

**THE IMPACT OF INVENTORY MANAGEMENT
MODELTECHNIQUES ON PROFITABILITY OF
MANUFACTURING COMPANIES IN NIGERIA**

BY

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Declaration

I declare that this project is based on a study conducted by me, Jeremiah Tubotamuno in the Department of Accountancy, Bayelsa State Polytechnic, Aleibiri under the supervision of Mr Anderson P. Obalakumo. This project report has not been submitted elsewhere for the award of a degree. The ideas and views of the research project are products of research undertaken by me. Where the ideas and views of other authors/researchers have been expressed, they have been duly acknowledged.

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Certification

The project, the impact of inventory management model techniques on profitability of manufacturing companies in Nigeria, meets the regulations governing the award of National Diploma in Accounting, Department of Accountancy, Bayelsa State Polytechnic, Aleibiri.

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DEDICATION

This project is dedicated to God Almighty for all His goodness and wonderful works in my life all through my studies.

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I want to appreciate all my lecturers at Bayelsa State Polytechnic, especially my project supervisor, Mr Anderson Obalakumo, for his patience, understanding, constructive and painstaking corrections in the course of this work. Special thanks to the Dean of our school, Dr. James Poyeri, our amiable HOD, Dr Laime Isaac Odogu, Dr Sunday Zibaghafa, Mr Sulaiman Disu and Mr Timinipre Okpobo, for the knowledge they have imparted in me throughout my programme.

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ABSTRACT

The main objective of our study was to determine the impact of inventory management model techniques on firm performance in Nigeria- Using Grass Roots Opinion. The methodology applied grass roots opinion (primary questionnaire) survey design with a focus on a purposefully sampled 10 firms with populations of 710 staff strength; while Taro Yamane formulae was used to arrive at 400 staff who formed our respondents. The method of analyses applied descriptive statistics; Pearson Correlation and OLS regression. The result showed that the Adjusted R-squared value of 0.879, which is 88% of the systematic variations in the dependent variable in the pooled firms, was jointly explained by the independent variables (ABC, LMH, and EOQ) on firm stock management. The F-statistic value of 429.250 with P-value of 0.0000 showed that the OLS pooled model on the overall is statistically significant @ 5% level. Other findings of the explanatory variables are: ABC; LMH; and EOQ inventory models have positive significant impact on firm performance in Nigeria. The study concluded that inventory management model techniques tested have positive significant impact on firm performance. The study therefore recommended that top management should emphasis on the proper inventory management techniques and measuring of efficiency deviations to identify weaknesses in the process of managing inventories.

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CHAPTER ONE INTRODUCTION

1.1 Background to the Study

According to Masembe (2011), the word inventory was first recorded in 1601. The French term inventaire, or "detailed list of goods," dates back to 1415. In any manufacturing company, nearly 60% to 70% of the total funds employed are tied up in current assets, of which inventory is the most significant component (Masembe, 2011). Inventory plays a major role in the operation of manufacturing businesses. In manufacturing, inventories of raw materials allow companies to operate independently of their sources of supplies. Day to day operations are not dependent on deliveries from supplies since stock of the necessary materials are maintained and used when needed. Kumar and Bahl (2014) affirm that inventory constitutes the most significant part of majority of manufacturing industries. Because of the huge inventories maintained by most firms, a considerable sum of an organization's fund is being committed to them. Inventories are vital to the successful functioning of manufacturing and retailing organizations. They may consist of raw materials, work-in-progress, spare parts/consumables, and finished goods. It is not necessary that an organization has all these inventory classes. Inventory represents an important decision variable at all stages of product manufacturing, distribution and sales, in addition to being a major portion of total current assets of many organizations. Inventory often represents as much as 40% of total capital of industrial organizations (Moore, Lee & Taylor, 2003). It may represent 33% of company assets and as much as 90% of working capital (Sawaya & Giaouque, 2006). Similarly, inventories often constitute the most significant part of current assets of large companies. In the public limited companies, inventories are approximately 60% of current assets on the average. The US Bureau of the Census stated that inventory and accounts receivable were the two largest accounts of equal magnitude and together they comprise almost 80% of current assets and over 30% of total assets for all manufacturing companies.

Since inventory constitutes a major segment of total investment, it is crucial that good inventory management be practiced to ensure organizational growth and profitability. Considering the large sum of money that is committed to the stocks of raw materials, work in progress and finished goods, it is therefore of paramount necessity that these inventories should be managed efficiently and effectively in order to avoid the jeopardizing of the profit position of the firm.

In the light of this, it would not be out of place to state that inventory management is pivotal in effective and efficient performance of organizations. Temeng, Eshun and Essey (2010) said that firms have long ignored the potential savings from proper inventory management, treating inventory as a necessary evil and not as an asset that requires a proper management. An effective inventory management is able to generate more sales for the company which directly affects the performance of the company (Mohamad, Suraidi, Rahman & Suhaimi, 2016). Improper inventory management models have been observed as very devastating to firm performance. Several firms especially manufacturing companies have been consistently challenged of improper inventories controls and management such as: wrong estimate, pilfering, poor reaction to customers' demand, lack of proper accounting recording systems and inability to choose find the required model to handle inventory (Wanko, 2014; Mohamad, Suraidi, Rahman & Suhaimi, 2016). Similarly, Abdulrasheed, Khadijat, Sulu and Olanrewaju (2013) observed that companies face problems of inconsistent deliveries, reduced consumer effective demand and high cost of production due to poor inventory management techniques leading to poor performance. Other authors like Duru, Okpe and Udeji (2014) insist that inventory is the livewire of any manufacturing firm. They maintain that because of shortage of materials to meet sudden increase in customers' demand, reduction in profit margin, low returns on equity, wastages of materials, pilferage arising due to excess inventory and sleep in communication chains that exist in most industries, inventory management has become mandatory on each and every manager responsible for production in an organization. Inventory is one vital resource that any corporate organization needs. Like any other business resource, inventory is limited in supply; hence it requires effective management rather than neglect. Based on some facts gathered from prior literatures, there have been mixed and inconclusive results both in developed and undeveloped economy on inventory management (Koumanakos, 2008; Juan & Martinez, 2002; Sitienei & Memba, 2016; Mohamad, Suraidi, Rahman & Suhaimi, 2016; Prempeh, 2015; Mukopi & Iravo, 2015; Mwangi & Nyambura, 2015). It is also vital in the control of materials and goods that have

to be held (or stored) for later use in the case of production or later exchange activities in the case of services. The principal goal of inventory management involves having to balance the conflicting economics of not wanting to hold too much stock. Inventory problems of too great or too small quantities on hand can cause business failures (Ndirangukung'u, 2016).

An efficient management of inventory is required because a substantial share of a firm's funds is invested in them. Every company must ensure that inventory is maintained at desired levels. Too much and too low inventories bring down the level of profitability of an organization. Whether it is a manufacturing organization or a merchandized organization, the goal should always be the same, that is, to ensure the inventory is ready and at the same time the inventory level should be low. The conclusion one might draw is that effective inventory management can make a significant contribution to company's profit as well as increase its return on total assets. It is thus the management of this economics of stockholding that is appropriately being referred to as inventory management. The reason for greater attention to inventory management is that this figure, for many firms, is the largest item appearing on the asset side of the statement of financial position. Therefore, inventory management approaches are essential aspects of any organization.

Inventory management refers to all activities involved in developing and managing the inventory levels, whether the inventory is raw materials, semi-finished materials or finished goods, so that adequate supplies must always be available and the form must make sure that the cost of over or under stocks are always low (Anichebe&Agu, 2013). According to Mohamad, Suraidi, Rahman and Suhaimi (2016), an effective inventory management is able to generate more sales for the company which directly affects the performance of the company. For inventory management to be effective, there must be a system which is managed by a group of employees who are experts in this area. The sales department may argue for a large amount of stock but the finance department may on the other hand argue for a minimal amount of stock so that the spare finance can be utilized elsewhere (Anichebe&Agu, 2013). Whichever, the case the inventory level must be able to generate the highest profit possible. Inventory management is one of the strategies employed by organizations as away of having an edge/ competitive advantages over others and a way of maximizing profits at large. The main objective of Inventory management is to acquire the right quantity and quality of materials at the right time, at the same time keeping the cost of holding stock as low as possible so as to fully acquire the benefits of managing inventory.

1.2 Statement of the Problem

Effective management of inventory can lead to a reduction in cost, resulting in a significant saving. A potential 6% saving on total cost through effective inventory management is achievable. Organizations that do not adopt the tools of inventory management and Inventory control systems face a lot of challenges and hence the performance of these organizations declines due to no profits made. If there are no profits, it means that there is no business (Ugwu & Nwakobi, 2020). According to Nnubia, Omaliko, Okechi and Etuka (2017), the primary concern of every manager of inventory management is to provide the right goods in the right condition at the right place and at the right time. Improper control of inventory can result in a lot of problems to the company. These problems could be theft, damaged goods, obsolescence, improper inventory recording, mismanagement, which can invariably lead to the increase in additional cost and loss of profit.

In Nigeria, the likes of Anichebe and Agu (2013), Ugwu (2012), Ogbo and Ukpere (2014), Ugwu and Nwakobi (2020), Nnubia, Omaliko, Okechi and Etuka (2017) etc published studies on inventory management and profitability of manufacturing companies in Nigeria, covering several areas. As a result of the methodology employed by past authors and their mixed results, this study will assess the impact of inventory management on profitability of manufacturing companies in Nigeria using both content analysis and regression research design to see if results will now conform with that of past authors.

