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Logistics Management Practices and Performance of Nigerian Manufacturing Firms

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ABSTRACT

The study investigated the effect of logistics management on the performance of manufacturing firms in Nigeria. These were with a view to providing information on the logistics management practices in enhancing performance in the Nigerian Manufacturing Industry. Primary data were sourced for the study. The data were obtained through administration of a questionnaire to 210 respondents of selected firms in the Nigerian manufacturing sector. Multi-stage sampling technique was used for this study. Purposive sampling technique was used in selecting the Managing Directors and Heads of Accounts, Purchasing, Transport and Stores of the 42 firms; because they were in positions to give the type of information needed for this study. Data collected were analyzed using simple percentages, frequencies distribution, mean and median; and regression analyses. The results showed that manufacturing firms in Nigeria were making little use of logistics tools in their manufacturing activities as indicated by the majority of the respondents of this study. The results revealed further showed that logistics management measured by inventory warehousing ($t=19.94$; $p<0.05$), transportation coordination ($t=7.3$; $p<0.05$) and production distribution ($t=11.9$; $p<0.05$) had significant effect on performance of firms in the Nigerian manufacturing sector.

Key words : Logistics Management, Performance, Manufacturing Firms,

INTRODUCTION

Manufacturing sector has been described as a very important component of the Nigerian economy; potential tool for modern development, jobs creator and generator of positive spill-over effects (Tybout, 2000). The growth in manufacturing output has been a key element in the successful transformation of most economies that have risen in their per capital income (Soderbom & Teal, 2002). However, despite the quintessential roles of this sector to sustainable economic development manufacturing firms in developing countries including Nigeria are still performing below expectation (Eleanya, 2009).

In the recent times, Nigeria has recorded a significant decline in manufacturing activity losing approximately 8,708 manufacturing jobs as a result of incessant plant shut downs. Just 5 percentage of Nigeria GDP are contributed by manufacturing firms, which is considered very low among the countries of Africa in comparison to 20 percent level of contribution by South Africa and Mauritius (Solderbon & Teal, 2002). Also, Manufacturing Association of Nigeria in 2009 declared that 820 Manufacturing companies have closed down in the past nine years (Africa Vanguard, 2009). The Nigerian manufacturing sector and the economy as a whole is recording a high level deindustrialization (Eke, 1985; Eleanya, 2009; & Green, 2006). Whereas, studies have shown that a greater improvement in logistics management contribute to superior firm performance (Sakchuchawan & Hong, 2011; Rutner & Langley, 2000; Nada, 2008; Lambert & Burduroglo, 2000).

Studies in the literature have shown that logistics management among Nigerian firms is left to the vagaries of circumstances; failing to transform materials according to customers' requirements. Cursory examination of annual reports of many Nigerian manufacturing firms shows poor commitment of resources into logistics management; despite the significant roles of logistics management in production and operations management. Review of literature also revealed that in practice, there seemed to be no clear direction as logistics managers continuously sought approaches and tools that could assist in manufacturing decision making in addition to divergent opinion by some studies pointing to two negative impacts of suppliers involvement of technology risk and uncertainty (Handfield & Nichols, 1999). However, the limitations of Nigerian manufacturing firms to use logistics tools to achieve competitive advantage have not been adequately established empirically. The question that must be addressed consequent upon the review of Literature is that: What is the effect of logistics management on the performance of manufacturing firms in Nigeria? This paper will attempt to provide answer to this question.

LITERATURE REVIEW

Logistics as a concept is very ancient. There is nothing new about the components of logistics as a field. The ancient Egyptian had been engaging in warehousing of goods. Things have been moving by transport since people first learnt that logs float downstream. Moreover, storage has been in existence since people first discovered that, that was a way to survive long and cold winter. What is new is how it

is done (Glaskowsky, 1990; Waidringer & Eng, 2001) and which is perhaps synonymous to logistics management.

