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EFFECT OF INVENTORY MANAGEMENT PRACTICES ON OPERATIONAL PERFORMANCE OF FLOUR MILLING COMPANIES IN NIGERIA

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This study examined effect of inventory management practices on the operational performance of flour milling companies in Nigeria. Cross-sectional survey research design was used. The target population comprised 2,237 staff of selected flour milling companies. A stratified random sampling technique was used to select the sample size of 776. A structured questionnaire was used to collect data. Hypotheses were tested using inferential statistics with the aid of SPSS. The findings revealed that inventory shrinkage had a significant negative effect on customers' satisfaction. There was a significant relationship between inventory control and cost effectiveness of selected flour milling companies. The study concluded that inventory management practices significantly affect operational performance of flour milling companies in Nigeria. The recommendation focused on ensuring that stocks are sufficient to meet production requirements and customer demands at all times.

Keywords: Inventory shrinkage, Inventory control, Customer's satisfaction, Cost effectiveness, Flour milling

1.0 INTRODUCTION

In recent years, many firms in the world have faced several challenges particularly in inventory management and control, thus affecting their operational performance. There have been cases of materials overstocking which eventually got expired or out dated, under stocking, lack of stock-taking, theft of materials by workers and delay in delivery of materials into the organizations among others. Many manufacturing firms have more than 50% of total assets invested in working capital, which includes inventory, as well as accounts receivable and accounts payable (Beheshti, 2010; Darun, Roudaki, & Radford, 2015; Gill, Biger, & Mathur, 2010). The general business problem is that excessive levels of working capital invested in inventory negatively affect a company's operational performance (Aktas, Croci, & Petmezas,

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2015; Bagchi, Chakrabarti, & Roy, 2012; Charitou, Elfani, & Lois, 2010; Chisti, 2013; Mojtahedzadeh, Tabari, & Mosayebi, 2011). The basic business problem is that some managers lack strategies for efficient inventory management (Basu & Wang, 2011; Hatefi & Torabi, 2015). Hence, there is a need by manufacturing firms to develop strategies for managing and maintaining optimal inventory level of raw materials and saleable products. The basic method of managing stock by quantity by manufacturing firms are by means of fixing for each commodity stock levels which are recorded in the stock control system and subsequently used as a means of indicating when some actions are necessary. Most firms cannot work properly without stock and therefore they have to consider its management. There is a need for organization to maintain a minimum, ordering, hastening and maximum stock levels (Harrison, 2001 cited in to Munyai, Omulo, Mwithiga, & Chepkulei, 2015).

The flour milling manufacturing firms operating in Nigeria are facing problem in determining appropriate inventory level that should be kept to ensure that customer needs are met and production process is not interrupted. Striking a balance between overstocking and running out of stock has been a serious challenge for the companies. They are confronted with the challenges of stock out of goods or materials during production (Ikoni & Nwankwo, 2016; Takim, 2014). According to Njoku & Kalu, 2015a and Takim (2014), majority of the flour milling companies in Nigeria are suffering from operating environment problems and lacks a strategic operating system for inventory management and control. Due to stock-outs, the companies received a lot of complaints and criticism by the customers, so this causes a lower sales and decrease in revenue. The issue of dissatisfied customers as a result of missing items on the shelf have caused flour mills companies' challenges in terms of reputation and trust which in turn result in loss of sales. The problem of inventory shrinkage has not been resolved by many flour milling companies in Nigeria due to materials and operational challenges amongst others. This problem has led to customer dissatisfaction and several backorders.

The problem of inventory control is one of the most important concept in organizational management (Ziukov, 2015). Empirical evidence has shown more and more manufacturing firms have failed inventory control, and therefore suffered losses (Kariuki, 2013). Moreover, Jefwa and Everlyn (2015) indicated that most firms have not yet adopted inventory control tools and systems in their operations. Nsikan *et al.* (2015) noted that most of the Nigerian flour milling companies were still using traditional methods of inventory control and valuation which was considered inappropriate and unsophisticated. Anichebe and Agu (2013) stated that flour milling companies at times do not control their inventory holding, resulting in under stocking and causing the organizations to stay off production, thereby resulting to high cost overrun. The implication is that poor inventory control leads to high cost of operations. The findings of several studies consulted on inventory management and control revealed that inventory control systems in flour mills companies in Nigeria are still based on traditional and mathematical models which often leads to higher

operational costs.

The general objective of this study is to examine the effect of inventory management practices on the operational performance of flour mill companies. The study sought to find out the effect of inventory shrinkage on customer's satisfaction and determine the relationship between inventory control and cost effectiveness of flour mills companies in Nigeria. A cross-sectional survey research design was used in this study.

2.0 THEORETICAL FOUNDATION

This study was guided by Deterministic Inventory Model (DIM) and Resources Based View Theory (RBV).

2.1 DETERMINISTIC INVENTORY MODEL

The Economic Order Quantity (EOQ) is one most common deterministic inventory models. The EOQ is a mathematical model formulated within the scope of operations management to determine the optimal inventory level. The model was developed by F.W. Harris in 1913 and is also known as Wilson EOQ model, who critically analyzed the model. The EOQ model requires that for every item stocked in the stores, there is need to determine the point of order and that of the most cost effective quantity to order. The model assumes that all other variables are constant even though uncertainties are common and regular in all business. For instance, uncertainties may include change in demand, damage during transportation and delay in delivery. Uncertainty in demand, will therefore force EOQ to be adjusted to buffer against uncertain business atmosphere. Blackburn (2010) is among researchers who agree that EOQ is one of the models widely used to manage inventory in many industries. Economic Order Quantity approaches have proven to be effectively inventory management technique when the demand and lead time are relatively stable, as well as when significant variability and uncertainty exist. Coleman (2002) and Ogbo (2011) adopted EOQ and applauded the model as one that order quantities which minimize the balance of cost between inventories holding costs and re-order costs.

