PROJECT INFRASTRUCTURE MANAGEMENT AND ECONOMIC GROWTH: THE IMPACT OF SEAPORT CONCESSIONING ON NIGERIA'S ECONOMIC GROWTH (A FOCUS ON DELTA PORT)

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ABSTRACT:

The objective of this paper is to determine the effects of different characteristics of the terminal concessions on port performance in Nigeria sea port (case study of Delta port).The study used mainly secondary data obtained from secondary sources including annual reports of the Nigerian ports authority. Data used covers the period 1995-2010, with 1995-2005 being the pre concession period, while 2006-2010 is the post concession period. The variables were subjected to both trend and time series analyses, using the Minitab statistical software. A time series analysis was used in establishing the nature of an observable fact represented by a sequence of observations, and using current information to predict future values of the time series variable. The recommendations based on the study could help to enhance Nigeria's benefits from the concessioning policy if adopted.

Key words: **Cargo throughput, privatization, economic growth, concession and seaport**

INTRODUCTION:

Maritime transport investment is one of the major transport sector that requires various infrastructural investment and as well large equipment facilities which enhances its maritime operation. This is because maritime transport (sea port) accoomodate large vessels and other maritime and interantional shipping which helps in the economic development of the nation. Therefore, there is need to allow private sector to come through concenssion and privatisation in the development of the sector so as to help the nation in the maritime transport sector. This because the port (maritime domain) act as a catalyst and gateway for any nations economy.

There is a notion that because ports serve as vital links in the trading chain (Chin and Tongzon, 1998), a greater participation of the private sector in both the ownership and operation of container ports could not only enhance the operational efficiency of these ports (Tongzon and Heng, 2005), but also the economic well being of the entire country. It is about eight years that the Nigerian port system was concessioned to private investors; and there are observations that this has caused tremendous improvement in port operations culminating in high level of efficiency in the ports. Anagor (2014) notes the transfer of port operations to private organizations has resulted in high level of improvement, with substantial investments in terminal infrastructure and cargo handling equipment, increased cargo throughput (which has grown by about 250% in most terminals over the past eight years), leading to a restoration of importers' confidence to doing business in Nigerian ports. It is in the light of this that this paper would assess the impact of concession of Nigerian seaports on the economic growth of the country.

A consideration of Nigeria's large coastal water and seaports (predominantly in the Southern region of the country) reveals that the maritime sector has contributed substantially to the economic development of the country. It is not surprising that a large volume of the country's international trade is in one way or the other connected to the maritime sector; for instance, the distribution of the crude oil and related products from the various oil wells in the country is distributed to the international buyers through the various seaports and maritime routes of the country. This perhaps explains why Ndikom (2006) views a port as a gateway to the nation's economy, with shipping services being a primary logistic service of critical importance. This impact is not peculiar to Nigeria as there are suggestions of similar impacts in other countries. For instance, the observation by Trujillo (2005) that there are 2,814 international ports catering for freight traffic in the world is an indication of the level of business activities associated with the maritime sector across the world. It is estimated that port traffic increases at an average rate of 3% per year, with nearly 90% of goods exchanged through international trade facilitated through the maritime transportation network. The United Nations Conference on Trade and Development believes that a large share of international trade would not have been possible without the infrastructures provided by seaports, regarded generally as the interface between maritime transport and land transport or inland navigation (UNCTAD, 2002).

In contemporary global commerce, seaport or maritime transport play an important role as a nation's major gateway to international trade, thus becoming a good instrument for measuring the economic health of a nation (Ogunsiji and Ogunsiji, 2010; UNCTAD, 2008). The ports have considerable influence not only on the volume and conditions of trade, and by implication, on the capacity for economic development. In Nigeria, for instance, greater percentage of international trade is routed through the sea, and by virtue of her population, may account for about 70% of all seaborne trade in the West African sub region (Fivestar Logistics, 2008). This may also explain the Federal government of Nigeria's transformation agenda for the sector through the establishment of agencies such as NIMASA, which has been is working towards building requisite human capacity in the maritime sector.

