

Effect of Port Reform on Cargo Throughput Level at Onne Seaport Nigeria. A Comparative Study Before and After Reform Policy Implementation

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Abstract: *This Thesis focuses on the impact of reforms on port performance using Onne and Rivers ports as a reference point. It analyses the pre and post reform eras of the ports in terms of their performance. The reforms took effect from 1996 after the Federal Government of Nigeria concessioned the ports to private investors. Parameters such as Cargo throughput, Ship turn round time, Berth Occupancy l were used as variables for the assessment. Secondary Data were collected from the Nigerian Ports Authority and Integrated Logistic Services Nigeria (Intels) for the period 2001 to 2010 and analyzed using a two sample t-test to evaluate the difference between sample means of the cargo throughput before the introduction of the reform and after. The findings show that the reforms resulted in significant improvements in cargo throughputs as compared to the pre-reform era. The t-test shows that average Port throughput has increased significantly since the reform (concessioning) came into effect. There is an increase in Ship traffic calling at the ports, resulting in increased cargo throughput and berth occupancy rate at ports of Onne. This study concludes that the ports of Onne is performing better under the reform programme of the Federal Government of Nigeria. It finally recommends the introduction of an Integrated Intermodal Transport system for an effective and swift transfer of cargoes to and from the hinterland. Also, there is an urgent need for a regulator to appraise the performance of the reform programme from time to time as provided by the agreement, and for the full adoption and utilization of management information system (MIS) to aid performance efficiency.*

Keywords: *cargo throughput, Seaport, Reform, performance. Berth Occupancy*

I. Introduction

In the modern world of a fast growing technological era, ports are playing the role of an industry, not just passive actor in transportation but also in complete supply chain management. This is why it is said that "ports are more than piers" that is, more than just infrastructure or a complex infrastructure (Prakash, 2005).

Today in any context and in any country, it is essential that ports provide efficient, adequate and competitive services. If they fail, ship-owners who find them too costly or too slow will go elsewhere. Hence if ports do not provide cost-effective services, imports will cost more for consumers and exports will not be competitive on world markets, national revenue will decline as well the standard of living of all people. Nigeria has a total of eleven ports and eight oil terminals organised in three zones of Western, Central and Eastern zones. The central zone with its headquarters in Warri and the Eastern zone with its headquarters in Port Harcourt are predominantly oil terminals, although Warri, Sample, Koko, Port Harcourt, Calabar and the Federal ocean terminal are important general cargoes. (Chioma, 2011)

Ports not only a chain in transportation for inter-change, but they function as self-sustaining industry that is linked with domestic and international trade. At some places, ports also act as a foreign exchange earner not only in the form of transshipment or hub port but as part of supply chain management by providing logistics services to the industry. That is why a port needs to be treated as an industry. The management of a port should not only be concerned with the demand and supply of throughput but with institutional framework, application of technology, marketing strategy and ultimately economic impact of the development and implementation of projects or programmes (Prakash, 2005).

Ndikom (2006) summarized that a port is a gateway to the nation's economy and that shipping is a primary logistic service of critical importance. There are 2,814 international ports catering to freight traffic in the world (Trujillo 2005). Port traffic increases at an average rate of 3% per year. Nearly 90% of goods exchanged through international trade in the world rely on maritime transport along the logistics chain that takes them from their origin to their destination. A large share of that trade would not exist without their port infrastructures which are the interface between maritime transport and land transport or Inland navigation (UNTAD, 2002).

1.2 Research Problem

The pertinent question is to ask if the port reforms have succeeded in easing the bottlenecks to the port development thereby attracting more cargo to Nigeria ports, reduce congestion and generally enhance the productivity and efficiency in port operation.

So far, how has the port reforms fared, judging from the annual throughput/quantity of cargo that has passed through the ports since the inception of the reform programme? An answer to this question will also give a clue to the level of efficiency in the operations in the ports .