1.3 Objectives of the Study

The broad objective of this study is to determine the impact of inventory management model techniques on profitability of manufacturing companies in Nigeria. Other objectives are:

- i. To determine the effect of ABC model techniques in inventory management on profitability of manufacturing companies in Nigeria.
- ii. To examine the relationship between Low, Medium and High (LMH) model techniques and profitability of manufacturing companies in Nigeria.
- iii. To ascertain the effect of Economic Order Quantity (EOQ) model techniques in inventory management on profitability of manufacturing companies in Nigeria.

1.4 Research Questions

The following research questions were raised in order to produce a critique for the study:

- i. To what extent does ABC model techniques in inventory management impact profitability of manufacturing companies in Nigeria?
- ii. What is the extent of the relationship between Low, Medium and High (LMH) model techniques and profitability of manufacturing companies in Nigeria?
- iii. What is the extent of effect of Economic Order Quantity (EOQ) model techniques in inventory management on profitability of manufacturing companies in Nigeria?

1.5 Statement of Hypotheses

The following hypothesis statements were formulated for the purpose of the study:

H₀1: ABC model techniques in inventory management have no significant impact on profitability of manufacturing companies in Nigeria.

H_a1: ABC model techniques in inventory management have significant impact on profitability of manufacturing companies in Nigeria.

H₀2: Low, Medium and High model techniques in inventory management has no significant impact on profitability of manufacturing companies in Nigeria.

H_a2: Low, Medium and High model techniques in inventory management has a significant impact on profitability of manufacturing companies in Nigeria.

H₀3: Economic Order Quantity model techniques in inventory management has no significant impact on profitability of manufacturing companies in Nigeria.

H_a3: Economic Order Quantity model techniques in inventory management has a significant impact on profitability of manufacturing companies in Nigeria.

1.6 Significance of the Study

The Nigerian economy is seen to be the largest economy in Africa and the manufacturing sector being the third largest on the continent. The manufacturing sector is also seen to be a major driver of economic growth in Nigeria even though the rate of growth is said to be slow. In view of this, the significance of the study on inventory management and organizational performance is as follows:

Firstly, this study will be significant to manufacturing companies, firms and businesses as it will enable them keep an adequate inventory control and ensure that they do not run out of stock or have excess stock which can endanger their liquidity position. More so, this study will reveal the relevant methods to be used in preventing mismanagement and improve stock control which has led to the mismanagement and unproductively of materials.

The findings of this study will also greatly assist the policy makers and the business community inappreciating how Inventory management greatly impacts on the profitability in organizations.

Additionally, the study will be important to the government as its conclusions and subsequent implementation of its recommendations will help to increase the profitability of manufacturing companies, thereby increasing the revenue generation of government via tax.

1.7 Scope of the Study

The scope of this study is considered in two different folds:

The Geographical Scope: This study is concerned with the impact of inventory management on profitability of manufacturing companies in Nigeria. Therefore, the geographical scope of this study is the entire manufacturing sector, with focus on fifty-three (53) manufacturing companies in Nigeria.

The Content Scope: The theoretical area that was covered in this study includes ABC inventory techniques model, Low, Medium & High technique model and Economic Order Quantity technique model and their respective impact profitability of manufacturing companies, using return on assets as profitability indicator.

1.8 Definition of Terms

Inventory: It can be defined as the merchandise or supplies held in store by an organization at a particular point in time.

Inventory Management: Inventory management involves planning, organizing and controlling the flow of materials from their initial purchase unit through internal operations to the service point through distribution.

Economic Order Quantity (EOQ): It is an inventory management system that demonstrates the quantity of an item to reduce the total cost of both handling of inventory (Handling Cost) and order processing (Ordering Cost).

ABC Model Technique: ABC model analysis is a business term used to define an inventory categorization technique often used in materials management. It is also known as “Selective Inventory Control”. ABC analysis provides a mechanism for identifying items which will have a significant impact on overall inventory cost; whilst also providing a mechanism for identifying different categories of stock that will require different management and controls.

Organizational Performance: It can be regarded as the performance, in terms of profitability, of the organization over a period of time, usually a year.

Profitability: Profitability means a state of producing a profit or the degree to which a business is profitable. Profitability is the primary goal of all business ventures

Return on Assets: It can be defined as the company’s profit after tax divided by its average assets. It is measured in percentage.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The importance of inventory management in the organizational of any manufacturing concern cannot be over-emphasized. Its impact is enormous and contributions to the development of the society are noteworthy. In order to discuss this issue more elaborately, several related literatures will be reviewed under the following points: conceptual framework, theoretical framework and empirical framework.

2.1 Conceptual Framework

2.1.1 Concept of Inventory

Inventories are vital to the successful functioning of manufacturing and retailing organizations. This is because many companies hold inventories as part of their business operation. Inventories make up the most significant part of current assets of most companies especially the manufacturing companies. The need for management to ensure inventory control if properly managed cannot be over emphasized. A firm neglecting inventory management will be jeopardizing its long run profitability and it may end up failing in its business (Ugwu, 2012)

The definition of inventory has been defined by many professional bodies and scholars in different ways.

According to Nwaorgu (2005), inventory can be defined as a tangible property held for resale in the ordinary course of business, in the production for sale, to be consumed in the production of goods and services. Ghosh and Kumar (2003) define inventory as a stock of goods that is maintained by a business in anticipation of some future demand. Stock and Lambert (2001) define inventory as a stock or store of goods. These goods are maintained on hand at or near a business's location so that the firm may meet demand and fulfill its reason for existence. If the firm is a retail establishment, a customer may look elsewhere to have his or her needs satisfied if the firm does not have the required item in stock when the customer arrives. If the firm is a manufacturer, it must maintain some inventory of raw materials and work-in-process in order to keep the factory running. In addition, it must maintain some supply of finished goods in order to meet demand. Coyle, Bardi and Langley (2003) define inventory as raw materials, work-in-progress, finished goods and supplies required for creation of a company's goods and services. Davis, Aquilano and Chase (2003) also define inventory as the stock of any item or resource

used in an organization. It is an idle resource held for future use. Inventory is the stock purchased with the purpose of resale in order to gain a profit. It represents the largest cost to a manufacturing firm. For a manufacturing firm, inventory consists of between 20% and 30% of the total investment (Garcia – Teruel& Martinez, 2007). The term can also mean a detailed list of goods in a given place or stocktaking. Haudorson et al (2004) define Inventory as the value or quantity of raw materials, assemblies, components, work in progress and finished stock that are kept or stored for use as the need arises. According to Jain (2009), inventory is the aggregate of these items of intangible property which are held for sale in the ordinary course of the business, held in the process of production for such sales to be currently consumed in the production of goods and services to be made available for sale. According to Morse (2017), inventory is a general term describing goods which are held in the store house and stock yards, the bulk of which is usually intended for the connection with production or operation activities and also finished products awaiting dispatch to customers. Ama (2000) defines inventory as the stock of goods a firm is producing for sale and the components that make up the goods.

Inventory should therefore be managed well in order to facilitate the firm's operations. There are three main types of inventories namely; raw materials, work in progress and finished goods. However, Hopp and Spearman (2000) classify inventory into raw materials, work in progress, finished goods and spare parts. Raw materials are the inventories that have been purchased and would be used in the process of manufacture while work in progress represents partially finished goods. Finished goods on the other hand, represent those items of inventory that are ready to be monetized (Nwankwo&Osho, 2010). Since the level of inventory is large, the financial manager has to put into consideration the ordering cost, carrying cost and stock out cost of the inventory in determining the inventory level. For the purpose of this study, inventory level and inventory control systems were considered. A key decision in manufacturing and retail is how much inventory to keep on hand. Once an inventory level is established, it becomes an important input to the budgeting system.

2.1.2 Types of Inventory

Ndirangukung'u (2016) classifies inventories according to the purpose for which they are held. He stated that inventories may be held for a variety of purposes, but in general these are five types of inventories that an organization can use for serving these purposes and they include:

i. Movement Inventories

This is also called transit inventories. It is due to the fact that transportation time is involved in transferring substantial amount of resources. For example, when goods are on transit, they cannot provide any service to the customers.

ii. Buffer Inventories

This is also known as reserve stock. This is a stock of basic commodity accumulated by a government when supplies are plenty, and prices low and held for use when supplies are short to establish the price. Buffer inventories are held so as to protect against the uncertainties of demand and supply. An organization generally knows the average and could well exceed it. To be able to handle this kind of situation, inventories may be held in excess of the average or expected demand. The lead time may be known but at times unpredictable events could cause the lead time to vary.

iii. Anticipation Inventories

These inventories are held for the purpose of the future demand for a product. This situation occurs when a company embarks on the production of some specialized items before the season for them sets in. For example, the production of umbrellas and rain coat before the rainy season sets in.

iv. De-coupling Inventories

This is to disengage different parts of the production system. Inventories in-between the various machines are held in order to disengage the processing on these machines. Different machines and people normally work at different rates so that when a machine breaks down, the work will not stop. The de-coupling inventories act as a cushioning effect in the face of the varying work rates and machine failures.

v. Cycle Inventories

These inventories are held for the purpose of purchases which are usually made in lots rather than for the exact amounts which may be needed at a point in time. If all purchases are made exactly as at when the item is required, there would be no cycle inventories.

2.1.3 Classification of Inventories

According to Ndirangukung'u (2016), inventories are classified in manufacturing companies as follows:

i. Raw Materials

This is defined as an unprocessed natural product used in manufacturing processes. Horngren (2007) defines raw materials as direct materials in stock awaiting use in the manufacturing process. Finished goods of one industry might be the raw materials of another. Ogbo (2011) defines raw materials as these basic inputs that are converted into finished products through the manufacturing process. This usually consists of the essential item needed to create or make a finished product.