The importance of the maritime sector to the Nigeria's economy and the need to enhance its efficiency led to the establishment of the Nigerian Ports Authority (NPA), through the Ports Act of 1954, as an autonomous Federal government wholly owned regulator and operator (Mohammed, 2008). However, with increased sophistication and competition, it became necessary for private sector involvement in the management of Nigeria's seaports. Consequently, the Technical Committee for Privatization and Commercialization (TCPC) was established in 1988 with a responsibility to transform NPA into a commercial organization. This culminated in the commercialization and metamorphosis of the Nigerian Ports Authority to Nigerian Ports Plc (NPPlc) in 1992; nonetheless, the Federal government still retained ownership of the organization. Information from the Nigerian Ports Authority shows that around 1996, the name was again changed from Nigerian Ports Plc to Nigerian Ports Authority, but now as a parastatal under the Federal Ministry of Transport; this reversion however, did not affect its commercialization efforts (NPA Brand Manual, 2005).

With globalization, government realized it lacked the resources and managerial ability to drive a modern seaport successfully (Razak,2005), making it inevitable that government disengages from ventures (activities) that could be more efficiently provided by the private sector. Consequently, governments and port authorities around the world have withdrawn from port operations knowing that enterprise based port services and operations would allow for greater flexibility, efficiency, and better services to port consumers (Notteboom, 2007). Razak (2005) further notes that the process allowing greater participation and expertise of the private sector in the management of Nigerian seaports was begun in 2003 by the National Council on Privatization (NCP), the apex policy body on sector reforms in the country, in conjunction with the Bureau of Public Enterprises (BPE). This may have prompted the Nigerian government to initiate infrastructure concessioning programmes in September 2004 (Leigland & Palsson, 2007), with the World Bank serving as project monitors, CPCS Transcom of Canada serving as concession managers, and Royal Haskoning of Holland as consultants (Fivestar Logistics, 2008).

There are observations that seaports are key logistic elements of supply chains (Photis et.al, 2007; Robinson, 2007 and Wouter,2007), serving as the interface between maritime and land transportation systems. However, this role (especially the volume of trade would have occurred) cannot be efficiently carried out without sufficient ports infrastructure. Therefore, it is expected that seaports move from the traditional port functions of loading and discharging, to more advanced activities that would add value and enhance efficient management of internal port operations.

Several factors impact on maritime port administration, especially those managed by public authorities. For instance, it has been suggested that port reformation process and the overlap between public and private ownerships are critical elements that influence seaport performance (Everett, 2007; Robinson, 2007). There are also views that the level of investment is critical in ports management. Due to the complex nature of ports, analysts suggest that any analysis of investment made in ports should take into consideration in ports infrastructure, superstructure, as well as hinterland connections (Hilda, 2005; Paixao, 2005). Other elements to be considered include port capacity and landside limitations (Bassan, 2007); port competitive structure, and port regulations changes (Goss, 1990); port networks (Zeng, 2002); port efficiency (Clark *et al.*, 2004), among others.

The transfer of the management of public (government) owned and administered ventures to private organizations could be achieved through the privatization process. This could be in the form of public private partnerships (PPP), or Private Finance Initiatives (PFIs) among other forms. Indeed, privatization of state owned enterprises (SOEs) according to Jerome (2008) has become a key component of the structural reform process and globalization strategy in many economies. Although its popularity has increased in recent times, it is, however, an old innovation as could be seen from the 1776 water project of the French government (Idornigie, 2006).

There are observations that economic theory fails to provide unequivocal propositions on the issue of the relative efficiency of public vis-a`-vis private enterprises (Liu, 1995). Tongzon and Heng (2005) notes that based upon the principal agent theory assessment of the impact of private and public ownerships on efficiency, private ownership should be more efficient than the public one. Consequently, Parker (1994) among others believes that a change from public to private ownership, irrespective of whether there is a change in competition or not, will invariably be lead to improvement in efficiency. However, it has also been observed that problems, occasioned by capital market imperfections, may arise in the private sector (Estrin and Perontin, 1991). There have been empirical studies (Estache et al., 2002, Notteboom et al., 2000) that sought to establish the relationship that may exist between port ownership structure and efficiency of port operations. This study extends these earlier ones by looking at the relationship between the reforms (leading to involvement of the private sector) and port efficiency in Nigeria.

