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CORRELATE OF PORT PRODUCTIVITY COMPONENTS IN TIN CAN ISLAND PORT, APAPA, LAGOS

Somuyiwa, Adebambo Olayinka (Ph.D, MCILT, MCIS)
Ogundele, Ayodele V. (M.Tech,)
Department of Transport Management
Faculty of Management Sciences
Ladoke Akintola University of Technology,
Ogbomoso P.M.B. 4000, Oyo State.

ABSTRACT: *This study examined the relationship between cargo handling equipment and port productivity in Tin Can Island Port, Apapa, Lagos. This study made use of 50 plant operators as sampled size based on simple random sampling technique, in which questions like how storage capacity of Tin Can port could be analysed and what is the relationship between equipment and productivity in the port. These data were subsequently analyzed through regression analysis and Pearson Product Moment Correlation Co-efficient. The result showed that port productivity components were few, unserviceable and obsolete, storage capacity was inadequate and unable to cater for the existing volume of cargo in pre – reform era. While in post – reform era more cargo handling equipment have been procured, storage capacity have been increased and expanded, latest cargo handling equipment with high lift capacity have been procured. Therefore, the study recommended that faulty cargo handling equipment should be repaired, government and other stakeholders should encourage research into areas of post productivity.*

KEYWORD: Concession, Productivity, Tons of Cargo, Equipment, Cargo throughput.

INTRODUCTION

Transport is the movement or conveyance of people, goods ideas and information from one place to another. It is a very important system in a society, since not all areas are equally endowed or gifted by nature, hence the need for interaction through transport. In short, transport influences the quality of life in the society as there is hardly any aspect of development which does not involve transport. There is always the need to collect, assemble, move transfer and distribute people, goods and services. Transport also serves as catalyst for other forms of development.

No growth or development effort can be made by any responsive government if not anchored on the transformational wheel of transport. This is because transport is a service which is not demanded for its own sake, but for the satisfaction it will generate in quick response to a mobility demand by members of a society at a particular time Ndikom (2006). As a reflection of derived demand, as in the case of service provision, transport plays a crucial role in the turn-around process of other factors of production and geopolitical transformation. Due to the fact that various activities are going on in the port, its environment become a very attractive zone for different personnel such as Haulage companies, Police, Insurance agents, Dockworkers, Stevedorers, Clearing and Forwarding agents among others too numerous to mention. Because activities like importation and exportation of goods and services involve many procedures, the

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port becomes congested by both personnel and goods which are now posing economic loss and safety threats to ports and the country at large.

The level of efficiency attained in vessel pilotage, anchorage and cargo handling, maximizes cargo output in the berth and quickens the turnaround time of ships in the port and reduces cargo handling costs, demurrage and enhances international distribution of goods and logistics. In view of the above fact, this research work will analyze the impact of cargo handling plants in Nigerian seaports with a precise application on seaport traffic which is expected to result in high level of operational efficiency attained in vessel pilotage, anchorage, cargo handling and in turn results to greater cargo output at the berth, increased ship turnaround time, reduction in cargo handling costs, and low demurrage costs, reduction in security threat to port as a whole, enhancement of international trade, increased productivity and high revenue generation to government and port authority.

In the light of the above,Nigeria maritime industry is characterized by government polices inconsistencies and other major problems that have led to operational delays. Thus, resulting to inefficiency, dwindling productivity and some form of negative scenario in the maritime industry. Maritime operations have enhanced the growth, development and transformational changes on national economic development of Nigeria. Nigerian maritime industry has witnessed some operational developments that negate the requirements of International Maritime Organization (IMO) (Ndikom, 2008). Ndikom (2008) opined that the industry is one that operates with clear rules and regulations in conformity with international standards. The industry has witnessed problems relating to operational inefficiency and policy inconsistencies.

