

Standard Containerization and International Trade in Seaport, Rivers State

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Abstract

The study examines the relationship between standard containerization and international trade in seaports in Rivers State, Nigeria. The population of the study comprises of two the two seaports in Rivers State with 61 staff participants as drawn the port examined. The sample size of the study was 61 hence census was adopted. The study in its methodology adopted the cross-sectional survey design. In order to obtain data from the respondents, structured questionnaire was used while the data were analyzed using Spearman's Rank Order Correlation Coefficient as aided by Statistical Package for Social Science (SPSS). Consequently, the study revealed that there is a positive significant relationship between standard containerization and all measures of international trade used in the study. Hence, it was recommended that there is the need to initiate new pliable supply chains and harmonize existing ones connecting the hinterland in order to enhance attractiveness and increase the economic success of Nigerian Ports.

Keywords: *Standard Containerization, International Trade, Importation, Exportation*

Introduction

Traditionally, seaports have become a strategic economic endowment and major catalyst of globalization process (Stopford, 2009). This is as almost 80% of the total global trade volume is facilitated by ocean transportation (Shan *et al.*, 2014). Today, seaports trade represents quite 90 percent of the international trade the planet (Sayi, 2008). As an interface between sea and land transportation, ports have constituted a core of the transport system and the economic determinant of any state that owns them. Seaport promotes international trade between countries of the world. However, studies show that international trade plays a vital role in the life of every nation. For instance, Smith (2010) maintains that trade between nations has always made a significant contribution in terms of increasing wealth among the world population. International trade is particular important because no nation is self-sufficient. As such, country "A" depends on country "B" for continuous survival and this is achieved through exchange of goods and services based on comparative advantage. It is also argued on that the impact of foreign trade on a country's economy is not only limited to the quantitative gains, but also structural change in the economy and facilitating of international capital flow. Trade enhances the efficient production of goods and services through allocation of resources to countries that have comparative advantage in their production. Foreign trade has been identified as an instrument and driver of economic growth (Frankel & Romer, 1999). Consequently, seaborne has been acknowledged as one of the most cost effective channels in which international trade between countries is executed through containerization. This is Michael (2019) observed that the significance of ports has been massified by the now global maritime trade influencer called container. According to Urry (2007), container refers to as a mobility-system which produced complex and paradoxical effects in transport system. It is the object of the most advanced form of unitization called containerization. As described by Levinson (2006), container is at the core of a highly automated system for moving goods from anywhere, to anywhere, with minimum of cost and complication on the way.

Apart from cost minimization, introduction of containerization using standard container has lowered time expended in transferring freight from manufacturer to consumer, as well as time spent in storage yard (Michael, 2019). Since the introduction of standard container into global maritime transport system, maritime market has been greatly altered as containerization has provided the mechanism to expand to international markets while improving the reliability, flexibility and costs of freight distribution. At the same time, dependence of shipping lines on particular ports has reduced (Kolos, 2006). Also, greater efficiency and savings have been achieved by capitalizing on the relative advantages of various transport modes on every segment of the journey and through improved coordination of various transport segments (Lingaitienė 2008; Pocklad 2007; Kazakov, 2006). Efficiency created by container innovation has created an ambience of competition in the port industry.

However, amid its criticality in promoting international trade, we have not seen any empirical study that specifically examines the relationship between containerization and international trade. Though studies exist which tend to provide solution to the problem of international trade without but did focus on containerization as a precursor of international trade, while others adopted containerization as a predictor variable in a different context other than international trade, thus, creating an empirical gap in this domain. Some of these identified studies include Notteboom, Coeck, Verbeke, Winkemans (2006) who examined containerization and the competitive potential of upstream urban ports in Europe. Raghuram and Gangwar (2007) investigated the impact of containerization on building global trade competitiveness in India. Furthermore, Zahonogo (2017) investigated how trade openness affects economic growth in developing countries, with a focus on sub-Saharan Africa. Therefore, based on this identified lacuna, this study empirically examined the relationship between standard containerization and international trade in Nigerian Port Authority, Rivers State.