MARITIME PORT PRIVATIZATION AND ITS RATIONALE:

A port is a vital link in the overall trading chain, and its performance determines to a large extent, a nation's international competitiveness (Tongzon,1995), and due to globalization, privatization of ports has become an international trend (Cullinane et.al,2002). Shaw et al. (1996) note that privatization of ports could be achieved through mechanisms such as concessions, management contracts, divestures, leases, or outsourcing. Privatization of ports is often with a view to increasing efficiency and flexibility of ports or terminals (Baird, 2002; Notteboom, 2007). The definition of port privatization, however, is not often an easy one and as such a careful analysis is required when defining port privatization (Ircha, 2001). Nonetheless, port privatization is used to describe all manner of steps taken to enhance the commercial orientation of port operations (Ircha, 2001). It is carried out in order to improve overall efficiency (Cullinane et al., 2005).

The privatization of terminal operations is expected not only to increase technical expertise and the degree of involvement of expatriates in management, increase the potential for diversification (UNCTAD cited by Qy-len,2012), but also lower the costs associated with running the ports (Cullinane et.al,2002). Furthermore, according to Tongzon et al. (2005), port privatization leads to a quicker response to changes in the market, and faster adaptation to changes in both maritime transport technology and intermodal transport. It could therefore, be argued that port privatization increases efficiency, productivity and competitiveness. This is, however, contingent upon the preparedness to adapt new innovations and roles in the management of the changing market environment (Tongzon et.al, 2005). Earlier studies that tried to identify factors that influence the choice of ports suggest that port efficiency is a decisive factor. Thus, port efficiency leads to a high level of port throughput if effectively managed.

There are, nonetheless, mixed views expressed about the contribution of privatization to improved performance of ports (Cullinane et al., 2005). While some studies (Ircha, 2001, Cullinane et al., 2004) show that the introduction of port reform and privatization lead to improve the performance of ports, others (Thomas, 1994, Turnbull and Weston, 1993a, Turnbull and Weston, 1993b) argue that the improvement noticed were not necessarily caused by port privatization, but rather by a culmination of several factors.

There are several reasons why ports are privatized. The United Nations Conference on Trade and Development (UNCTAD, 1998), for instance notes that ports are privatized in order to improve of the management capability of the port entities (improvement as used here implies increased efficiency and upgraded operational productivity); reduce the financial demands on the public sector through the increased use of private sector resources to replace those of the public sector; enhance the quality of service offered to users and reduce the price they have to pay for port services; redistribute wealth or other social objectives (e.g.curbing the power of trade unions); attract new or additional trade and business; share risks (commercial, economic, technological or management) between the public and the private sector; stimulate private entrepreneurs and investment in the economy; as well as the transfer technology in the form of advanced equipment deployment or the introduction of state of the art management systems.

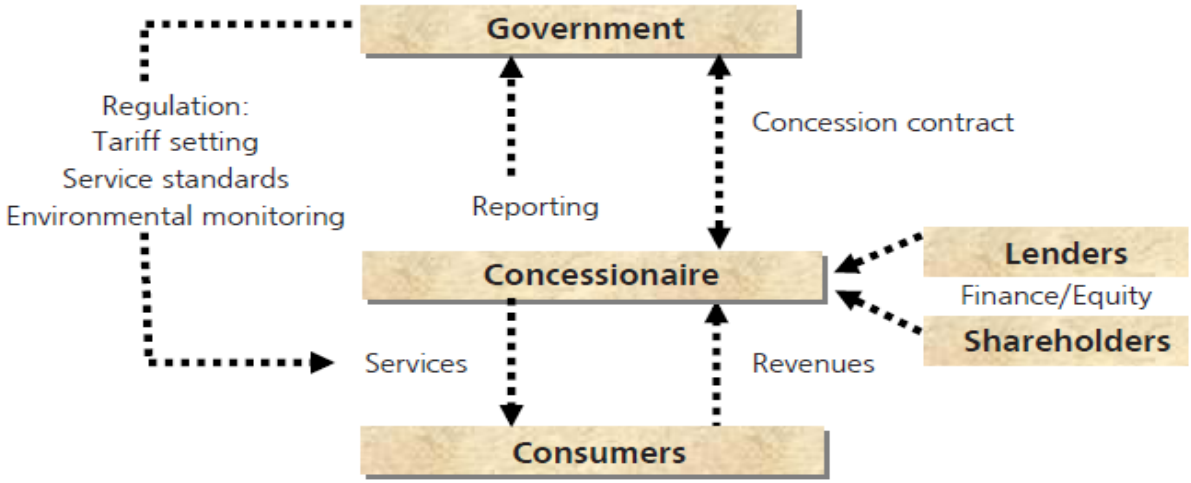
PORT CONCESSION:

It is not in every circumstance that an outright privatization is possible. Thus, according to Guasch et al. (2005), in circumstances where political, constitutional or legal reasons make outright privatization difficult, concession becomes a viable choice for achieving private sector participation in the management of public sector ventures, and confers on the concessionaire the right to operate a service for a limited period of time, after which full ownership of these assets reverts back to the government.