Igbokwe (2013) is of the opinion that there has been little improvement on the efficiency and productivity of the port management in meeting the International Maritime Organization (IMO) stipulation of 48 hours cargo clearance. The situation in Nigerian Ports is that handling equipment and plant are either old, obsolete, malfunctioning, broken down or insufficient. Thus, slowing down cargo handling operations, stacking and onward transfer of cargos to consignee. Consequently, leading to low port productivity, longer ship turnaround time, inefficiency, damage to and loss of cargo, high port charges, demurrage payment and high corruption level at shippers expenses, port operators and consignees. These factors summed up, tends to make Nigerian Ports user unfriendly and unattractive to some shipping lines. Thus, prompting shippers and importer to route their cargo to neigbouring ports of Contonou in Benin Republic (Kareem, 2000). Nigeria port is characterized by the problem of predominant use of road transportation for movement of cargoes. Road transport has been relied upon to move cargoes from the port to other parts of Nigeria. The concept of intermodalism has been neglected in Nigeria, intermodalism which is the synergistic interrelation of all model of transport working together as a complete system for the purpose of transporting passengers and cargoes is not given attention by stakeholders.

Port infrastructure enhances port operation which includes schedule of arriving vessels, allocation of wharf space and quay crane resources to service the vessels; ship operation such as loading and unloading of cargoes are also enhanced through the provision and availability of cargo handling equipment. In addition, port operations such as yard operation, gate operations scheduling and income generation into the economy are all indices of port productivity measurement. This in turn necessitated the enquiry about the relationship between port productivity components on port productivity. Hence this paper is predicated on the

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hypothetical statement of no relationship between productivity components and port productivity.

LITERATURE REVIEW AND CONCEPTUAL UNDERSTANDING

Badejo, (1994) is of the opinion that one of the fundamental issues affecting freight operations in Nigeria is lack of coordinated efforts between and within freight modes and operations. Most ports are not linked with dependable road and rail networks. This in turn hampers transport of heavy and extra-ordinary traffic, (Ikporukpo, 1993). Rapu and Ayoade, (1996) stated that one of the most important blocks of sound economic performance is the efficient delivery of goods and materials as quickly and cheaply as possible freight transport plays a key role in the economic development of both developed and developing countries of the world. Freight transport demand is a derived demand which is generated only by inputs to or outputs from agriculture, mining, construction or manufacturing industry by purchasing or sales. Thus, the demand for freight is related to economic growth whether it is measured in terms of output expenditure or income.

Over the years the traffic through the Nigerian ports are increasing along with the economic development of the country. It is frequently observed that queues of arriving ships are formed and sometimes ships have to wait for a longer time before berthing. This can be attributed firstly, to the mobility of the existing port facilities to match the ever increasing global trade and secondly, some obnoxious government policies and regulations. This incessant congestion in our ports has resulted in diversion of ships meant for Nigeria ports to other neighbouring country ports. In the reforms and concessioning of 2006, Tin-Can Island Port was concessioned to four different private organizations to manage.

Maduka (2004) defined port congestion as massive un-cleared cargo in the port, resulting in delay of ships in the seaport. According to him, this occurs when ships spend longer time at berth than usual before being worked on or before berth. Onwumere (2008) made mention of port congestion as a situation where in a port; ships on arrival spend more time waiting to berth. In this scenario, more ships will queue at the channels and the outside bar waiting to get space at the terminal for berth age. According to him this waiting time is calculated using the service time of vessels which is one of the ways of measuring port efficiency. His view was that this is a situation whereby cargoes coming into the port are more than the storage facilities can handle.

Port congestion is a global phenomenon not limited to only Nigeria. In 2005 global map of congestion around the world Africa inclusive, the West Coast of Africa including Nigeria was there, the Eastern part of Africa, around Kenya, Southern part of Africa even the West Coast of the United States of America was there several factors attributed to this Zhang et al (2008). Maduka (2004) highlighted the factors responsible for port congestion in Nigeria and suggested ways to control congestion at the ports. According to him, there are advantages and disadvantages in port congestion. He said port congestion brought about realization for better planning, port expansion and development. He cited loss of revenue, unemployment and bad image to the country as its major disadvantages.

Tom (2009) is of the opinion that Nigeria should be warned about reoccurrence of congestion in its port. According to him in spite of the various waivers conceded by the government the

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dwell time of consignment in the port is gradually jerking up against expected time. He cited the use of manual clearing process as one of the major factors responsible for the reoccurrence of the looming congestion.

