

IMPACT OF INVENTORY MANAGEMENT ON FINANCIAL PERFORMANCE OF MANUFACTURING INDUSTRY

(A CASE STUDY OF TUYIL PHARMACEUTICAL INDUSTRY, ILORIN)

By

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CERTIFICATION

This is to certify that this research work has been written by Okinbaloye Abiola Deborah, ND/23/ACC/PT/0123 and has been approved as meeting part of the requirements for the award of National Diploma (ND) Department of Accountancy, Institute of Finance and Management Studies, Kwara State Polytechnic, Ilorin.

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DEDICATION

This research project is dedicated to Almighty God, the most beneficent and the most merciful for his guidance throughout the course of my programmes.

I also dedicate this work to my parents, Mr and Mrs. Okinbaloye.

ACKNOWLEDGMENT

I remain grateful firstly to Almighty God the only provider of knowledge, wisdom and understanding for the infinite mercy and blessings that he bestow on me throughout my period of study.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

In the past, inventory control was not seen to be necessary, in factual proof, excess inventories were considered as indication of wealth. Management by then considered over stocking beneficial. But today firms have started to embrace effective inventory control (Susan & Michael, 2020). Managers, now more than ever before, need reliable and effective control in order to reduce costs and remain competitive. Lyson (2016) posits that inventory control enhances profitability by reducing costs associated with storage and handling of materials. There are several reasons for keeping inventory. Too much stock could result in funds being tied down, increase in holding cost, deterioration of materials, obsolescence and theft. On the other hand, shortage of materials can lead to interruption of products for sales, poor customer relations and underutilize machines and equipment.

Inventory management also becomes a fundamental part of supply chain management (SCM). A lot of research in SCM over the last two decades can be characterized as so called “multi-echelon inventory theory” (Quayle, 2003). SCM has in recent years become an important way to enhance the company’s competitive strength and therefore an important issue for most companies. There is need for installation of a proper inventory technique in any business organization in developing country like Nigeria. Kotler (2002) said 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 goods so that adequate supplies are made available and the costs of over or under stocks are low. Inventory represents a cost to their owner. The manufacturer has the expense of materials and labor. Therefore, the basic goal the manufacturer is to maintain a level of inventory that will provide optimum stock at lowest cost. Effective inventory management is essential in the operation of any business. Hankinson and Pearson (2004) identifies three different trends in the development of logistics solutions within industry, one trend is concerned with the

increased integration of logistics activities beyond organization boundaries with an aim to reduce cost items such as capital costs for inventory and handling costs of flows.

Drury (2016) defined inventory as a stock of goods that is maintained by a business in anticipation of some future demand. This definition was also supported by Schroeder (2020) who stressed 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 is said to occur when there is a need to hold stock to meet production and sales requirements. A firm might also decide to hold additional amounts of stock to cover the possibility that it may have under estimated its future production and 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 larger quantity of material than normal in anticipation of making abnormal profits.

Inventory Control System or techniques is the process of managing inventory in order to meet customer demand at the lowest possible cost and with a minimum of investment, (Byoungho, 2014). A successfully implemented inventory control program is stated by (Ellram, 2016) to take into account such things as purchasing goods commensurate with demand, seasonal variation, changing usage patterns, and monitoring for pilferage. Thus a fundamental step in the process of inventory control is to determine the approximate costs of carrying inventory.

Inventory management and control is a critical management concern for many companies, effective inventory management in supply chain is one of the critical factors for successful management and control of stock. Inventory plays a significant role in the growth and survival of an organization in the sense that ineffective and inefficient management of inventory will mean that the organization loses customers and sales decline. Careful management of inventory reduces depreciation, pilferage, and wastages while ensuring availability of the materials as at when required (Agu, Obi-Anike&Ozioma, 2016). Efficient inventory management system provides information

to efficiently manage the flow of materials, effectively utilize people and equipment, coordinate internal activities and communicate with customers (Orga&Mbah, 2017). Anshur, Ahmed and Dhodi (2018), stated that inventory problems are likely to arise when inventories are not tracked correctly, wastefulness and extra cost of sum affect the overall operational performance of firms. Inventory management techniques such as inventory forecasting, inventory reorder point, information technology and inventory turnover are some of the techniques applied by inventory and warehouse managers in order to control and improve performance of organizations. Adeyeye, Ogunnaile, Amaihian, Olokundun and Inelo (2016) mentioned that, inventory control is the most vital function of inventory management and it forms the nerve centre in any organization that manages inventory. It is a function that is very vital and significant to the performance of any kind of organization.

Inventory is a vital part of current assets mainly in manufacturing concerns. Huge funds are committed to inventories as to ensure smooth flow of production and to meet consumer demand. However, maintaining inventory also involves holding or carrying costs along with opportunity cost. Inventory management, therefore, plays a crucial role in balancing the benefits and disadvantages associated with holding inventory. Efficient and effective inventory management goes a long way in successful running and survival of a business firm, when organizations fail to manage their inventory effectively they are bound to experience, stock out, the decline in productivity and profitability, customer dissatisfaction.

1.2 Statement of the Problems

The life blood of any organization, organization is inventory. 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 stock 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 organization requires and just like any other resource that is very scarce and that requires effective

management rather than neglect. The cost of acquiring these inventories is also important for the fact that too much of it will mean tying down capital and risk of becoming obsolete while having little could lead to shortage and production bottle neck. How then, to determine adequate quantity of raw material to buy, where to buy on a regular basis devoid of scarcity, the amount to invest on the inventory and projection towards maximizing profit is the concern of the study. High cost of materials purchased and rate of wastage are also main concerns that affect organizations productivity, sales and profitability.

