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# EXAMINATION OF THE EFFECT OF LOGISTICS FUNCTIONS ON FINANCIAL PERFORMANCE OF ORGANIZATION

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## ABSTRACT

The contributions of logistics functions to the performance of an organization have been the subject of research over the years. Thus, this present study further examined the effect of outbound logistics functions on financial performance of quoted manufacturing companies in Nigeria. Panel data regression analysis was employed to test the effect of logistics functions on financial performance of the selected companies over a period of five years (2015-2019). Logistic functions costs and financial performance indicators were extracted from secondary data. The findings of the study showed that logistics function has a positive and significant effect on financial performance of manufacturing companies in Nigeria. Therefore, the companies are implored to pay more attention to logistics functions when aiming at a better financial performance.

## 1. INTRODUCTION

Logistics is an important factor to be considered in achieving a successful supply chain operation in an organization. It creates value by establishing customers' delivery requirements in a cost-effective manner (Bowersox, Closs, & Cooper, 2002). It is also a significant source of competitive advantage for organizations as well as a cogent factor to be considered in improving the firm performance (Hoang and Nguyen, 2019).

Logistics is part of operations management functions and plays an important role in transporting the flow of goods in and out of the company (Tracey, 2005). This logistics role improves the quality of finished products and the accuracy of goods delivery by the organization. In other words, the logistics functions should optimize the flow of goods to maintain quality, on-time delivery and customer satisfaction. According to Lambert and Burduroglo, (2000) the logistic functions can be divided into two categories which are: inbound and outbound logistics. Inbound logistics are activities connected with the procurement of material, handling, storage and transportation. With inbound logistics, the smooth flow of incoming raw materials to support the company's operations will be facilitated. The proper inbound management will impact aspects such as production schedules, effective distribution, and customer satisfaction in an organization, which, in turn, improves firm performance (Tracey, 2005). Moreso, despite the role of logistics functions in facilitating the incoming flows, it also facilitates the outcome delivery. Thus, outbound

logistics are those activities connected with collecting, maintaining, and distributing or delivering the product to the final consumer (Ristovska, Kozuharov, and Petkovski, 2017). Furthermore, outbound logistics involves storing and delivering finished goods to the final consumer (Porter 1985). Thus, the capability of logistics to manage these flows will enhance the value-added and impact maintaining the organization's performance (Tracey, 2005).

According to Fabbe-Costes and Jahre, (2008)organization performance can be measured operationally, financially, and strategically. Operational performance measurement is more relative to the improvement of the organizational activities like logistics cost reduction, inventory turnover, on-time delivery and cycle time reduction. The organization's financial performance is measured based on the relationship between total revenue and cost that can be proxy by profitability i.e. Return-on-Investment (ROI), and Return-on-Sales (Morgan, 2012). Lastly, the strategic performance is the improvement of market goals and this includes sales, market share, growth in sales and market share.

The relationship between logistics and the organization's financial performance has been getting a lot of attention from scholars in both developed and developing nations. Logistics can reduce costs, increase revenue and efficiency and effectiveness of business assets used (Anderson et al., 1997). Also, functioning logistics can assist the company in maintaining its tile with customers through a reduction in the cycle time required (Lambert and Pohlen, 2001).

However, despite the overwhelming roles of logistics functions to organization performance in Nigeria, many manufacturing companies are still undermining the contributions of logistics especially 'outbound' in achieving great financial performance. Physical distribution of finished product to the consumer across States in Nigeria is supposed to be major dominant activities of transportation, due to the importance of logistics to every organization but reversed is the case. Perhaps, the organizations are lagging the importance of logistics to effective performance. Nevertheless, many research findings revealed the significant relationship between logistics and organization's performance (Mbondo, Okibo, & Mogwambo, 2015; Kathurima, Ombul, & Iravo, 2016; Ristovska, Kozuharov & Petkovski 2017)while, others indicated insignificant relationships between these variables (Bawa, Asamoah, & Kissi, 2018; Oyebamiji, 2018; Umar, 2019) but little concentration was on outbound logistics functions. Thus, there is little or no evidence that the engagement in outbound logistic functions would translate into better organization performance. This created a gap in the literature. Therefore, the objective of this study is to examine the effect of outbound logistics functions on financial performance as measured by Return on Investment (ROI) of quoted manufacturing' industries in Nigeria.