According to Anichebe and Agu (2013), raw materials include all items purchased by an organization for processing. For instance, flour, yeast, eggs etc. are all part of raw materials inventory of a confectionary organization.

ii. Work in Progress

This can be defined as an incomplete ongoing piece of work. It also refers to items that are partially completed but are not yet finished products. It also refers to the stock of all materials in which processing has commenced but it is not yet completed. Such materials are usually found between raw materials and finished goods. Malomo (1999) defines work-in-progress as partly finished goods and material subassemblies between manufacturing stages.

In the words of Anichebe and Agu (2013), "work in progress is also called goods-in-progress inventory. This is an intermediate stage of raw material inventory that is yetto be finished by the plant to enter into another stage of processing. These are materials that have been partlyprocessed but are yet uncompleted."

iii. Finished Goods

These are the products that are completed and that are ready to be purchased by consumers. Ogbo (2011) defines finished goods as those products that are completed and are ready for sale. Stock of raw materials and work-in-progress facilitates production while stock of finished goods is required for the smooth marketing operations.

Anichebe and Agu (2013) opine that finished goods represent the stock of finished goods. These could be stock of goods awaiting shipment or in the warehouse, the level of finished goods stock is a matter of co-ordination between the production and sales departments of the organization.

2.1.4 Reasons for Inventory

There are many reasons why organizations maintain inventory of goods. The fundamental reasons for doing so is that it is either physically impossible or economically unsound to have goods manufactured whenever they are demanded for, without inventory of goods, customers would have to wait until the goods they ordered for are manufactured. There are some other reasons for keeping inventory, they are; the fluctuating nature of price of raw materials may make an organization stock up inventory of raw materials when price is low, it is good and profitable for an organization to buy in large quantity and keep it in inventory so it can last through high price seasons.

Mohammed (2011) identifies three motives/ reasons for holding inventories:

1. Transaction motive: This is to meet demand for the inventory item, where the size of demand is known with certainty or replenishment of inventories is immediate when stock-out occurs
2. Precautionary motive: The demand for the inventory item or the re-supply lead time is uncertain because it varies from time to time. For goodwill sustenance, safety or buffer stocks are held to forestall a situation whereby the company will run out of supply.
3. Speculative motive: This is where a decision may be taken to increase current inventories in anticipation of a price rise, so as to make a speculative profit.

According to Ogbodo (2017), the reasons for inventory are as follows:

- i. To give customers assurance of availability
- ii. To handle production variations.
- iii. To provide customer service in the face of sales fluctuation and other problems.
- iv. To await shipment to fill unexpected orders.
- v. To allow for batch production.

- vi. To provide raw materials storage.
- vii. To keep storage equipment operational
- viii. To protect against strike and work stoppages
- ix. To be ready when unforeseen circumstances occur.

Ogbo (2011) opines that a company should maintain adequate stock of material for an interrupted production for customer's supply. According to him, the following are reasons for inventory:

- i. To take advantage of seasonal fluctuations in price and price will be minimized by having inventories of raw materials.
- ii. To take advantage of price discounts when orders are placed in large quantities.
- iii. To allow firms to meet orders placed in spite of temporary unexpected fluctuations in the rate of output.

In his own words, Banjoko (2004) stresses that manufacturing organizations carry inventories for a variety of reasons. Inventories perform significant functions in the total production system and since "it is physically impossible and economically impracticable for each stock of item to arrive exactly where and when it is needed", there is need to keep some amount of inventory at any point in time. Hence, he outlined seven reasons for holding inventories, which include:

1. To enhance uninterrupted flow of production
2. To meet variations in product demand.
3. To allow flexibility in production scheduling
4. To decouple successive stages of operations
5. To level production activities
6. To provide a means of hedging against future prices and delivery uncertainties
7. To provide a means of obtaining economic lot size and gaining quantity discounts.

On their own part, Ugwu and Nwakobi (2020) enumerate five reasons for holding inventories.

They are:

1. To maintain independence of operations

2. To meet variations in product demand
3. To allow flexibility in production scheduling
4. To provide a safeguard for variation in raw material delivery time
5. To take advantage of economic purchase order size.

From the foregoing, one observes that the authors are saying virtually the same thing, despite the fact that Banjoko (2004) considers seven reasons against five proffered by Ugwu and Nwakobi (2020). We therefore subscribe to their views for holding inventories, and conclude that the reasons for holding inventories are to minimize cost and consequently, maximize profit in an organization.

Going further, Ogbo and Ukpere (2014) affirm that a firm would hold more inventory than is currently necessary to ensure the firms operations. Reasons for maintaining inventories:

1. Demand

A retailer stays in business when he has the product the customer wants on hand when the customer wants them. If not, the retailer will have to back order the product. If the customer can get the goods from some other source, he or she may choose to do so rather than wait than wait in order to allow the original customer to meet demand later (through back-order). Hence, in some instances a sale is lost forever if goods are not in stock.

2. Running Operations

In order to manufacture a product a manufacturer must have certain purchased items (raw materials component or subassemblies). Completing the production of finished goods can be prevented when a manufacturer is running out of only one item. Inventory between successive dependant operations also serves to decouple the dependency of the operations. A work-centre often depends upon the previous operation to provide it with parts to work on. If work stops at a work-centre, all subsequent centre's will shut down for lack of work. Each machine can maintain its operation for a limited time, hopefully until operations resume at the original centre if a supply of work-in-progress inventory is kept between each work-centre (kuku, 2004).

3. Lead Time

Lead time is the time that elapses between when order is placed (either a production order issued to the factory floor or a purchase order) and actual time goods ordered are received. If an external firm or an internal department or plant (supplier) cannot supply the required goods on demand,

then the client firm must keep an inventory of needed goods. The larger the quantity of goods the firm must carry in inventory depends on the longer the lead time.

4. *Hedge*

Inventory can also be used as a hedge against price increases and inflation. Before a price increase goes into effect, salesmen routinely call purchasing agents. This gives the buyer a chance to purchase material in excess of current need at a price that is lower than it would be if the buyer waited until after the price increase occurs (Kuku, 2004).

5. *Quantity Discount*

Purchase of large quantities of goods often times attracts a price discount to the firms. This also frequently results in inventory in excess of what is currently needed to meet demand. However, the decision to buy in large quantities is justifiable if the discount is sufficient to offset the extra holding cost incurred as a result of the excess inventory.

6. *Flexibility of Inventory Service*

Flexibility of inventory service provides an organization with the ability to keep inventory services to an agreed service level in a predictable fashion with acceptable risk and cost. This capability can be tested and valued by customers. Managing inventory to ensure high customer service level is critical in the supply chain. However, to maintain asset is very costly. Reflecting the level of availability of inventory to the customers is in three categories namely, raw material inventory, work-in-progress inventory and finished goods inventory (Lieberman, Helper & Demester, 2002).

Excess in each side is wasteful, although there may be reasons for it, such as prevention of stock-outs, production runs, seasonality or improvement of customer's satisfaction levels (Lieberman et al, 2002). However, it is critical keeping the right amount of the three types of inventories to meet customer needs. In addition, inventory service flexibility can also be as pursuing high inventory utilization while reducing waste, because an important indication of management efficiency and effectiveness is inventory utilization. In the business market, inventory management is the structuring of internal and external organizational groups and how resources are leveraged based on environmental demands. Furthermore, the relations between firms' performance, capability and competence have seldom been studied simultaneously; the resource-based view of the firm contends that firm performance is a function of resource mix. When resources and capability are heterogeneous, special, and difficult to replicate; when organizational offerings create more value or capability for customers, then competitive advantage is achieved. Thus, differences in

performance across firms result from variances in service capability, which is further, decided by the resource or competence portfolios.

7. Flexibility

The survival of an organization in the long run is critically the ability of the organization to adapt to change. In the short run, the competitive position of the firm is affected by the management flexibility and may impact on its overall profitability. Flexibility in supply chain management may well represent a potential source to improve a company's efficiency and may be a significant measurement of supply chain performance. Especially through inter-firm inventory management flexibilities, organizations can reduce reliance on forecasting when and where inventory will need to be located to meet customer demand and instead allow suppliers to respond to demand on a just-in-time basis. Meanwhile, intra-firm inventory management flexibilities can be directly linked to overall firm performance for its control and coordination inventory allocation and delivery to multiple destinations at the warehouse level. The organizations within the supply chain should see improvements in performance as a result of both intra- and inter-inventory managerial flexibility.

Stock and Lambert (2001) propose that one of the common delivery service variables is inventory service level. As a kind of service flexibility, the competence of a firm inventory management directly reflects inventory service level. On the one hand, intra-firm inventory management flexibilities enable a firm to have good control on stock and keep a high level of availability to customer demands, thus, by leveraging the service-cost trade off relationship, the organization can keep a reasonable level of raw material inventory, work-in-process inventory, and finished goods inventory and reduce inventory waste simultaneously. On the other hand, inter-firm inventory management flexibilities allow a firm to manage stock between supply chain participants. These flexibilities seek a reasonable inventory service chain level based on a high level of coordination, participation, and close communication. Through these joint efforts, organizations along the supply chain can prevent running out of stock or overstocking.

Zhang, Vonderembse and Lom (2005) have argued that causal relationship exists between inventory management flexibility and performance. They suggested that good inventory management flexibility allows firms to leverage their managerial experience and intra- and inter-inventory management competences, and finally generate high levels of inventory service flexibility. That is because flexible competency, which is an internal management focus,

provides the processes and infrastructure that enable a firm to achieve the desired levels of capability.

The outcome of an efficient inventory service is “developing service capabilities as these investments will provide firms with access to different market segments, hence, yield economic returns. So, the higher the level of inventory flexibility, the higher the performance of firms. Therefore, the simultaneous development of inventory management flexibility and service flexibility will reinforce a firm’s ability to improve performance. This implies that inventory management flexibility is expected to positively influence performance via its positive impact on service flexibility (inventory service flexibility as a mediating variable).