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, 2018; Juan, & Martinez, 2012; Sitienei & Memba, 2016; Mohamad, Suraidi, Rahman & Suhaimi, 2016; Prempeh, 2015; Mukopi & Iravo, 2015; Mwangi & Nyambura, 2015). Our current study focuses on impact of inventory management on financial performance of manufacturing industry in Nigeria.

1.3 Objectives of the Study

The general objective of the study is to examine the impact of inventory management on financial performance of manufacturing industry in Nigeria. However, the specific objectives are as follows:

- i. To examine the relationship between Inventory management and financial performance.
- ii. To ascertain the impact of information technology on inventory management in manufacturing industry.
- iii. To investigate whether inventory management ensures smooth flow of production towards meeting consumer's demand

1.4 Research Hypothesis

The following are hypotheses developed to guide this research work:

Ho₁: There is no significance relationship between Inventory management and financial performance

Hi₁: There is significance relationship between Inventory management and financial performance

Ho₂: There is no significant relationship between the impacts of information technology and inventory management in manufacturing industry.

Hi₂: There is significant relationship between impact of information technology and inventory management in manufacturing industry.

Ho₃: Inventory management does not ensures smooth flow of production towards meeting consumer's demand

Hi₃: Inventory management ensures smooth flow of production towards meeting consumer's demand

1.5 Research Questions

The following hypothesis will be tested in this research work.

- i. Is there any relationship between Inventory management and financial performance?
- ii. Does information technology have any impact on inventory management in manufacturing industry?
- iii. Does inventory management ensures smooth flow of production towards meeting consumer's demand?

1.6 Significance of the Study

This research work will be important to various field of endeavor such as:

Researcher: this research work is important and significant to the researcher which is carrying out this research work as it is part of the prerequisite for the completion and fulfillment for the award of Higher National Diploma.

Manufacturing Industry: this research work will be of importance to manufacturing industry at large as it serve as an aid to foster financial performance.

To Further Research: this work will be significant as it could be used by future researcher who wish to endeavor in this topic of research.

1.7 Scope of the Study

The study is based on the topic impact of inventory management on financial performance of manufacturing industry in Nigeria.

Organizational Scope: the organizational scope of this study is the Tuyil Pharmaceutical industry, Ilorin.

Time Scope: this study is been carried within the range of an academic year.

1.8 Limitations of the Study

The scope of this study is limited to the impact of inventory management on financial performance of manufacturing industry in Nigeria. This study is limited to Tuyil Pharmaceutical industry, Ilorin kwara state.

1.9 Definition of Terms

Inventory: this refers to the goods and materials that a business holds for the ultimate goal of re-sale, production or utilization

Inventory Management: this is a discipline primarily about specifying the shape and placement of stock goods

Financial Performance: this is complete evaluation of a company's overall standing in categories, such as; assets, liabilities, equity, expenses, revenue and overall profitability.

Management: this is the coordination and administration of tasks to achieve goals.

Manufacturing Industry: these are industries transforming good that is mainly manufacturing industry in their own right, but they also concern the repair and installation of industrial equipment and sub-contracting operations for third parties.

Stock-Taking: is the physical verification of the quantities and condition of items held in an inventory or warehouse.

Consumer Goods: Consumer goods, or final goods, are goods sold to consumers for their own use or enjoyment and not as means for further economic production activity.

Work in Progress: this are company's partially finished goods waiting for completion and eventual sale or the value of these items. These items are either just being fabricated or waiting for further processing in a queue or a buffer storage

Raw Material: A raw material, also known as a feedstock, unprocessed material, or primary commodity, is a basic material that is used to produce goods, finished products, energy, or intermediate materials that are feedstock for future finished products.

Finished good: Finished goods are goods that have completed the manufacturing process but have not yet been sold or distributed to the end user

Supplies: Supply is a fundamental economic concept that describes the total amount of a specific good or service that is available to consumers. Supply can relate to the amount available at a specific price or the amount available across a range of prices

CHAPTER TWO

LITERATURE REVIEW

2.1 CONCEPTUAL FRAMEWORK

2.1.1 Concept of Inventory Management

Stock and Lambert, (2001) defined 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), defines 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 defines inventory as "the stock of any item or resource used in an organization". It is an idle resource held for future use (Dilworth, 1993). Effective management of inventory is a major concern for firms in all industries (Mentzer, et al., 2007). 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 (Namit and Chen 1999; Silva 2009). As regards this, Wanke (2011a), observed 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. Literatures have demonstrated as Wanke, (2014) said that choosing the most adequate inventory management model is essentially an empirically-based decision that may involve the use of simulation, scenario analysis, incremental cost analyses (Silva 2009; Rosa et al.

2010; Rego and Mesquita, 2011; Wanke 2011b) or qualitative conceptual schemes also known as classification approaches (Huiskonen 2001).

The latter usually considers that the impact of product, operation and demand characteristics constitute intervening variables in this choice as opined by (Dekker, Kleijn, & De Rooij 1998; Botter & Fortuin 2000; Braglia, Grassi, & Montanari 2004; Eaves and Kingsman 2004; Wanke 2011b). Prior analysis of the literature dealing with inventory management model selection indicates that it originally focused on production and distribution environments in which demand and lead time tend to be more predictable or, in other words, in which it is easier to answer the questions of —what|| and —how much|| to order (Wanke and Saliby, 2009; Wanke 2011b; Rosa et al. 2010). However, there is a growing literature related to the specific problems raised by other models (Botter and Fortuin 2000; Silva, 2009; Rego and Mesquita 2011; Syntetos et al. 2012).