Business logistics management is the process of planning, organizing, executing and controlling the efficient, effective flow and storage of goods, services and related information between the place of origin and the place of consumption or application for the purpose of optimally meeting customer requirements in order to help maximize the welfare of the firm (Vogt, Pienaar & Wit, 2002). The following activities are involved in the flow of product and information between place of origin and place of consumption or application :Demand forecasting, Facility site selection, Procurement, Materials handling, Packaging, Warehousing, Inventory management, Order processing, Logistics communications, Transport, Waste disposal, Return goods handling, and Parts and service support (Vogt, Pienaar & De Wit, 2002). Ferri and Rosli (2012) opined that most activities along the distribution channel functions are concentrated in logistics and include: order handling, information sharing, product distribution scheduling, inventory management and control, transportation, packaging, warehousing and acquisition. The commonality among the identification of the activities involved in logistics is separately discussed as follows:

Materials handling and Manufacturing performance

This is concerned with every aspect of the movement of raw materials, work in progress goods and finished goods on a premise and within a facility. Properly handled materials contribute toward reduction in inventory, minimization of costs and improvement in productivity (Vogt, Pienaar & De Wit, 2002).

Packaging and Manufacturing performance: This is a form of promotion and advertising and it plays a key role to induce repeat purchase. From a logistics perspective, packaging plays a dual role. It protects the product from being damaged and prevents it from causing damage for other goods through any potential hazards it might possess. In addition, packaging can also make it easier to store and move products thereby leading to reduction on the costs distribution system (Vogt, Pienaar & De Wit, 2002)

Warehousing and Manufacturing performance: This involves the activities of managing the space needed to hold or maintain inventories. Goods must be stored for later sale and consumption unless customers need it immediately after production. Generally, the greater the time-lag between production and consumption, the larger the quantity of inventory required. Specific warehouse management decisions include warehouse location, capacity and design, whether the storage facility should be owned or rented, level of mechanization or atomization, goods mix considerations, security and maintenance, personnel training and productivity measurement (Vogt, Pienaar & De Wit, 2002).

Inventory management and Manufacturing performance: Inventory management is a critical issue. The needs of both manufacturing and marketing have to be met continuously. However, large volumes of inventory occupy capital-intensive warehouse space, while possession of the inventory itself requires financial sacrifice.

The cost of warehouse space and the value of the inventory both have an opportunity cost. An optimal trade-off must be reached between this opportunity cost and the harmful effects that will emanate from a stock out situation. This clearly illustrates the importance of accurate demand forecasting in order to satisfy customer needs without sacrificing efficiency (Vogt, Pienaar & De Wit, 2002) .

Order processing and Manufacturing performance: This involves activities associated with filling customer orders and included: transmittal of the order details to the sales section, verifying the customer's creditworthiness, transmittal of the consignment's required packaging details to inventory control staff for delivery to the dispatch section, preparation of the shipment documentation, and communicating the order status the method of payment and the delivery details to the customer. The time duration and accuracy of a firm's order processing are important determinants of the level of customer service it provides. Advanced automatic systems, such as electronic data interchange and electronic funds transfer can reduce the time between order placement and shipment from a warehouse.

Logistics communications and Manufacturing performance: Successful logistics entails the effective management of information and communications systems. Effective communication must take place between: the firm and its customers, the firm and its suppliers, the major functional components of the firm. Accurate and timely communication is the cornerstone of successfully integrated and coordinated logistics management (Vogt, Pienaar & De Wit, 2002) .

Transport and Manufacturing performance

The movement of goods is a key activity and usually the largest cost component of the logistics processes. It includes decisions on aspects such as: operating one's own transport versus hiring transport, mode, carrier and service selection, freight consolidation, vehicle routing and crew and trip scheduling, and vehicle selection, replacement timing and acquisition (i.e. purchase, lease, or rent) (Vogt, Pienaar & De Wit, 2002).