2.1.5 Inventory Management

According to Masembe (2011), effective management of inventory is a major concern for firms in all industries. The issue of inventory management permeates decision-making in many firms and this has been extensively studied in the academic and corporate spheres (Rosa, Mayerle, & Gonçalves, 2010). Wanke, (2014) stated that the key questions – usually influenced by a variety of circumstances – which inventory management seeks to answer are: when to order, how much to order and how much stock to keep as safety stock (Silva, 2009). As regards this, Wanke (2014) observes that inventory management involves a set of decisions that aim at matching existing demand with the supply of products and materials over space and time in order to achieve specified cost and service level objectives, observing product, operation, and demand characteristics. According to (Lyson, 2003), inventory management is referred to as the technique used to ensure those stocks of raw materials or other supplies, work in progress and finished goods kept at levels which provide maximum service level at minimum costs. According to Burt (2003), inventory management is the efficient administration of how orders for goods, services, supplies and works are brought into the organization.

Also, Ogbodo (2017) defines inventory management as a systematic control regulation of purchase, storage and usage of materials in such a way to maintain an even flow of production, avoiding excessive investment in inventory. Due to effective inventory management, organizations produce in time and meet customer's orders and expectations of product availability and hence leading to profitability in organizations. The major objective of inventory management is seen in the need to control and manage the large asset called inventory /stock.

This is seen where by organizations sustain operations that are always available at alltimes and at the same time holding the ordering and carrying costs at the same time holding the ordering and carrying costs at the same time holding the ordering and carrying costs to the highest possible levels. According to Gillingham and Lysons (2000), the main objectives of inventory management is to provide both the internal and external client/ customers with the appropriate service levels in terms of order rate fill, quality and quantity, and to ascertain the present and the future requirements for all types of inventory, and to both bottlenecks and overstocking in productions. Not forgetting keeping costs to a minimum by variety reduction, economic lot sizes and analysis of costs incurred in obtaining and carrying out inventories.

However, it should be noted that, a lot of problems or challenges are constantly faced by organizations in their effort to achieve the objectives of inventory management. Normally, challenges originate from both within and outside the organizations. These are normally in terms of inventory costs like for instance acquisition costs, holding costs, cost of stockouts and of course not forgetting the natural calamities/ diseases like earthquakes, floods among others hence leading to high operational costs. Most firms/ organizations employ substandard inventory managers and techniques that do not match their activities, at times the human resource itself do not have the experience in handling or managing inventory and as a consequence operations decline and profits dwindle, losses are seen through unprofessional mistakes made and hence leading to high operational costs. It would be a great deal to save money by trying to hire inexperienced personnel because of the availability of cheap inexperienced labour but in the long-run organization do not make profits and hence more challenges are instead brought about.

Nwandu (2006) defines inventory management as a form of administration control that is particularly essential in all manufacturing, wholesale and retail organizations. The essence of inventory isto have the right goods quality and quantity, at the right place and time. The essence of inventory management is for a contemporary organization. This process is needed as a part of supply chain network to protect production system against anykind of disturbance. Orga (2006) defines inventory control as a process of ensuring that the right quality of the relevant stock is available at the right time and in the right place. Nweze (2004) on his own part defines inventory control as the means of ensuring that actual flow of inventory in an organization conforms to plan. Ugwu (2012) states that inventory control can be defined as an inventory policy designed to obtain right quantity and right quality of raw materials at the right places. It can also be defined as the system used in the firm to control a firm's investment in stock. It includes the recording

and monitoring of stock levels, forecasting future demand and deciding when and how many to order. Nweze (2004) defines inventory control as the means of ensuring that actual flow of inventory in an organization conform to plan. Ezeani (2008) defines inventory control as the techniques used by store managers to ensure that materials are made available when they are needed in the quantity, quality and price that they are needed without the risk of stock out and over stocking. Inventory control is the supervision of the storage, supply and accessibility of items to ensure an adequate supply without excessive oversupply (Miller, 2010). Inventory control means availability of materials whenever and wherever required by stocking adequate number and kind of stocks. The sum total of those related activities essential for the procurement, storage, sales, disposal or use of material can be referred to as inventory management. Inventory managers have to stock-up when required and utilize available storage space resourcefully, so that available storage space is not exceeded. Maintaining accountability of inventory assets is their responsibility. They have to meet the set budget and decide upon what to order, how to order and when to order so that stock is available on time and at the optimum cost (Nnubia et al, 2017). Inventory management involves planning organizing and controlling the flow of materials from their initial purchase unit through internal operations to the service point through distribution (Smaros, Lehtonen, Appelquist & Holmstrom, 2003). Intelligent inventory management strategies can not only help boost profit but they can mean the difference between a business thriving or barely surviving. Holding inventories at the lowest possible cost and giving the objectives to ensure uninterrupted supplies for on-going operations is the aim of inventory management. When making decisions on inventory, management has to find a compromise between the different cost component, such as the cost of supplying inventory, inventory holding cost and cost resulting from sufficient inventories (Zipkin, 2010). According to Miller (2010), inventory control is the activity which organizes the availability of item to the customers. It coordinates the purchasing, manufacturing and distribution functions to meet the marketing needs. This role includes the supply of current sales items, new product, consumables, spare parts, obsolescent items and all other supplies. Inventory enables a company to support the customer's services, logistics or manufacturing activities in situation where purchasing or manufacturing of the items is not able to satisfy the demand. Inventory plays an important role in the growth and survival of an organization in the sense that failure to an effective and efficient management of inventory, will mean that the organization will lose customers and sales will decline. In order to attain its organizational objectives, a

business is to meet customer's needs. Customer desire has always been a vital issue in a company not only to maintain sales but also to increase it (Potilen & Goldsby, 2003). Kotler (2002) posits that inventory management refers to all the activities involved in developing and managing the inventory levels of raw materials, semi-finished materials (work-in-progress) and finished good so that adequate supplies are available and the costs of over or under stocks are low. Inventory management is primarily about specifying the size and placement of stocked goods. Inventory management is required at different locations within a facility or within multiple locations of a supply network to protect the regular and planned course of production against the random disturbance of running out of materials or goods. The scope of inventory management also concerns the fine lines between replenishment lead time, carrying costs of inventory, asset management, inventory forecasting, inventory valuation, inventory visibility, future inventory price forecasting, physical inventory, available physical space for inventory, quality management, replenishment, returns and defective goods and demand forecasting. Balancing these competing requirements leads to optimal inventory levels, which is an on-going process as the business needs shift and react to the wider environment (Ghosh & Kumar, 2003). Rosenblatt (2007) opines that the cost of maintaining inventory is included in the final price paid by the customer. Good in inventory represent a cost to their owner; the manufacturer has the expense of materials and labour. The wholesaler also has funds tied up. Therefore, the basic goal of the manufacturers is to maintain a level of inventory that will provide optimum stock at lowest cost. Morris (1995) stresses that inventory management in its broadest perspective is to keep the most economical amount of one kind of asset in order to facilitate an increase in the total value of all assets of the organization human and material resources. Ogbo (2011) posits that the major objective of inventory management and control is to inform managers how much of a good to re-order, when to reorder the good, how frequently orders should be placed and what the appropriate safety stock is, for minimizing stock-outs. Thus, the overall goal on inventory is to have what is needed, and to minimize the number of times one is out of stock. While supporting the definition of Ghosh and Kumar (2003), Brag (2005) stresses that inventory management has an impact on all business functions, particularly operations, marketing, accounting, and finance. He established that there are three motives for holding inventories, which are transaction, precautionary and speculative motives. The transaction motive occurs when there is a need to hold stock to meet production and sales requirements. A firm might also decide to hold additional amount of stock to cover the possibility that it may have under estimated its future

production and sales requirements. This represents a precautionary motive, which applies only when future demand is uncertain. The speculative motive for holding inventory might entice a firm to purchase a larger quantity of materials than normal in anticipation of making abnormal profits. Advance purchase of raw materials in inflationary times is one form of speculative behaviour. Installation of a proper inventory control system in any organization in developing countries like Nigeria is of paramount necessity. Inventory management is defined as a science based art of ensuring that just enough inventory stock is held by an organization to meet demand (Coleman, 2000; Jay & Barry, 2006). Inventory is the availability of any stock or resources used in an organization. An inventory system is the set of policies that controls and monitor inventory level and determine what level should be maintained, how large orders should be made and when stock should be replenished.

From the foregoing therefore, one infers that inventory management is the act of ensuring that balanced items of stock are maintained at the right quantity, quality, place and time in an organization, to ensure organizational business continuum.

2.1.6 Costs Associated with Inventory

In order to determine an optimal inventory level or policy, the method often used is the cost function. The classical inventory analysis identifies four major cost components and it all depends on the structure of an inventory situation.

The four major components of the cost are:

a. **Purchase Cost**

This is described as the purchase price for the items that are bought from external sources and the production cost if the items are produced within the organization. It also refers to the nominal cost of inventory. This may be constant per unit or it may vary as quantity purchased increases or decreases. The quantity of discounts are considered because they are available for bulk purchases and savings in production cost which would be possible with longer batch run which affect the decision.

b. **Ordering Cost**

This can be defined as the cost incurred in sending inquiries, writing purchased order. It is also when goods are purchased from outside. According to Okeke (1997), ordering cost refers to the cost associated with replenishing the inventory for purchased goods. According to Adeniji (2008), ordering cost is a cost incurred in placing the order up to the point of receiving the goods into the warehouse. Inventory ordering cost includes:

- i. Cost of processing the papers.
- ii. Cost of communications –telephone, e-mail, fax.
- iii. Carriage in costs.
- iv. Transport and travel.

c. Carrying or Holding Cost

This refers to cost which consist of all cost relating to carrying inventories. According to Ugwu and Nwakobi (2020), carrying cost refers to cost associated with maintaining the items in inventory. According to Adeniji (2008), carrying cost is the cost incurred whenever a material is stored. They are incurred because the firm has decided to maintain inventories. Carrying costs are costs that are associated with storing an item in inventory and they are proportional to the amount of the inventory and the time in which the inventory is held. Carrying cost includes:

- i. Cost of funds tied down
- ii. Insurance premium costs.
- iii. Inventory handling costs.
- iv. Heat light power and depreciation costs associated with the inventory storage facilities.
- v. Cost of spoilage, obsolescence (machines). Deterioration (for perishable goods) and evaporation (for volatile products).
- vi. General insurance and security costs.