Statement of the Problem

As an import dependent nation, the importance of international trade effectiveness to Nigerian Port Authority cannot be overemphasized. Effective and efficient international trade mechanisms are considered indispensable for optimal exchange of goods and services between nations. Generally, the problems affecting the success of international trade include the problem of lack of adequate finance. The problem of insufficient or inadequate market research and analysis; the absence of this vital information poses a serious challenge to international trade success. This is because foreign market and domestic market are not the same and hence require different levels of treatment. But within the context of Nigerian Port Authority, some of the identified operational problems inhibiting the effectiveness of international trade include the problem of high cost of operation as a result of poor containerization to freight distribution. Thus creating room for high transportation costs due to lack of standardization. The problem of insecurity constitutes a major problem to the success of international trade between Nigeria and other parts of the world, more especially in cases associated with not containerized goods. This is because the safety of such goods is not guaranteed due to tendency of spoilage, and theft by sea pirate at ease, thus, making containerization necessary for voyage of goods across national frontiers in a timely manner at a much lower price.

Conceptual Framework

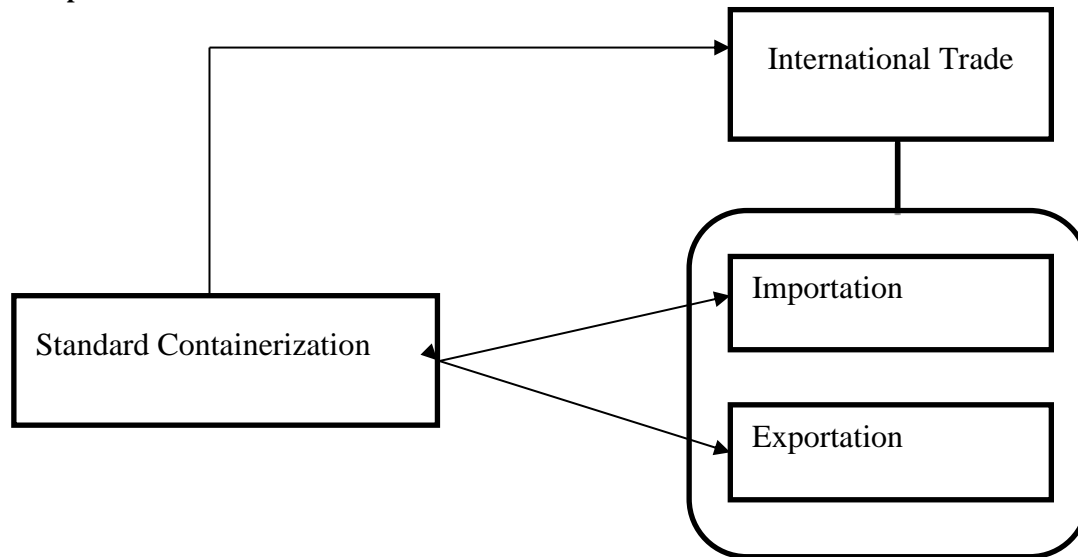


Fig.1: Conceptual Framework of Standard Containerization and International Trade

Source: Desk Research, 2021

Purpose of the Study

The purpose of this study is was to examine the relationship between standard containerization and international trade in Nigeria Ports Authority, Rivers State.

Research Questions

In view of the study objectives, the following research questions were put forward to guide the study:

- i) How does standard containerization relate with importation in Nigerian Port Authority in Rivers State?
- ii) How does standard containerization relate with exportation in Nigerian Port Authority in Rivers State?

Research Hypotheses

In order to provide answers to the research questions as relates to the purpose of study, the following research hypotheses were formulated:

- i. There is no significant relationship between standard containerization and importation in Nigerian Port Authority in Rivers State.

- ii. There is no significant relationship between standard containerization and exportation in Nigerian Port Authority in Rivers State.