**Hypothesis of the study**

To critically examine the study objective, the following hypothesis was tested.

H01: Logistics function has no significant effect on the financial performance of selected manufacturing industries in Nigeria.

### 1.1. SCOPE OF THE STUDY

Data for the study were sourced from only secondary sources. Consumer goods' manufacturing companies quoted in the Nigeria Stock Exchange as of 2020 were the focus for this study. For consistency in the findings, this study focused on five fiscal years i.e. 2015, 2016, 2017, and 2019 of the selected companies. The study assumed the organization's engagement in outbound logistics activities, provided there are logistic function costs such as distribution cost/expenses indications in their yearly financial statements. Therefore, outbound logistics costs/expenses over the periods under review become the independent variable.

## 2. LITERATURE REVIEW

### 2.1. OUTBOUND LOGISTICS SYSTEMS – PHYSICAL DISTRIBUTION

Physical distribution management refers to an approach to manage a set of interconnected activities such as transportation, distribution, warehousing, finished products, inventory levels, packaging, and materials handling in a systematic manner, to guarantee that finished goods are delivered as quickly as possible to suppliers (Kwateng, Nkrumah, Manso & Osei-Mensah, 2014). Physical distribution management entails managing finished goods

distribution in a way that will meet customer expectations at the lowest possible cost (Kwateng, et. al., 2014). Apart from transportation, physical distribution management involves a close relationship with production planning, purchasing, order processing, material control and warehousing ((Kwateng, et. al., 2014). Thus, all these areas need interaction with each other and must be managed effectively to provide all the level of service that the supplier expects with a cost that the organization could afford. Therefore, outbound logistics begins when an organization receives an order from its customer. Furthermore, outbound logistics costs are included in the expenses of the company which must be inculcated to get a return on the organization's investment.

Transportation involves the physical movement of products from where they are produced to where they are needed (Kwateng, et. al., 2014). This movement over a space or distance adds value to the finished products and this value is often called place utility. It's also known as a time utility factor, which determines how quickly and continuously a product moves from one location to another. (Lambert et al, 1998). According to Chopra et al (2007), a transportation network is referred to as a collection of nods and links. Transportation originates and ends at nodes and travels along links. For many modes of transportation, infrastructure like roads, ports, waterways, and airports are required. It is paramount that infrastructure is managed for maintenance and investment in capacity needs. Transportation is the most important area of logistics because of the impact on customer service level and cost structure (Kwateng, et. al., 2014). Generally, transport involves covering distances or changing the location of cargo/freight. There is a difference between internal transport within an operation and external transport. For example, internal transport takes place from one production line to another within a factory or between different departments in the warehouse. On the other hand, external transport, is a shipment from the organization to the customer, between various factories or warehouses of the organization.

Warehousing is an essential component of any logistics system. It plays a vital role in providing the desired level of customer service at the lowest possible total cost (Kwateng, et. al., 2014). Warehousing activities serve as a vital link between the manufacturer and the consumer. Warehousing has progressed from a minor component of a company's logistics system to one of its most critical functions. (Grant et al, 2006). Warehousing is defined as that part of a firm's logistics system that stores products (raw materials, parts, goods – in-progress, and finished goods) at and between the point of origin and point of consumption, and provides status information to management (Grant et al., 2006). A warehouse can also be used to redirect goods to other routes within the network, even without having to store any goods at all and different warehouses have been designed to support these functions. According to Blanchard (2004), the basic function of a warehouse is the movement, storage and information transfer. A major objective of warehousing is to provide an ideal product flow and acceptable level of service among the producer and the customer by providing warehouses at designated locations with various inventory levels based on local demand. Similarly, a warehouse is a node in a logistics network where goods are temporarily stored or rerouted to another channel. (Grant et al., 2006).