2.1.2 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:

- I. **Lack of Alignment between Measurements with Strategy:** A key challenge for firms is to find out which non-financial measures they need to implement.
- II. **Validate the Measurements:** Companies do not validate the model, which leads to the measuring of many things, and most of them are irrelevant.
- III. Inability to set up the right goals and measures.
- IV. **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 & 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). 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 $(\text{profit/Base measurement}) \times 100\%$. Selvam, Gayathri, Vinayagamoorathi 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.

2.1.3 Inventory Management and Control

Inventory are raw materials, work-in progress, finished goods and supplies required for creation of a company's goods and services. It is also the number of units and/or value of the stock of goods a company holds. Also, inventory is defined as "the stock of any item or resource used in an organization". In a broader context, inventory can include inputs such as financial, energy, human, equipment, and physical items such as raw material; inputs such as parts, components, and finished goods; and interim stages of the process, such as partially finished goods or work-in-progress. postulate that inventory management refers to the entire 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 the process of effectively overseeing the constant flow of units into and out of an existing inventory. This process usually involves controlling the transfer of the units in order to prevent the inventory from becoming too high, or dwindling to levels that could put the operation of a business into jeopardy.

Effective inventory management seeks to control the costs associated with the inventory, from the perspective of the opportunity cost of the capital tied up in the inventory, the holding cost and the ordering costs. Gitau (2016) describes inventory control as the managerial activity performed to ensure that materials sufficient for uninterrupted organizational operations are available both in quality and in quantity. It is concerned with the control of the physical quantities and the monetary values of inventory items at predetermined levels or within safe limits. The philosophy of inventory control is that the organization neither suffers a stock-out situation nor ties down large capital in form of heavy stock carrying. Naliaka and Namusonge (2015) opines that it is the coordination of materials controlling, utilization and purchasing. It has the purpose of getting the right inventory at the right place in the right time with right quantity because it is directly connected with the production. The objective of any organization is to get a good return out of every money invested in the company.

2.1.4 Inventory Management Techniques

Different manufacturers adopt different technique of inventory management. The choice of technique is determined by each manufacturer's level of exposure and the importance attached to stock keeping. Among the commonly used techniques are perpetual inventory method, Just-in-time (JIT) techniques, ABC Analysis method, and VED Analysis. According to Harrington and Lambert (2020), perpetual inventory method is the act of continuously monitoring stock levels for the purpose of detecting early the items of stock that have gone down for immediate replenishment and those that are slow-moving for the purpose of cutting purchases. Under perpetual inventory methods, stock taking is done after every receipt and issue. Each time stock-taking is done, record balance is compared with physical balance to detect error and fraud.

According to Atseye, Ugwu and Takon (2015), JIT is an inventory technique companies employ to increase efficiency and reduce waste by receiving goods only as they are needed in the production process, thereby reducing inventory cost. JIT, as an inventory control method, requires that producers are able to accurately forecast demand. It is a strategy for inventory management in which raw materials and other

components are delivered by the suppliers immediately they are needed in the manufacturing process. Adeyemo and Salami (2010) hold the view that the storage of unused inventory is a waste of resources and that JIT system exposes hidden cost of keeping inventory. As highlighted by Munyao, Omulo, Mwithiga, Chepkulei (2015) the fundamental factors that must be present for JIT to be an effective inventory management technique include steady production, quick machine set up and high sense of dedication on the part factory workers .Problems associated with JIT includes unforeseen failure on the part of supplier, unexpected change in taste of consumers and manufacturers' inability to meet unanticipated demands. Onuoha (2012) describes ABC analysis and VED analysis methods as different ways of classifying inventory for the purpose of knowing the item of stock that deserve great care and attention.

Under VED analysis technique, items of stock are classified based on criticality into V=Vital, E = Essential and D =Desirable .Vital items (V) must be available all the time because they are critically needed for the continuous flow of production .Non-availability of vital items can have negative implication on the survival of the company .Essential items (E) are materials with lower critical need but which may be available .Essential items are items whose non-availability can be afforded for a short time .Desired items are the remaining materials with lowest criticality, the absence of which will not so much affect manufacturing activities even if their non-availability persist for a very long period. In effect, vital items deserve more care and attention in the warehouse than essential items while essential items deserve more care and better handling in the warehouse than desirable items.

2.1.5 Manufacturing Firm Profitability

In determining the business success of a firm, profitability performs a crucial role. Profitability can be defined as the amount of money a firm can create with whatever resources the firm has. The ultimate goal for any organization is maximizing its profitability (Niresh & Velnampy, 2014). Stella and Gladson (2018) describe profitability as a degree to which a business or activity yields profits or financial gains. The ability of a business to earn profit. In order words, profitability or profit is what is

left of the revenue a business generates after it must have paid all expenses directly related to the generation of the revenue (Orga & Mbah, 2017). Profitability is one of the most important objectives of financial management since one goal of financial management is to maximize the owners' wealth, and, profitability is very important determinant of performance. A business that is not profitable cannot survive. Conversely, a business that is highly profitable has the ability to reward its owners with a large return on their investment.

According to Bourne, Kennerley, & Franco-Santos (2005) performance measurement is traditionally concentrated on financial measures. In this context operational performance is a measure of change of operations of tea processing firms or their outcome resulting from use of inventory control systems. Business performance provides the basis for a tea processing firm to assess how well it is progressing towards its predetermined objectives. According to Atrill, and McLaney (2006), there is need to analyze the costs of maintaining certain levels of inventory as there are costs involved in holding too much stock and there are also costs involved in holding too little inventory. According to Lardenoije, Van Raaij, & Van Weele (2015) financial measures ignore market dynamics and increased complexity in acquisition of goods and services for business firms. They are of contrary opinion that firms have to assess the complexity of acquisition of inventory and on how to control in order to improve operational performance of the firm. The study challenges the entrepreneurs to find formula to reduce inventory without compromising production and without increasing cost. The present study has slightly different variables.