1.3 Aims And Objectives

The research aims at assessing how port reform has fared in attaining its major goals of increasing efficiency and raising throughput in Nigeria with reference to Onne Ports.

1.4 Research Question

Has there been any significant improvement in the cargo throughput level since the inception of the Port Reform?

1.5 Research Hypothesis.

Ho: There is no statistically significant difference between the mean of cargo throughput before the reform era and after the reform era at Onne Port

II. Review Of Related Literature

Introduction

Much of Nigeria trade is continental primarily between Nigeria and Europe, Asia and North America during the past decades, continental trade has grown in importance for Nigeria. The creation of the free trade agreement among the Economic Community of West African States (ECOWAS) and other bi-lateral and multi-lateral agreement with other countries, including globalization of world economics contributes to the continued integration of these national economies on a continental scale.

These trade agreements directly impacts Nigeria ports by encouraging overseas trade and cargo throughputs in our ports increased on a relative scale. Although Nigeria maintains both a multi-lateral (supporting the world trade organization and seeking trade partners abroad) and a bi-lateral trade policy (ECOWAS). Nigeria ports have benefited immensely from continental trade more than trade within her territory. As such, the marine sector with its focus on overseas trade is as important in the transportation policy as it is in other more maritime oriented nations.

2.1 Port Privatization

Defining “privatization” in today’s international ports system is fraught with frustration: the term is loosely used to refer to all manner of steps taken to enhance the commercial side of port operations, part of the definition problem arises from the purpose of privatization ranging from the ideological belief in the superiority of market discipline to the pragmatic need to redress failed nation economic development efforts (particularly in the developing world) (Ircha 2001).

Wade (1992) argued that from an ideological perspective, privatization is a sub-field in neo-classical perspective economics known as neo-liberalism which, as a general rule tends to view short-run optimal resource allocation (as derived from market forces) as the key factor for maximizing the rate of long-term economic growth.

Banister (,1995) defined “privatization” as ranging from “government disengagement and deregulation to the sale of publicly- owned assets”.

Osareti (2006) suggests that some American writers use privatization to mean contracting for services, while non-American writers “restrict their use of the word to mean de-rationalization”. Savas goes on to suggest that privatization is a broad policy to improve the economic performance of governments and nations. It is a response to the recognized need for structural return of government agencies, state enterprise and national economics.

The United Nations Development Programme (UNDP) (1991) opined that privatization is a process of “marketisation”, the opening of public enterprises to market forces.

De Monie (1992) and Ndikom (2006) argues that privatization refers to the transfer of port property from government to the private sector, but they further acknowledge that privatization also relates to leasing facilities, licensing, operations and granting concessions. In order words, it seems it is not ownership that counts in privatization but rather the sector delivering the services or the performance of the ports in this case.

The main objective of port privatization in its many guises appears to be ideological and/or financial. The introduction of commercialization in ports to enhance service quality or improve trade appears as a

secondary consideration. From a neo-liberal perspective, there is a fundamental belief in privatization as opposed to service delivery by public bureaucracies. Public ports often adopt bureaucratic traits as identified by Goss (1993). He noted that a bureaucracy tends to develop ideas and objectives of its own. First among these, is its own survival, and second is its expansion. Such bodies are not subject to the disciplines of the market. As they are being either supported by taxes of some kind and/or having an essentially monopolistic position, they may be able to continue for many years without responding to new technological solutions.

This has been a marked feature of the Nigerian port system in the pre-reform era. Therefore, there was an urgent need to reform the ports by way of privatization through concessioning.

Thus in Goss view, creativity, innovation and efficiency tends to be stifled in the typically rule bound environment of bureaucracies. The proliferation of constraining rules and regulations in ports and shipping leads to delays in cargo handling, higher freight rates and lower productivity. This was generally experienced in the Nigerian Maritime Sector.