## 2.2. LOGISTICS FUNCTIONS AND RETURN ON INVESTMENT (ROI)

Recently business environment has produced an extreme awareness of the financial dimension of decision making amongst managers (Barrett, 1982). Cash flow is a powerful influence on decision making in an organization. A strong positive cash flow has become as much a desired goal of management as profit. Another financial dimension to decision making is 'resource utilization', most especially the use of fixed and working capital. The pressure in most organizations is to improve the productivity of capital in order to make the assets buoyant. In this regard, it is usually done through the utilization of the concept of Return on Investment (ROI). Return on investment is a significant form of financial performance of an organization and it is the ratio between the net profit and the capital that was employed to produce that profit. However, there are many ways in which logistics can influence ROI, performing a well-meaning customer service can influence sales revenue while efficient logistics functions could influence the cost and this will make up the profit of the organization. Cash-to-cash cycle time and effective just-in-time logistics can influence accounts receivable/payable and inventory respectively and this make up capital employed. Therefore, in this study ROI will be a proxy of financial performance and mathematically is give as thus:

## 2.3. ELEMENTS OF RETURN ON INVESTMENT (ROI)

The composition of return of investment adopted for this study is highlighted in figure 1. Profit, which is the nominator, will be computed by adding sales revenue together with the cost. On the other hand, the denominator i.e. capital employed will be the addition of cash, accounts receivable/payable, inventory and fixed assets.

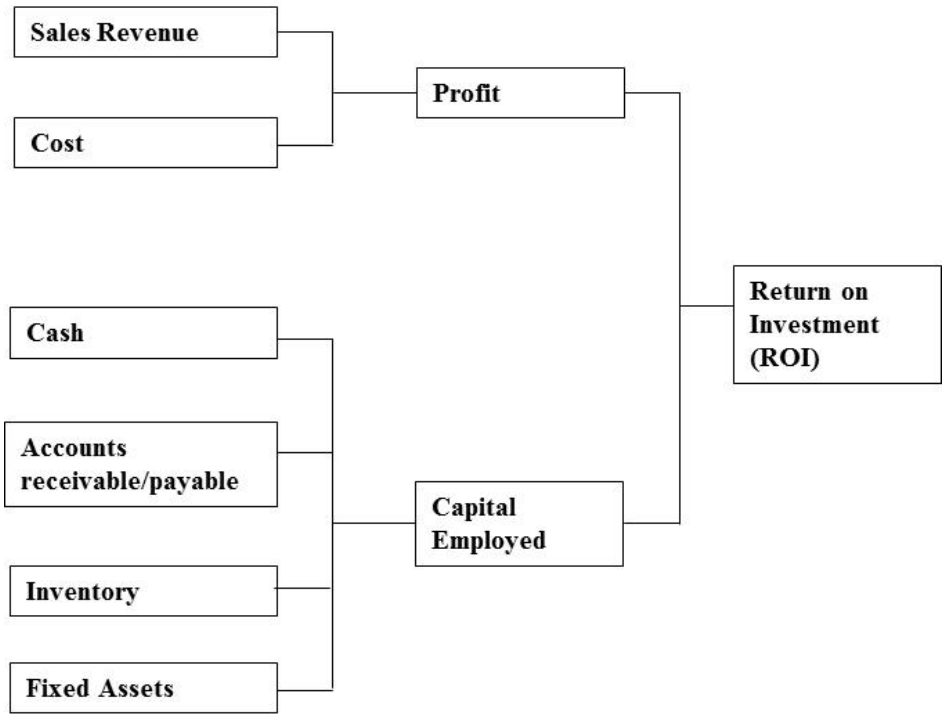


**Figure 1:** Adapted computation of financial performance

**Source**: Adapted from Barrett, (1982)

## 3. MATERIALS AND METHODS

Panel regression analysis was employed in this study to determine the effect of outbound logistics function on the financial performance of 14 Consumer Goods' companies quoted on the Nigeria Stock Exchange (NSE) as of 2020. Financial statements, i.e. balance sheets and income statements of the selected companies for the period of five years (2015-2019) were used. Similarly, Return on Investment (ROI) was used as a performance indicator. Model was developed to measure the effect of ROI on Logistics functions. The model is explained as follows:

$$Y_{it}=\beta_0+\beta_1 X_{1it}+ +\epsilon_{it} \quad (1)$$

$$ROI= \beta_0+ \beta_1 LF_{it} + \epsilon_{it} \quad (2)$$

Where

$Y_{it}$ = Financial Performance (ROI).
$X_{it}$ = K times independent or descriptive variable belong to the model
ROI = Return on Investment
$LF_{it}$ = Logistic Functions (LOGFUN)
B = Coefficient of explanatory variables
$\epsilon_{it}$ = Inclusions
$\alpha_i$ = The degree of heterogeneity
$u_{it}$ = Refers compound error term

## 4. RESULT AND DISCUSSIONS

### 4.1. STATIONARITY OF THE STUDY VARIABLES

Panel Unit roots test was conducted on the variables used in this study. The presence of a unit root means that the series under investigation is non-stationary, while the absence of unit roots shows that the stochastic process is stationary. Therefore, in testing for the stationarity of the panel variables used in the study Levin, Lin and Chu test were employed while the results is presented in table 1. The decision rule adopted is that if the probability value of each variable is lesser than 5% critical value, it is accepted that the variable tested is stationary. However, if the probability value is greater than 5% critical value, then the variable tested is non-stationary. The indications are I (0), I (1) or I (2) in order to know the difference level at which the variables are stationary i.e. no difference, 1 difference and 2nd difference. The result revealed that the variables tested are stationary (no unit root) at no difference.

**Table 1:** Stationarity Result for Levin, Lin & Chu Test of the Study Variables.

| Variables | Level | 1st Difference | 2nd Difference | Order of Integration |
|---|---|---|---|---|
| ROI | 4.09382** | | | I(0) |
| Outbound_logistics | 1.38432** | | | I(0) |

Source: Author's Computation, (2020)

*Notes: (**) indicates significance at 5% level*

### 4.2. PANEL LEAST SQUARE TEST ON THE EFFECT OF LOGISTICS FUNCTIONS ON FINANCIAL PERFORMANCE OF THE SELECTED MANUFACTURING COMPANY

For the purpose of analysis, Panel analysis (Least Square, Fixed Effect Model, Random Effect Model and Hausman Test) were applied to make a robust estimate of the logistics functions on financial performance of the selected manufacturing company. The result of model one in Table 2, showed that Logistic Functions (LOGFUN) has no significant effect on Return on Investment (ROI). The result implies that an increase in logistic functions will have a significant effect on company's return on investment. This result was supported by the probability value 0.00000 indicated that the variable is significant at 5% level of significance.

Furthermore, the coefficient of determination ($R^2$) 0.674434 suggested that the independent variables account for 67% of total variation in the dependent variable. The F-stat showed the total significance of the model with the value 5.152312 which is significant at 5% level of significance. The study rejects the null hypothesis that stated that there is significant relationship between logistic function and financial performance of the selected manufacturing company and accepts the alternative. The Durbin Watson (DW) showed that there is no autocorrelation or serial correlation in the model with the value DW 0.673374. The result has corroborated the findings of Bawa *et. al*., (2018); Oyebamiji, (2018); Umar, (2019). Thus, whenever there is a change in logistics functions (most especially outbound) there will be a change in financial performance of the organization. The impact was consistent and affirmed within the five fiscal years examined.