Detoratus, Raman, & Craig, (2013) state that a lot of revenue is lost due to stock-outs induced inventory inaccuracy. Salawati, Tinggi, & Kadri, (2012), analyzed the impact of inventory management on performance. They empirically examined the relationship between inventory management and firm performance on a sample of financial data for 82 construction firms in Malaysia for a period 2006-2010. They employed regression and correlation technique to analyse their findings. Their finding was that inventory management is positively correlated with firm performance. Their

study focused only on general performance of the firms using financial change as a performance indicator.

According to Ogbadu, (2019) profit is an index for measuring performance. Manufacturing operational performance is a combination of practices; hence several performance measures can be used efficiently. According to Vastag and Whybark, (2015), the most typical measures of operational performance are rejects and scrap, reworking, labour and machine productivity, product quality, inventory levels and turnover, unit manufacturing cost, manufacturing cycle time, delivery speed and reliability. Much literature suggest that inventory control systems effectiveness and efficiency as measures of procurement performance which map onto operational performance of the organization in terms of competitive advantage, level of profitability, providing error-free goods and service, cost efficiency and increased level of output.

Hence, the ultimate goal of a business entity is to earn profit in order to make sure the sustainability of the business in prevailing market conditions (Sivathaasan, Tharanika, Sinthuja & Hanitha, 2013). Profitability is a crucial measure of the performance of a firm and it constitutes a significant aspect of its financial reporting. It discloses a firm's ability and capacity to generate earnings at a rate of sales, level of assets and stock of capital in a specific period of time (Margaretha and Supartika, 2016).

2.1.6 Evidence on Inventory Management and Financial Performance

There have been numerous attempts to explain financial performance of companies in the fields of strategic management, accounting, finance, marketing and management science. Naturally each of these areas concentrates on different explanatory variables and therefore this study limits the survey to papers that are perceived as immediately relevant. In the US, Sanghal (2015) studied the effect of excess inventory on long term stock price performance. These announcements are clear and unambiguous acknowledgement by affirm that it is suffering from excess inventory. Examples include instances of production curtailment, temporary shutdowns, price mark downs, promotion to liquidate inventory and inventory write- offs to deal with

excess inventories. He found evidence suggesting that stock market partially anticipates excess inventory situations and that firms do not recover quickly from negative effects of excess inventory. He further noted that the negative effect of excess inventory is economically and statistically significant.

In Malaysia, Agus and Noor (2016) examined the relationship between inventory management practices and financial performance. The study measured the manager's perceptions of inventory and supply chain management practices and the level of performance in the industry. The practices include lean inventory systems, Technology and strategic supplier partnerships. They employed a structured questionnaire, which was designed to assess the companies in terms of the described dimensions. The sample companies were randomly chosen from manufacturing companies (non- food based manufacturing companies with medium to high technology) in Klang valley, Malaysia. The findings suggest that inventory management practices have significant correlations with profitability and return on sales (ROS).

2.2 THEORETICAL FRAMEWORK

2.2.1 Economic Order Quantity EOQ Model

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 is no quantity discounts.

2.2.2 Resource-Based View Theory

This was introduced in the mid-1980s by Wernerfelt (1984), Rumelt (1984) and Barney (1986) the resource based view (RBV) has become one of the most dominant existing approaches to the analysis of sustained competitive advantage. A central idea of the resource-based view is that firms compete on the basis of their resources and capabilities. The theory highlights the resources of a firm as the fundamental determinants of competitive advantage and performance. The resource-based view (RBV) adopts two vital assumptions in analyzing sources of competitive advantage. Firstly, the theory assumes that firms within an industry or within a strategic group may be heterogeneous with respect to the bundle of resources that are have control over, and secondly, it also assumes that resources are heterogeneity may persist over time because the resources used to implement firms' strategies are not perfectly mobile across firms, in order words, some of the resources a firm control cannot be traded in factor markets and are difficult to accumulate and imitate. Uniqueness of resources is considered to be one of the conditions in achieving or contributing to a competitive advantage (Bridoux, 2004). It is however pointed that, sustained competitive advantage is derived from the resources and capabilities a firm control, that are valuable, rare, imperfectly imitable, and not substitutable. These resources and capabilities can be viewed as bundles of tangible and intangible assets, including a firm's management skills, its organizational processes and routines, and the information and knowledge it controls (Barney, Wright & Kitchen, 2001). In the early stage of the RBV, the main concern was to identify the characteristics of resources that are not subject to imitation by competitors. If the

resources possessed by a firm can easily be replicated by competitors, even though the resources are the source of competitive advantage of the firm, then the advantage will not last long (Akio, 2005).

2.2.3 Queuing Theory

This theory will guide the study in investigating the relationship between material handling equipment and effective inventory management. Queuing theory is a mathematical study of waiting for lines or queues (Pandey, 2005). The theory enables mathematical analysis of several related processes, including arriving at the back of the queue, waiting in the queue

(a storage process) and being served in front of the queue. The theory permits the derivation and calculation of several performance measures including the average waiting time in the queue or the system, the expected number waiting or receiving service, and the probability of encountering the system in certain states such as empty, full having an available server or having to wait a certain time to be served.