Neo-liberals have a strong desire to inject a commercial, competitive stimulus into ports forcing them to operate efficiently in an increasingly competitive global economy (Ircha 2001).

Structural adjustment in Nigerian ports was considered among the alternatives to revive the ailing ports. This is a neo-liberal programme emphasizing, limited public sector intervention in the national economy, monetary rather than fiscal policy, and increased commercialization and privatization of public sector enterprises. Global port reforms tend to be guided by this view. Although structural adjustment has occurred within the industrial nations, it was introduced to the developing world by the International Monetary Fund (IMF) and the World Bank in the early 1980's. These institutions demanded dramatic changes in the economy of countries seeking international loans and financial support as a means of ensuring their investments stimulated national economic development. The Objective of Structural Adjustment Programme was to stabilize faltering national economies and introduce specific macro-economic elements to induce sustained growth.

2.2 Port Reforms In Other Countries

Stakeholders and Port users alike are concerned with the concept of Port performance despite the absence of a universally accepted formula for its measurement. Understanding performance is a concept fundamental to any business, whether it is the measuring of achievements against set goals and objectives or against the competition. Ports are no exception and it is only by comparison with other ports that performance can be evaluated (Valentine 2002).

There are many factors that have an effect upon the performance of a port;

- a) The location
- b) Infrastructure
- c) Superstructure
- d) Connectivity to other ports (hub ports) etc

Over the last twenty (20) years, much reorganization has occurred within ports following the global adoption of privatization policies by individual governments. Between 1990 and 1998 there were 112 port projects with private participation in 28 developing countries providing an investment totaling more than US \$9billion (Sommer 1999). Numerous studies have been conducted on port efficiency, some made using the assessment of productivity, based upon output per worker (De Monie 1987), output per Wharf (Frankel 1991), while others use production functions (Kim and Sachish 1986, De Neufville and Tsunokawa 1981).

Ports are, however, a complex business with many different sources of inputs and outputs that makes direct comparison between apparently homogeneous ports products seem difficult (Valentine 2003).

Privatization in developing countries is often the first phase in a process of industrial liberalization and a move towards industrial progression. Viewed as this first step towards creating free trade, it has therefore not surprisingly been a high priority for developing countries; it begins with the transfer of absolute control of industry away from the government to private partners with particular expertise. The reasons for this change are numerous but can be summarized as follows:

- (a) Improvement in efficiency through private sector management skills
- (b) Enhancement in service quality through improved commercial responsiveness, that is productivity
- (c) Reduced tariff or costs
- (d) Reduction in the fiscal burden of loss-making state enterprises.

2.2.1 Colombia And Argentina Ports

Colombia and Argentina are some examples where Port reform operation benefits are visible today. In Colombia, the liberalization of Port labour practices along with the transfer of most services to the private sector resulted in large and rapid improvement in productivity, lower fees for Ports users and very attractive returns for the concessionaires

Similarly, in Argentina, the improvements following the concessioning of terminal operations in Buenos Aires have been dramatic;

1. Shipping tariffs and port charges declined sharply
2. Labour productivity nearly quadruped
3. Cargo volumes have increased by more than 50%.

TABLE 2.1 PORT OF CARTEGENA (COLOMBIA) PERFORMANCE IMPROVEMENT SINCE PRIVATE CONCESSIONING IN 1994

PERFORMANCE MEASURE	NATIONAL PORT 1993	REGIONAL PORT 2003 (CONCESSIONING)
Containership Waiting Time	10days	< 2hours
Containership turn round time	72hours	7 hours
Gross productivity/hour	7 moves/ship hr	52moves/ship hr
Berth Occupancy	90%	50%
Cost per Move	\$984	\$224
Bulk Cargo Productivity	500tons/vessel/day	3,900-4500tons/vessel/day
Hours worked/day	16	24
Cargo dwell time	30+ days	2 days
Port Cost	\$984/move	\$222/move

Source: Kent Paule, and Anatoly Hochstein 1998 “Port Reform and Privatization in condition of limited compensation. The experience in Colombia Nicaragua and Costa Rica. www.worldbank.org.