However, the use of EOQ model has shown increase in some costs as other costs decline, an example of ordering costs decline with the inventory holdings, while holding costs rise and the total inventory associated costs curve have a minimum point. Another disadvantage of EOQ is that it ignores the need to have buffer stocks, which are maintained to cater for variations in lead-time and demand making it difficult to be observed in practice. In addition, the EOQ model not account for seasonal or economic fluctuations and is most limited by the assumption of a one-product business, and the formula does not allow for combining several different products in the same order.

2.2 RESOURCE BASED VIEW THEORY

Resource based view theory is a major research theory to understand the source of

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sustained competitive advantage of a firm. The theory was initiated in the mid-1980s by Wernerfelt (1984), Rumelt (1984) and Barney (1986). Resource based view theory proposed that there are two major sources of competitive advantage within the internal environment of an organization that are important to the preparation of firm strategy and the efficient and effective application of these resources can enable organization to achieve sustainable competitive advantage (Ringim, Razalli, & Hasnan, 2012). These resources are tangible and intangible resources. Resource based view theory holds two major assumptions which state that resources must be heterogeneous in nature. The heterogeneous nature of resources assumes that firms achieve competitive advantage when organization makes use of resources that are significantly different from that of competitors (Kim, Shin, K. kim & Lee, 2011). The second assumption of resource based view theory is that firm's resources are non-movable and non-transferable that is, resources attributed to a particular company do not move from one company to another at least in a short run (Akio, 2005).

In the context of resource-based view, a flour mills companies might lose its competitive advantage if important inventory management skills are scarce or getting lost as they are not easily duplicated or substituted. The supporters of this RBV theory argue that organizations should look inside the company to find the sources of competitive advantage instead of looking at competitive environment for it. Inventory management skills are valuable as they help providing supply strategies for future needs and developing supply management strategies to support company strategies (Carr & Pearson, 2002). As purchasing professionals interact with other functions within a complex social network, purchasing skills are difficult to duplicate (Eltantawy, 2005). Sulastrri (2006) argued that RBV approach is useful by employing various strategies in controlling inventories in the organization through optimal utilization and allocation to be more competitive and improve on performance. RBV also uses techniques such as value analysis to study the function of material, components or systems to identify areas of unnecessary costs as it forms a key component of an inventory control strategy that minimizes costs to the bottom-line (Husnah, 2013).

However, the RBV has been largely criticized by several critics. One of the major draw backs of resource based view theory raised by critics is that the theory is operationally invalid in the sense that this theory is only applicable in a static environment which is not the case for real life situation (Therious, Aggelidis, & Theriou, 2009). Resource based view theory has been largely criticized from the dynamic point of view and this view remains the most prominent of all other critical views. The environment in which firms operate in reality is dynamic in nature which is characterized with radical changes and high velocity, and achieving a sustainable competitive advantage with the aid of some specific resources may not be achievable in dynamic environment which thus limit this theory to be effective only in a static environment.

3.0 LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

3.1 INVENTORY MANAGEMENT PRACTICES

According to Ashok (2013) inventory is the stock pile of products a firm is offering for sale in various components making up the product which includes stock of raw material, goods in process, finished goods in stores and spares. Ghosh and Kumar (2007) also defined inventory as a stock of goods that is maintained by a business in anticipation of some future demand. It is any stock that a firm or business keeps to meet its future requirement of production and sales (Arti & Dhawal, 2013). Inventory management on the other hand is the art and science of maintaining stock levels of a given group of items incurring the least cost consistent with other relevant targets and objectives set by management (Lwika, Ojera, Mugenda & Wachira, 2013). According to Noor-Ajjan, Faqih-Anas, Saimon, Fadzli and Bih-Lii (2014), inventory management relates to the question of how much stock of materials is needed to buffer against change of state in forecast, customer demands and supplier's deliveries. The objective of inventory management is to enable organizations to determine and maintain the optimum level of investment in inventories which aids in realizing the required objective. Benjamin (2001) cited in Oladejo & Ajala, (2016) stated that inventory management aims at achieving the inventory level which minimizes the total cost associated with inventory, that is, the optimal and most economical level. Because too much inventory consumes physical space, creates financial burden, and increases possibility of damage, spoilage and loss. On the other hand, too little inventory often disrupts manufacturing operations and increases the likelihood of poor customer service.

Inventory management practices as one of the supply chain management practices is an activity that organizes the availability of goods to the customers from sales items to consumables and spare parts (Tungo, 2014). It is a balancing act that enables a system (or operations) to have long runs of operation for better efficiency and ensuring high inventory are ready for sale, purchasing long run orders for better efficiency and balancing act of working capital and cash flow. Furthermore, inventory management practices involves the use of many techniques of managing inventories in an organization, these techniques are EOQ method, Stock levels, ABC analysis, Strategic Supplier Partnership, EDI, JIT, EPOS, Bar coding, Lean inventory system, MRP, ERP and VMI. All these methods can be used by any organization in managing inventories (Tungo, 2014).

A broad review of the variables of Inventory Management Practices used in this study will be explained in the following sub-headings of Inventory Shrinkage and Inventory Control.