Tatcchia et al (2008) has observed that performance operations in most ports of developing nations to be frustratingly slow. However, literatures have substantiated knowledge of logistics as an important ingredient of efficiency. Ogunsiji (2010) is of the opinion that adequate logistics management is the road map involved in the design of efficient and effective configuration of two important flows information and product which often facilitate distribution of a firm's products and services at the right place, right time and right price. Fawcett et al (2002) is of the opinion that conducive environment is a prerequisite for an efficient logistics system. And any country lacking a good base network of dependable transportation, warehousing communication and other related facilities would hardly be able to configure activity network for sustainable economic survival and development. Most less development countries like Nigeria lacks the expertise needed for crafting environment conducive for the development of good logistics system, have are unable to attract foreign investment a pivotal potential to global business strategy for sustainable competitive advantage.

Ogunsiji (2002) is of the opinion that South African's increasing competitiveness and her ability to attract more foreign investment relative to her other African neighbours like Nigeria. With the recent increasing globalization of business, of improved logistics and management, ports are assuming strategic dimension in international business. Any country bereft of ideological redefinition of her distribution network and port logistics performance in this dynamic and ever changing global competitive market will ultimately be left lagging behind. The speedy accessibility of any container port relates to the potential for the movement of containerized cargoes to and for the ports via the networks, i.e. cargo, through put is significantly and positively related to its degree of accessibility to other shipping services (Cullinane et al, 2005, 2006).

Madu (2011) defined infrastructure as a part of a structure, material or economic base of a society or an organization. Therefore, infrastructure can be seen as the basic structure that fosters the good performance of cities, states or countries essential services. Infrastructure as defined above can be understood as the basic structure directly responsible for the efficient functioning of the transport systems and others that support a country's economic development. Thus, the fundamental factors to competitiveness are established by economic performance, government, business and infrastructure efficiency. Stated that one of the major challenges facing Nigeria at present is that it has no meaningful participation in the shipping industry on which Nigeria depends, both for exports and imports. Statistics show that Nigeria pays over $2 billion in freight each year to foreign ship owners either to export oil to import finished goods. He is of the opinion that off shore rigs and support vessels, coastal cabotage trade and import and export trade amounts to well over $20billion. The consensus is that if Nigeria can gain a foothold in its shipping industry. The potentials will be enormous, the potentials includes the followings, namely.

* Job creation.
* Foreign exchange earnings.
* Wealth creation.

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* Indigenous shipping capacity.

Egharevba (2011) posited that Nigerian Ports Authority desire to change is borne out of the need to embrace global best practice that is to be the best not only in the sub region but indeed in Africa as a whole. She further stated that the proposed Ports Community System (PCS) in what Nigerian Ports Authority has been yearning for. She added that the organization expects the system to generate data directly from the vessels while also helping to solve truck management and control especially in the area of truck congestion at the port gate after clearance.

Iweala (2011) stated that the Federal Government has mandated all the agencies driving port operations; including the Nigerian Customs Service (NCS) to commence 24 hrs service, seven days a week at the nation's ports. Customs and other port operators that now work from 9 am to 5pm would start working round the clock, so that Nigerian ports could operate like ports in other parts of the world. The objective of the above stated efforts is to reduce the time spent on clearing goods from months to 21 days and finally to 48 hours clearing in the long run. To ensure 24 hours clearing of cargoes in the port, the issue of power supply at various terminals must be addressed. Terminal operators have complained that power supply at various facilities is dependent on their own generating set and not electricity which is to be supplied by Nigeria Ports Authority as enshrined in the concession agreement Ologbese (2010).Productivity is a widely used economic concept and is the ratio of the output of a good or service to the input of one or more of the factors producing it. This ratio may be an average expressing the total output of goods divided by the total input of a factor of factors. It may also be incremental expressing the ratio of a change in output to the associated change in input, (Ndikom, 2007).

The output of a port as a service facility providing the means of exchanging commodities between land and maritime transport can be measured in terms of its through put; the amount of traffic that passes through it in a given time. Productivity is then throughput divided by the amount of factor or factors of production involved in achieving the output. Generally, any of the inputs associated with a given productive effort can be used in the denominator of the productivity ratio. The three traditional factors of production are land, labour and capital. Element of these three factors of production can be used in measurement of port operational productivity. Port productivity can be evaluated from the stand point of the various factors of production labour, infrastructure and equipment in relation to cargo throughput. Analysis of port productivity is a prerequisite for proper port management both for current operations and for planning the replacement of equipment and for investment in new facilities.