A concession is a practice whereby a public authority grants a franchisee the right to finance, build, own, improve, upgrade, maintain or operate a public infrastructure, and charge users for the cost of services, for a limited period of time (Bousquet and Fayard, 2001). There are many views about the term concession and what it connotes. Idornigie (2006) notes that Section 168 of the draft Ports and Harbour Authorities Bill

defines a 'concession' as an arrangement between an authority and a third party pursuant to which such third party shall be authorized to provide a port service or operate a port facility in accordance with the bill. With respect to Nigeria, Oghojafor et al. (2012) note that concession of ports refers to lease of port terminals and re organization of stevedoring companies. Atypical concession contract is as shown in Figure 1 below.

Figure 1: Typical Structure of a Concession Arrangement



Source: Skilling and Booth (2007) cited in Felsinger (2011)

Felsinger (2011) notes that a concession arrangement transfers the responsibility for the full delivery of services (including operation, maintenance, collection, management, construction and rehabilitation of the system) in the specified area to the concessionaire, while ensuring that ownership of such assets still resides with the public sector which retains the responsibility for establishing performance standards and ensuring that the concessionaire meets them; the public sector's role therefore shifts from being the service provider to being a regulator of price and quality of service. Consequent to the foregoing, it could be inferred that concession arrangements are usually made within the provisions of extant laws, and in the case of Nigeria, this fall within the provisions of the Infrastructure Concession Regulatory Commission Act, 2005 which established the Infrastructure Concession Regulatory Commission (Olatunji and Diugwu, 2013). It is equally worth noting that concession is only a valuable option where there is effective port competition, but not necessarily in cases where regulation is relied upon to create competition (Niekerk and Henriette, 2005).

Although concession could be used synonymously with public private partnerships (PPPs) and Private Finance Initiatives (PFIs), or an arm of privatization if defined broadly, there are, however, broad distinctions (Oghojafor et al., 2012). Furthermore, According to Guislain (1997), concession could be used in place of privatization if the latter is defined broadly; however, the two, Guislain (1997), while concerned with how to secure private sector management, operational expertise and investments, differ in the following areas:

1. concession relates only to the right to use assets and operate the enterprises, but does not involve the sale or transfer of ownership of physical assets;

2. concession agreements are usually for a limited period of time (which varies depending usually on the context and sector);
3. the Government, as the owner of the assets, retains close involvement and oversight in concessions through regulatory bodies.

Various reasons have been adduced for the adoption of concession by many public authorities. Some have attributed this to the inability of public authorities to efficiently maintain facilities that were either built or bought using public fund (Mundhe, 2008). Although the difficulties associated with its implementation of concession and the complex design and monitoring systems as some disadvantages of concession are major challenges encountered in a concession arrangement, it nonetheless, creates an opportunity for private sector participation in areas that would have been either economically inefficient or politically impossible for their participation (Mundhe, 2008).

There are indications that the Federal government of Nigeria embarked on the concession of Nigerian Ports essentially to solve the protracted problems of inefficiency, corruption, mismanagement, and huge debts that characterize the Nigerian ports. This view has been corroborated by many analysts and observers. For instance, Kruk (2008) notes that prior to concession, Nigerian ports were associated with long turnaround time for cargo and ships, insecurity of cargo, unproductive labour force in NPA, multiple government agencies in the ports, corrupt practices, excessive charges; and concession was applied as a reformation strategy to improve efficiency and productivity in the Nigerian ports. Similar reasons are also cited by Razak (2005). An observation similar to the above were made by Abdullahi (2014) who observed that the port reforms in Nigeria, which increased the level of private sector participation in the port sector was carried out to address the problems of inadequate funding, ineffectiveness and inefficiency, bureaucratic bottlenecks, multiple and uncoordinated security agencies, decaying port infrastructure, restive dock labour, as well as inadequate cargo handling equipment; this process led to increased efficiency in port services, upsurge in cargo throughput, reduction in cargo dwell time, improved vessel turnaround, better and safer navigation channels, and improved port infrastructure. Table 1 below lists the existing ports and the number of concessions arrangements in operation.

