

Inventory Management and Financial Performance of Listed Industrial Goods Companies in Nigeria

JONAH Ngbomowa Moses PhD.

Department of Accountancy, Faculty of Management Sciences
Rivers State University,
Nkpolu, Port Harcourt, Rivers State. Nigeria.
E-mail: ngbomowa.jonah@ust.edu.ng

COURT Eunice Ralph

Department of Accountancy, Faculty of Management Sciences
Rivers State University,
E-mail: ebireneunice@gmail.com

AARON Clinton Chika

Department of Accountancy, Faculty of Management Sciences
Rivers State University,
E-mail: aaron.clinton@ust.edu.ng

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Abstract

The study sought to determine the relationship between inventory management and financial performance of listed industrial goods companies in Nigeria. The predictor variable proxies used include inventory turnover and inventory conversion period while the referents for the criterion variables used for the study were net profit margin and return on assets. The study adopted the use of an ex-post facto research design. Secondary data were used in the study, which was collected from ten listed industrial goods companies in Nigeria for the 2018 to 2020 financial year. The statistical tools used for the study were descriptive statistics, regression analysis and Pearson's product-moment correlation coefficient. The result of the finding shows that there is a significant positive relation between inventory turnover, inventory conversion period and net profit margin as well as return on assets of listed industrial goods companies in Nigeria. The study, therefore, concluded a significant relationship between inventory management and financial performance of listed industrial goods companies in Nigeria. The study recommended that the management of listed industrial goods companies should monitor inventory to ensure that optimum levels are maintained at all times to improve performance.

Keywords: *Inventory Management, Inventory Turnover, Inventory Conversion Period, Net Profit Margin, Return on Assets, Financial Performance*

INTRODUCTION

The successful operation of any business enterprise depends largely on the effective management of its inventory to provide services to customers or users and remain financially viable. Inventory management does an essential role in every organization because an ineffective inventory system will result in loss of customers, sales and finally profit. Effective inventory management produces more sales for the company, which affects the financial performance of the entity (Francis et al., 2017). Inventories constitute a large size of the working capital of a business as such, it is very important to manage it efficiently and effectively to avoid unnecessary investment. Any firm ignoring the management of inventories will jeopardize its long-run profitability and may ultimately fail. (ICAN 2009)

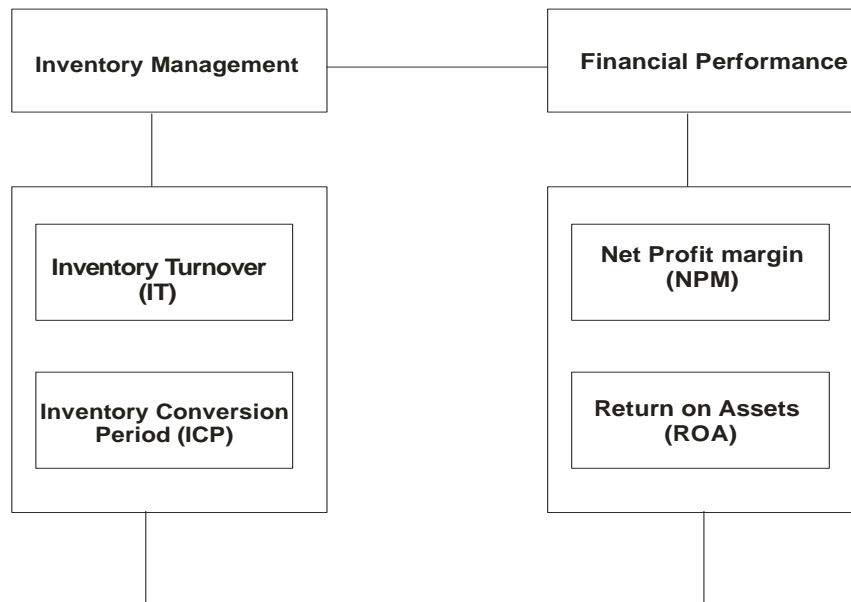
Ngereboa (2009), Posited that inventory or stock refers to the holding of a company's, operational inputs and resalable output. Furthermore, inventory management dealt with the regulating level of investment in inventory in such a way that the control procedure should be advantageous to the firm in the form of an increase in the worth of the firm rate of return. Sekeroglu and Altan, (2014), stated that the main aim of effective inventory management is monitoring all inventory movement, determining when and how much order will be gotten from each inventory item. Onikoyi et al, (2017), assert that inventory control was not viewed as important in the past rather excess inventory was seen as wealth management but now many organizations have clinch to effective control as an answer for performance. It is a fact that inventory management improves financial performance by decreasing costs associated with handling and storage of material or even stock out of goods.