Carrying cost is considered to be variable cost because the larger the stock, the more the cost associated with maintaining the inventory of the item. The cost of carrying an inventory of item is sometimes expressed as a percentage of the value of the item and it is usually expressed in terms of the amount of money per unit time period.

d. Stock-Out Cost

This cost is incurred when customer's demands cannot be fulfilled because the inventory is completely depleted. It refers to the disrupted production when materials are unavailable. According to Ogbo (2011), stock is as a result of an item that is needed but its inventory level is completely depleted in a manufacturing system. a stock-out might cause production delays idle labour, equipment and sometimes emergency supply order in the warehouse or retail production and this may lead to loss of sales. According to Adeniji (2008), stock-out cost is the cost that involves a situation where customers' demands cannot be met because the stock is exhausted. They are the opportunity cost of not having a stock item when there is effective demand. Stock-out cost simply implies shortage of inventories of items. When an organization runs out of supplies for its needs, it implies that its inventory level is too low and this situation leads to loss of profit through cost sales, loss of future sales because it drives away customers, wages being paid for idle time, loss of customers goodwill and customers canceling their orders because of delay in the delivery.

2.1.7 Model Techniques in Inventory Management

2.1.7.1 Concept of ABC model techniques in inventory management

A firm needs control system/techniques to effectively management of inventory (Pandey, 2008). The authors stated further that several control systems/techniques are at vogue from simple to very complicated systems/techniques. Small firms may opt to adopt simple two bin systems/techniques and the very large firms may choose to adopt very complicated systems such as ABC inventory control systems/techniques. Grablowsky (2005) finds that only large firms established sound inventory control systems/techniques for determining inventory re-order and stock levels by application of quantitative techniques such as EOQ and Linear Programming to provide additional information for decision making.

Inventory control techniques are employed by organization within the framework of one of the basic inventory models. The model techniques to be applied depend on the type of firms and the inventory involved. However, every model adopted should cover all items of inventory and at all stages, i.e. from the stage of receipt from suppliers to the stage of finished goods and disposals. Vollmann said that ABC model analysis is a business term used to define an inventory categorization technique often used in materials management. It is also known as Selective Inventory Control. ABC analysis provides a mechanism for identifying items which will have a significant impact on overall inventory cost; whilst also providing a mechanism for identifying different categories of stock that will require different management and controls. B. Gerald, N. King, and D. Natchek said that when carrying out an ABC analysis, inventory items are valued (item cost multiplied by quantity issued/consumed in period) with the results then ranked. The results are then grouped typically into three bands. These bands are called ABC codes. ABC CODES "A class" inventory will typically contain items that account for 80% of total value, or 20% of total items. "B class" inventory will have around 15% of total value, or 30% of total items. "C class" inventory will account for the remaining 5%, or 50% of total items. K. Lysons and B. Farrington observed that ABC Analysis is similar to the Pareto principle in that the "A class" group will typically account for a large proportion of the overall value but a small percentage of the overall volume of inventory (Ugwu & Nwakobi, 2020).

2.1.7.2 Concept of Low, Medium and High model Techniques

The Low, medium and high LMH model classification follows the same procedure as is adopted in ABC classification. The only difference is that in LMH, the classification unit value is the criterion and not the annual consumption value. The items of inventory should be listed in the descending order of unit value and it is up to the management to fix limits for three categories. The LMH analysis is useful for keeping control over consumption at departmental levels, for deciding the frequency of physical verification, and for controlling purchases (Gomez 2008; Teunter & Duncan 2009). However, the procurement department is more concerned with prices of materials for decisions purposes such as, who will procure what based on the hierarchy and price of material. Some of the other objective can be as under Helps in taking the decision such as whether to procure in exact requirement or opt for EOQ or purchase only when needed When it is desired to evolve purchasing policies then also LMH analysis is carried out i.e. whether to purchase in exact quantities as required or to purchase in EOQ or purchase only when absolutely

necessary When the objective is to keep control over consumption at the department level then authorization to draw materials from the stores will be given to senior staff for H item, next lower level in seniority for M class item and junior level staff for L class items. Cycle counting can also be planned based on HML analysis. H class items shall be counted very frequently, M class shall be counted at lesser frequency and L class shall be counted at least frequency as compared to H & M class.

Wanke (2014) describing inventory management using low consumption According to Tavares and Almeida (1983) said that very low consumption parts are those whose average consumption is less than one unit per year. According to these authors, the stock control of these items should not be performed using the usual models because, due to their particular consumption characteristic, there are not enough previous occurrences to make a precise estimate of probability distribution (Syntetos & Boylan 2001; Ghobbar & Friend 2003; Eaves and Kingsman 2004; Willemain, Smart, & Schwarz 2004; Regattieri et al. 2005; Hua et al. 2007; Gutierrez, Solis, & Mukhopadhyay 2008; Gomez 2008; Teunter and Duncan 2009). In addition, following Masembe (2011), it is the analysis of total shortage, excess and order placement costs, given a certain service level, that makes it possible to determine whether a part should, or should not, be kept in stock, and a replenishment request made solely against an order.

Medium consumption (Wanke, 2014) described medium cost items as those with a historical consumption of between 1 and 300~500 units per year, which leads to an average daily demand close to one, as suggested by Wanke (2005). But, High consumption items are frequently considered to be those with a historical consumption of over 300~500 units per year, roughly one unit/day (Wanke, 2005).

2.1.7.3 Economic Order Quantity model techniques in inventory management

Economic Order Quantity (EOQ) is an inventory management system that demonstrates the quantity of an item to reduce the total cost of both handling of inventory (handling Cost) and order processing (Ordering Cost). EOQ as a model has been introduced by Ford W. Harris 1913; and R.H. Wilson and K. Andler have been given credit for their in-depth analysis and application of the EOQ model. The economic order quantity (EOQ) formula plays an important role in inventory management. EOQ model has been practice in the fields of operations management and operations research. As noted above the Father of EOQ model is Harris (1913) describes a very simple deterministic inventory planning model with a tradeoff between fixed ordering cost

and inventory carrying cost (Drake & Marley, 2014). EOQ lays the foundation for all kinds of extensions and real world management applications, (Huang, Kulkarni & Swaminathan, 2003; Khan, Jaber, Guiffrida, & Zolfaghari, 2011; Pentico, & Drake, 2011). The deterministic and the stochastic EOQ models were developed as in (Pentico, & Drake, 2011; Zhang, Kaku & Xiao, 2011)

In practice, the size of required Q is determined by the Economic Order Quantity formula (Harris 1913) and the reorder point is defined so as to assure a specific service level measure (Rego et al. 2011). In inventory management, the EOQ is the number of units that a company should add to inventory with each order to minimize the total costs of inventory—such as holding costs, and shortage costs. EOQ is applied as part of a continuous review inventory system in which the level of inventory monitored at all times and a fixed quantity is ordered each time the inventory level reaches a specific reorder point. The EOQ provides a model for calculating the appropriate reorder point and the optimal reorder quantity to ensure the instantaneous replenishment of inventory with no shortages. EOQ model assumes that demand is constant, and that inventory is depleted at a fixed rate until it reaches zero. Thus, the cost of inventory under the EOQ model involves a tradeoff between inventory holding costs (the cost of shortage, as well the cost of tying up capital in inventory rather than investing or using it other purposes) and order costs (any fees associated with placing orders, such as delivery charges).

In inventory management using EOQ, it is necessary to know the format of the distribution of lead-time demand to determine the safety stock embedded within the reorder point. According to Porras and Decker (2008), this calculation requires specifying the distribution of lead-time demand so that the safety factor can be determined. Traditionally, lead-time demand is modeled using a Normal distribution (Ugwu & Nwakobi, 2020). Due to the properties of this distribution, the safety factor K for a specific service level is the same as of the standard normal distribution curve, Z, which can be found in several statistics and logistics literatures (Levine et al. 2005; Ballou, 2006). Various studies, however, criticize this (Wanke, 2014) methods of calculation of EOQ. Furthermore, according to Masembe (2011), items that present a normal distribution of lead-time demand are found in only a few cases. As an attempt to balance the advantages and disadvantages of choosing a specific premise, Silver et al. (1998) has propose a general rule for approximating lead-time demand using the probability distribution of the coefficient of variation (CV).