Theoretical foundations

Resource Dependent Theory

From the perspective of organizations as open systems, the environment is thought of as an important factor in the continuation of the organization (Scott & Davis, 2003), even though the closed rational system perspective is mainly concerned with internal activities, internal operations, and the behavior of individuals for maximizing organizational efficiency on economic rationality (Pfeffer & Salancik, 2003; Scott & Davis, 2003). Resource dependence theory as an open systems approach postulates that organizations are embedded in networks and relations of diverse social actors (Granovetter, 1985), and such, networks and relations can be understood as a product of patterns of inter-organizational dependence and constraints (Pfeffer, 1987). Under the resource dependent theory, organizational behavior, actions and performance (success) are partially explained by the environments or contexts which provide critical resources to organizations. In this regard, organizations are not internally self-sufficient (Pfeffer, 1982). An organization makes an effort to exchange resources which are needed for its success or survival. And this is usually achieved through international trade agreement wherein an organization or a nation on the basis of comparative advantage, exchanges what it has for what it cannot produce for itself with other organization/nations. Specifically, organizations obtain critical resources through adapting to contexts or environments, reducing uncertainty for minimizing their dependence on outside organizations, and maximizing dependence of other organizations (Pfeffer & Salancik, 2003). Therefore, effective use of containerization in the execution of international is acknowledged as having many benefits such as profitability; improve security and protection of cargo from theft and spoilage.

Conceptual Review

Standard Containerization

Despite the availability of specialized containers, standard containers or general purpose containers also exist. It refers to as a steel box used for those cargoes described as "general", i.e. any commodity that does not need specialized equipment (Ding & Chou, 2015). This type of container is the most used type of freight containers for all types of general cargo (Bordahandy, 2005). They can be supplied with doors at one or both ends and one or both sides depending on the requirements. 20ft and 40ft are the most common container size although they are available in a wide range of other sizes such as; 10ft, 30ft, 45ft and even 53ft from specialist suppliers. According to Bortfeldt and Forster (2012), standard containerization is usually made of steel and sometimes aluminum. The aluminum containers have a slightly higher payload. The standardization of cargo containers is regulated by the International Organization for Standardization (ISO) and this ensures containers can be stacked most efficiently, literally one on top of another (Chen, Bostel, Dejax, Cai & Xi, 2007). Although freight containers are manufactured around the world they are built to specific ISO specifications to enable the efficient and easy intermodal transportation of goods across the globe. Despite the standardized sizes of 20 and 40-foot containers, the capacity of this type of containers can vary from operator to operator. Standard containers can carry most types of dry cargo such as boxes, pallets, sacks, barrels, etc. It can be customized on the inside to carry a specific type of goods. For instance, hangers can be fit inside to carry clothes that could be directly transported to the store. More, since standard containers are basic, they are not expensive to access.

International Trade

Trade has long been identified as an important variable in explaining economic growth and development of a nation (Frankel & Romer, 2014). This is why across the globe today, there is a growing presence of bilateral trade agreement between countries. According to Abebefe (2005), trade is a repeated sequence of exchanges

of goods through market transactions. It is however, referred to as international when it involves transactions beyond the boundaries of a sovereign political authority. Therefore, Samuelson and Nordhaus (2002) views international trade as a system through which nations export and import goods, services and capital. However, literature on international trade and growth of the Nigerian economy are large. Whereas some scholars argued that international trade promotes economic growth and development, others argued that it does not (Agbo, *et al.*, 2018). For instance, Winters (2002) argues that trade liberalization is beneficial because it affords a country the opportunity to trade in larger markets and therefore the risks associated with trading in smaller markets are significantly reduced. Most studies show that internationally active countries that engaged in international trade and opened the door to foreign investment are more productive than countries that only produce for the domestic market. Exports support the state budget with foreign currency and increase investment in the country, and on the other hand, imports supply the country with machines and new technology (Nasreen & Anwar, 2014; Bayer & Marius, 2018). Besides, due to globalization and liberalization, a country's economy has become much more associated with external factors such as openness, oil price, and global markets. Thus, exploring the effect of international trade on economic growth is important. However, even if we take the positive impacts of international trade, it is important to consider that international trade alone cannot bring about economic growth and affluence in any country.

Importation

Importation is refers to as goods and services purchased into one nation from another (Hamdan, 2016). This means that importation is the act of buying from other countries goods and services the importing country cannot produce or render for itself. According to Lyke (2017), developing countries import scarce raw materials, capital goods and advanced technology required for rapid industrial development. According to the findings of researchers, 85% of transportation devices and machinery needed by emerging economies, such as Nigeria are imported from developed world and this has an important role in their economic growth (Grossman & Helpman, 1991), for instance, the current rail way project being executed by the federal ministry of transportation wherein most of the materials are being imported from China. Imports generally reflect the weakness of the state in achieving its needs itself and makes them dependent and at the mercy of foreign countries. Imports unlike exports lead to the exit of the local currency and weaken the trade balance, thus weakening economic growth. However, and in some cases it is considered as a source of economic growth, especially if it includes hardware and electronic equipment to help and contribute to the increase and improvement of the investment, or include products that require a production value of more than imported (Tehranian, 2006). Due to these reasons, the export and import remain a controversial topic for their ability to influence the social and economic growth of the countries.