Lydon and Paymaster, (2016), asserts that insufficient inventory posed an adverse effect on the smooth running of the firm, likewise excess inventory result in additional cost which reduce the organization's profitability. The profitability of a corporate entity can be maximized easily with the aid of an effective inventory management system. Proficient inventory management increases the financial performance of an entity, which indicates the ability of a corporate entity to generate earnings, from the use of its assets for a specific time, in essence, profit is an index used to measure business performance. Most managers have ignored the potential saving resulting from proper inventory management by looking at inventories as an essential evil and not a benefit that needs to be managed. Hence some organizations ignore controlling inventory holding, which results in under or over-stocking thereby causing slow or stoppage of production and resulting in high carrying costs leading to firm effectiveness.

Previous empirical studies have evaluated the impact of profitability on corporate organizations both in Nigeria and in other countries (Edwin & Florence, 2016, Lyndon et al, 2016, Francis et al, 2017, Onikoyi et al, 2017, Agu, et al, 2016). However, most of these studies evaluated inventory management and profitability by focusing on inventory policy, liquidity, solvency and operating efficiency in determining financial performance and fail to take into consideration inventory turnover, inventory conversion period, net profit margin, and return on assets in majoring inventory management and financial performance. They also fail to look into other sectors like industrial goods companies. Therefore this research seeks to breach the gap in the literature by evaluating inventory management and financial performance of listed industrial goods companies in Nigeria.

CONCEPTUAL FRAMEWORK

The conceptual framework relevant to this study Inventory Management and Financial Performance of Listed industrial goods companies in Nigeria is presented below.



PURPOSE OF THE STUDY

The main aim of this study is to examine the relationship between Inventory Management and financial performance of listed industrial goods companies in Nigeria. The specific objectives are to:

1. Examine the relationship between inventory turnover and net profit margin of listed Industrial goods companies in Nigeria.
2. Examine the relationship between inventory conversion period and net profit margin of listed industrial goods companies in Nigeria.
3. Examine the relationship between inventory turnover and return on assets of listed industrial goods in Nigeria.
4. Examine the relationship between inventory conversion period and return on assets of listed industrial goods companies in Nigeria.

RESEARCH QUESTION

The following research questions were addressed:

1. What is the relationship between inventory turnover and net profit margin of listed industrial goods companies in Nigeria?
2. What is the relationship between inventory conversion period and net profit margin of listed industrial goods companies
3. What is the relationship between inventory turnover and return on assets of listed industrial goods companies in Nigeria?
4. What is the relationship between inventory conversion period and return on assets of listed industrial goods companies in Nigeria?

RESEARCH HYPOTHESES

The following Hypotheses were tested.

- Ho₁: There is no significant relationship between inventory turnover and net profit margin of listed industrial goods companies in Nigeria.
- Ho₂: There is no significant relationship between inventory conversion period and net profit margin of listed industrial goods companies in Nigeria
- Ho₃: There is no significant relationship between inventory turnover and return on assets of listed industrial goods companies in Nigeria.
- Ho₄: There is no significant relationship between inventory conversion period and return on assets of listed industrial good companies in Nigeria

CONCEPTUAL REVIEW

Inventory management dealt with how much inventory is kept on hand, how regularly to reorder, and how much to order. This is important for day-to-day business operations to meet customer's requirements as well as keep inventory costs at a reasonable level (Francais et al, 2017). Onikoyi et al (2017) assert that inventory is a stock of goods that is maintained by an organization in expectation of some future demand. Sanni et al (2008) opined that inventory is a collective term used for the stock of finished goods, opening and closing stock. Inventory is a stock of the product a firm is manufacturing, for sale and the components that make up the products. It is made up of finished goods for a trading company and a manufacturing company. It is in various firms such as raw materials, work-in-progress and finished goods. (ICAN 2009)