2.1.8 Firm Performance

Omar, Taouab and Zineb Issor (2019) said that successful firms represent a key ingredient for developing nations. Many economists consider them similar to an engine in determining their economic, social, and political development. To survive in a competitive business environment, every firm should operate in conditions of performance. At all times, firm performance has become a relevant concept in strategic management research and is frequently used as a dependent variable. Although it is a very common notion in the academic literature, there is hardly a consensus about its definition and measurement. However, due to the absence of any operational definition of firm performance upon which the majority of scholars' consent, there would naturally be diverse interpretations suggested by various people according to their personal perceptions. Siminica (2008) has the opinions that a firm is performing when it is at the same time efficient and effective. Therefore, the performance is a function of two variables, efficiency and efficacy. Colase (2009) considers the word performance as a bag-word because it covers various and different notions such as growth, profitability, return, productivity, efficiency, and competitiveness. Bartoli and Blatrix (2015) believed that the definition of performance should be achieved through items such as piloting, evaluation, efficiency, effectiveness, and quality. Ittner and Larcker (2003) point out the mistakes that firms make when trying to measure the non-financial performance as: 1) Lack of Alignment between Measurements with Strategy: A key challenge for firms is to find out which non-financial measures they need to implement. 2) Validate the Measurements: Companies do not validate the model, which leads to the measuring of many things, and most of them are irrelevant. 3) Inability to set up the right goals and measures. 4) Wrong Measurements: Many companies use metrics that have no statistical validity. Tangen (2004) says that many companies still rely on the traditional quantitative financial performance measurement systems. Man (2006) determined that the measures of performance are divided into four categories: Financial, non-financial, tangible, and intangible. According to Gimbert, Bisbe and Mendoza (2010) said that performance measurement system is a concise and defined set of measures (financial or non-financial) that supports the decision-making process of an organization by collecting, processing, and analyzing quantified data of performance information. Performance is viewed as financial and organizational and can be measured based on variables that involve productivity, returns, growth or even customer satisfaction (Nnubia, et al. 2017).

In firm performance profit is not the same thing as profitability. Profit is the excess of revenue over revenue expenditure in a given trading period say in calendar year, profitability means the measure of the ability of the firm to earn profit (Huynh, 2011). According to Bodies, Kane and Marcus (2004), there are 5 measures of profit the use of which depends on the purpose for which such measure is computed viz. gross profit, operating profit, profit before interest and tax (PBIT), profit before tax (PBT) and profit after tax (PAT). Idiko and Tamas (2009) said that profitability is expressed as a ratio measuring the rate of some profit which is bench marked against some base measurement or variable of reference such as total assets, equity, non-financial assets, gross profit, investment, net capital employed and other appropriate variables. Therefore, profitability is given as $(\text{profit}/\text{Base measurement}) \times 100\%$. Selvam, Gayathri, Vinayamoorthi and Kasilingam (2016) developed a performance model with nine determinants/dimensions: profitability, growth, market value, customer satisfaction, employee satisfaction, environmental audit, corporate governance and social performance and found that these nine performance dimensions or determinants cannot be used interchangeably since they represent different aspects of firm performance and different stakeholders of firms have different demands that need to be managed independently.

Our study applied return on asset (ROA) to evaluate firm's performance ability in profit making according to total investments in assets. ROA is a financial ratio that shows the percentage of profit that a firm earns in relation to its overall resources. It is generally defined as net income (or Pretax profit)/total asset. According to Ogbodo (2017), ROA is calculated as the net profit after tax divided by total assets and indicates the returns generated from the assets financed by the firm. Our study applies performance as the dependent variable with (ROA) as proxy to measure the impact of inventory management models on firm profitability (performance) but not operating profit only.

2.1.9 The relationship between inventory management and profitability

Every firm/ organization goes into business to make profits. Therefore, every firm's main objective is profit maximization. Profit maximization is the (short run) process by which a firm determine the price output level that returns the greatest profit. If organizations fail to achieve profits organization, they fail to succeed or crumble; that is why organizations have been forced to search for better ways of maximizing profits of which inventory management is one of them

among others. Inventory management enables an organization to meet customers' expectations of product availability while maximizing profits. Much as this is true, inventory management has its associated costs like acquisition costs among others. The costs have an impact on the profitability performance of any organization. However, if these costs are well managed and controlled then there are high chances of maximizing profits due to the fact that cost management is the major determinant of profit maximization. It should be noted that for instance stocks running out, associated with interruption in the production process, failure or delays in fulfilling customer needs which also further lead to loss of customers, incompetent personnel, among others and hence these reduce the volume of sales which definitely leads to low profit margins. Inventory management with the use or help of the tools and control inventory systems/ techniques, profit maximization will be achieved. Therefore, inventory management costs are supposed to be kept low in order to reap the benefits of holding inventory. This is normally achieved by maintaining an optimal inventory level. For example, the ABC analysis, barcoding, vendor managed inventory, economic order quantity among many others with these in place, profits would be achieved due to the fact that they control costs incurred in the organization. All in all, inventory management is a very important aspect in the organization's performance because, if it is not considered, then the profits of the organization would not be realized.

There is no doubt that inventory management has a very strong relationship with the profitability performance of any organization. However, this depends largely on the fact that the way management of an organization handles its inventory determines the future or the profitability performance.

2.1.9.1 Profitability

Profit is one of the major reasons for venturing into business. Profitability therefore, means a state of producing a profit or the degree to which a business is profitable. Profitability is the primary goal of all business ventures (Amah, 2000). Without profitability the business will not survive in the long run. Conversely, a business that is highly profitable has the ability to reward its owners with a large return on their investment. According to Thompson (2005), achieving acceptable financial result is crucial. Achieving acceptable financial performance is a must, otherwise the organization's financial standing can alarm creditors and shareholders, impair its ability to fund needed initiatives and perhaps even put its very survival at risk. This makes measuring current and past profitability and projecting future profitability a very important issue.

Profitability is therefore identified as criteria for organizational performance. It may be expressed in terms of net income and earnings per share or return on investment (Daft, 1998). A variety of profitability ratios can be used to assess the financial viability of the business but this study adopted return on investment as a measure of profitability.

2.2 Theoretical Framework

2.2.1 Economic Order Quantity Theory

This study is anchored on Economic Order Quantity (EOQ) Model of Inventory Management which opines that inventory control model uses minimization of costs, between stock holding and stock ordering. This model requires the determination of (EOQ) as the ordering quantity at which stock holding costs are equal to stock ordering costs (Saleemi, 1993). The view of the model is that the optimal inventory size is the point at which stock ordering costs are equal to the stock holding costs. However, the optimal inventory size is also known as (EOQ). This model helps an organization to put in place an effective stock management system to ensure reliable stock needs for production or sales forecasts to be used in ordering purposes (Atrill, 2006). EOQ model puts several assumptions into consideration: the usage of stored product is assumed to be steady; ordering costs are assumed to be constant, i.e. the same amount has to be paid for any order size; and the carrying costs of inventory which are composed of cost of storage, handling and insurance are assumed to be constant per unit of inventory, per unit of time. The EOQ model therefore merely takes variable costs into consideration, although it can easily be extended so as to include fixed costs (Ross et al., 2008). Prior researchers like (Nyabwanga et al., 2012) have applied this model. Other EOQ model assumptions are that only one product is produced, annual demand requirements are known, demand is spread evenly throughout the year so that demand rate is reasonably constant, lead time does not vary, each order is received in a single delivery and there are no quantity discounts.

2.2.2 Agency Theory

This theory is believed to have been propounded by Berle and Means in 1932. The seminal papers of Alchian and Demstz (1972) and Jensen and Meckling (1976) describe the firm as a nexus of contracts among individual factors of production resulting in the emergence of the agency theory. The firm is not an individual but a legal fiction where conflicting objectives of

individuals are brought into equilibrium within a framework of contractual relationships. These contractual relationships are not only with employees, but with suppliers, customers and creditors (Jensen & Meckling, 1976). The intention of these contracts is that all the parties acting in their self-interest are motivated to maximize the value of the organization, reducing the agency costs and adopting accounting methods that most efficiently reflect their own performance (Deegan, 2004).

The agency role of the directors refers to the governance function of the board of directors in serving the shareholders by ratifying the decisions made by the managers and monitoring the implementation of those decisions, because according to the perspective of agency theory, the primary responsibility of the board of directors is towards the shareholders to ensure maximization of shareholder value. The focus of agency theory of the principal and agent relationship (for example shareholders and corporate managers) has created uncertainty due to various information asymmetries (Deegan, 2004). The separation of ownership from management can lead to managers of firms taking action that may not maximize shareholder wealth, due to their firm specific knowledge and expertise, which would benefit them and not the owners; hence a monitoring mechanism is designed to protect the shareholder interest (Jensen & Meckling, 1976). This emphasizes the role of accounting in reducing the agency cost in an organization, effectively through written contracts tied to the accounting systems as a crucial component of corporate governance structures, because if a manager is rewarded for their performance such as accounting profits, they would attempt to increase profits which will lead to an increase in bonus or remuneration through the selection of a particular accounting method that will increase profits.

The agency model assumes that individuals have access to complete information and investors possess significant knowledge of whether or not governance activities conform to their preferences and the board has knowledge of investors' preferences (Smallman, 2004). Therefore, according to the view of the agency theorists, an efficient market is considered a solution to mitigate the agency problem, which includes an efficient market for corporate control, management labour and corporate information (Clarke, 2004).

2.3 Empirical Framework

Ogbo and Ukpere (2014) extensively studied the impact of inventory management in organizational performance, with respect to Seven-up Bottling Company, Nile Mile, Enugu. Using descriptive statistics and non-parametric test(chi-square), the result of the analysis showed that flexibility in inventory control management is an important approach to achieving organizational performance. As such, organizations benefit from inventory control management by way of easy storage and retrieval of material, improved sales effectiveness and reduced operational cost. Therefore, they recommended that organizations should adopt the inventory keeping method that best suit their operations.

The study carried out by Ugwu (2012) examined the essence of effective inventories control and management to manufacturing companies with particular emphasis on Ama Greenfield Breweries Plc. In carrying out this study, she made use of questionnaires and oral interview to collect data from respondents, analyzing the data generated with Chi-square. Based on the analysis, it was discovered that inventory management plays a vital role in the manufacturing company. It was therefore recommended, among others, that sufficient inventory should be held in order to avoid stock-out so that when the ordering level is high; there will be enough stock to be delivered.