Exportation

Exportation refers to as the goods and services manufactured in one country and acquired by citizens of another country (Jain & Ohri, 2019). Exportation is one of the important elements of economic development and of great importance for companies (Aktepe and Karşlı, 2020). Over the past two decades, exporting has been one of the fastest growing economics activities (Ural & Acaravcı, 2006). According to Kotler and Armstrong (2013), it is the fastest and easiest way for companies to open up to the international arena. This is because export is a crucial business activity for nations' economic health, as it significantly contributes to employment, trade balance, economic growth, and higher standard of living (Czinkota & Ronkainen, 2001). It plays a vital role in the pursuit of sustainable competitive advantage of firms in the turbulent market through improvement of financial position, increased capacity utilization, higher technological standards, and attainment of a desired performance (Leonidou & Katsikeas, 2000).

More so, it serves as an engine for the individual firm's growth and profitability, and for the nation's economic growth. Consequently, attention to the significance of exporting has drawn considerable interest in recent times from economic policy makers in government as well as academic researchers (Lee & Giorgis, 2004).

Thus, Calof (2012) reveal that growing liberalization, integration and competition in the world economies have been responsible for the increasing engagement of firms in exporting activities. Export activity is traditionally seen as one of the critical routes to corporate growth and financial strength (Cooper & Kleinschmidt, 2004). Exporting offers numerous benefits to an individual firm. For instance, exporting firms can take advantage of growing market abroad, while the same market indicates a sign of saturation in the home country. Such strategy enables the firm to extend the life of its products and to increase its sales.

Standard Containerization and International Trade

The essence of containerization of ship cargoes is to cut down the costs of maritime transport by reducing cargo handling costs. Instead of loading/unloading each piece of transport item to or from a ship in a labor-intensive manner, containerization such as standard box increases the efficiency and speed of transport by reducing the packing requirements and handling processes at all transfer points. That is between port, rail and road (UNCTAD, 2006). Thus, countries without adequate transport facilities like standard or general purpose container will be disadvantage in their international trade (Valentine & Gray, 2002). This is because standard containers provide sturdy, secure storage and considered suitable for the transport of a variety of cargoes. Again, with regards to the growing international sea traffic and changing technology in the maritime transport industry, seaports are being forced to improve container terminals efficiency to provide comparative advantages that will attract more traffic and enhanced international trade activities (Castro, 1999). Also, Cullinane and Wang (2006) in their study evaluated the efficiency score of the world's major container sea-ports over time with the DEA window analysis using panel data and cross-section data. They compared the cross-section method and the panel data with the window analysis, and concluded that the cross-section method did not yield port performance in detail.

Hirsch and Bijaoui study (2006) examined the relationship between innovation (R&D expenditures) and export behavior of 111 Israeli firms. They found that innovation is an important factor explaining export performance. In another research, Ito and Pucik (2007) concluded that the ratio of R&D expenditures to sales was a significant determinant of international trade activity such as export performance (the share of export on sales) only when the size variable (total assets) was dropped from the regression. Other researchers such as Lebevre *et al.* (2015), Bechetti and Rossi (2012), and Wakelin (2011) conclude that R&D expenditure is an insignificant determinant of exports.

Methodology

A research design is a kind of blueprint that guides the researcher in his or her investigation and analyses. The research design adopted in this study is the cross-sectional survey design. Therefore, this study adopted the cross-sectional survey design. According to Sekeran (2003), a cross-sectional study is one that involves data generation at one single point which might be over a given period ranging from few days, weeks or months. Also, Saunders *et al.*, (2003) argued that it involves the observation of a situation or incidence at a one instance and it often uses the survey method. However, the population of the study is 61 managerial officers of the two seaports in Rivers State. The study also adopted the population size as its sample sizes based on census. In order to obtain data for the study, administration of structure questionnaire was adopted while analysis was carried out using the Spearman's rank order correlation coefficient at a significance level of 0.05. This statistical tool was adopted particularly because the study being carried out is relationship study.