Inventory as cash is kept for three main purposes transactions, precautionary and speculative purposes. The aim is to prevent excess stocks or a lack of enough inventories. Management keeping excess stocks avoid incurring holding cost which includes interest on capital tied down, rent and insurance of warehouse, pilferage and obsolescence. However, when management keeps inadequate inventory, ordering costs will result such as cost sales, disruption in production runs, loss of documentation, and loss of customer goodwill for efficient management of inventories, the ideal level of the quantity ordered is that quantity at which the cumulative of the two categories of cost is minimized. The optimum size is known as economic order quantity it is the inventory level where the total cost of inventory is lowest (Ngerebo, 2009).

Inventory is the physical stock of goods or idle resources held for future use that is essential for the smooth operation of an enterprise, which enhances its economic value. The problem of inventory management is to maintain adequate and not excessive levels of inventory. Reduction in inventories entails that value is converted into cash, which improves the cash flow and returns on investment, however, the cost of carrying inventories increases the operating cost and decreases the firm profit (Unyimadu & Kifordu, 2014).

According to Braide, (2001), a cardinal objective of any efficient system of inventory (stores) control is to ensure that raw materials are available as and when required for production, but at the same time ensure that too much material is not carried in stock. He further pointed out that continuous availability of raw materials is essential for uninterrupted production flow; a company will not just maintain any quality of raw material without considering the financial implication of such an action. As such, a sizeable proportion of a company's total investment is devoted to inventory, because a well-coordinated inventory system can contribute

significantly to a company's profit. He further highlighted some costs a company incurs when holding insufficient inventories including **Quantity discount foregone**: Suppliers allow discounts on large orders placed for material. Insufficient inventory means not taking the discount offer and so losing possible savings which may have accrued to the firm. **Lost sale**; Insufficient inventory means the quantity of finished goods will likely be insufficient and as such some potential sales will not be made. **Loss of Profit**; since some sales were not affected due to insufficient goods, the profit that would have been made on such sales is lost. **Customer ill will**: Prolonged insufficient finished goods may cause customer dissatisfaction, and discontinue patronage thereby resulting in loss of sales and profit that would have been accrued from such sales. **Rush order and attendant costs**: A company experiencing a stock-out situation may be forced at certain times to use faster means when procuring material thereby increasing cost to the firm. **Erratic Production**: Scheduling of production runs may not be coordinated as such extra set-up costs may be expenses due to insufficient materials. (Braide, 2021)

EMPIRICAL REVIEW

Francis, et al (2017), investigated inventory management and organizational profitability in Uganda. The methodology used was descriptive research design. Primary data were used, an instrument for data collection was a structured questionnaire and the population of study companies employees of Gumutindo coffee corporative enterprise (GCCE). The sampling size used was 181 out of a population of 345 staff; probability and non-probability sampling were used to test the reliability. Descriptive statistics along with regression analysis were used to determine the strength of the relation of the variable. The finding revealed that inventory management positively influences the profitability of the organization. The study concluded that inventory management adopted in GCCE was effective and contributed to profitability by 20.2%. The study recommended more investment in inventory to boost inventory level.

Edwin et al (2016) studied inventory management on the profitability of cement manufacturing companies in Kenya. The independent variable used for the study were inventory turnover, inventory collection period, inventory level, and storage cost, while the dependent variable used was gross profit margin, return on assets and firm growth. Panel data design was used in the study secondary data used in the study was collected from three (3) sample cement manufacturing firms' annual reports in the Nairobi stock exchange (NSE) from 1999 to 2014. The analysis of data was done using multiple regression models. The result revealed a negative association between inventory turnover, inventory conversion period, and storage cost with profitability. It was also discovered that inventory level is related to firm size and storage cost. The study concluded that proper inventory management influences the profitability of an enterprise. It was recommended that a firm inventory system must maintain an appropriate inventory level to improve profitability.