Anichebe and Agu (2013) similarly carried out a research on the effect of inventory management on organizational effectiveness in selected organizations in Enugu, using descriptive research method, (i.e survey and case study). Data were generated using questionnaire, oral interviews, and the generated data were analyzed using Pearson product moment correlation coefficient and linear regression. The findings indicated that there is significant relationship between good inventory management and organizational effectiveness. Against this background, the study recommended that organizations should diversify their inventory system to suit specific needs of production, and that management should closely monitor and manipulate their inventory system to maintain production consistency for organizational profitability and effectiveness.

Chan, Tasmin, Aziati, Rasi, Ismail and Yaw (2017) tried to identify the problem of inventory management faced by the manufacturing small medium enterprise MSME and also to determine the factors that influence the effectiveness of inventory management. They applied 80 employees in Batu Pahat, Johor using questionnaires. They found that the problems of inventory management faced by manufacturing organization were underproduction, overproduction, stock out situation, delays in the delivery of raw materials and discrepancy of records. The factors,

documentation/store records, planning, knowledge of employees/staff skill have shown to significantly influence the effectiveness of inventory management while the funds have shown slightly significant influence on the inventory management in MSME.

Nnubla, Omaliko, Ogechi and Etuka (2017) investigated the effect of inventory control on profitability of manufacturing companies listed on (NSE) from 2011-2015. The study used descriptive and Ordinary Least Square (OLS) multiple regressions to analyze the data collected. They discovered that raw material has positive significant effect on profitability using Return on Asset (ROA) as profitability indices; inventory conversion period has significant effect on profitability; inventory turnover has significant effect on profitability; storage cost has a negative insignificant effect on profitability.

Lwiki, Ojera, Mugenda and Wachira (2013) applied a survey design on all the eight (8) sugar manufacturing firms in Kenya found that there is generally positive correlation between each of inventory management practices. Specific performance indicators were proved to depend on the level of inventory management practices. They established that Return on Equity had a strong correlation with lean inventory system and strategic supplier partnerships.

Eneje, Nweze and Udeh (2012) studied the effects of raw materials inventory management on the profitability of brewery firms in Nigeria from (1989-2008). (OLS) multiple regression model was applied in the analysis. Result is that the local variable raw materials inventory management designed to capture the effect of efficient management of raw material inventory by a company on its profitability is significantly strong and positive and influences the profitability of the brewery firms in Nigeria.

Anichebe an Agu (2013) examined the effect of inventory management on organizational effectiveness in selected organizations in Enugu Nigeria, using (248) respondents, they discovered that there is a significant relationship between good inventory management and organizational effectiveness. Thus inventory management was found to have a significant effect on organizational productivity. There was a high positive correlation between good inventory management and organizational profitability.

Mohamad, Suraidi, Rahman and Suhaimi (2016) study inventory management and company performance in a textile chain store in Malaysia, and found that inventory days was significantly related to return on assets (used proxy for company performance). The study identified that the textile chain store company had unorganized inventory arrangement, large amount of inventory days and lacked accurate stores balances due to unskilled workers.

Abdulraheem, Yahaya, Isiaka and Aliu (2011) studied the impact of inventory management on the performance of small businesses in Nigeria, using multiple regression technique. They found that inventory management had a strong positive, impact on profitability among small businesses in Nigeria.

Falope and Ajilore (2009) sampled 50 Nigerian quoted non-financial firms from (1996-2005). Their study utilized panel data econometrics in a pooled regression where time series and cross sectional observation were combined and estimated and found a significant negative relationship between operating profit and the inventory turnover.

Hassan, Imran, Amjad and Hussain (2014) examined the effect of working capital management on the performance of listed non-financial firms in Pakistan. Ordinary Least Square technique was employed to analyze data collected from non-financial firms listed on the Karachi Stock Exchange from (2007-2010). The result shows that among the independent variables used for working capital management, average age of inventory had a positive insignificant relationship with gross profit margin and return on assets, but had a negative insignificant effect on return on equity.

Further, Sekeroglu and Altan (2014) examined the effect of inventory management on the profitability of firms in the weaving, food, wholesale and retail industries in Turkey from (2003-2012). The analyses used regression and correlation techniques on the data collected and the results indicates positive relationship between inventory management and profitability in the food industry, but no relationship in the weaving, wholesale and retail industries.

Panigrahi (2013) explored inventory conversion period and the profitability of cement companies in India from (2001-2010). Gross operating profit was the dependent variable and for profitability and inventory conversion period applied as the independent variable; while current ratio, size and financial debt ratio were employed as control variables. They found a significant negative linear relationship between inventory management and firm performance of profitability.

Priniotakis and Argyropoulos (2019) discussed some basic concepts and techniques for classifying inventory, controlling inventory levels, avoiding stock outs and increasing customer satisfaction. It also discusses the importance of forecasting demand and uses the Root Mean Square Error (RMSE) as an effective measure of the forecast error, which later becomes a basic driver for inventory management. They state that Service Level (SL) as a performance metric and emphasizes on the importance of Safety Stock (SS) and also the use of the Reorder Point

(ROP) as an efficient indicator for triggering production replenishment and proposes a simple technique for prioritizing production orders.

Senthilnathan (2019) described that in stock management (EOQ) is an important inventory management system that demonstrates the quantity of an item to reduce the total cost of both handling of inventory (Handling Cost) and order processing (Ordering Cost). The author argues that the purpose of determining the EOQ is to minimize the Total Incremental Cost (TIC), beyond the cost of purchasing of a product/material, in consideration of two main total costs: Total Ordering Cost (TOC) and Total Handling Cost (THC) and finally highlights two basic methods of determining the EOQ: Trial and error method and Mathematical approach and emphasizes the mathematical model as highly useful to enhance the inventory management of a product.

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CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter is concerned with the method and procedures that were employed in carrying out the research. They include research design, study population, selection of sample/ sampling technique, sources of data, methods of data collection and method of data analysis. The points listed shall be discussed in detail in the succeeding headings:

3.1 Research Design

The objective of the study is to examine the impact of inventory management model techniques on profitability of manufacturing companies in Nigeria. Therefore, with respect to this study, a descriptive and analytical research design is used to establish the inventory management tools and control systems; in particular, the research design applied in this study is primary survey design.

3.2 Characteristics of Study Population

The population of this study is the entire manufacturing sector in Nigeria, with a focus on a population of fifty-three (53) manufacturing firms in Nigeria. The respondents (staff) are: Production, Accounts, Human Resource, Administration and Operations. Populations of 710 staff strength data of these firms were collected from each of the firms' Human Resource records. The staff cadre ranges from senior, principal, chief officers, deputy directors and the directors at the top levels.

3.3 Sampling Design and Procedures

A purposive sample of 10 firms applied; while Taro Yamane formulae was used to calculate the sample which arrived at 256 staff approximately who formed our respondents.

Arriving at the sample size, using the Taro Yamane formula is as follows:

$$n = \frac{N}{1 + N (e)^2}$$

Where n = sample size

N= population size

1= constant

e = level of significant taken to be 0.05

$$n = \frac{710}{1 + 710 (0.05)^2}$$

n = 256 staff

3.4 Data Collection Instrument

The instrument used in collecting data for this study is the primary instrument, which is the use of questionnaire. The study constructed the questionnaires on equal numbers of five questions for both dependent and each of the independent variables to remove bias and difficulties in preparation of the raw data to fit properly in the statistical tools analyses to be applied.

The study adopted Likert Scale five-point style of structured questionnaire as; strongly disagree (SD) = 1, Disagree (D) = 2, Undecided (UND) = 3, Agree (A) = 4 and strongly agree (SA) = 5.

3.5 Validity and Reliability of Data

3.5.1 Validity of Instrument

The questionnaire used as the research instrument was subjected to face its validity. This research instrument (questionnaire) adopted was adequately checked and validated by the supervisor, his contributions and corrections were included into the final draft of the research instrument used.

3.5.2 Reliability of Instrument

Method of instrument consisted of questionnaires distributed to selected staff of the manufacturing companies used as sample. To ensure the reliability of the instrument, the researcher used the test-retest method. The questionnaire was given to fifty (50) people who were part of the target population and after two weeks, the same questionnaire was given to the same people and the Cronbatch Alpha was computed using SPSS.

3.6 Method of Data Analysis

The study applied Ordinary Least Square Regression Method and the model indicating the link between the dependent and the independent variables is given thus:

Profitability is the Dependent Variable = Return on Asset ROA

Inventory Management is the Independent Variable proxy by;

ABC Model techniques

Low Medium High, LMH model techniques

Economic Order Quantity, EOQ Model technique

The model function is shown as thus:

$$Y=f(X_1, X_2, X_3,u) \dots\dots\dots i$$

$$Y=a+\beta_1X_1 + \beta_2X_2+\beta_3X_3+u \dots\dots\dots ii$$

From this we have:

$$FP = a_0+\beta_1ABC+\beta_2LMH+\beta_3EOQ+u \dots\dots\dots iii$$

$$ROA_{it} = \beta_0 + \beta_1ABC_{it} + \beta_2LMH_{it} + \beta_3EOQ_{it} + it \dots\dots\dots iii$$

Where:

Y= Performance (ROA); β_0 = Constant Term (intercept) of the model; it = Beta Coefficient;

$\beta_1 - \beta_3$ = Coefficients of inventory Management Techniques; u = Component of unobserved error term of firms

X(= ABC model techniques); X2= Low, Medium, High LMM Techniques; X3=Economic Order Quantity EOQ model techniques.

There is no significant relationship between inventory control techniques and firm performance in Nigeria @ 0.05 levels of significance: Decision reject or accept the hypothesis.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA

4.0 Introduction

This chapter deals with the presentation and analysis of data obtained from questionnaire design as stated in Chapter three. The statistical tool used in the analysis of data, especially in testing the hypothesis statement is the simple linear regression which was run using SPSS software.