TABLE 2.2 SELECTED PERFORMANCE INDICATORS FOR ARGENTINA (BUENOS AIRES)

INDICTOR	BEFORE 1993	1996
Cargo (thousands of tons)	4,000	6,000
Container (thousands of TEUS)	300	540
Capacity (thousands of contains/yr)	400	1000
Operational Area (hectares)	65	95
Productivity (tons/worker/yr)	800	3,000
Average stay for full container (days)	2.5	1.5
Cost for container imports (\$ per ton)	450	120
Port Tariff for exports (\$ per ton)	6.7	3.0
Port Tariff imports (\$ per ton)	2.1	1.5

SOURCE:ColombiaGeneralPort Supt; July 1997 – World Bank Report.

In the case of Colombia there have been a greater improvement currently than it were in 1997 as shown above; as the ports of Colombia handled 4,200 – 6000 tonnes of cargo per employee per day in 1996.

TABLE 2.3COLOMBIA: OPERATING PERFORMANCE BEFORE AND AFTER REFORM

INDICATOR	BEFORE 1993	1996
AVERAGE WAITING TIME (DAYS)	10	no waiting or in hrs, depending on the ports
WORKING DAYS PER YEAR	280	365
WORKING HOURS PER DAY	16	24
TONNES PER VESSEL PER DAY		
BULK CARGO	500	< 2,500
GENERAL CARGO	750	1,700
CONTAINER PER VESSEL PER HR (GROSS)	16	25

SOURCE: PUERTOS (COLOMBIA GENERAL PORT SUPERINTENDENT; JULY 1997)

2.2.2india – Jawaharlal Nehru Port Trust (Jnpt) Mumbai

India has almost 5560km of natural peninsular coast line strategically located on the crucial East West trade route, which links Europe and the Far East. The coast line is serviced by 12 major ports and about 180minor and intermediate ports.

The volume of cargo traffic in India has also expanded significantly. Total throughput of all the major ports taken together was 313.52 million tonnes in 2002-2003, an increase of almost 15times since 1950-51, when India embarked on the path of economic development.

The Indian ports was under the control of the Government as they appoints the Board of Trustee that control each of the major port prior to the reform era as contained in Indian ports Act (1908) and the major Port Trust Act (1963). It is of note that the ports trust are expected to serve public interest rather than maximizing profits or revenues, while at the same time, ensuring optimum deployment of assets.

III. Methodology

Data was collected for the study through secondary sources and various statistical techniques was used in analyzing the data collected for the period 2001 to 2010 (10 years) which overlaps the pre and post

concession era of the Ports in the study. These statistical tool include descriptive tools such as the mean, percentage, frequency, tables and charts, The two-sample t Test was also used to test the difference between the sample mean cargo throughput for the pre reform era and the post reform era to validate if there exists any statistically significant difference in cargo throughput level otherwise signifying an improvement or reduction as the result will show.

IV. Data Analysis

Based on the hypotheses already stated in section 1.5 in chapter one above , the following hypotheses were proposed:

Ho1: There is no statistically significant difference between the mean cargo throughput for the pre reform era and post reform era at Onne Port.

The T-test statistical was adopted in the testing of the hypotheses proposed in the study. The TTest compares the means of two variables by computing the difference the differences between the values of the two or more variables and ascertain if the average differs from zero. The time series data is analysed using SPSS version 11

4.1 Berth Occupancy Rate (%)

The Berth occupancy rate (%) of Onne is shown on the table 4.1 .The Berth Occupancy Rate of Onne Ports since 2001, 2002, 2003, 2004 and 2005 prior to the reform has been 44.44%, 62.96%, 74%, 72% and 71% respectively which is at an optimum point. This is as a result of the fact that from the inception of the Ports of Onne as Oil and Gas Free Zone, provision was made for enough stacking areas with an expansion space possibility. The ship call for 2001,2002, 2003, 2004 and 2005 are 3,412, 4,203 3,978, 3,579 and 3,585 vessels respectively made up of mostly Offshore Service and Supply boats .