Daniel and Assefa (2018) investigated the impact of inventory management practices on firms' competitiveness and organizational performance in Ethiopia. The theories used in the study were constraints and learning theories. A quantitative survey approach was used in the study and primary data were also used in the study, which was collected from a population of small and micro-scale enterprise manufacturing sub-sector in the Aris zone. The stratified random sampling technique was used in selecting the sub-sector while the purposive sampling method was used in data collection and the question was organised using a Likert scale of 1 to 5 points. The data analysis was done with the use of STATA version 13-science software. The finding

showed a positive significant association between inventory management practice and competitive advantages of organizational performance of MSE, under the manufacturing sub-sector. It was concluded that enhanced competitive advantage and increase organizational performance could improve the inventory management practice. It was recommended that policymakers, NGOs and concerned parties should support Micro and small enterprise by providing essential training and resources to improve performance.

Onikoyi, et al (2017), evaluated the effect of inventory management practices on the financial performance of Lafarge Wapco plc. Nigeria. The survey research design was adopted for the study. It was a secondary data source that gathers data from the annual report of Lafarge Wapco plc. from 2005 to 2013. The collected data were analysed using descriptive statistics and regression techniques. The study revealed a significant positive association between the value of stock carried and the cost of goods sold. It was discovered that the inventory policy of the organization does not affect profitability. The study further discovered a positive association between profitability and inventory management. It was recommended that an appropriate policy framework be put in place to facilitate the prompt implementation of the management of inventory practice.

Lyndon et al, (2016), investigated the effect of inventory cost management on profitability in Nigeria. The referents of inventory cost used were raw material cost, work in progress cost and finished goods cost while profitability was proxy by gross profit margin. The Longitudinal research design with time series panel data was used for the study. The secondary data used were collected from the annual report and accounts of selected listed brewery companies in Nigeria's stock exchange from 2005 to 2014. The data were analysed with multiple regression techniques aided by SPSS version 20.0. The finding showed a positive significant relation between inventory cost management and the profitability of brewery companies in Nigeria. It was recommended that appropriate and modern technology should be deployed to enhance effective inventory management, and efficient inventory cost management should be adopted with adequate regular training of staff on proper inventory management.

Kilonzo, et al, (2016), investigated the effect of inventory management on the financial performance of firms funded by government venture capital in Kenya. The study adopted a descriptive research design, primary data was used for the study and a questionnaire was used in collecting data from seventy-two (72) respondents of firms funded by government venture capital. The use of Cronbach Alpha, the instrument of validity and reliability was tested through a pilot study. The data collected were analysed using descriptive statistics and regression analysis. The finding from the study revealed a positive relationship between inventory management and the financial performance of firms funded by government venture capital in Kenya. It is recommended that managers can create value for their firm by reducing turnover days to the barest minimum.

Enock, et al, (2017), studied the effect of inventory management on organizational performance in Kenya. The study adopted the convergent parallel mixed methods design; the study was guided by learns theory. The study used Primary data, an instrument for data analysis was a questionnaire, and the sample size was 139 respondents, stratified simple random sampling methods were used for selecting employees. The data were analysed using inferential statistics, multiple regression and correlation analysis. The finding showed that inventory management had a significant positive relationship with firm performance in textile firms in Nairobi. The

study concluded that inventory management possesses the potential of influencing the performance of textile firms positively.

Kwadwo, (2015), investigated the impact of efficient inventory management on profitability in Ghana. The study adopted a descriptive research design. The study used secondary data obtained from four (4) selected brewery companies listed in the Ghana stock exchange using a purposive sampling technique. Data for analysis were collected from the annual report of selected brewery companies from 2004 to 2014. The analysis of collected data was done using regression and Pearson product-moment correlation. The finding showed a significant positive relation between material inventory management and the profitability of listed brewery companies. The study concluded that inventory management influences profitability, as such. It was recommended that manufacturing firms in Ghana should pursue adequate management of raw material inventory.

Asu, et al, (2016), evaluated the effect of inventory management on the organizational performance of selected manufacturing firms in Nigeria. The study adopted a descriptive research design. Primary data was used for the study while the instrument for data collection was a questionnaire used on a population size of 996 out of which a 285-sample size was used and 270 questionnaires were returned and used for the analysis. The statistical tool used in the analysis was linear regression and Pearson product-moment correlation coefficient. The finding showed inventory control had a positive significant association with profitability. A positive relationship was also discovered between demand management and customer satisfaction. The study concludes that the management of inventory is essential for business operations. The study recommended appropriate training of staff (personnel) on how to manage inventory efficiently.