Data Analysis

Table 1: Correlations for Standard Containerization and international Trade

		Standard Containerization	Importation	Exportation	
Spearman's rho	Standard Containerization	Correlation Coefficient	1.000	.914**	.883**
		Sig. (2-tailed)	.	.000	.000
		N	42	42	42
Importation		Correlation Coefficient	.914**	1.000	.887**
		Sig. (2-tailed)	.000	.	.000
		N	42	42	42
Exportation		Correlation Coefficient	.883**	.887**	1.000
		Sig. (2-tailed)	.000	.000	.
		N	42	42	42

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

Source: SPSS Output

Ho₁: There is no significant relationship between standard containerization and importation in Nigerian Port Authority in Rivers State. The result of correlation matrix obtained between standard containerization and importation shown in Table 1. The correlation coefficient of 0.914 confirms the direction and strength of this relationship. The coefficient represents a positive very strong correlation between the variables. The tests of significance shows that that this relationship is significant at $p < 0.000 < 0.01$. Therefore, based on observed findings the null hypothesis earlier stated is hereby rejected and the alternate upheld. Thus, there is a significant relationship between standard containerization and importation in Nigerian Port Authority in Rivers State.

Ho₂: There is no significant relationship between standard containerization and exportation in Nigerian Port Authority in Rivers State. The result of correlation matrix obtained between standard containerization and exportation was shown in Table 2 . The correlation coefficient of 0.883 confirms the direction and strength of this relationship. The coefficient represents a positive very strong correlation between the variables. The tests of significance shows that

that this relationship is significant at $p < 0.000 < 0.01$. Therefore, based on observed findings the null hypothesis earlier stated is hereby rejected and the alternate upheld. Thus, there is a significant relationship between standard containerization and exportation in Nigerian Port Authority in Rivers State.

Discussion of Findings

The finding established that there is a positive significant relationship between standard containerization and international trade in Nigeria Port Authority, Rivers State. The finding corroborates with UNCTAD, (2006) opine that containerization of ship cargoes aim to cut down the costs of maritime transport by reducing cargo handling costs. Instead of loading/unloading each piece of transport item to or from a ship in a labor-intensive manner, containerization such as standard box increases the efficiency and speed of transport by reducing the packing requirements and handling processes at all transfer points. That is between port, rail and road. Thus, Valentine and Gray, (2002) posit that countries without adequate transport facilities like standard or general purpose container will be disadvantage in their international trade. This is because standard containers provide sturdy, secure storage and considered suitable for the transport of a variety of cargoes. Again, with regards to the growing international sea traffic and changing technology in the maritime transport industry, seaports are being forced to improve container terminals efficiency to provide comparative advantages that will attract more traffic and enhanced international trade activities (Castro, 1999). Hirsch and Bijaoui study (2006) found that innovation is an important factor explaining export performance. In another research, Ito and Pucik (2007) concluded that the ratio of R&D expenditures to sales was a significant determinant of international trade activity such as export performance (the share of export on sales) only when the size variable (total assets) was dropped from the regression. Other researchers such as Lebevreet *al.* (2015), Bechetti and Rossi (2012), and Wakelin (2011) conclude that R&D expenditure is an insignificant determinant of exports.

Conclusion and Recommendations

This study examined standard containerization and international trade in Nigeria Port Authority, River State. The study adopted international trade as its criterion variable with importation and exportation as its measures. The hypotheses were tested using the Spearman Rank Order Correlation with the aid of SPSS version 23.0. The overall finding of the study indicates that there is a significant positive relationship between standard containerization and international trade in Nigeria Port Authority, River State. Based on the finding, it was concluded that to remain effective and efficient in shipping operation, the adoption of standard containerization in the shipment of all kinds of cargoes in and out of the country is critical. Thus, it was recommended that (i) terminal expansion and intensive investment in more state-of-the-art facilities are needed to accommodate ever increasing container throughput as is the case in other developed ports of the world; (ii) there is the need to initiate new pliable supply chains and harmonize existing ones connecting the hinterland in order to enhance attractiveness and increase the economic success of Nigerian Ports.

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