In the light of the above, this chapter shall be discussed under the following sub-chapters:

4.1 Presentation and Analysis of Data

Table 4.1: Descriptive Statistics of the Variables

VARIABLES	ROA	ABC	LMH	EOQ
Mean	36.6000	36.6000	36.6000	36.6000
Median	25.5000	23.5000	26.0000	25.0000
Maximum	140.000	140.000	140.000	140.000
Minimum	4.00000	4.00000	4.00000	6.00000
Std. Dev.	35.0611	36.3476	34.2505	35.3300
Skewness	1.15147	1.17788	1.13234	1.22246
Kurtosis	3.00086	3.00190	3.100256	3.21720
Jarque-Bera	33.6324	35.0073	32.7182	39.0625
Probability	0.00000	0.00000	0.00000	0.00000
Sum	5985.00	5985.00	5985.00	5985.00
Sum Sq. Dev.	183163	196851	174791	185983
Observations	256	256	256	256

Source: Author's Computation, 2022

The result of the descriptive statistic shows positive Skewness distribution values (ROA 1.15147; ABC, 1.17788; LMH, 1.13234; EOQ, 1.22246) with a long right tailed skewed to the right. The Kurtosis, shows (K=3) approximately (3) and this indicates a normal —bell shaped (Mesokurtic) distribution for all the independent and dependent variables of the study. The mean values of both the criterion and the explanatory variables are equal; while the median values are ROA=25.5; ABC=23.5; LMH=26; and EOQ=25. The maximum values show an equal distribution of 140 for each; while the minimum values are 4.0 for each except EOQ which has different value of 6 stocks. The assumption is that the large differences between the maximum and minimum value show that the variables portrayed significant variations in terms of magnitude, thus suggesting varying estimation stock levels.

Diagnostic Test to Check for Multi-co-linearity Problem, Using Correlation Matrix

In order to diagnose for the presence of multi-co-linearity in our data used, as well as evaluating the association among the variables adopted, the Pearson correlation coefficient (correlation matrix) analysis was employed.

Table 4.2: Pearson Correlation Matrix

VARIABLES	ROA	ABC	LMH	EOQ
ROA	1.00000	0.92075	0.92310	0.91225
ABC	0.92075	1.00000	0.94449	0.93898
LMH	0.92310	0.94449	1.00000	0.94665
EOQ	0.91225	0.93898	0.94665	1.00000

Source: Author's Computation, 2022

The correlation matrix above shows that ROA has a positive relationship with ABC, LMH, EOQ and with each of the independent variables, but none has a perfect correlation. In other words, there is no multi-co linearity observed from the result hence the use of the proposed model for the study.

4.5 Summary and Discussion of Findings

In this section, an attempt was made to discuss in some details what the research findings entail. The findings are discussed one after the other as outlined in the objectives of the study by relating them to prior studies.

i. Inventory Management and Profit before Taxation

The result of our analysis as indicated in Table 4.2 shows that a significant relationship exists between inventory management and profit before taxation of manufacturing companies in Nigeria. This implies that adequate inventory policies and management will lead to increase in organizational performance.

ii. Inventory Management and Return on Capital Employed

The result of our analysis as indicated in Table 4.3 shows that an insignificant relationship exists between inventory management and return on capital employed of manufacturing companies in Nigeria. This implies that inventory management does not have any significant impact on return on capital employed of manufacturing companies.

iii. Inventory Management and Return on Assets

The result of the analysis in relation to hypothesis three (Table 4.4) reveals that there is a significant relationship between inventory management and return on assets. This implies that proper management and control of manufacturing companies' inventories can lead to increase in organizational performance.

These findings, although consistent with the findings of the likes of Kumar and Bahl (2014), Ogbo and Ukpere (2014), Ugwu (2012), and Anichebe and Agu (2013), as far as inventory management and organizational performance is concerned, are not consistent with the works of others that were reviewed.

This is so because, as earlier stated, there is a dearth in the study of inventory management and organizational performance, especially in Nigeria. Moreover, to the best of the knowledge of the researcher, no other researcher has done any work on inventory management and organizational performance, using the determinants of organizational performance used in this study.

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CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter is concerned with the summary of the research work, especially the findings, drawing conclusions from the study and making recommendations that will help to increase inventory management and consequently, improve the performance of organizations in the manufacturing sector. In addition, since the study covers only a few indicators of organizational performance, this study makes suggestion for further research to be carried out.

5.2 SUMMARY

Inventory management has been defined as the act of ensuring that balanced items of inventory are maintained at the right quantity, quality, place and time in an organization, to ensure organizational business continuum. It also involves planning, organizing and controlling the flow of materials from their initial purchase unit through internal operations to the service point through distribution. The major objective of inventory management and control is to inform managers how much of a good to re-order, when to reorder the good, how frequently orders should be placed and what the appropriate safety stock is, for minimizing stock-outs.

There are basically three types of inventories. They are: Raw materials, Work-In-Progress and Finished goods. Similarly, there are many reasons why organizations maintain inventory of goods. The fundamental reason for doing so is that it is either physically impossible or economically unsound to have goods manufactured whenever they are demanded for, without inventory of goods, customers would have to wait until the goods they ordered for are manufactured. However, three basic motives for holding inventory are: transaction, speculative and precautionary motives. In the same manner, the four major costs associated with inventories are: Purchase Cost, Ordering Cost, Carrying or Holding Cost and Stock-Out Cost. Furthermore, the methods that are used for the control of inventories include Perpetual inventory method, Physical inventory method and Materials-control cycle method. Besides, there are four levels of inventory. They are: re-order level, maximum stock level, minimum stock level and optimum stock level.

In the presentation and analysis of data, using simple linear regression analysis and the SPSS software, the following findings were obtained:

- i. Inventory management has a significant impact on the profit before tax of manufacturing companies.
- ii. Inventory management has an insignificant impact on the return on capital employed of manufacturing companies.
- iii. Inventory management has a significant impact on the return on assets of manufacturing companies.
- iv. The impact of inventory management on the performance of manufacturing companies is significant, positive and strong.

5.3 CONCLUSION

The importance of inventory management to every manufacturing organization cannot be over-emphasized. Based on this, there is the need for manufacturing concerns, if they must continue as a going concern, to establish and implement policies that will help to improve inventory management and control, thereby improving their performance in terms of profitability, growth and survival. There is a strong relationship between inventory management and organizational performance. Similarly, effective organizational performance leads to increase in taxation for the government, which ultimately spurs economic growth and development. It is equally expedient to note that the bottom line of all organizations, including manufacturing ones, is to make profit and on the long run, exist as a going concern. Therefore, every manufacturing organization that intends to improve its performance must not treat its inventory management with kids' gloves.

In conclusion, the findings of this study, in a nutshell, revealed that inventory management impacts positively on the performance of manufacturing companies.

5.4 RECOMMENDATIONS

Based on the research findings, the following recommendations are made, in order to ensure proper management of inventory and improve organizational performance of manufacturing companies:

- i. There should be proper and adequate communication of the established inventory policies to all employees, especially those concerned with manufacturing. This is to ensure that no employee is ignorant of the inventory policies.
- ii. Policies on inventory established must be implemented by those saddled with such task, and adequate control measures must be set to ensure compliance with the set policies.
- iii. Sanctions for default must be stipulated. These sanctions can range from query, suspension to termination of appointment, depending on the extent of default.
- iv. Since accounting is tending steadily towards global harmonization, it is important for the International Accounting Standards Board to consider developing and publishing standards on inventory management.

5.5 SUGGESTION FOR FURTHER RESEARCH

As earlier stated, there is a dearth of the study of inventory management and organizational performance in a developing economy like Nigeria. Moreover, this study has shown that inventory management plays an important role in increasing organizational performance, which subsequently leads to increase in tax generation for the government.

In the light of this, it is suggested that further research should be carried out by prospective researchers in order to shed more light on the impact of inventory management on the performance of manufacturing organizations in Nigeria.

More importantly, other variables of organizational performance such as gross profit, earnings per share, dividend per share, return on equity, profit after taxation and so on can be explored so as to determine extensively how much impact inventory management has on organizational performance.

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APPENDIX A

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.874163356
R Square	0.764161574
Adjusted R Square	0.73468177
Standard Error	4279298.776
Observations	10

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	474685354551699.00	474685354551699.00	25.92152891	0.000939878
Residual	8	146499184114973.00	18312398014371.60		
Total	9	621184538666672.00			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	5601098.07	1695654.942	3.30320629	0.01080707	1690910.762
X Variable 1	0.390730014	0.076744359	5.091318976	0.000939878	0.213757203

APPENDIX B

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.389743064
R Square	0.151899656
Adjusted R Square	0.045887113
Standard Error	8115007.862
Observations	10

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance</i>
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					<i>F</i>
Regression	1	94357717842691.90	94357717842691.90	1.43284608	0.26556497
Residual	8	526826820823980.00	65853352602997.50		
Total	9	62118453866672.00			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper</i>
Intercept	7410356.51	3823536.625	1.938089585	0.08860729	1406734.76	16227
X Variable 1	147529.2847	123247.599	1.197015487	0.26556497	136680.188	43173

APPENDIX C

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.586805334
R Square	0.3443405
Adjusted R Square	0.262383062
Standard Error	7135172.951
Observations	10

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	213898994355623.00	213898994355623.00	4.201455168	0.074537661
Residual	8	407285544311049.00	50910693038881.10		

Total 9 62118453866672.00

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	4511825.142	3809468.778	1.184371209	0.270257872	-4272825.614	13259375.798
X Variable 1	967165.2357	471846.5791	2.049745147	0.074537661	-120914.927	3143470.400

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