Akinyomi, (2014), investigate the effect of inventory management on the profitability of the Nigerian manufacturing sector. The referent used for inventory management was the inventory conversion period while return on equity was used as a dimension for profitability. The methodology adopted was correlational research design. Secondary data sources were used for the study involving a population of eight (8) beverage firms listed under the manufacturing sector on the Nigeria stock exchange. The data were obtained from 2008-2012. The statistical tool used for the analysis was regression and Pearson product-moment correlation. The finding of the study showed that there is no significant relationship between stock management and the profitability of manufacturing companies. It was recommended that future research be conducted to ascertain if there exists a relationship or not.

METHODOLOGY

The methodology adopted in the research is an ex-post facto research design. According to Anyanwu, (2000), is a study after the facts had been known or an event had taken place. This research design like survey research gathered data to be able to further evaluate the available facts. Secondary data was used for the study, which was collected from ten (10) listed industrial goods companies in Nigeria's stock exchange for the period 2018 to 2020. The data were analysed using descriptive statistics, multiple regression and correlation analysis. The companies chosen are Beta Glass plc, CAP plc, Austin Laz and co plc, Cement Company of Northern Nigeria plc, Cutix plc, Dangote Cement plc, Lafarge African plc, Meyer plc, Premier Paints plc, Port Land and Product Nigeria plc.

MODEL SPECIFICATION:

The general multiple regression model used is stated below

FP=FM (IM)

$$NPM = c_0 + c_1 IT + c_2 ICP + e \dots\dots\dots 1$$

$$ROA = c_0 + c_1 IT + c_2 ICP + e \dots\dots\dots 2$$

Where;

FP= Financial Performance (NPM, ROA)

IM= Inventory management (IT, ICP)

NPM= Net Profit margin

ROA= Return on assets

IT= Inventory turnover

ICP= Inventory conversion period

C₀= Regression constants/intercept

C₁- C₂= Regression coefficient

E= Error term

RESULT AND DISCUSSION

Table 1:1 summary of descriptive statistics on the study variables

	NPM	ROA	IT	ICP
N	30	30	30	30
Missing	0	0	0	0
Mean	15.642	26.137	5.438	67.120
Standard dev.	7.319	9.924	1.346	22.723

Sources: SPSS version 22 output 2021

Table 1:1 above showed the descriptive statistic of mean and standard deviation for all the variables in the study it showed that net profit margin (NPM) had a mean value of 15.642 and standard deviation of 7.319, Return on Assets (ROA) had a mean value of 26.137 and standard deviation of 9.924. Inventory turnover (IT) had a mean value of 5.438 and a standard deviation of 1.346. And Inventory collection period (ICP) had a mean value of 67.120 and a standard deviation of 22.723.

Table 1.2 Correlation analyses on inventory management and financial performance.

Correlation

		IM	FP
IM	Pearson correlation	1	0.621*
	Sig. (2 tailed)		0.006
	N	30	30
FP	Pearson correlation	0.621*	1
	Sig. (2 tailed)	0.006	
	N	30	30

*correlation is significant at the 0.05 level (2 tailed)

Sources: SPSS version 22 output 2021

Table 1.2 depicted a positive correlation coefficient of 0.621* significant at 0.006<0.05 level of significance. This value indicates a strong relationship between inventory management and financial performance. The positive correlation coefficient observed highlighted that an increase in financial performance is associated with an increase in inventory management.

Therefore the researcher concludes that there is a significant association between inventory management and the financial performance of listed industrial goods companies in Nigeria.

Table 1:3 regression results showing the relationship between inventory turnover (IT), inventory conversion period (ICP) on net profit margin (NPM).