After the reform came to stay in 2006, the Berth Occupancy rate of Onne Ports improved the more as can be seen in table 4.1 and figure 4.4. In 2006 & 2007, it stood at 71% and 70% respectively with a corresponding ship call of 4,033 and 4311; but in 2008, there was a sharp drop in the berth occupancy rate to 34% with a ship call of 3,457.

The sharp drop in berth occupancy rate of 34% and 65.86% for the Onne and Rivers Ports is as a result of the Niger Delta crisis that threatened the safety of life and properties of mostly the Oil Exploration activities in the region hence the great impact on the economy of the region and the Nation as a whole since Oil and Gas Exploration accounts for greater source of Nigeria Revenue base. After the Amnesty programme of the Federal Government, Ship call at Onne Ports improved to 3,828 and 4,086 in 2009 and 2010 respectively.

It is of note to reference here that Onne Ports operates an indirect cargo delivery system as most of the cargoes coming into Onne Ports are taking to the stacking areas for storage prior to their need in the Oil and Gas sector, and not direct to the customers as in the case of General cargo ports like port Harcourt Hard Quays, whereas WACT and Brawal Shipping are into container and General Cargo at Onne Ports.

The rehabilitation and re-construction of the port areas by the concessionaires since 2006 has equally made more space and road networks which aided in the cargo delivery and transfer within the port areas. It created more berthing space hence more cargo throughput in the ports.

The improvement of the navigational access to the ports like Channel dredging, Pilotage, has impacted positively on the characteristics of the ships calling at the ports of Onne and Rivers Ports. There are more modern vessels with bigger drafts, carrying more cargo (economy of scale) and cargo handling equipment calling at the ports.

Table 4.1 Berth Occupancy Rate (%) Of Onne Ports

YEAR	ONNE PORTS
2001	44.44
2002	62.96
2003	74.00
2004	72.00
2005	71.00
2006	71.00
2007	70.00
2008	34.00
2009	35.66
2010	35.00

Source: Port Bulletin (2011)

$$\text{Berth Occupancy} = \frac{\text{Not Working} + \text{Working}}{\text{Not Working} + \text{Working} + \text{Vacant}} \times 100$$

ABLE 4.2 Cargo throughputs (m/t) of Onne and Port Harcourt ports (2001 – 2010) (excluding Petroleum products).

		Table 4.4 Paired Sample T-Test for Onne Port				t	df	Sig. (2-tailed)	
		Paired Differences							
		Mean difference	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	PRE – POST	5,019,096	7726.56	2.59196E5	-1.19250E6	2.46787E5	5.4604	4	0.000

	ONNE Pre Reform (2001-2005)m/t	ONNE Post reform (2006-2010)m/t
CARGO THROUGHPUT	9,056,487	15,820,381
	10,951,729	21,558,925
	12,032,149	22,089,920
	13,699,975	17,180,233
	13,818,843	23,825,586
TOTAL		

Source: Extraction from Port statistics and Performance Report

The table 4.2 above show the cargo throughput level from the year 2001 down to the year 2010 which was further sub divided into two eras. The year 2001-2005 indicates the era before the introduction of the reform and the year 2006-2010 represents the years after the introduction of the reform.

Table 4.3 Paired Samples Descriptive Statistics for Onne Port					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PRE	11,911,837	5	397882.242	177938.348
	POST	16,930,933	5	4.02194E5	1.79867E5

Source: Analysis on SPSS Version 17(2013)

Source: Analysis on SPSS Version 17(2013)

Table 4.3 gives the descriptive statistics for each of the two groups/era for Onne Sea Port. In this example, there are 5 groups per group/era which in the study represents the five year for the pre concession era and five for the post concession era and they have, on average, 11,911,837 and 16,930,933 metric Tonnes for the pre and post concession era respectively with a standard deviation of 397882.242 and 4.02194E5 for both groups respectively. The last column gives the standard error of the mean for each of the two variables.