3.1.1 INVENTORY SHRINKAGE

The term 'shrinkage' refers to something becoming smaller or a gradual contraction over time an impact not considered to be serious or of much concern (Beck & Peacock, 2009). Inventory shrinkage means the amount of inventory that exists in account records but no

longer exists in actual records. It is the discrepancy between the physical count of the inventory and its book value. In inventory management, shrinkage is classified as risk costs resulted particularly from product obsolescence, theft (that is, from customer shoplifting and employee theft), natural disaster, poor inventory storage, among others. It was described as a shortage occurring when the final calculated inventory value in a company's accounting records fall below the final valuation from the physical inventory.

Gilbert (2003) and Levy and Weitz (2004) see inventory shrinkage as the difference between the recorded value of stock in the inventory stock system, which records merchandise received at the store, and the value of actual inventory in the store, as determined by a physical count of inventory. Shrinkage is usually expressed in the actual naira mount difference, or as a percentage of the total inventory balance.

There are many studies carried out on the area of inventory shrinkage and its implication towards customers' satisfaction (that is, operational performance) of manufacturing firms. The findings from these studies have been mixed; while some researchers established positive results, others discovered negative effects of inventory shrinkage on customers' satisfaction. The reason for the contradiction was based on level of error acceptable. Fariza, Rushami, and Rohaizah (2014) discovered that effective inventory management has become a potential way nowadays to improve performance through customers' satisfaction, matching supply chain practices and competitive advantages in the competitive world. Li, Ragu-Nathan, Ragu-Nathan, and Subba (2006) found out that implementation of inventory management practices have greater impact on achieving customer satisfaction as well as improving a firm's performance. On the other hand, other studies have shown that inventory shrinkage create a huge negative impact to a manufacturer that leads to reduction in the overall performance such as customer's satisfaction and profitability (Fariza, Rohaizah, Mohd, & Rushami, 2015). Oballah, Waiganjo, and Wachiuri (2015) conducted a study on effect of inventory management practices on organizational performance in public health institutions in Kenya. The research findings revealed that losses resulting from medicine expiration leads to increased inventory shrinkage, losses resulting from medicine damages leads to increased inventory shrinkage, losses resulting from medicine obsolesce (medicine purchased not meeting intended purposes leads to increased inventory shrinkage and that losses resulting from medicine theft leads to increased inventory shrinkage. As such inventory shrinkage affects customer satisfaction. Carl and Shaun (2014) conducted a research on the assessment to determine the Impact of Retail Shrinkage on the Sustainability and the Profitability of the XYZ Franchise Retailer Stores in the Western Cape Region of South Africa". The findings revealed that a definite link exists between shrinkage and store profitability. Also, the findings revealed that shrinkage reduction presents an opportunity for the average XYZ Franchise owner to increase their profitability. Mazanai (2012) expressed that stock shortages are a headache for most organizations and it leads to customer's dissatisfaction which eventually leads to

low performance of a firm. In the light of the previous findings, it is hypothesized that: *inventory shrinkage has no significant effect on customer's satisfaction of selected Flour Mills companies in Nigeria.*

3.1.2 INVENTORY CONTROL

Controlling is a process by which some aspect of system is modified to achieve a desired change in system performance. Hailing and Guochao (2011) defined inventory control as a process in which the materials and parts carried in stock are regulated within pre-determined limits or set in accordance with the policy and procedures implemented or adopted by the manufacturing firms. Jeff (2010) points out that inventory control is the process of managing inventory in order to meet customer demand at the lowest possible cost and with a minimum investment. Gbadamosi (2013) 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. Kwado (2016) 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.

The effect of inventory control systems on cost reduction effectiveness of manufacturing firms have been widely researched by many researchers (Kumar & Suresh, 2008; Mogere, Oloko, & Okibo, 2013). However, the direction of the relationship between inventory control systems and cost reduction effectiveness of business firms has not been cleared (Mathuva, 2013). Furthermore, studies on the relationship between inventory control systems and cost reduction effectiveness had produced mixed results (Gill, Biger, & Mathur, 2010). While some argued that inventory control ensures that the cost incurred in inventories is minimal and promotes economy in purchase (Kumar & Suresh, 2008; Mwangangi, Guyo, & Arasa, 2015), others indicated the possession of inventory, through judicious purchasing and manufacture, can in times of escalating prices generate cost savings (Christopher & Falconer, 2012). Haribhau-Pitamber (2014) study on inventory control and valuation systems among retail SMEs in a developing country. The study discovered that retail owners/managers employ inventory control procedures in their enterprise. The findings also revealed that Last-in-First-out (LIFOM) method have a positive association with inventory methods and inventory records. The retailers also accepted that the LIFOM is no longer an acceptable method used in practice. The SME owners/managers identified and implemented cost of inventories. Nyabwanga and Ojera (2012) examined the

relationship between inventory management practices and business performance of SSEs in Kisii Municipality, Kisii County, Kenya. The empirical results revealed a positive significant relationship between business performance and effective inventory management practices. The findings also showed that that inventory budgeting had the largest effect on business performance. Wauna and Obwogi (2015) carried out a study on “An Assessment of the Effects of Inventory Management Procedures on Performance of Kengen Company in Mombasa Kipevu power station”. The study revealed that material classification procedures had a significant positive effect on performance at KenGen. It was established that, at KenGen, storage procedures are effective, that is to say, they use first-in-first out procedures, materials well documented, and stock levels are well monitored. The storage procedures were found to correlate positively and significantly with performance. Furthermore, it was found that the coding of materials at KenGen help in properly identifying materials and it is effective. Proper material codification procedures were found to be positively and significantly related to performance at KenGen. Finally, it was established that the inspection procedures put in place were quite effective in ensuring only quality materials are allowed into the store which are comprehensively inspected against set standards. The inspection level of materials and thoroughness positively and significantly related with performance. Also, Mogere et al. (2013) revealed that some previous studies did not indicate the extent to which inventory control systems reduce cost of the firm. From the foregoing it is hypothesize that: *inventory control has no relationship with the cost reduction effectiveness of selected Flour Mills companies in Nigeria.*

The study is guided by the following conceptual framework.