**Table 2:** Panel Least Square Test for effect of Logistic Functions on ROI of selected Manufacturing Company

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 47.10402 | 11.68140 | 4.032394 | 0.0001 |
| LOGFUN | 1.88E-11 | 3.90E-10 | 0.048081 | 0.9618 |
| R-squared | 0.674434 | Mean dependent var | | 46.86859 |
| Adjusted R-squared | 0.575671 | S.D. dependent var | | 88.08931 |
| S.E. of regression | 88.73316 | Akaike info criterion | | 11.83730 |
| Sum squared resid | 535403.0 | Schwarz criterion | | 11.90154 |
| Log likelihood | 412.3055 | Hannan-Quinn criter. | | 11.86282 |
| F-statistic | 0.152312 | Durbin-Watson stat | | 0.673374 |
| Prob(F-statistic) | 0.000000 | | | |

Source: Author's compilation (2020)

### 4.3. ANALYSIS OF THE FIXED EFFECT MODEL DETERMINATION ON THE EFFECT OF LOGISTIC FUNCTIONS ON ROI OF SELECTED MANUFACTURING COMPANY

The fixed effect between logistics functions (LOGFUN) and financial performance (ROI) is presented in table 3. The result revealed that LOGFUN has a positive relationship with ROI which implies that LOGUN can influence ROI. The result implies that an increase in logistic functions will have a significant effect on company's return on investment. This result was supported by the probability value 0.000004 indicated that the variable is significant at 5% level of significance.

However, the coefficient of determination ($R^2$) 0.572427 suggested that the independent variables account for 57% of total variation in the dependent variable. The F-stat showed the total significance of the model with the value 5.259495 which is significant at 5% level of significance. The study rejects the null hypothesis that stated that there is significant relationship between logistic function and financial performance of the selected manufacturing company and accepts the alternative. The Durbin Watson (DW) showed that there is no autocorrelation or serial correlation in the model with the value DW 1.573454.

**Table 3:** Fixed Effect Model for effect of Logistic Functions on ROI of selected Manufacturing Company

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 43.93192 | 9.453499 | 4.647159 | 0.0000 |
| LOGFUN | 2.34E-10 | 4.36E-10 | 0.537004 | 0.5934 |
| | Effects Specification | | | |
| Cross-section fixed (dummy variables) | | | | |
| R-squared | 0.572427 | Mean dependent var | | 46.86859 |
| Adjusted R-squared | 0.463590 | S.D. dependent var | | 88.08931 |
| S.E. of regression | 64.51663 | Akaike info criterion | | 11.35913 |
| Sum squared resid | 228931.8 | Schwarz criterion | | 11.84095 |
| Log likelihood | -382.5696 | Hannan-Quinn criter. | | 11.55052 |
| F-statistic | 5.259495 | Durbin-Watson stat | | 1.573454 |
| Prob(F-statistic) | 0.000004 | | | |

Source: Author's compilation (2020)

### 4.4. ANALYSIS OF THE DETERMINATION OF THE RANDOM EFFECT OF LOGISTIC FUNCTIONS ON ROI OF SELECTED MANUFACTURING COMPANY

The Random effect nature of the variables used for this study is presented in table 4. The result of Random Effect Model shows that there is positive relationship between logistic function (LOGFUN) and financial performance (ROI). The result implies that an increase in logistic functions will have a significant effect on company's return on investment. This result was supported by the probability value 0.000000 indicated that the variable is significant at 5% level of significance. The coefficient of determination ($R^2$) 0.532266 indicated that the independent variables account for 53% of total variation in the dependent variable. The F-stat showed the total significance of the model with the value 0.154472 which is significant at 5% level of significance. The study rejects the null hypothesis that stated that there is significant relationship between logistic function and financial performance of the selected manufacturing company and accepts the alternative. The Durbin Watson (DW) showed that there is no autocorrelation or serial correlation in the model with the value DW 1.287386.