Table 1: Details of ports and number of concession arrangements

Ports	No. of Concessions
Lagos Port Complex	6 + 1 (ICD)
Tin Can Island Port Complex	4+ (BOT)
Rivers Port	2
Delta Port Complex	5
Onne Ports (FLT & FOT)	4
Calabar Port	3
ICD – Inland Container Depot BOT – Build, Opertae and Transfer	

Source: Abdullahi (2014)

However, to benefit from concession arrangements, Farrell (2012) argues that governments (including the Nigerian government) must develop more innovative contractual arrangements that will make it necessary for them to take the initiative in redesigning concession agreements, rather than relying on market competition. For port authorities it is important to know if and how concessions make the ports perform better. Therefore creation of better understanding of the effects of different characteristics of the terminal concessions on port performance is needed.

MATERIALS AND METHOD:

The study used mainly secondary data obtained from secondary sources including annual reports of the Nigerian ports authority. Data used covers the period 1995-2010, with 1995-2005 being the pre-concession period, while 2006-2010 is the post concession period. The variables were subjected to both trend and time series analyses, using the Minitab statistical software. A trend analysis, using the linear, quadratic, exponential growth or decay, or S-curve model, fits a general trend model to time series data and provides

forecasts. It is mainly applied in a situation showing no seasonal component in the series. A linear trend model was utilized in this particular study. A linear model is of the form, $Y_t = \beta_0 + (\beta_1 * t) + e_t$, where β_1 represents the average change from one period to the next (Farnumand Stanton, 1989). A time series analysis is usual in establishing the nature of an observable fact represented by a sequence of observations, and using current information to predict future values of the time series variable.

Table 2: Table of data

YR	Revenue (N'000) (REV)	Cargo Throughput (CAT)	No. of Vessels (ENTRED)	No. of Vessels Cleared (CLRD)	LOG_REV	LOG_CAT	LOG_ENTRED	LOG_CLRD
1995	117221.6	1561391	450	422	5.069008	6.193512	2.653213	2.625312
1996	133322	1940044	524	526	5.124902	6.287812	2.719331	2.720986
1997	153718.3	1960736	498	483	5.186726	6.292419	2.697229	2.683947
1998	111116.2	2107991	576	571	5.045777	6.323869	2.760422	2.756636
1999	169125	1394223	398	401	5.228208	6.144332	2.599883	2.603144
2000	263549.6	1836660	331	323	5.420862	6.264029	2.519828	2.509203
2001	461594	1855204	414	428	5.66426	6.268392	2.617	2.631444
2002	450032.3	2042959	386	385	5.653244	6.31026	2.586587	2.585461
2003	749134.2	1886085	327	328	5.87456	6.275561	2.514548	2.515874
2004	258377	1565588	298	301	5.412254	6.194677	2.474216	2.478566
2005	613367.1	2222758	361	362	5.78772	6.346892	2.557507	2.558709
2006	550567.4	1460965	257	261	5.78772	6.346892	2.557507	2.558709
2007	314039.3	584380	272	271	5.78772	6.346892	2.557507	2.558709
2008	230639.2	1919148	301	330	5.78772	6.346892	2.557507	2.558709
2009	624647.1	1872644	323	327	5.78772	6.346892	2.557507	2.558709
2010	737633.1	1923258	341	338	5.78772	6.346892	2.557507	2.558709

RESULT AND DISCUSSION:

The time series charts for the revenue (LOG_REV), cargo throughput (LOG_CAT), number of vessels (LOG_ENTRED), and number of vessels cleared (LOG_CLRD) are shown in **Figures 2, 3, 4, and 5** respectively. The trend analysis for revenues generated (LOG_REV) has a fitted trend equation of the form: $Y_t = 5.0516 + 0.0557*t$ and accuracy measures MAPE (2.10650), MAD (0.11701), and MSD (0.02123). The trend analysis plot of this variable is shown in **Figure 6**. The trend analysis for cargo throughput (LOG_CAT**)** has a fitted trend equation of the form:

$$Y_t = 6.2216 + 0.00802*t$$

and accuracy measures MAPE (0.593578), MAD (0.037107), MSD (0.002506). The plot for this is shown in **Figure 7**.

