated corrupt practices in high places in Nigeria.

- Above all, there is need for policy makers to be consistent, both in terms of formulation and policy implementation.

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