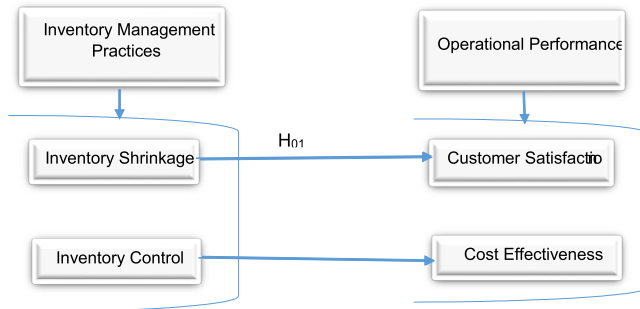


Figure 1: Conceptual Model

The conceptual model presents the perceived relationships as formulated for testing. The conceptual model shows the various relationships among the variables in the inventory management practices and operational performance of selected flour mills companies. According to the model, operational performance is the dependent variable using both customer satisfaction and cost effectiveness as indicators influenced inventory management practices. Independent variable is presented by inventory management practices with its

corresponding indicators; inventory shrinkage and inventory control.

4.0 METHODOLOGY

4.1 RESEARCH DESIGN

This study adopted a cross-sectional survey research design. A cross-sectional survey offers the opportunity to collect data across different flour mills companies and test this relationship. With respect to the time period over which data will be collected, which will be one point in time across the various flour mills companies, a cross-sectional survey was found appropriate. Further, it was ideal because the researcher intended to collect descriptive data that was accorded statistical treatment to allow for hypothesis testing to come up with objective conclusions (Cooper & Schindler, 2003).

4.2 POPULATION

The primary population for this study consisted of all the flour mills companies in Nigeria and the secondary population was all flour mills companies listed on the Nigerian Stock Exchange. According to Sterling Capital (2015), there are four (4) quoted flour mills companies namely: Dangote Flour Mills, Flour Mills of Nigeria Plc, Honeywell Flour Mill Plc and Northern Nigeria Flour Mill Plc out of which three (3) companies (that is, Dangote Flour Mills, Flour Mills of Nigeria Plc, and Honeywell Flour Mill Plc) constituted the focus of this study. The target population therefore consists of two thousand, two hundred and thirty seven (2,237) employees in charge of inventory management and policy of the selected flour milling companies operating in Nigeria that is, Dangote Flour Mills, Flour Mills of Nigeria Plc, and Honeywell Flour Mill Plc. These companies control over 65% of the market (Leadcapital, 2008). They have a total installed capacity (production) of 15,360 metric tons per day with Flour Mills of Nigeria Plc controlling 49% (Sterling Capital, 2015).

4.3 SAMPLE AND SAMPLING TECHNIQUE

The sample for this study was limited to three (3) listed flour milling companies in Nigeria out of four (4) listed flour milling companies on the Nigerian Stock Exchange. The three selected flour milling companies for the study; namely Dangote Flour Mills Plc, Flour Mills of Nigeria Plc, and Honeywell Flour Mill Plc are located in Lagos State. Beside, these three companies have the largest percentage of total installed capacity in the industry: Dangote Flour Mills Plc (29%), Flour Mills of Nigeria Plc (49%) and Honeywell Flour Mill Plc (10.8%). In addition, the Flour Mill Group, with majority stakes in Northern Nigeria has an estimated 60% share of the market. The study was conducted among the top management, middle management staff and low level management of the three selected flour milling companies in the following departments: procurement, production, warehouse, distribution and value chain support. The researcher used these departments because of their connection and direct involvement in inventory management. Leedy and Ormrod (2012) advised that the

target population should be a set of all individuals relevant to a particular study and must be defined in terms of elements, geographical boundaries and time.

Having established the population of study, multi-stage sampling procedure was used to select the subjects of study. In the first stage, the researcher stratified the flour mills companies in Nigeria into two namely: listed and non-listed flour milling companies. According to Sterling Capital (2015), there four quoted flour milling companies in Nigeria while the remaining eighteen flour milling companies are not quoted. The four companies control over 65% of the market in Nigeria. In the second stage, proportional stratified sampling technique was used to select 3 companies out of the 4 quoted flour mills companies in Nigeria. These were 75% of the total number of quoted flour mills companies in Nigeria. Three companies were finally chosen because Flour Mills of Nigeria controls the largest stake of the Northern Nigeria Flour Mill. In the last stage, simple random sampling was used to select a sample size of 776 from the population of 2,237 at 3.5% error tolerance and 96.5% degree of freedom using Krejcie and Morgan (1970) sample size determination table. 641 (82.6%) of the questionnaire distributed were returned while 135 (17.4%) of the questionnaire distributed were not returned.