2.3 EMPIRICAL FRAMEWORK

The study carried out by Fatogun O.I (2019), this study examines inventory management and organizational performance of the selected Small and Medium Enterprises in Nigeria. The objective of the study was to examine the relationship between inventory management and organizational performance. Primary and secondary data was employed, primary data collection instrument is a structured questionnaire designed and statistical Package for social Sciences for the study (SPSS) was used as the secondary data analysis. The independent variables used was inventory management while the dependent variable used were profitability and productivity. Data were analyzed with the aid of descriptive statistic such as simple percentage and mean. Results reveal that inventory management have positive and significant impact on the performance. Hence the study recommends that inventory management is very vital to the success and growth of organizations. The entire profitability of an organization is tied to the volume of products sold which has a direct relationship with the quality of the product against this background the study recommended that organizations should

ensure that inventory were sufficient to meet production requirement and customer demands at all times and avoid holding unnecessary surplus inventory that might increase holding cost and thus ensure enhanced customer satisfaction.

Sonko, M.L (2020) carried out a research on the Food and beverage manufacturing companies and the several challenges he face with regards to their daily operations. These challenges have continued to affect their performance in the form of low product quality, decline in sales, excessive inventory and low product turnover. Key challenge to the companies is poor inventory management and implementation. Inventory management is the backbone of many manufacturing companies around the world which when properly managed contributes immensely in improving firm performance. The food and beverage manufacturing companies in Nigeria however faces issue with regards to poor management and control of materials within the sector which contributes to its low performance. This study therefore examines the effect of inventory management on profitability of food and beverage manufacturing companies in Lagos State, Nigeria. A cross sectional survey research design was adopted. The target population comprised of 2027 top, middle and lower level managers within the selected food and beverage companies in Lagos State, Nigeria. Stratified random sampling technique was used for the study. A validated questionnaire was used. Cronbach's alpha coefficients for the constructs ranged from 0.702 to 0.955. Data was analyzed using descriptive and inferential statistics. The findings revealed that inventory management had significant effect on profitability of selected food and beverage manufacturing companies in Lagos State, Nigeria (Adj. $R^2 = 0.538$, $F(4, 351) = 104.185$, $p < 0.05$). The study concluded that inventory management affects profitability of selected food and beverage manufacturing companies in Lagos State, Nigeria. The study thus recommended that proper inventory management techniques should be put in place by the companies in order to avoid delays, wastage and increase the overall profitability.

Dedunu (2018) examined the effect of Inventory management on Company Performance of listed Manufacturing Companies in Sri Lanka. They used inventory

days as a dependent variable and gross profit and net profit as an independent variable. They employed descriptive analysis, correlation analysis and regression analysis using STATA package. The result of the study showed a positive relationship between inventory management and gross profit. Net profit had a negative relationship and inventory management significantly affect to gross profit margin and net profit margin. Koumanakos (2003) examined the effect of inventory management on firm performance. The study tested the hypothesis that efficient (lean) inventory management leads to an improvement in a firm's financial performance. Data for the analysis from the ICAP database was used which contains financial information on all medium to large Greek firms. The study period was from 2000 to 2002. For each year all manufacturing firms with the corporate form of *societe's* anonyms operating in any one of the three representative industrial sectors in Greece: food, textiles and chemicals were selected. The result of the study showed that the higher the level of inventories preserved (departing from lean operations) by a firm, the lower its rate of returns.

Another study was carried out by Onikoyi (2017) The research examines effect of Inventory Management Practices on Financial Performance of Larfage Wapco Plc, Nigeria, by analyzing the extent to which value of stock carried and inventory policies employed has on cost of goods sold and profitability respectively in the firm. Survey design method was adopted for this work, which made use of Annual audited financial reports. Field design coupled with descriptive statistics was also used. The findings of study for hypothesis 1 showed that there was a significant relationship between the value of stock carried and cost of goods sold over the years between 2005 – 2013: (- value of 0.005 and F- 23.96) while hypothesis 2 revealed - value of 0.001 and F- statistics 46.26. The firm should also strengthen the supplier relation to the level of partnerships. This will facilitate implementation of programmes such as Vendor Managed Inventory (VMI). The company should diversify their inventory system to suit specific needs of production.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the methodology employed to carry out the research work

3.2 Research Design

Research design according to Abadella and Lewis (2018) is concerned with the question of how the study subjects will be brought into the scope of the research and how it will employed data. Research design could therefore be seen as framework or plans that are used in collecting and analyzing the data for study. The study attempts to examine the impact of inventory management on financial performance of manufacturing industry in Nigeria. Since the various elements of the design of this study are under the control of the research, Survey research design is adopted. This method will enable us carry out an exploratory and qualitative survey which is mainly what this study is all about.

3.3 Population of the Study

Since the research design adopted implies the use of case study, the target study populations are the staffs at Tuyil Pharmaceutical who has to do with the inventory, such as the managers, store keepers, factory workers, and sales agent etc. The total population for the study is the number of Sixty (60) staffs.

3.4 Sample Size and Sampling Techniques

Considering the nature of this study which is constrained by time and material resources, a reasonable size was randomly draw from study population- the numerical strength of the sample size was anchored on the assumption of the statistical techniques adopted for the study. Thus a sample size of 50 respondents was used for the study.

3.5 Sources and Methods of Data Collection

This research entails the collection of data from both primary and secondary source. The primary source of data collection for the study is the structured questionnaire administered on the respondents. Similarly, data was obtained secondarily from textbooks, journals and internet sources. Both primary and secondary source of

data were adhered to on the course of this study and the attitude and responses of those interviewed were noted.