The trend analysis for the number of vessels that entered the ports (LOG_ENTRED) gave a fitted trend equation:

$$Y_t = 2.6868 - 0.011046*t$$

with accuracy measure values MAPE (1.68643), MAD (0.04373), MSD (0.00318). **Figure 8** is the plot of the natural logarithm of the number of vessels received at the ports. The analysis for the number of vessels cleared at the ports has a fitted trend equation of:

$$Y_t = 2.6772 - 0.010087*t$$

and accuracy measures MAPE (1.73222), MAD (0.04494), MSD (0.00329). This is shown in **Figure 9**.

From the time series analysis result of the revenue (LOG_REV) generated and cargo throughput (LOG_CAT) before concession shown in **Figure 2 and figure 3**, there was overall increase throughout the period (1995-2003) for revenue generation, with a little spike in 1997 and a little dip in 1998. From 1995-1998, there was an increase in cargo throughput. In 1999 there was a decrease in cargo throughput. But from 2000-2002 there was a decrease in cargo throughput. Thereafter, there was a big spike in 2003 indicating increase in revenue generation, and a decrease in cargo throughput up to 2004. More so, there was a big decrease in 2004 for revenue generation respectively. From 2005, there was an increase in revenue generation and cargo throughput. After the concession in 2006, there was stable revenue generation and cargo throughput as shown in **figure 2** and **figure 3** respectively until 2010. That of the number of vessels that entered (LOG_ENTRED) shown in **Figure 4** and number of vessels that were cleared (LOG_CLRD) shown in **Figure 5** exhibited the same characteristics. Before the concession, there was overall decrease in vessels throughout the period (i.e. 1995-2004) with erratic spikes in 1996, 1998 and 2001, and dips in 1997, 2000 and 2004. Then after the concession, it became stable until 2010.

From the trend analysis results, the linear trend of revenue (LOG_REV) and cargo throughput (LOG_CAT) shown in **Figures 6 and 7** respectively, it could be seen that there was a steady, straight-line increase in value of the variable, with shallow angles (periodic fluctuations). Their Mean Absolute Percentage Error (MAPE), Mean Absolute Deviation (MAD) and Mean Squared Deviation (MSD), which measure the accuracy of the fitted models, were very negligible indicating a better fitted model to the data. The MAPE which expresses accuracy as a percentage error was off forecast on the average by 2.11% and 0.59% respectively indicating that the models were 97.89% and 99.41% fits the data.