Productivity is the quantitative relationship between output and input, productivity is a measure of output to some index of input use. Arithmetically productivity is nothing more than the arithmetic ratio between the amount produced and the amount of any resources used in the course of production. This conception of productivity goes to imply that it can indeed be perceived as the output per unit input or the efficiency with which resources are utilized. Labour which is the most commonly used among the factors of production may be taken as the dock labour input in port operation or the total size of personnel, (unskilled, semiskilled, skilled and managerial staff) engaged in port services. It is more usual to define port labour productivity in terms of actual dock labour engaged in cargo work on the quays. Capital also relates to the stock of equipments, plants and other mechanical handling aids used in port operations on

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which the enhanced productivity of labour much depends. Port productivity issue, which has been discussed and argued by many scholars since the emergence of containerization for more than three decades have evolved a lot of development. The most important objective of a port is to decrease or increase throughput (Ng, 2003). As a result, the turnaround of vessel depends on effective allocation and scheduling of key resources such as quay cranes, berths trucks and yard cranes. Nagorski, (1972) already foresaw this scenario when he stated that careful planning is necessary for obtaining satisfactory results.

Marlow and Paixao, (2003) argued that most researches conducted on port productivity are based on quantitative measures, as it is easier in assessing port performance. Ports are service oriented, therefore efficiency is very crucial in determining moves per hour for loading and discharging container from and onto vessel. Some researchers have researched into port performance and productivity; they were able to show the critical aspect of productivity in terminals (Clark et al., 2004; Sataridis, 2002; and Estache et al., 2002).

Since the current scenario of world trade goes to cellular vessels, thus the demand for transportation of goods via sea increases tremendously. In view of this, more and more terminals are expanding in order to cater for available demand. Terminals are facing challenges on productivity with more and larger vessels in the shortest possible time. Hartmann (2004). As a result, in order to obtain operational efficiency, there are three aspects between planning and control level which can be segregated into strategic level, tactical level and operational level (Kozan, 2001). This shows that terminal operators need to enhance their planning and operational capability by deploying innovative and state of the art equipment in order to optimize terminal operational process. In order to optimize terminal resources, it is vital to ensure that port terminal operational flow is able to operate smoothly.

Whereas in 2000's most research in port productivity are been narrowed in scope by focusing on terminal equipments such as yard crane and truck (Ng, 2003) quay crane (Kim et al., 2004; Kozan, 2002) and rubber tyre gantry crane (Zhang et al., 2002). They focused on these aspects to ensure that terminal operators are able to maximize these kinds of equipments. In maritime subsector, Tongzon, (2001) described that port productivity and performance is measured in terms of the number of containers moved though a port, known as cargo throughput, on the assumption that the ports are throughput maximizers. Talley, (1994) was of the opinion that port performance indicators are based on economic perspective. As far as shipping industry is concerned, port performance measurement is important to everyone who involves in shipping. The concept of efficiency is very vague and proves difficult to apply in a typical organization extending across production, trading and service industries. However, no known study have examined if some of the basic objectives of the concession where achieved eight years after the concession. Hence, the need for the study.

MATERIALS AND METHODS

The population of the study were cargo handling plant operators in the port, the sample was taken from the total population by randomly selecting 50 plant operators in the study area, the study looked at pre – reform era (2000 – 2005) and post – reform era (2005 – 2010) respectively. Data were collected through primary and secondary sources. The study hypothesis was later analyzed through inferential statistics such as multiple regression and Pearson

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Product Moment Correlation Co-efficient statistical tool. This was done with the aid of computer software package for the social sciences (SPSS).

Multiple Regression Model Specification

$Y = a + b_1x_1 + b_2x_2 + ... + b_nx_n + e$

Where;

Y = Dependent Variables

a_0 = slope/intercept

$b_1 – b_n$ = Regression coefficient

$x_1 – x_n$ = Regression coefficient

e = error term

Pearson Product Moment Correlation Co-efficient Model Specification.

$$\gamma = \frac{N(\sum x_1 y_1) - (\sum x_1)(\sum y_1)}{\sqrt{\sum {x_1}^2 - (\sum x_1)^2[\sum {y_1}^2 - (\sum y_1)^2]}}$$

Where:

γ= correlation coefficient

Y = Criteria variable

X = variable

N = Number of sample/Sample size

$\sum$ = Summation

RESULT AND DISCUSSION

With regards to the formulated hypothesis, the inferential analysis as obtained in table 1 reveals that The result of the findings in table 1 shows that correlation co–efficient (r) computed for cargo throughput and number of equipment is 0.065 with p – value of 0.917. The p – value of 0.917 is greater than 0.05 critical value which implied that there is no statistical relationship between equipment and port productivity in the port. This confirmed that available equipment prior to port reform were few, unserviceable and obsolete. Cargo throughput in this period was reduced as a result of lack of competitiveness of ports in Nigeria. Thus, cargos destined for Nigeria are diverted to neghbouring countries of Benin Republic and Togo (Chidi, 2000). Based on this result, the hypothesis that there is no significant relationship between equipment and productivity is accepted. This implied that available equipments were obsolete with limited cargo handling capacity as stated above

Table 1: Correlation results showing relationship between equipment and productivity in pre and post reform era

Study variables		**Pre reform era Tons of cargo**	**Post reform era Tons of cargo**	**Pre reform era Number of Equipments**	**Post reform era Number of Equipments**
Tons of Cargo	Pearson Correlation Sig. (2 – tailed) N	1 5	1 5	0.065 0.917	0.895* 0.040 5
Number of Equipments	Pearson Correlation Sig. (2 – tailed) N	0.065 0.917 5	0.895* 0.040 5	1 5	1 5

Source: Output of the Analysis based on Author's field survey (2014).

*** Correlation is significant at the 0.05 level (2 tailed).**

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In the same vein, the result of correlation analysis for relationship between equipment and productivity in post reform era shows that correlation co – efficient (r) computed for cargo throughput and number of equipment is 0.895 with p – value of 0.040. This showed that there is positive correlation among the variables. The p – value of 0.040 is less than 0.05 (critical value) which implies that there is statistical relationship between equipment and port productivity. Based on this result, the hypothesis that there is no significant relationship between equipment and productivity is rejected. The importance of this is that more equipment has been procured for cargo handling operations by the concessionaire, latest cargo handling equipment have been purchased. Managerial expertise has been improved as a result of the arrival of expatriates who are vast in global best shipping practices as concession arises. Cargo throughputs have improved considerably. So also the financial revenue yield of the government have been increased considerably (NPA, 2010). The reform programme embarked upon by the government have made the ports user friendly and competitive to an extent as a result of investment in port super structures and modern cargo handling plants, ports and terminal have attracted more tonnage of cargo since the reform programme of 2005 (Ogbojafor et al, 2012).
With regards to the formulated hypothesis Pearson Product Moment Correlation Coefficient statistical tool was used to test the hypothesis. The inferential analysis as obtained in table 4 revealed that terminal area requirement and average daily stock have correlation co-efficient (r) of 0.996 with p – value of 0.000. This shows that there is high and positive correlation between them, which implies that as terminal area requirement decreases average daily stock decreased in pre – reform era. This relationship is significant considering p –value of 0.000 which is less than 0.05 level of significance. In pre – reform era, the maritime industry is characterized by less utilization of capacity as goods destined for Nigeria ports are shipped to Cotonou and Lome ports. Thus, resulting to terminal area being underutilized. Consequently, leads to decrease in average daily stock as a result of lack of port competitiveness.

In the same clime, Table 1 shows that terminal area requirement and yard occupancy have correlation co – efficient (r) of 0.92 with p – value of 0.026. This shows that there is positive correlation between them, which implies that as terminal area requirement decreases yard occupancy decreases in pre – reform era. It is also observed that relationship between terminal area requirement and yard occupancy is significant considering p – value of 0.026 which is less than 0.05 level of significance. The implication is that terminal area was under utilized as a result of port congestion. Cargos were left to overstay in the terminals for more than the required period of time. Thus, resulting to low yard occupancy level in the terminal resulting to capacity under utilization in the terminal.

Similarly, dwell time and storage area have correlation co – efficient (r) of 0.922 with p – value of 0.026. This shows that there is high correlation and statistical significance between them. Which implies that as dwell time increases, storage area decreases. It is also observed that relationship between dwell time and storage is significant considering p – value of 0.026 which is less than 0.05 level of significance. In pre – reform era cargo dwell time in the terminals is very high, cargos stay for months in the terminal before they are auctioned or released to consignee. The effect of high dwell time is that port storage area is reduced. Thus, resulting to port congestion which is prevalent in the pre reform era.