Variables	Co-ef.	T-cal	T-tab _(0.05,30)	Sig.t	R	R ²	Durbin Wat.	F-cal	F-tab _(0.05,2,27)	Sig.f
Constants	2.341	4.121		0.000						
IT	0.279	2.163		0.007						
			2.045		0.607	0.368	2.042	4.261	3.400	0.018
CP	0.316	2.341		0.002						

Dependent variable: Net Profit Margin

Sources: SPSS version 22 output 2021

$$NPM = c_0 + c_1 IT + c_2 ICP + e \dots\dots\dots 1$$

$$NPM = 2.341 + 0.279IT + 0.316ICP \dots\dots\dots 2$$

T-values in bracket (4.121) (2.163) (2.3421)

Table 1:3 shows a Pearson correlation coefficient of 0.607 which indicates a strong correlation between the regressors and net profit margin. The coefficient of determination $R^2=0.368$ means that a 36.8% change in net profit margin is described by changes in the regressors, while a 63.2% change in net profit margin is described by variables not used in the model. The f-cal of $4.261 > f\text{-tab}(0.05,2,27) = 3.400$ and had a significant probability value of 0.018 meaning that the model is useful likewise the Durbin Watson calculated value of 2.042 which indicates the absence of autocorrelation, therefore the utility of the model was upheld by the researcher.

Inventory turnover had a t-value of $[2.163] > t\text{-tab}(0.05, 30) = 2.045$ and a significant probability value of $0.007 < 0.05$ level of significance. Therefore the investigator concludes that inventory turnover had a significant relationship on net profit margin of listed industrial goods companies in Nigeria.

The inventory conversion period had a t-value of $[2.341] > t\text{-tab}(0.05, 30) = 2.045$ and an important probability value of $0.002 < 0.05$ level of significance. The researchers therefore conclude that the inventory conversion period had a significant relationship on net profit margin of listed industrial goods companies in Nigeria. The finding corroborates the work of Edwin et al, 2016, Kilonzo et al, 2016).

Table 1:4 showing regression results on the relationship between inventory turnover and inventory conversion period on return on asset.

Variables	Co-ef	T-cal	t-tab _(0.05,30)	Sig.t	R	R ²	Durbin Watso n	f-cal	f-tab _(0.05,2,27)	Sig.f
Constant	1.64	6.01		0.00						
s	2	0		4						
IT	0.39	2.13		0.02						
	7	2		7						
			2.045		0.56	0.31	2.005	3.94	3.400	0.02
					1	5		1		0
ICP	0.34	2.40		0.01						
	0	1		1						

Dependent variable: ROA

Source: SPSS output 2021

$ROA = c_0 + c_1IT + c_2ICP + e$1

$ROA = 1.642 + 0.397IT + 0.340ICP$2

T-values in bracket (6.010) (2.132) (2.401)

Table 1:4 showed the Pearson correlation coefficient of 0.561 indicating a moderate correlation between the regressors and return on assets. The coefficient determination $R^2 = 0.315$ implies that the 31.5% variation in return on assets is explained by changes in the regressor, while the 68.5% variation in return on assets is explained by another variable not included in the model. The f-cal calculated of $3.941 > f\text{-tab}(0.05, 2, 27) = 3.400$ and a corresponding probability value of 0.020, hence the investigator concludes the utility of the model. In addition, the Durbin Watson calculated value of 2.015 indicates the absence of autocorrelation; as such the utility of the model was upheld by the investigator.

Inventory turnover had a t-value $[2.132] > t\text{-tab}(0.05, 30) = 2.045$ and an important probability value of $0.027 < 0.05$ level of significance. The researcher concludes a significant relationship between inventory turnover and return on assets of listed industrial goods companies in Nigeria.

The inventory collection period had a t-value of $[2.401] > t\text{-tab}(0.05, 30) = 2.045$ and an important probability value of $0.011 < 0.05$ level of significance. Therefore the researchers conclude a significant relationship between inventory collection period and return on assets of listed industrial goods companies in Nigeria. The study affirms the work of Enock et al, 2017 whose results confirm a significant association with financial performance.

CONCLUSION AND RECOMMENDATION

Inventory management had been defined as the art and science of maintaining stock levels of a given group of items incurring the least cost consistent with other relevant targets and objectives set by management (Kwadwo et al, 2015). Evidence from the study shows that inventory turnover and inventory conversion period had a significant positive relationship with a net profit margin as well as return on asset. Therefore the study concludes a significant relationship between inventory management and financial performance of listed industrial goods companies in Nigeria.

Based on the finding, managers are recommended to always monitor inventory to ensure that optimum levels are maintained at all times, likewise, there should be retraining of personnel on the need to maintain an optimum level of inventory.

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