Waste disposal and Manufacturing performance

Waste is a side-effect of the manufacturing process. If waste can be re-used or recycled, logistics manages its handling, storage and carriage to plants. If it cannot be recycled, it must be disposed of. In the case of hazardous, material special disposal standards and environmental regulations need to be heeded. Waste disposal will assume greater importance as recycling and environmental considerations gain greater significance.

Theoretical Review

Resource Dependence Theory

Several theories were reviewed to analyze the implications of using logistics management among manufacturing firms to enhance efficiency and effectiveness. The theories include resource based theory, resource dependence theory and firms' theory.

However, resource dependence theory was adopted because of its explanation of dependent and independent variables of this study

Resource dependence theory suggests that management decisions are influenced by those who control critical resources, both internal and external to the firm (Pfeffer & Salancik 1978). The resource dependence perspective indicates that some functions may control resources key to the success of the company and those functional areas can derive power from the control of these important resources (Tremblay, Cote, & Balkin, 2003). The relative influence of one subunit over another is a function of the resources the subunit contributes (Pfeffer & Salancik 1978).

Homburg, Workman, and Krohmer (1999) used resource dependence theory to suggest subunits that provide valued resources, with no close substitutes, on which others are dependent, have more power and influence than other subunits. Functions that are important within the firm are those that provide valued information or upon which other functions in the firm depend. Therefore, if functions such as logistics provide resources other functions need, logistics could become more salient within the firm.

Various empirical studies had been carried out on the relationship between logistics management practices and performance of manufacturing firms, Adebayo (2012) in a research examine the level at which the Nigerian manufacturing companies are involved in SCM practices as well determine the effect of these practices on SCM performance. With a total of 31 companies forming the sample size of the study, the data collected was analyzed using both descriptive statistics (tables, mean and standard deviation) and inferential statistics (correlation and multiple regression analysis), the result showed that SCM practices definitely impacts on SCM performance.

Also, Somuyiwa and Adewoye (2010) sought to explain the theoretical background of articulating effective logistics information system in any industrial outfit. This is predicated on the fact that logistics is "the process of strategically managing the acquisition, movement and storage of materials, parts and finished inventory (and the related information flow s) through the organization and its marketing channel in such a way that current and future profitability is maximized through the cost-effective fulfillment of orders. The study concluded that emphasis should be placed on attributes of logistics information systems and particularly information cost in order to enhance logistics efficiency and effectiveness.

Nyaberi and Mwangangi (2014) in their study investigate the effects of order processing logistics management practices on the performance, to find out effects of transport control logistics management practices and the performance, to investigate effects of inventory control logistics management practices on the performance, to establish the effects of information systems logistics management practices on the performance. The study conclude that order process logistics management practices contributes to increase in profit, sales volume, service delivery, production levels and quality of product.

Alimhinaga (2000) applied Markov Chain on data from Guinness Nigeria Plc in order to determine the brand loyalty of consumers to its products. The study revealed that there was a dwindling trend in the brand loyalty of consumers to Guinness. He therefore recommended that firms in the brewery sector should apply Markov Chain model in analyzing brand switching pattern and market shares of brands at regular intervals for better marketing decisions and policy formulation to obtain repeat purchase of their products. We agreed with Alimhinaga on the suitability of Markov Chain model to stimulate repeat of purchase of products, we are compelled to probe this study for restricting its study to Markov Chain model as other techniques like transportation model that is key to products distribution was not examine despite its relevance to brewery company like Guinness.

Agorzie, Akinola, and Monday (2014) examined the awareness of operations research among corporations in the Nigerian manufacturing sector. Primary data were sourced for this study through the use of structured questionnaire. Its findings showed that the level of awareness of operations research among managers in the manufacturing sector of Nigeria could be described as fair, so also was the level of familiarity with common operations research models.

Akindipe (2014) took up a research on the role of raw materials management in production operations in the Nigerian manufacturing sector. The study was intended to bring to the fore the salient issue of inefficiency in the practice of raw material management and its effects on production operations of manufacturing concerns. It concluded that only the practice of material management (logistics management) could eradicate the incessant stoppage of production, low level of capacity utilization, inability to meet production targets, poor liquidity and other identified problems will be solved.