In addition, it is observed that average daily stock and yard occupancy have correlation co – efficient (r) of 0.940 with p – value of 0.017. This reveals that there is positive correlation between the variables, which implies that as average daily stock decreases yard occupancy

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decreases. This shows that relationship between average daily stock and yard occupancy is significant considering p – value of 0.017 which is less than 0.05 level of significance. There were less people patronizing Nigerian Ports prior to port reform exercise in Nigeria, the implication of this ugly situation is that average daily stock and yard occupancy is reduced. Consequently, revenue drive of the government and general port development is negatively affected.

It is interesting to note that, dwell time and storage area have correlation co-efficient (r) of -0.959 with p – value of 0.010. This shows that there is high negative correlation between them which implies that as dwell time increases, storage area decreases and storage area is significant considering p – value of 0.010 which is lesser than 0.05 level of significance. Similarly, the issue of dwell time in pre – reform era is one of the main focal point of stakeholders discussion in Nigeria. High cargo dwell time leads to port congestion resulting to less storage area in the terminals. This implies that, available storage area in the terminal is underutilized in the period under study .

In tandem with the study, it is revealed that dwell time and peak factor have correlation co-efficient (r) of -0.959 with p – value of 0.010. This shows that there is high negative correlation between them which implies that as dwell time increases, peak factor decreases. It is also observed that relationship between dwell time and peak factor is significant considering p – value of 0.010 which is less than 0.05 level of significance. In pre – reform era, dwell time has been noticed to be unnecessarily high as a result of ineffectiveness, in efficiency and poor managerial ability on part of NPA port managers. The resultant effect of this is that peak factor in the terminal is drastically reduced in the terminals. Consequently, financial revenue accruable to government and terminal operators are reduced as a result of managerial in efficiency in the port.

Furthermore, dwell time and yard occupancy have correlation co-efficient (r) of -0.959 with p – value of 0.010. This shows that there is high negative correlation between them, which implies that as dwell time increases, yard occupancy decreases. It is also observed that relationship between dwell time and yard occupancy is significant considering p – value of 0.010 which is less than 0.05 level of significance. Dwell time is pre – reform era in the maritime industry has been found to be very high as a result of managerial ineffectiveness and inefficiency by NPA managers. The effect of this situation is that cargo stay longer than expected in the terminal. Consequently, congestion which is as a result of the above scenario arise and leads to under utilization of storage and terminal capacity in pre – reform era, resulting to lack port competitiveness and loss of revenue.

Based on the above result, the hypothesis that storage capacity has no influence on port productivity is rejected and the alternate hypothesis that storage capacity has influence on port productivity is accepted. This can be inferred from the result of analysis that storage capacity variables have statistical and significant relationship at P less than 0.05 level of significance. This implies that storage capacity during pre – reform era is limited and underutilized as a result of managerial ineptitude on part of NPA management pre – reform era.

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Table 1: Pearson product moment correlation co – efficient showing storage capacity variables