From table 4.4 above, the column labeled "Mean" is the difference of the two means(era). The next column is the standard deviation of the difference between the two variables. The column labeled "T" gives the observed or calculated t value. In this study, the t value is 5.4604 for Onne Sea Ports. The column labeled "df" gives the degrees of freedom associated with the t test. In this case, there are 4 degrees of freedom. The column labeled "Sig. (2-tailed)" gives the two-tailed p value associated with the test. In this study, the p value is .0.000 for Onne Port.

By convention, once the generated (T) value is greater than the critical T value on the table at any chosen level of significance, there is enough reason to reject the null hypothesis. Should the reverse hold, this means that calculated T statistics turns out to be less than the critical table value then there is a basis for the acceptance of the null hypothesis.

From the study, for Onne Port Cargo throughput, in considering the pre reform era (2001-2005) and the Post reform era (2006-2010), the calculated T value (**5.4604**) is greater than the critical value(1.425), the null hypothesis is therefore rejected on this grounds. Any hypothesis on this status that the difference in the means of the cargo throughput between the pre reform and the post reform era is zero cannot stand. Restating the hypothesis means there is a significant difference in the cargo throughput between the pre concession era and the post concession era. Obviously, there has been a positive improvement from the pre concession era to post concession era which can be seen by the increase in the means of both eras.

V. Conclusion

From the result of the study, it was found that reforms have been beneficial to the ports and the economy by an improving the cargo throughput at Onne, drop in the berth occupancy rate at Onne, Faster vessel and cargo turn round time due to more and modern cargo handling equipment and Increase in ship traffic and ship size too which brings about Economics of scale Economy of scale.

VI. Recommendations

The impacts of reforms on port operation in Nigeria have contributed positively to the economy but the following recommendation will equally increase the productivity, operational efficiency and competitiveness of the ports.

1. Provision of Integrated Intermodal Transport System:

There is an urgent need for an integrated Intermodal transport system, since a port is also a link in the transport chain and of course, similar requirements apply as regards capacity, performance and quality of connections with short sea and feeder shipping lines and with inland transportation networks, road, rail, barges, pipelines etc; hence swift transfer of cargoes to and from the hinterland.

2. Full utilization of Management Information System (MIS):

It is difficult to achieve real success in operation and increased port performance without proper implementation of Management Information System (MIS). The benefit of MIS tool like cargo tracking network (CTN), Electronic Data Interchange (EDI), enables fast transfer of information between terminal operators, port management and statutory agencies like customs and stakeholders, hence increased efficiency. The use of paper medium for most information transfer or retrieval can adversely hamper or distort information.

3. There is a need for a Regulator:

The concession agreement made provision for an appraisal for the reform operation but there is non-implementation of such as contained in the agreement.

There is also the problem of arbitrary increase in charges by the shipping companies hence there is an urgent need for a regulator to check the excesses of the shipping companies. The terminal operators ought to always publish its rates, charges and the conditions..

4. Full Utilization of e-payment system:

The use of e-payment will go a long way in reducing cash gratification and delays thereby realizing the 48hours cargo clearance.

4. Stoppage of siting of Oil Depots (Tank Farms) in the port Areas:

The siting of oil depots (Tank Farms) in the port areas is not in line with World standard. It occupies most land spaces for port expansion, creates vehicular traffic to the ports and its fire attendant risk is better not experienced because of the volatility of the oil products stored in the tanks. The Department of Petroleum Resources (DPR) and the Federal Government of Nigeria should reverse this trend in our ports for safety reasons.

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