4.4 DATA COLLECTION INSTRUMENT

The study used structured questionnaire as data collection instrument. This study used closed-ended questions which is one where responses are restricted to small set of responses that generate precise answers to develop the empirical (Mwangangi, Guyo, & Arasa, 2015). The reason for the choice of this instrument is advantage of high response rate and minimum intervention bias from the researcher. A six-point modified Likert scale type was used to elicit responses for every questions in the questionnaire, and this covers extremes of 'very often' and 'rarely' and 'very high' and 'very low'. This scale is expected to increase the reliability of the responses; and also to gain more effective screening power (Sin & Tse, 2002; Osuagwu, 2006). The instrument consists of three (3) sections: section A deals with the demographic variables in which the respondents were asked to provide some basic background information; section B was a multidimensional variable adapted to measure inventory management practices while section C was put in place to assess operational performance. The questionnaire was adopted from combination of sources and modified to meet the need of this study. Inventory shrinkage questions were gathered from Raymond, Vincent, Mercy, and Bellah (2015); Oballah *et al.* (2015); Kamau and Kagiri (2015). Inventory Control were obtained from Raymond, Vincent, Mercy, and Bellah (2015). Customer satisfaction were collected from Thogori and Gathenya (2014), and Cost effectiveness questions were gotten from Nwangangi (2016).

4.5 PILOT STUDY

A pilot study was conducted to determine whether potential respondents would have

difficulties in understanding or interpreting the questionnaire. Seventy eight (78) conveniently sampled respondents forming 10% of sample from each category were asked to give the needed information for piloting. Fink (2013) suggests that for most student questionnaire the minimum number for a pilot is 10% of the sample size. The pilot test refine the questionnaire so that respondents will have no problems in answering the questions and there will be no problems in recording the data. The pilot study also focused on ensuring validity and reliability were achieved.

The study used construct validity which was established using exploratory factor analysis. The main measures used to test the validity of the instrument in exploratory factor analysis include: Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy, and Bartlett's test of sphericity. The results of the EFA show high values of the KMO for all the variables and significance of the Bartlett's test of sphericity at 0.000 which indicate the suitability of the research data for structure detection. The reliability test was done using internal consistency method. The result gave a reliability coefficients (Cronbach's Alpha) for the constructs ranged between 0.804 and 0.882 indicating a high degree of consistency.

4.6 DATA PROCESSING AND ANALYSIS

The study used descriptive and inferential statistical techniques to process and analyze the data analyzing data. The descriptive statistics was first used to analyze responses of the respondents to the various questions for each of the variables using frequencies, percentages, mean and standard deviation. Inferential statistics such as Pearson product moment correlation and simple linear regression were used test the hypothesis. Pearson product moment correlation was used to assess the relationship between inventory control and cost effectiveness. Simple linear regression was used to determine effect of inventory shrinkage on customer satisfaction in the selected flour mills companies. All the hypotheses were tested at 95 percent confidence level (level of significance, $\alpha = 0.05$). The regression formula is presented below;

$$Cs = \beta_0 + \beta_1 \ln VSh + e \dots\dots\dots \text{Eq. 1}$$

Where:

- Cs = Customer Satisfaction
- β_0 = Constant term
- β_1 = Parameter to be estimated
- INVSH = Inventory Shrinkage
- e = Error term

$$CE = f(\text{INVC}) \dots\dots\dots \text{Eq. 2}$$

Where:

- CE = Cost Effectiveness
- INVC = Inventory Control

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The a priori expectation for the conceptual stated models can be given as follows. It is expected that inventory shrinkage will have significant (that is, negative) effect on customers' satisfaction ($\beta_1 < 0$). Finding from previous research works reveal that inventory shrinkage create a huge negative impact to a manufacturer that leads to reduction in the overall performance such as customer's satisfaction and profitability Fariza *et al* (2014) and Oballah *et al* (2015). Stock shrinkage is uneconomical to the organization, and it could leads to customer dissatisfaction. In contrast, it is expected that inventory control will have significant and positive relationship with cost effectiveness because proper inventory control will reduce inventory related costs (carrying cost) and promote cost effectiveness. Past studies have indicated that effective inventory control ensures that cost incurred in inventories is minimal and promotes economy in purchase (Kumar & Suresh, 2008; Mwangangi, Guyo, & Arasa, 2015).

5.0 RESULTS AND DISCUSSION

The data obtained from the field were presented and analyzed with descriptive statistics to provide answers to the research questions while the corresponding hypotheses were tested with Simple linear regression and Pearson's Correlation and Linear regression at 0.05 alpha level.

5.1 INVENTORY SHRINKAGE AND CUSTOMERS SATISFACTION

The first specific objective of the study was to determine the effect of inventory shrinkage on customers' satisfaction. The results of the descriptive analysis are presented below:

Table 4.1: Descriptive Analysis of Inventory Shrinkage

Inventory Shrinkage	Rarely	Not Often	Seldo in Often	Slightly Often	Often	Very Often	Mean	Std. Dev.
Underproduction	143 22.3%	67 10.5%	55 8.6%	88 13.7%	55 8.6%	233 36.3%	3.85	2.009
Damaged inventory/stock	64 10.0%	164 25.6%	95 14.8%	52 8.1%	229 35.7%	37 5.8%	3.51	1.557
Excessive stocks	85 13.3%	94 14.7%	138 21.5%	157 24.5%	45 7.0%	122 19.0%	3.54	1.620
Stock out situations	146 22.8%	89 13.9%	67 10.5%	106 16.5%	154 24.0%	79 12.3%	3.42	1.764
Production Bottlenecks	101 15.8%	86 13.4%	94 14.7%	184 28.7%	95 14.8%	81 12.6%	3.51	1.588
Delays in delivery of raw materials	110 17.2%	132 20.6%	73 11.4%	148 23.1%	130 20.3%	48 7.5%	3.31	1.586
Stock outs of spare parts for machines	181 28.2%	108 16.8%	116 18.1%	62 9.7%	98 15.3%	76 11.9%	3.02	1.754
Expired inventory/stock	243 37.9%	118 18.4%	73 11.4%	76 11.9%	79 12.3%	52 8.1%	2.67	1.713
Average							3.35	1.698