Storage capacity variables		Pre reform Terminal area requirement	Post reform Terminal area requirement	Pre reform Dwell time	Post reform Dwell time	Pre reform Average daily stock	Post reform Average daily stock	Pre reform Space needed for result	Post reform Space needed for result	Pre reform Yard occupancy	Post reform Yard occupancy	Pre reform Peak factor	Pre reform Peak factor	Pre reform Storage area	Pre reform Storage area
Terminal area requirement	Pearson Correlation Sig. (2 – tailed) N	1 5	1 5	-0.820 0.089 5	-0.991** 0.001 5	0.996** 0.000 5	0.979** 0.004 5	0.921* 0.026 5	0.133 0.831 5	0.921* 0.026 5	0.977** 0.004 5	0.921* 0.026 5	0.980** 0.003 5	0.922* 0.026 5	0.980** 0.003 5
Dwell time	Pearson Correlation Sig. (2 – tailed) N	-0.820 0.089 5	-0.991** 0.001 5	1 5	1 5	-0.862 0.060 5	-0.947* 0.014 5	-0.959** 0.010 5	-0.251** 0.684 5	-0.959** 0.010 5	-0.942** 0.017 5	-0.959** 0.010 5	-0.950* 0.013 5	0.959** 0.010 5	-0.950* 0.013 5
Average daily stock	Pearson Correlation Sig. (2 – tailed) N	0.996** 0.000 5	0.979** 0.004 5	-0.862 0.060 5	-0.947* 0.014 5	1 5	1 5	0.940* 0.017 5	-0.029* 0.963 5	0.940* 0.017 5	0.998* 0.000 5	0.940* 0.017 5	1.000* 0.000 5	0.940* 0.017 5	1.000* 0.000 5
Space needed for result	Pearson Correlation Sig. (2 – tailed) N	0.921* 0.026 5	0.133 0.831 5	-0.959** 0.010 5	-0.251 0.684 5	0.940* 0.017 5	- 0.029 0.963 5	1 5	1 5	1.000** 0.000 5	- 0.031 0.961 5	1.000** 0.000 5	-0.005 0.993 5	1.000** 0.000 5	-0.005 0.993 5
Yard Occupancy	Pearson Correlation Sig. (2 – tailed) N	0.921* 0.026 5	0.977* 0.004 5	-0.959** 0.010 5	-0.942* 0.017 5	0.940* 0.017 5	0.998* 0.000 5	1.000** 0.000 5	-0.031* 0.961 5	1 5	1 5	1.000** 0.000 5	0.998** 0.000 5	1.000** 0.000 5	0.998** 0.000 5
Peak factor	Pearson Correlation Sig. (2 – tailed) N	0.921* 0.026 5	0.980* 0.003 5	-0.959** 0.010 5	-0.950** 0.013 5	0.940* 0.017 5	1.000* 0.000 5	1.000** 0.000 5	-0.005** 0.993 5	1.000** 0.000 5	0.998** 0.000 5	1 5	1 5	1.000** 0.000 5	1.000** 0.000 5
Storage area	Pearson Correlation Sig. (2 – tailed) N	0.922* 0.026 5	0.980* 0.003 5	-0.959** 0.010 5	-0.950** 0.013 5	0.941* 0.017 5	1.000* 0.000 5	1.000** 0.000 5	-0.005** 0.993 5	1.000** 0.000 5	0.998** 0.000 5	1.000** 0.000 5	1.000** 0.000 5	1 5	1 5

Source: Output of the Analysis based on Author's field survey (2014).

**** Correlation is significant at the 0.01 level (2 – tailed).**

*** Correlation is significant at the 0.05 level (2 – tailed).**

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However, the result of the findings in Table 2 in post reform era shows that terminal area requirement and average daily stock have correlation co-efficient (r) of 0.979 with p – value of 0.004. This shows that there is positive correlation between them, which implies that as terminal area requirement increases average daily stock increases. It is also observed that relationship between them is significant considering p – value of 0.004 which is less than 0.05 level of significance. The implication of this scenario is that the port reform exercise of the government has made the ports commercial and user friendly as a result of investment in modern cargo handling equipment and employment of professional. Ports have attracted more tonnage of cargos and TEUs as a result of more influx of container into the terminals Oghojafor et al., (2012). Thus, resulting to increase in average daily stock in the terminals. Similarly, it is revealed that terminal area requirements and yard occupancy have correlation co-efficient (r) of 0.977 with p – value of 0.004. This shows that there is positive correlation between them, which implies that as terminal area requirement increases yard occupancy increases. It is also observed that relationship between them is significant considering p – value of 0.004 which is less than 0.05 level of significance. The implication is that improved shipping operations in post reform era has increased cargo throughput and TEU capacity of the port of study. Furthermore, increased income generation through import duties and taxes on imported and exported is as a result of improvement in shipping operations by the concessionaires. Consequently, more terminal area and super structure have been acquired and expanded to cater for more tonnage of cargo as a result of managerial efficiency in the post reform era.

In addition, it is revealed that storage area and dwell time have correlation co-efficient (r) of -0.950 with p – value of 0.013. This shows that there is high negative correlation between them. Which implies that as storage area increases dwell time decreases. It is also observed that relationship between them is significant considering p – value of 0.013 which is less than 0.05 level of significance The implication is that with the influx of more cargo into the terminal as a result of improved shipping operations in post – reform era, cargo dwell time have been reduced. This is a clear departure from the pre – reform era where cargo spend weeks and even months in the terminal. Consequently, storage area in the terminal have been expanded, thus, resulting into more financial productivity for government and terminal operators.