Primary sources of data

The primary sources of data are the sampling or study unit from which information is obtained on a first hand basis (Eboh, E.S 1998:68). It is very important to note here that the researcher did not adopt any rigid method in the collection of data; rather the data for the research were collected in response to the requirements of the research problem. Creativity and judgment also played a vital role at this stage of project, bearing in mind that the final judgment will be partly constrained by the type and value of information collected. The primary data were gathered from the following sources:

Secondary Sources of Data

Secondary data on financial performance was drawn from annual country budget implementation review reports prepared by the office of the controller of budgets in the organization for the last four country financial operations.

3.6 Instrument for Data Collection

A structured closed-ended questionnaire was utilized for the collection of first-hand information from participants of the study which involved 60 staffs from the organization. The questionnaire was designed and divided into three sections, where section one involves the bio-data of the respondents, section two involves the questions directly related to the research work.

3.7 Techniques for Data Analysis

For the purpose of this research survey, a percentage table was used for the presentation of data which includes the use of tabulation and percentage. The statistical analysis used in the project is chi-square i.e χ^2 distribution was applied to test the hypothesis the χ^2 distribution is considered appropriate because of the size of the sample.

CHAPTER FOUR

ANALYSIS AND DISCUSSION

4.1 Introduction

Under this heading we are talking about how the data is been analyzed and present.

As already stated in the preceding chapter, completed questionnaire was collected from 50 staffs from a single research site. Data was analyzed both descriptively and using statistical programmes for social science. A survey questioner administrated to collect data from the respondents in additional interview was conducted for selected respondent to authenticate be the information supplied to the questioner.

4.2 Demographic Characteristics of Respondents

The data collected from respondents was from staffs from Tuyil Pharmaceutical Industry, Ilorin manufacturing enterprises in Ilorin metropolis.

The respondents are distributed according to genders age, and educational qualification, position held and working experience, these are present below

Table 4.2.1 distribution of respondent according to gender

Gender	Number of respondent	Percentage
Male	10	20
Female	40	80
Total	50	100%

Source: Researcher's Field Survey, 2025

The table revealed that of the respondent 20% are male while 80% are female. This mean that there are more male than female in the opinion poll

Table 4.2.2 distribution of respondents according to age

Age	Number of respondent	Percentage (%)
18-30years	20	40
31-40year	15	30
41-50years	10	20
51 and above	5	10
Total	50	100

Source: Researcher's Field Survey, 2025

From the above table, the age bracket of the respondent are, 18-30 year has 40%, 31-40 years has 30% 41-50 years has 20% while 51 and above has the lowest percentage of 10% in the survey.

Table 4.2.3 Distribution of respondents according to their qualification

Qualification	Number of respondent	Percentage
SSCE	20	40
OND/NCE	10	20
HND/B.SC	15	30
Others	5	10
Total	50	100

Source: Researcher's Field Survey, 2025

The qualifications of the respondent is presented above as 40% are SSCE holders, another 20% are OND/NCE Holders, and 30% are HND/B.SC while the remaining 5% are for those that have other or no qualification

Table 4.2.4 distribution of respondent according to Religion

Religion	Number of respondent	Percentage (%)
Christian	30	60
Muslim	20	40
Total	50	100

Source: Researcher's Field Survey, 2025

From the above table it is clear that the Christians are much among the staffs at Kwara Hotel 60% of the respondents are Christians.

4.3 Statistical Analysis Of Responses

The analyses of these responses are shown below

Question 1: is there the presence of adequate and accurate management of inventory in Tuyil Pharmaceutical

Table 4.3.1

Options	Number of respondent	Percentage (%)
Yes	45	90
No	5	10
TOTAL	50	100%

Source: Researcher's Field Survey, 2025

The table shows that 45 respondent representing 90% of the respondents agrees with a yes that inventory is well managed while the remaining 5 respondent representing 10% said no

Question 2: Does your industry have any agreements with supplier for short cycle deliveries

Table 4.3.2

Options	Number of respondent	Percentage (%)
Yes	40	80
No	5	10
No Idea	5	10
TOTAL	50	100

Source: Researcher's Field Survey, 2025

The table above shows that 40 respondent representing 80% of the respondent believes that there is an agreement with suppliers for short cycles deliveries, 5 respondent with 10% says no while the remaining 10% has no idea.

Question 3: is there the involvement of suppliers early in product design process?

Table 4.3.3

Options	Number of respondent	Percentage (%)
Yes	50	100
No		
Total	50	100%

Source: Researcher's Field Survey, 2025

As shown in the table above all respondent agrees that there is the early involvement of suppliers in product design process.

Question 4: is there Long – term agreements between the firm and its suppliers

Table: 4.3.4

Options	Number of respondent	Percentage (%)
Yes	30	60
No	20	40
TOTAL	50	100%

Source: Researcher's Field Survey, 2025

The above table shows that 60% of the respondent are aware of the presence of long term agreement between their firm and its suppliers, while the remaining 40% disagreed as they pick the option No.

Question 5: is there proper communication between the firm and suppliers

Table 4.3.5.

Options	Number of respondent	Percentage (%)
Yes	42	84
No	8	16
TOTAL	50	100

Source: Researcher's Field Survey, 2025

The table above shows that the total of 84% of respondents agrees that there is proper communication between the firm and suppliers while the remaining 16% are of a negative option.

Question 6: does your company schedule frequent meetings between firm's inventory staff and the suppliers

Table 4.3.6.

Options	Number of respondent	Percentage (%)
Yes	50	100
No	-	-
TOTAL	50	100

Source: Researcher's Field Survey, 2025

The above table shows that all respondent agrees that there is frequent meeting between the firm's inventory management and its supplier.