3.35 | 1.698 Source: Field Survey Result, 2016

Table 4.1 presents results of descriptive analysis of respondents' opinions to the statements in the inventory shrinkage scale. According to the results of the analysis on Table 4.1, by combining responses under slightly often, often and very often, majority (58.6%) of the respondents indicated that underproduction often occurred in the companies; 55.4% supported that damaged inventory/stocks do not occur often in the companies; 52% believed that excessive stocks often occurred in the companies; 52.8% indicated that stock out situations often occur in the companies; 56.1% revealed that the companies often suffered production bottlenecks because of inventory shrinkage; while 56.1% avowed that there are delays sometimes in delivery of raw materials to the companies by the suppliers. However, 63.1% of the respondents asserted that stock outs of spare parts for machines did not happen in the companies at any time. Finally, 56.3% indicated that there have been little incidence of expired products. The average mean of the responses was 3.35 which means that majority of the respondents were not actually agreeing to the statements in the inventory shrinkage scale. However, the opinions were varied as shown by a standard deviation of 1.698. It is observable from the analysis in Table 4.1 that the incidence of inventory shrinkages did not usually occur in the selected flour mills companies.

Table 4.2: Descriptive Analysis of Customer Satisfaction

Customer Satisfaction	Do not Occur	Rarely	Occasionally	Often	Very Often	Most Often	Mean	Std. Dev.
Not completely happy with the supplier	44 6.9%	143 22.3%	122 19.0%	46 7.2%	21 3.3%	265 41.3%	4.02	1.842
Repeat purchase from the supplier	26 4.1%	16 2.5%	45 7.0%	86 13.4%	376 58.7%	92 14.4%	4.63	1.140
Bad experience with the supplier	35 5.5%	154 24.0%	186 29.0%	86 13.4%	42 6.6%	138 21.5%	3.56	1.575
Pleased with the supplier services	5 0.8%	5 0.8%	48 7.5%	204 31.8%	315 49.1%	64 10.0%	4.58	.857
Pleased with day to day dealings with the supplier (on time delivery)	10 1.6%	28 4.4%	51 8.0%	231 36.0%	235 36.7%	86 13.4%	4.42	1.059
General satisfaction with the supplier	9 1.4%	5 0.8%	63 9.8%	242 37.8%	261 40.7%	61 9.5%	4.44	.922
Average							4.28	1.232

Source: Field Survey Result, 2016

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Table 4.2 presents the descriptive analysis of respondents' opinions to the statements in the customers' satisfaction scale. By combining responses under slightly often, often and very often together, 51.8% of the respondents stated that they were not completely happy with the suppliers. A majority of 73.1% of the respondents indicated that they are satisfied with the repeat purchase from the supplier, 58.5% answered that the companies have never had bad experience with the supplier, 90.9% of the respondents indicated that they are often pleased with the supplier services, 86.1% affirmed that they are often pleased with day to day dealings with the supplier (on time delivery), while 88% declared that they have general satisfaction with the supplier. On a six point scale, the average mean of the responses was 4.28 which means that a majority of the respondents agreed with the statements in the customer satisfaction scale; however the answers were varied as indicated by a standard deviation of 1.232.

Hypothesis One (H₀₁): Inventory shrinkage has no significant effect on customers' satisfaction of the selected flour mills companies in Nigeria.

Table 4.3a: Summary of Simple Regression Analysis for Effect of Inventory Shrinkage on Customers' Satisfaction (N= 641)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	-.338 ^a	.114	.113	4.269
a. Predictors: (Constant), Inventory Shrinkage				

Table 4.3b:

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	22.054	.431		51.168	.000
	Inventory Shrinkage	-.134	.015	-.338	9.066	.000
F(1,640) = 82.196, p<0.05						

Source: Field Survey Result, 2016

Table 4.3 presents summary of results of regression analysis on the effect of inventory shrinkage on customers' satisfaction of flour mills companies in Nigeria. The

findings on Table 4.3 shows that inventory shrinkage has a significant negative effect on customers satisfaction ($\beta = -0.134$, $t = 9.066$, $p < 0.05$). The result shows that inventory shrinkage and customers' satisfaction moves in the opposite direction (that is, has inverse relationship). This finding is supported by F-statistic of 82.196 and p-value of 0.000 which is less than the adopted level of significance 0.05. The model R^2 (that is, goodness of fit for the regression between inventory shrinkage and customer satisfaction) was 0.114, which indicates that 11.4% of the variations in customer satisfaction are explained by inventory shrinkage. 88.6% variations of customer satisfaction cannot be explained by inventory shrinkage in this study necessitating interrogations through research on other variables influencing customer satisfaction in this industry. The p-value equals to 0.000 indicates that inventory shrinkage significantly affects customers' satisfaction of the selected flour mills companies in Nigeria. The null hypothesis which states that inventory shrinkage has no significant effect on customers' satisfaction of the selected flour mills companies in Nigeria is hereby rejected.

5.2 INVENTORY CONTROL AND COST EFFECTIVENESS

The first specific objective of the study was to examine the relationship between inventory control and the cost effectiveness of the selected flour mills companies in Nigeria. The results of the descriptive analysis are presented below.