In a related development, average daily stock and yard occupancy have correlation co – efficient (r) of 0.998 with p – value of 0.000. This shows that there is positive correlation between them, which implies that as average daily stock increases yard occupancy increases. It is also noted that relationship between them is significant considering p – value of 0.000 which is less than 0.05 level of significance. The implication is that more cargo throughput during post reform era and investment in cargo handling equipment with more super structure capacity have made average daily stock and yard occupancy of the terminal to increase considerably. Consequently, terminal operators and concessionaries will be able to forcast, project and plan future operations, which in turn will enhance port productivity as a result of knowing the average daily stock and yard occupancy level of the terminals.

Similarly, dwell time and storage area have correlation co – efficient (r) of – 0.950 with p – value of 0.003. This shows that there is negative correlation between them which implies that as dwell time decreases storage area increases. It is also noted that relationship between them is significant considering p – vale of 0.003 which is less than 0.05 level of significance. The implication is that availability of modern cargo handling plant and availability of super structure have reduced cargo dwell time in the terminal. Consequently, the reduction cargo

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dwell time have led to increase in storage area capacity and port productivity for concessionaire. Furthermore, dwell time and peak factor have correlation co – efficient (r) of – 0.950with p – value of 0.013. This shows that there is high negative correlation between them, which implies that as dwell time decreases, peak factor increases. It is also observed that relationship between them is significant considering p – vale of 0.013 which is less than 0.05 level of significance. The implication is that improved shipping practices as a result of port reform exercise and dwell time reduction have enhanced terminal peak factor. Thus enhancing terminal flexibility and work efficiency in peak situation which in turn enhances port productivity.

Conclusively, dwell time and yard occupancy have correlation co – efficient (r) of -0.942 with p – value of 0.017. This shows that there is high negative correlation between them, which implies that as dwell time decreases yard occupancy increases. It is also observed that relationship between them is significant considering p – value of 0.017 which is less than 0.05 level of significance. The implication is that reduction in cargo dwell time have resulted in enhanced yard occupancy level. Thus, enhancing terminal cargo handling equipment flexibility and efficient working condition in the terminals. Based on the above result, the hypothesis that storage capacity has no influence on port productivity is rejected. It can be inferred from the result of analysis that storage capacity variables have statistical and significance. This further implied that storage capacity during post – reform era been expanded and utilized as a result of best managerial practices imbibed by concessionaire.

CONCLUSION AND RECOMMENDATION

Based on the analysis of the findings, it was revealed that there was no relationship between equipment and productivity prior to port – reform exercise. Because cargo handling equipment were few, unserviceable and obsolete, thus, cargo throughput during this period dropped considerably resulting to lack of patronage of the port and loss of foreign exchange earning for the government. On the other hand, more equipment were procured by concessionaires in the post – reform era, latest cargo handling plant have been procured and best global shipping practices have been put to use by concessionaires. Thus, resulting to more employment and income generation for the government and other stakeholders.

Furthermore, it was revealed that there exist relationship between storage capacity and productivity in port operations. It was revealed that storage capacity and port productivity was very low in capacity prior to port reform exercise compare to post – reform era when concessionanires have expanded storage capacity and this has led to increase in port productivity. The study also discovered that government and other stakeholder in the industry should improve on the issue of dwell time which has been one of the major variables of port productivity measurement in order to achieve the benefits of port reform. In the light of the above, the study recommended that:

Faulty Cargo handling plants should not be allowed to rot away intermediate. They should be repaired, serviced regularly and put into use. As the cost of replacement may be costlier than repairing and refurbishing faulty ones. Secondly, research in areas of port productivity should be encouraged as this will allow better understanding of the problems of port operations. In furtherance with the objective of the study

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1. Government and other stakeholder should expand the existing terminals so as to enhance existing terminal capacity to accommodate more cargos.
2. There is the need by government to respect contract agreements with the concessionaires by providing legal frame work within the ports to enable a more friendly business environment.
3. Government should encourage more research in the areas of port productivity. This will allow better and further understanding of the problem resulting from port operations.

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