Question 7: is there the complete sharing of information between the firm and its suppliers

Table 4.3.7

Options	Number of respondent	Percentage (%)
Yes	35	70
No	15	30
TOTAL	50	100

Source: Researcher's Field Survey, 2025

The table 4.3.7 above shows that 35 respondent representing 70% of the population are of the Yes opinion that there is the complete sharing of information between the firm and its suppliers and the remaining 30% opposes this.

Question 8: Does your firm encourage the using of fewer suppliers as opposed to many suppliers?

Table 4.3.8

Options	Number of respondent	Percentage
Yes	50	100
No	-	-
TOTAL	50	100

Source: Researcher's Field Survey, 2025

Table above show that all respondent believe that Tuyil pharmaceutical management encourage fewer supplier as opposed to many suppliers

Question 9: has your firm computerized all inventory management systems

Table 4.3.9.

Options	Number of respondent	Percentage
Yes	50	100
No	-	-
TOTAL	50	100%

Source: Researcher's Field Survey, 2025

In accordance with the response gotten from the respondent in the table above, it is evident that the operation of the inventory in Tuyil Pharmaceutical has been computerized fully as all respondent agreed.

Question 10: is Inventory Control System/techniques the process of managing inventory in order to meet customer demand at the lowest possible cost and with a minimum of investment

Table 4.3.10.

Options	Number of respondent	Percentage
Yes	50	100
No	-	-
TOTAL	50	100%

Source: Researcher's Field Survey, 2025

All the respondent agrees that Inventory Control System/techniques is the process of managing inventory in order to meet customer demand at the lowest possible cost and with a minimum of investment

Question 11: Does inventory management ensures smooth flow of production towards meeting consumer's demand?

Table 4.3.11

Options	Number of respondent	Percentage
Yes	45	90
No	5	10
TOTAL	50	100%

Source: Researcher's Field Survey, 2025

This table shows that 90% of the respondent responded with yes to the question given and the remaining 10% said No.

Question 12: is there any active relationship between inventory management and the financial performance of your firm?

Table 4.3.12

Options	Number of respondent	Percentage
Yes	47	94
No	3	6
TOTAL	50	100%

Source: Researcher's Field Survey, 2025

The above table shows that 94% of the respondent are positive as they said Yes to the question that inquire of the relation between inventory management and financial performance and the remaining 6% ticked No in the option.

Question 13: Does effective inventory management controls the costs associated with the inventory

Table 4.3.13

Options	Number of respondent	Percentage
Yes	37	74
No	13	26
TOTAL	50	100%

Researcher's Field Survey, 2022

The above table shows that most of the employees at Tuyil pharmaceutical believes that inventory management controls as 74% of the .respondent said yes while the remaining 26% were of opposing option.

Question 14: is there adequate management of inventory journals in your firm.

Table 4.3.14

Options	Number of respondent	Percentage
Yes	42	84
No	8	16
TOTAL	50	100%

Researcher's Field Survey, 2022

84% of the respondent in the above table agrees that there is adequate management of inventory journals, the remaining 16% disagree.

Question 15: has the involvement of information communication technology improved the management of inventory?

Table 4.3.15

Options	Number of respondent	Percentage
Yes	45	90
No	5	10
TOTAL	50	100%

Researcher's Field Survey, 2022

The above table show that 90% of the respondent accept the fact that there is an improvement in the management of inventory through the use of information communication technology and a total percentage of 10 disagrees.

4.4 TEST OF HYPOTHESES

Hypothesis One

Ho: there is no significant relationship between inventory management and financial performance.

Question, 12 relates to this hypothesis. Thus its statistical analysis is being used.

STATISTICAL COMPUTATION FOR HYPOTHESIS ONE

Responses	O _i	E _i	O _i -E _i	(O _i -E _i) ²	(O _i -E _i) ² /E _i
Yes	47	25	22	484	19.36
No	3	25	-22	484	19.38

Total	50				38.72
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$\chi^2 = 33.24$

Decision Rules:

The computed values $\chi^2 = 38.72$ is greater than the critical value 0.05 level signification is 3.84, therefore we rejected the null hypothesis (H_0) and accept the H_1 (alternate hypothesis) that says that there is significant relationship between inventory management and financial performance.

Hypothesis two:

H_{02} : There is no significant relationship between the impacts of information technology and inventory management in manufacturing industry

STATISTICAL COMPUTATION FOR HYPOTHESIS TWO

Responses	O _i	E _i	O _i -E _i	(O _i -E _i) ²	(O _i -E _i) ² /E _i
Yes	45	25	20	400	16
No	5	25	20	400	16
Total	50				32

$\chi^2 = 32$

Decision Rules:

The computed values $\chi^2 = 32$ is greater than the critical value 0.05 level signification is 3.84, therefore we rejected the null hypothesis (H_0) and accept the H_1 (alternate hypothesis) which states that there are significant relationship between the impacts of information technology and inventory management in manufacturing industry

Hypothesis three:

H_{03} : Inventory management does not ensures smooth flow of production towards meeting consumer's demand

STATISTICAL COMPUTATION FOR HYPOTHESIS THREE

Responses	O _i	E _i	O _i -E _i	(O _i -E _i) ²	(O _i -E _i) ² /E _i
Yes	45	25	20	400	16
No	5	25	20	400	16
Total	50				32

$\chi^2 = 32$

Decision Rules:

The computed values $X_2 = 32$ is greater than the critical value 0.05 level signification is 3.84, therefore we rejected the null hypothesis (H_0) and accept the H_i (alternate hypothesis) which states that Inventory management ensures smooth flow of production towards meeting consumer's demand.