**Table 4:** Random Effect Model for the Effect of Logistic Functions on ROI of selected Manufacturing Company

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 44.93702 | 19.65704 | 2.286053 | 0.0254 |
| LOGFUN | 1.54E-10 | 3.94E-10 | 0.390667 | 0.6973 |
| | Effects Specification | | | |
| | | | S.D. | Rho |
| Cross-section random | | | 65.07582 | 0.5043 |

| | | | |
|---|---|---|---|
| Idiosyncratic random | | 64.51663 | 0.4957 |
| | Weighted Statistics | | |
| R-squared | 0.532266 | Mean dependent var | 18.99671 |
| Adjusted R-squared | 0.472406 | S.D. dependent var | 63.73473 |
| S.E. of regression | 64.12886 | Sum squared resid | 279650.7 |
| F-statistic | 0.154472 | Durbin-Watson stat | 1.287386 |
| Prob(F-statistic) | 0.000000 | | |
| | Unweighted Statistics | | |
| R-squared | 0.452846 | Mean dependent var | 46.86859 |
| Sum squared resid | 536945.1 | Durbin-Watson stat | 0.670494 |

## 4.5. HAUSSMAN TEST RESULT CONDUCTED FOR EFFECT OF LOGISTIC FUNCTIONS ON ROI OF SELECTED MANUFACTURING COMPANY

Table 5 revealed the Effect of Logistic Functions on ROI of selected Manufacturing Company. This test is conducted to know the model to be adopted between Random Effect Model and Fixed Effect Model, this study made use of the Haussman test. Using Haussman test, the decision rules is that if the Haussman is significant, the null hypothesis (Random Effect Model) will be rejected. Thus, from table 5, the p-value is 1.000 which is not significant. Thus, there is a fixed effect between Logistic functions and return on investment (ROI) of the selected manufacturing companies in Nigeria

**Table 5:** Haussman Test for Effect of Logistic Functions on ROI of selected Manufacturing Company

| Test Summary | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob. |
|---|---|---|---|
| Cross-section random | 0.000000 | 4 | 1.0000 |

**Source:** Author's compilation (2020)

## APPENDIX

Table showing 14 quoted Consumer goods' manufacturing industries used forthis study

| s/n | Company | Type | Date listed |
|---|---|---|---|
| 1 | Honeywell Flour Plc | Consumer goods | October 20th 2009 |
| 2 | Flour Mills Nig. Plc | Consumer goods | Augst 14th 1979 |
| 3 | Guiness Nig. Plc | Consumer goods | January 2nd, 1965 |
| 4 | PZ cuzon Plc | Consumer goods | Invalid date |
| 5 | Dangote Sugar Refinery Plc | Consumer goods | March 8th, 2007 |
| 6 | Vitafoam Nig. Plc | Consumer goods | Invalid date |
| 7 | Nig. Breweries Plc | Consumer goods | September 5th 1973 |
| 8 | Nestle Nig. Plc | Consumer goods | April 20th 1979 |
| 9 | Champion Breweries Plc | Consumer goods | September 1st 1983 |
| 10 | Cadbury Nig. Plc | Consumer goods | Invalid date |
| 11 | Nascon Allied Industries Plc | Consumer goods | October 20th 1992 |
| 12 | Unilever Nig. Plc | Consumer goods | January 1st 1973 |
| 13 | International Breweries Plc | Consumer goods | Invalud date |
| 14 | Mchichols Plc | Consumer goods | December 18th, 2009 |

Source: NSE, (2020)

## 5. CONCLUSIONS AND RECOMMENDATIONS

Sequel to the findings of this study, the conclusion is made that, the logistic function most especially the logistic functions has a positive and significant effect on the financial performance of manufacturing companies in Nigeria. Moreover, there is a fixed effect between logistic functions and financial performance of manufacturing companies in

Nigeria. Furtherance to the conclusions, it is recommended that manufacturing companies should pay more attention to logistics functions when aiming at improving their performance financially.

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## CONFLICT OF INTEREST

The author have declared that no competing interests exist.

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