Table 4.4: Descriptive Analysis of Inventory Control System

Inventory Control System	Very Low	Low	Fairly Low	Fairly High	Highly	Very Highly	Mean	Std. Dev.
ABC Classification	79 12.3%	35 5.5%	17 2.7%	177 27.6%	199 31.0%	134 20.9%	4.22	1.567
Economic Order Quantity (EOQ)	68 10.6%	11 1.7%	47 7.3%	169 26.4%	240 37.4%	106 16.5%	4.28	1.435
Economic Batch Quantity (EBQ)	68 10.6%	14 2.2%	39 6.1%	210 32.8%	212 33.1%	98 15.3%	4.21	1.415
Actions Level Methods	102 15.9%	18 2.8%	67 10.5%	169 26.4%	189 29.5%	96 15.0%	3.96	1.595
Just-in-Time	28 4.4%	39 6.1%	50 7.8%	140 21.8%	289 45.1%	95 14.8%	4.42	1.260
Periodic Review Technique	43 6.7%	56 8.7%	79 12.3%	169 26.4%	203 31.7%	91 14.2%	4.10	1.398
Materials Requirement Planning I	50 7.8%	20 3.1%	89 13.9%	149 23.2%	226 35.3%	107 16.7%	4.25	1.388
Average							4.21	1.436

Source: Field Survey Result, 2016

Table 4.4 presents results of descriptive analysis of opinions of respondents on inventory control system. By combining responses under fairly highly, highly and very highly together, 79.5% of the respondents reacted that the flour mills companies use ABC classification for inventory control; 80.3% declared that the companies use Economic Order Quantity (EOQ); 81.2% report that the flour mills companies use Economic Batch Quantity (EBQ); 70.9% revealed that the Companies are using actions level methods; 81.7% used Just-in-Time technique; 72.3% indicated Periodic Review Technique; and 72.5% used Materials Requirement Planning I. The results showed that Just-in-Time and Economic Order Quantity (EOQ) were major inventory control techniques used by the selected flour mills companies; on average, respondents rated them very high. These were followed by Materials Requirement Planning I (mean = 4.25, standard deviation = 1.388), ABC Classification (mean = 4.22, standard deviation = 1.567), Economic Batch Quantity (EBQ) (mean = 4.10, standard deviation = 1.415), Periodic Review Technique (mean = 4.21, standard deviation = 1.398) and Actions Level Methods (mean = 3.96, standard deviation = 1.595). The Actions Level Methods recorded the lowest mean score (Mean = 3.96, Std. Dev. = 1.595). The average mean of the responses was 4.21 which means that majority of the respondents agreed to the statements in the inventory control system scale. However, the answers were varied as shown by a standard deviation of 1.436.

Table 4.5: Descriptive Analysis of Cost Effectiveness

Cost Effectiveness	Very Low	Low	Fairly Low	Fairly High	High	Very High	Mean	Std. Dev.
Inventory running cost	30 4.7%	5 0.8%	103 16.1%	105 16.4%	178 27.8%	220 34.3%	4.65	1.359
Total ordering cost	163 25.4%	268 41.8%	105 16.4%	10 1.6%	15 2.3%	80 12.5%	4.53	1.075
Total storage and holding costs	307 47.9%	108 16.8%	101 15.8%	20 3.1%	8 1.2%	97 15.1%	4.21	1.112
Cost of stock out	151 23.6%	216 33.7%	79 12.3%	23 3.6%	54 8.4%	118 18.4%	4.12	1.289
Overall production cost	271 42.3%	162 23.5%	93 14.5%	13 2.0%	22 3.4%	80 12.5%	4.38	1.145
Average							4.37	1.196

Source: Field Survey Result, 2016

Table 4.5 explains the opinions of respondents on the various issues concerning cost effectiveness. By combining responses under fairly highly, highly and very highly together, the

table reveals that inventory running cost is very high with 72.5% (very low and low combined together) respondents, 83.6% agreed that total ordering costs of the flour mills companies are very low, 80.5% of the respondents agreed that total storage and holding costs are very low, and 69.6% agreed that cost of stock out is low. The respondents' assertion as to overall production cost attest to the fact that overall production costs of the selected flour mills companies are very low as a results of effective control practice. 80.3% of the respondents attested this. The average mean of the responses was 4.37, which implies that majority of the respondents were agreeing to the statements in the cost efficiency scale. However, the answers were varied as shown by a standard deviation of 1.196.

Hypothesis Two (H_{02}): There is no significant relationship between inventory control and the cost effectiveness of the selected flour mills companies in Nigeria.

The hypothesis was tested using tested using the Pearson's product-moment correlation coefficient analysis. The data for inventory control and cost efficiency were created by summing responses of all items for each of the variable. The findings are presented in Table 4.6.

Table 4.6: Summary of Pearson Product-Moment Correlation Coefficient Analysis between Inventory Control System and Cost Effectiveness

		Inventory Control System	Cost Efficiency
Inventory Control System	Pearson Correlation	1	.775*
	Sig. (2-tailed)		.000
	N	641	641
Cost Efficiency	Pearson Correlation	.775*	1
	Sig. (2-tailed)	.000	
	N	641	641

Source: Field Survey Result, 2016

Table 4.6 presents result of Pearson product-moment correlation coefficient analysis on the relationship between inventory control system and cost effectiveness. The results show that the relationship between inventory control system and cost effectiveness is strong and positive ($r = 0.775, p < .05$). This relationship was significant at $p = 0.000$ which is less than the level of significance 0.05 adopted for the study. As the value of inventory control system increases, so does the value of cost effectiveness. The result is consistent with the apriori expectation of positive relationship between the variables. Based on this result, the null hypothesis which states that there is no significant relationship between inventory control and the cost effectiveness of the selected flour mills companies in Nigeria is hereby rejected.