4.5 Summary Of Findings

The research work was carried out to look into the impact of inventory management on financial performance. The research found out that inventory management is an important phenomenon towards meeting's consumer demand as well as ensuring the adequate financial performance. The findings also discovered that there is a standard relationship between inventory management and financial performance.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.2 Summary

This study examines the effect of inventory management and profitability of selected food and beverage manufacturing companies in Tuyil Pharmaceutical Industry, Ilorin. This study examines the effect of inventory management and firm performance of Tuyil Pharmaceutical Industry, Ilorin. The study conducted using the Economic Order Quantity model as well as the resourced based view theory and theory of constraint. The study made use of Chi-square method of data analysis for the testing of hypothesis.

5.5 Conclusion

The present study on inventory management in manufacturing industry would certainly complement and supplement the existing knowledge on stock management. This strongly advocates the cost of sales, carrying cost, inventory policy, which made it to be growing from strength to strength increasing the productivity capacity in spite of the economic problem in Nigeria.

This research work found out that there is a positive relationship between Inventory management and profitability of the firm. The more inventories converted into money, the more profitability ratios included in analysis. If the firms operating in this sector sustain their inventory management policies effectively, they increase their profits. Prudent management of materials reduces depreciation, pilferage and wastages while ensuring availability of the materials as at when required, would lead to improved Financial Performance of Tuyil Pharmaceutical Ltd. in particular and Pharmaceutical Industry in general. Given the problem that arises as a result of the inefficiencies, breakdown and shut down of the plant and carrying cost of materials, it becomes very necessary to re-organize the materials management department, establish good relationship with suppliers of spare parts in order to minimize losses arising from frequent breakdown and improve profitability.

Inventory management has become highly developed to meet the rising challenges in most corporate entities and this is in response to the fact that inventory is an asset of distinct feature. The inventory management situation of Lafarge plc has been revealed using a well-built inventory policy to handle its idle stock without incurring unnecessary cost by also minimizing associated carrying cost.

5.6 Recommendations

This study thus suggests some recommendations to remedy certain defects in the company inventory policy and if these recommendations are implemented, the company's inventory management situation will attain a greater height and improve the firm financial position.

Firstly, as analyzed of positive relationship between inventory and cost of goods sold and value of carrying stock. This does not imply that inventory automatically determines production costs or sales and vice-versa. However, it does indicate that inventory levels can be of useful indication of what level of sales and profitability to expect. Thus, organization sales and marketing department of the company should pay attention to the growth pattern of inventory usage and incorporate it in sales forecasting technique. It is important to determine the incremental holding costs for a year.

Secondly, it is recommended that pharmaceutical industry develop a policy framework to facilitate faster implementation of the best inventory management practices such as JIT, MRP and EOQ. Thirdly, the firm should also strengthen the supplier relation to the level of partnerships. This will facilitate implementation of programmes such as Vendor Managed Inventory (VMI).

Fourthly, the company should diversify their inventory system to suit specific needs of production. Inventory management should maximize space and timely delivery to avoid staying off production. Management should closely monitor and manipulate their inventory system to maintain production consistency for organizational profitability and effectiveness. Fifthly, the flow of information should be increased and should be circulated adequately in order to enhance adequate updates of inventory records.

Sixthly, the company should try by all means to adhere to inventory policies made. A situation whereby materials or items are allowed to leave the stores without proper requisition, this shows the internal control is weak.

5.7 FRONTIERS FOR FURTHER RESEARCH

The researcher recommends that further researches should be carried out in other to find out other depth knowledge on the impact of inventory management as the researcher has limitation since it focus its study on large scale manufacturing industry, it therefore expect further researches to be centered on small scale business that has inventory.

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APPENDIX II: QUESTIONNAIRE

SECTION A

Instruction: In each of the questions below, please tick (✓) in the box beside the option you consider most appropriate against each question.

1. Sex: (a) Male [] (b) Female []
2. Age: (a) 18-30 years[] (b) 31-40 years[] (c) 41 - 50 [] (D) 51 and Above []
3. Qualification: (a) SSCE[] (b) OND/NCE[] (c) HND/BSC [] (D) Others []
4. Religion: (a) Christian [](b) Muslim []

SECTION B

1. Is there the presence of adequate and accurate management of inventory in Tuyil Pharmaceutical? (a) Yes () (b) No ()
2. Does your industry have any agreements with supplier for short cycle deliveries? (a) Yes () (b) No ()
3. Is there the involvement of suppliers early in product design process ?(a) Yes () (b) No ()
4. Is there Long – term agreements between the firm and its suppliers? (a) Yes () (b) No ()
5. Is there proper communication between the firm and suppliers?(a) Yes () (b) No ()
6. Does your company schedule frequent meetings between firm's inventory staff and the suppliers?(a) Yes () (b) No ()
7. Is there the complete sharing of information between the firm and its suppliers (a) Yes () (b) No ()
8. Does your firm encourage the using of fewer suppliers as opposed to many suppliers? (a) Yes () (b) No ()

- 9.** Has your firm computerized all inventory management systems? (a) Yes ()
(b) No ()
- 10.** Is Inventory Control System/techniques the process of managing inventory in order to meet customer demand at the lowest possible cost and with a minimum of investment? (a) Yes () (b) No ()
- 11.** Does inventory management ensures smooth flow of production towards meeting consumer's demand? (a) Yes () (b) No ()
- 12.** Is there any active relationship between inventory management and the financial performance of your firm? (a) Yes () (b) No ()
- 13.** Does effective inventory management controls the costs associated with the inventory? (a) Yes () (b) No ()
- 14.** Is there adequate management of inventory journals in your firm? (a) Yes ()
(b) No ()
- 15.** Has the involvement of information communication technology improved the management of inventory? (a) Yes () (b) No ()