Olusakin (2014) examined the role of raw material management in Nigeria production operations. The study intended to bring to fore the salient issue of inefficiency in the practice of raw material management among Nigerian manufacturing firms. The study recommended that for the enhancement of efficiency in the practice of raw material management in Nigeria, manufacturing firms should always determine and manage its inventory adequately.

Zacharia and Mentzer (2007) carried out research with respect to relating logistics involvement in NPD and firm performance. This research suggested there was strategic value in considering the role of logistics in NPD and also supported the basic tenets of resource dependence theory that the value of functions changes as they provide valued information. As logistics continued to provide valuable information, and that there was a benefit in involving logistics in NPD.

Adetumibi, Ayobami and Akin (2014) studied the pattern of cement distribution flow from Dangote cement, Obajana Nigeria. They gathered information from drivers of the company using systematic sampling technique. The results showed that road transport was the only method employed by the company. The study therefore recommends the use of rail, and water integration to reduce the level of travel obstacle and operating cost while also removing all barriers that delay cement

in transit because only a good coordination between each component would bring optimal benefits. There was no focus on other activities such as queuing model, discrete event simulation among others

In conclusion, some literatures took a narrower view of manufacturing logistics. In Nigeria, for example, manufacturing logistics was often primarily concerned with material and information flows from raw material inventory through production to finished goods inventories within a plant (for example Akindipe, 2014; Agorzie, Akinola and Monday, 2014; Asaolu, Agorzie and Monday, 2012). In such views, manufacturing logistics was distinguished from procurement logistics and distribution logistics where the former was responsible for material flows from suppliers into factory, the latter for material flows of finished goods out of the factory to the customers. The interrelationships between these sub-subjects were however recognized and accounted for in this study. The three sub-subjects together constitute the area of logistics in an in industrial organization

METHOD

Primary data were sourced for the study. The data were obtained through administration of questionnaires to 210 respondents of selected firms in the Nigerian manufacturing sector. Multi-stage sampling was used for this study. In the first stage, 84 out of 105 quoted manufacturing firms in Southwestern Nigeria were purposively selected. These firms have their headquarters based in this geo-political zone. Secondly, 42 manufacturing firms out of the 84 listed in the Nigerian Stock Exchange with complete data were selected using purposive sampling technique. In the third stage, purposive sampling technique was used in selecting the Managing Directors; and Heads of Accounts; Purchasing; Transport; and Stores of the 42 firms. These were selected because they were in positions to provide the information needed for the study.

. The Cronbach's Alpha (α) of the constructs of Logistics Management on research instrument ranges between 0.682 to 0.88 indicating that the constructs in the instrument were reliable to measure the variables of Logistics Management as shown in Table 3.1. Data collected were analyzed using simple percentages, frequencies distribution, mean and median; and regression analyses.

Model Specification

Models in this study are specified using regression analysis in line with the work of Nyaberi and Nwangangi (2014) with modification. In the linear regression, the logistics management of a firm depends on certain factors explained by Resource Dependence Theory.

$FP = \alpha_O + \beta_1 TRC + \beta_2 IS + \beta_3 PD + \beta_4 IW + \beta_5 AQ + \beta_6 OH + \varepsilon$ ……eqn 3.1 Where:

FP = Firm Performance measured in two ways: market share and profitability

α = Constant

$\beta_1 \ldots\ldots\ldots\ldots \beta_n$ = Co-efficient of the independent variables (TRC, IS, PD, IW, AQ, OH)

OH = Order Handling measured in terms of lowering costs and increasing productivity

IS = Information Sharing measured in terms of the relationship in the supply chain

IW = Inventory Warehousing measured in terms of location, capacity and design

PD = Product Distribution in terms of filling customers order

TRC = Transport Coordination measured in terms of costs of moving goods by own transport or through hiring

AQ = Acquisition of goods measured in terms of the cost of ensuring effective operation of the firms

ε = Error term

The a priori expectation was IW > 0; TRC > 0; PD > 0; IS > 0; OH > 0; AQ > 0 meaning that the mean of Manufacturing Firm performance in post Logistics Management period was expected to be greater than that of the mean of pre Logistics Management period.