5.3 DISCUSSION OF FINDINGS

The findings of hypothesis one indicated that inventory shrinkage had negative and significant effect on customers' satisfaction. This finding agrees with the empirical research done by Ogbo and Onekanma (2014) that having inventory in store has an added advantage for the organization since customers will be satisfied instantly leading to improved performance rating. The finding also conforms to the study done by Mazanai (2012) who expressed that stock shortages are a headache for most organizations and it leads to customer's dissatisfaction which eventually leads to low performance of a firm. The results is consistent with that of Afande (2015) which found that running out of stock is risky for production and marketing consequences in shortage cost. Gavan (2000) study to explore 'consumer response to stock out' confirm the findings of this study that consumers respond to stock outs by changing their evaluations of satisfaction with the decision process and by changing their store-switching behaviour, but not by changing their satisfaction with the consumption of the product ultimately selected. Further, the result of this hypothesis supports the finding of (Bowersox, Closs, & Cooper, 2010; Kwadwo, 2016; Ogonu, Ikegwuru, & Nwokah, 2016; Nsikan, *et al.*, 2015; Nwangangi, Guyo, & Arasa, 2015) that lean inventory management system emerged as the most significant positive impact on customer satisfaction. Cacioappo (2000) indicated that dissatisfied customers have the tendency to tell nine others while customers who are satisfied have the tendency to tell five other people about company's products and services and the way there were handled. Eckert (2007) claimed that a well-managed system of inventory has a direct linkage to customer satisfaction. Widing (2003) affirms that customers derives more satisfaction when suppliers are able to respond and fulfill their orders in a given time period. This desire to satisfy the customer enables the supply chain member to accumulate buffers stocks. According to Mehfooz and Muhammad (2012), inventory management helps firms to maintain customer satisfaction when it comes to product returns because they maintain extra inventory levels that mirror their return rates to help maintain customer satisfaction. A well-designed inventory management system, you are able to reduce the amount of time that products sit on your shelves.

The hypothesis two sought to establish the relationship between inventory control system and cost effectiveness. The finding of this study is in consonance with the findings of Enemuo and Uwazuruike (2012), Farzaneh (2012), Odiri (2015), and Takim (2014), who found that effective optimization of inventory control models such as economic order quantity (EOQ) and Just in Time (JIT) can eliminate the storage, capital, insurance, ordering and transportation costs, thereby improves cost minimization. The finding also corroborated the finding of Ogbo, *et al.* (2014) that there is a relationship between operational feasibility, utility of inventory control management in the customer related issues of the organization and cost effectiveness technique are implemented to enhance the return on investment in the organization. The study reveals that Just-in-Time and Economic

Order Quantity (EOQ) were the commonly used inventory control practice in the companies. However, the use of EOQ model, Reorder Point, Seasonal and Annual trend forecasting methods, Kaizen costing and work study are predominantly in manufacturing companies generally. Also, the finding is supported by the Theory of Constraints. Theory of Constraints measurements are based on a simple relationship that highlights the effect of inventory control system on progress toward the operational performance. The proof of effectiveness for any inventory control system is the degree to which it improves operational performance of business firms. For flour mills companies to ensure that the bottlenecks on their operations run smoothly they have to embrace the use of inventory control systems that can facilitate operational efficiency. Boyd and Gupta (2004) in their studies introduced a theoretical model for Theory of Constraints on Manufacturing Resource Planning and Just-In-Time in manufacturing firms, they suggest that a positive relationship between each of the three Constraints principles and ideas can be used to improve operational performance of flour mills companies in Nigeria.

6.0 CONCLUSION AND RECOMMENDATIONS

The objective of this study was to analyze the effect of inventory management practices on the operational performance of flour mill companies in Nigeria. The study provides an overview of emerging inventory control techniques in flour mills companies in Nigeria for the benefits of inventory managers, procurement managers, store supervisors and accountants. The study hypothesized that inventory shrinkage has no significant effect on customers' satisfaction of the selected flour mills companies in Nigeria, and there is no significant relationship between inventory control and the cost effectiveness of the selected flour mills companies in Nigeria. To test the hypotheses, linear regression analysis, and Pearson product moment correlation were conducted. The findings revealed inventory shrinkage has negative effect on customer satisfaction. In other words, inventory shrinkage leads to customers' dissatisfaction. Also, there is a significant positive relationship between inventory control and the cost effectiveness of flour mills companies in Nigeria. The study concluded that inventory management practices is essential in the operations of flour mills companies and any other business. Proper inventory management and control systems are associated with low storage costs, cost-reduction, stock-out reduction, and timely delivery of requisite goods, products, materials and services to customers, thereby enhancing customer satisfaction and cost effectiveness. Cost reduction helps in preparing employees towards managing the inventory ideology and equips organization with sufficient resources and that inventory cost reduction helps in achieving profitability objective.

Based on the empirical findings of this study, the study recommended that flour mills companies in Nigeria should ensure that stocks are sufficient to meet production requirements and customer demands at all times, and the same time avoiding holding unnecessary surplus stocks that may increase holding costs and enhanced customer

satisfaction. Furthermore, flour mills companies in Nigeria should adopt more modern sophisticated techniques such as the Just-In-Time systems, Economic Order Quantity model, and so on in their operations to ensure control of inventory so as to obtain cost efficiency and effectiveness. The flour mills companies should also minimize the cost of production (which includes materials, labour and service costs) to attain their optimum performance level. The study further recommended that top management should emphasize on the proper inventory management techniques and measuring of efficiency of efficiency deviations to identify weakness in the process of managing inventories.

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