Figure 2: Time series of natural log of revenue

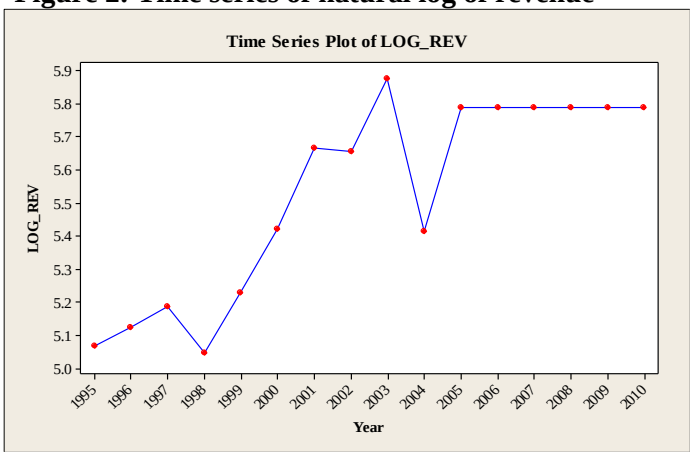


Figure 3: Time series of natural log of cargo throughput

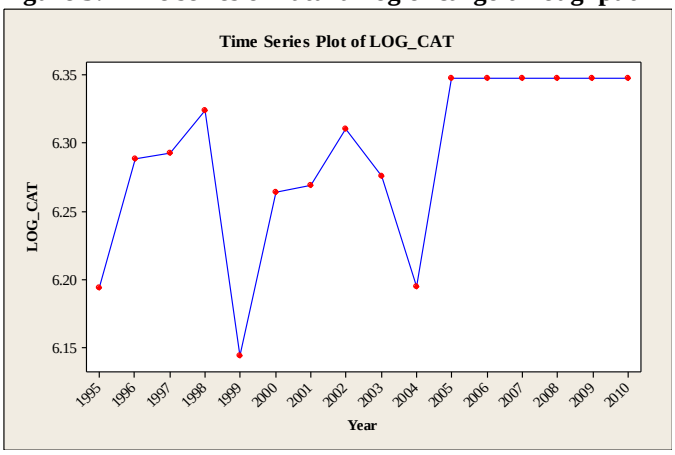


Figure 4: In time series of natural log of number of vessels

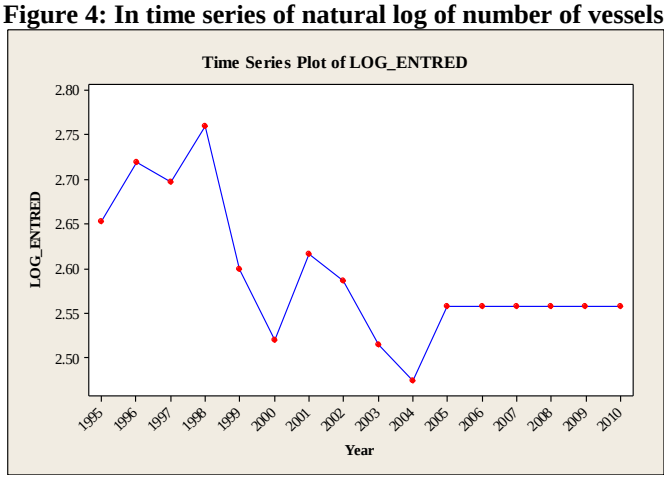


Figure 5: Time series of natural log of vessels cleared

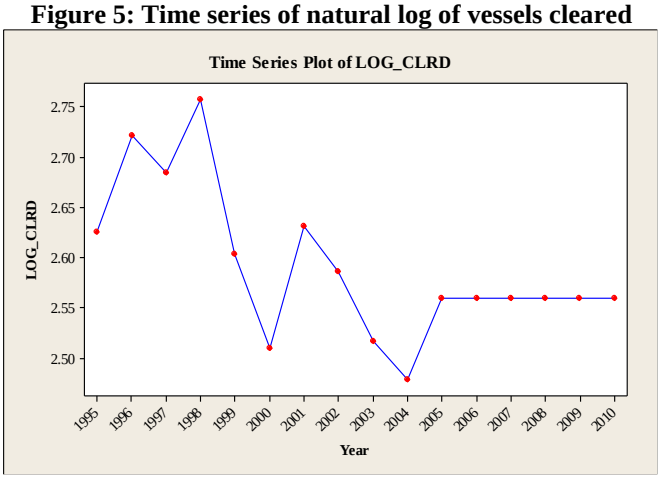


Figure 6: Trend analysis of natural log of revenue

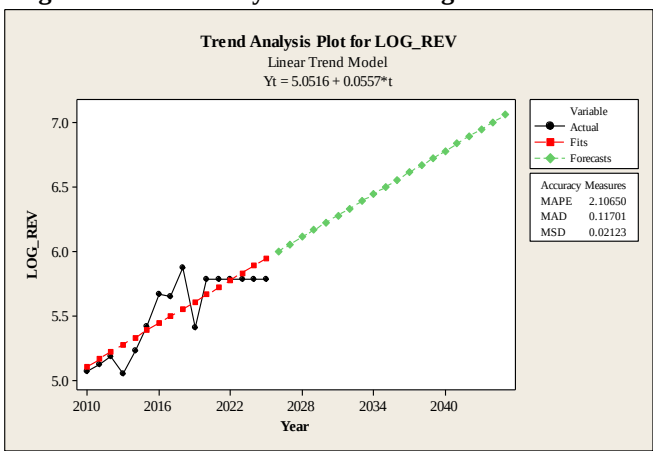


Figure 7: Trend analysis of natural log of cargo throughput

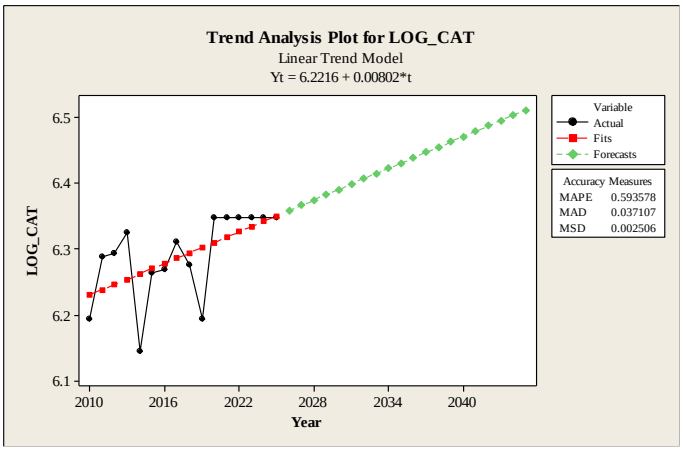


Figure 8: Trend analysis of natural log of number of vessels

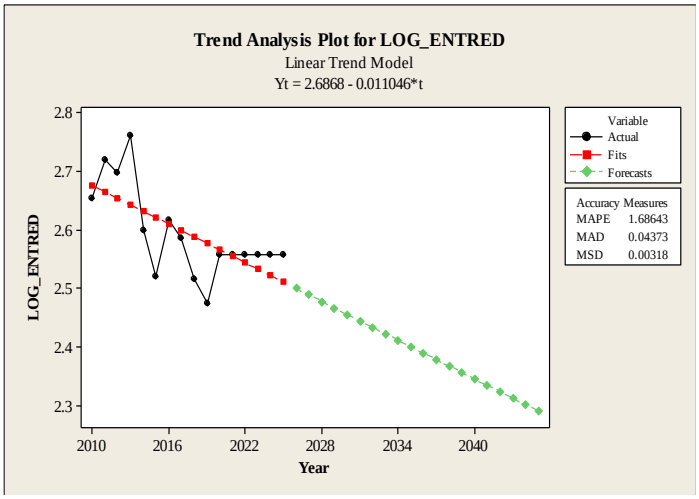
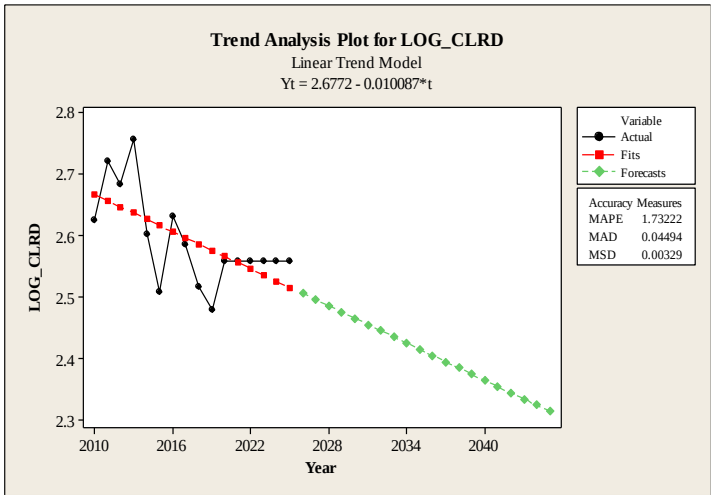


Figure 9: Trend analysis of natural log of number of vessels cleared



The trend analysis for the number of vessels that entered ports (LOG_ENTRED) shown in Figure 8, and those that were cleared (LOG_CLRD) shown in Figure 9, show a steady straight-line decrease in value of variable, with shallow angles in the linear trend. Their MAPE, MAD and MSD were also very small indicating a better fitted model to the data. Their MAPE indicate that the model were 1.69% and 1.73% off from the data implying that the model were 98.31% and 98.27% fitted to the data.

CONCLUSION:

This shows that in the Delta port, the concession scheme has little effect on the seaport revenue generation, cargo throughput and the number of vessels that called at the port. We suggest that government should call on the Port Authority and the concessionaires of the Delta port to improve their port facilities and skilled labour so as to increase their port productivity and efficiency. The concessionaires should upgrade their cargo handling equipment and invest more on transport infrastructural development in order to have an integrated transport system for the effective distribution of import and export products from the zone. The Nigeria Ports Authority should speed up documentation processes and procedures in the ports in other to help increase the turnaround time of vessels which will attract more shipping market to the port.

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