Table 3.1 Validity of Measurement Scale

Logistics Management Constructs	**No of Items**	**Cronbach's alpha**
Order Handling	4	0.782
Production Distribution	3	0.682
Information Sharing	3	0.692
Transportation Coordination	3	0.88
Inventory Warehousing	4	0.80
Acquisition of Materials	3	0.76
Performance	4	0.79

Field Survey, 2017

RESULT AND DISCUSS

The effect of Logistics Management on the Performance of Firms in Nigeria

One important thing in this research was to know which variable included in the model specification had more influence on dependent variable than others. On the basis of the overall statistical significance of the model as indicated by the F statistic, it was observed that the overall model was statistically significant. Since calculated F 97.744 was significant at 0.000 of significance. This implies that there is significant linear relationship between the dependent variable firm performance (FP) and the

explanatory variables IW, TRC, OH, PD, IS, and ACQ. Since at least one of the parameter estimates is significantly different from zero. Furthermore, we can infer that all the variables used in specifying estimated econometric model are appropriate and acceptable. The regression model as shown in Table 4.1 indicated that it could account for 76.5% contribution in explaining the effect of Logistics management practices on the performance of Manufacturing firms as confirmed by an F value of 97.744 at $p< 0.05$.

Discussion of Findings

The result of the regression analysis between the variables of this study as shown in Table 4.1 indicated that logistics management practices are positively significant to performance of manufacturing firms in Nigeria. This indicates that the more the effort being put into applications of Logistics Management practices the direct effect it will have on firm's performance. Therefore, the hypothesis that logistics management practices have positive effect on the performance of Nigerian manufacturing firms is therefore validated. Based on the standardized coefficients shown in Table 4.1, logistics management practices in term of Inventory Warehousing (Beta= 74.4%), Transportation Coordination (Beta=26.8%), Product Distribution (Beta= 44.4%) made significant contributions to firms performance.

However, Order Handling (Beta=0,004), information sharing (Beta=-0.071) and Acquisition of Materials (Beta= -0.024) were insignificant. This finding was also in agreement with our apriori expectation and conformed to results of empirical studies for developed countries that revealed positive relationship between Logistics Management and Firm's performance. This findings of this study substantially corroborated the findings of Lavalle, 2007; Lacroix, 2007; Simchi- Levi, Kaminsky and Simichi- Levi, 2009; Adebayo, 2012; Odoom, 2012; Asaolu, Agorzie and Monday, 2012; Mutwol, 2013; Nyaberi and Mwangangi, 2014; Akindipe, 2014; who argued that logistics management practices contributed to increase profit and market shares or sales volume of firms.

Regression Coefficients of Logistics Management Practices and Firms' Performance

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	19.590	.179		109.689	0.000
IW	0.363	.018	0.744	19.943	0.000
TRC	0.138	.019	0.268	7.300	.0000
PD	0.231	.019	0.444	11.904	0.000
OH	-0.002	.017	-.004	-.105	.915
IS	0.019	.010	-.071	1.925	.056
ACQ	-0.011	.017	-0.024	-.634	.627
R^2 = 0.773 Adjusted R- Square = 0.765 Prob (F- Statistics) = 97.744					

Source: Field Survey, 2017

CONCLUSION

The study concluded that though logistics management had enhanced performance of firms in the Nigerian manufacturing industry to a great extent; none-the-less, committing more resources would bring about a better significant contribution. This study therefore made the following recommendations: Given the pivotal roles of logistics management plays in enhancing performance of manufacturing firms, manufacturers should endeavor to increase their understanding and application of logistics management practices in their manufacturing activities

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