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INVENTORY MANAGEMENT AND PROFITABILITY OF MANUFACTURING FIRMS IN NIGERIA

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ABSTRACT

The study broadly investigated the impact of inventory cost management on the profitability of manufacturing firms in Nigeria. Specifically, the study examined the impact of inventory cost of raw materials on profit after tax, impact of inventory cost of finished goods on profit after tax, and impact of inventory cost work in progress on profit after tax of selected manufacturing firms in Nigeria. The study made use of secondary data sourced from the annual report of sampled firms.Data collated were analyzed using both descriptive and inferential statistical method of analyses. It was discovered in the study that raw materials exert insignificant positive impact on profit after tax(β= 7.912884, P=0.354), that finished goods exert significant positive impact on profit after tax (β=34.81571, P-0.000), also that work in progress exert insignificant negative impact on profit after tax (β=-24.62591, P=0.506). Based on the results, the study thus concluded that the connection between inventory cost and profitability of manufacturing firms varies depending on the subset of inventory cost focused on, which much significant accorded to the dominance of finished goods inventory. Premise on the findings and conclusions, the study thus recommended that inventory cost should carefully managed by management of manufacturing firms, management of manufacturing firms should organize stock taking practice at intervals to reduce the possibility of excessive inventory cost that can erode the profitability of the firm, also manufacturing firms should further strive to automate the inventory management procedures, harnessing the power of technological advancement so as to increase the effectiveness and efficiency of maintaining the appropriated inventory needed to fast track better operation and financial performance..

Keywords: I*nventory Management, Performance, Manufacturing Companies, Nigeria*

INTRODUCTION

Inventory management has become an important issue in most manufacturing companies in developing countries like Nigeria. Effective inventory flow in supply chains is one of the key factors that bring about business success (Kotler, 2002).The challenge faced by most manufacturing companies in managing inventory is balancing the supply of inventory with demand. There is need for controlling the inventories for any firm in Nigeria. A firm must install some set of inventory techniques to improve and also to balance their financial condition(Ogbadu, 2009). According to (Murtala & Sani,2016*)* inventory management is the technique of managing, controlling and developing the inventory levels at different stages i.e. raw materials, semi-finished goods and finished goods so that there is regular supply of resources at minimum costs. According to Coyle (2012), inventory management is the management of the materials in motion and at rest. According to Chinwuko, Nwakoby&Asowo (2016) the inventory management costs are the price which is paid by the customer but it is the cost to the owner. Inventory Management according to Stevenson (2010) is a terminology adopted by a firm to take charge of her investment in inventory. It comprises the recording and monitoring of the level of stocks, forecasting of future demand and a decision on when and how order could be executed (Adeyemi and Salami, 2010).

Inventory management is the supervision of supply, storage and accessibility of items in order to ensure an adequate supply without excessive oversupply (Chinwuko, Nwakoby&Asowo, 2016). Balancing the conflicting economics of not ready to hold too much stock, the tendency of incurring costs such as storage, spoilage, pilferage and obsolescence and, the desire to make items or goods available when and where required (quality and quantity wise) so as to avert the cost of not meeting such requirement is the focus of inventory management (Adeyemi & Salami, 2010). Inventory cost management is one of the principal strategies used by companies to ensure efficiency and optimality. The role of inventory cost management cannot be overemphasized in the discourse of improving organizational performance of a companies, this is because inability to manage the inventory could dampen the performance prospect of an organization. Efficient inventory cost is vital for the successful functioning of manufacturing andretailing organizations. Inventory consist of raw materials, work in progress, spare parts orconsumables, goods in transit and finished goods. It is not necessary that an organization willhave all these

inventory classes, but whatever may be the inventory items, they need efficient management as substantial share of the company's funds are invested in inventory.

Quite a number of investigation conducted in recent time to delineate the connection between inventory cost and performance of firms, for example Prempeh, (2015) analyzed the impact of efficient inventory management on profitability: Evidence fromselected manufacturing firms in Ghana using regression analysis, Ebenezer & Asiedu, (2013) studied the relationship between working capital management andprofitability of listed manufacturing companies in Ghana using correlation analysis, Sitienei &Memba(2015) examined the effect of inventory management on profitability of cementmanufacturing companies in Kenya: A case study of listed cement manufacturing companies in Kenya, using both descriptive and inferential statistical methods, Okwo&Ugwunta, (2012) examined the impact of firm's input costs on firm profitability: Evaluation of theNigerian brewery industry using regression analysis, Abdulraheem, Yahaya, Isiaka & Aliu, (2011) studied inventory management in smallbusiness finance: Empirical evidence from Kwara State, using descriptive methods of analysis, Etale, &Bingilar, (2016) investigated the effect of Inventory Cost Management on Profitability: A Study of Listed Brewery Companies in Nigeria using ANOVA regression.Observably these studies could not harness the potency of panel data analysis, as they could not track the heterogeneity effect that exist amidst sampled firms. Moreso none of the previous studies sampled sizable number of manufacturing companies covering a wide range of period. Hence this study intent to analysis the impact of inventory cost management on profitability of 5selected manufacturing companies in Nigeria over a period of 5 years. The study specifically analyzed:

(i) the effect of raw materials on profit after tax of manufacturing companies in Nigeria

(ii) the influence of finished goods on profit after tax of manufacturing companies in Nigeria

(iii)the impact work in progress on profit after tax of manufacturing companies in Nigeria

Conceptual Review:

Inventory Management:

According to Coyle (2012), inventory management is the management of the materials in motion and at rest. According to Rosenblatt (2014), the inventory management costs are the price which is paid by the customer but it is the cost to the owner. Inventory Management according to Stevenson (2010) is a terminology adopted by a firm to take charge of her investment in inventory. It comprises the recording and monitoring of the level of stocks, forecasting of future demand and a decision on when and how order could be executed (Adeyemi and Salami, 2010). Inventory management has become an important issue in most manufacturing companies in developing countries like Nigeria. Effective inventory flow of management in supply chains is one of the key factors that bring about their success. The challenge faced by most manufacturing companies in managing inventory is balancing the supply of inventory with demand. There is need for controlling the inventories for any firm in Nigeria. According to Kotler (2002), inventory management is the technique of managing, controlling and developing the inventory levels at different stages i.e. raw materials, semi-finished goods and finished goods so that there is regular supply of resources at minimum costs. According to Coyle (2012), inventory management is the management of the materials in motion and at rest. According to Rosenblatt (2014), the inventory management costs are the price which is paid by the customer but it is the cost to the owner. Inventory Management according to Stevenson (2010) is a terminology adopted by a firm to take charge of her investment in inventory. It comprises the recording and monitoring of the level of stocks, forecasting of future demand and a decision on when and how order could be executed (Adeyemi and Salami, 2010).

Inventory refers to the goods and materials that an organization, company, or business holds to support production, support activities and for sale or customer service. Inventory management is the supervision of supply, storage and accessibility of items in order to ensure an adequate supply without excessive oversupply. The principal goal of inventory management involves having to balance the conflicting economics of not ready to hold too much stock. Thereby having to tie up capital so as to guide against the incurring of costs such as storage, spoilage, pilferage and obsolescence and, the desire to make items or

goods available when and where required (quality and quantity wise) so as to avert the cost of not meeting such requirement (Adeyemi& Salami, 2012). Effective inventory management can make a significant contribution to a business profit as well as increase its return on total assets. It is thus the management of this economics of stockholding, that is appropriately being refers to as inventory management. The reason for greater attention to inventory management is that this figure, for many firms, is the largest item appearing on the asset side of the balance sheet. Essentially, inventory management, within the context of the foregoing features involves planning and control (Chinwuko, Nwakoby&Asowo, 2016)

Inventory Recording:

Accurate and up-to- date store record is the key to effective inventory management. The basic procedures include counting and recording promptly after receipt or production and whenever there is a store transaction, issue of stores should be properly authorized and show details such as code number, quantity of the transaction and the voucher reference. It is undertaken by organizations to reduce the errors of stock management and to ensure accurate and reliable stock records. It involves spot checks/ surprise checks, stock taking, which is the physical counting and measuring of quantity of each item in stock and recording the results. Checking Receipts - Receipts into store are normally checked (or either by weighing, counting or measuring). If this is done properly, it provides a good foundation for all subsequent operation by ensuring, that the quantities are correct in the first instances. Checking /Issues - It should be a matter of routine for the store house staff to check the quantities and descriptions of all issues made before they are handed over. It is also common practice to expect the recipient to counter-check the quantity received and to sign for it. This provides a reasonable assurance that quantities taken off stores are correct. Spot checking - Spot-checking is the practice of making random checks of some items at irregular and unspecified intervals. It is often done by senior stores officers in course of their supervisory duties, but can also operate in paralleled with the stocktaking programmed, irrespective of whether the periodic or continuous method is in use. Where the main stocktaking is carried out annually on a periodic basis, spot-checking throughout the year is the best safe guard against malpractice during the period between stocktakingsABC

Analysis- This has already been covered before, but is also regarded as a material control tool.

Inventory Valuation:

It is also a stock control technique, which refers to the establishment of the value of stock and therefore its implication on the profits. Lacey (2005) identified the following methods of stock valuation; First in First out (FIFO), Last in First out LIFO) and the average price method. First in First out (FIFO***)*** is a method whereby prices of goods are determined by depending on the oldest stock until all the units are finished and then the second oldest is used to determine the prices and the trend continues. FIFO method follows the principle that materials received first are issued first. After the first lot or batch of materials purchased is exhausted, the next lot is taken up for supply. The inventory is priced at the earliest costs. This means that the unused raw materials (closing stock) are constituted by the goods, which were not recently purchased. Physical Inventory Counts -The inventory value should be provided to UIS Accounting Office within one week after the fiscal year end. Adjustments to correct discrepancies must be adequately documented by management

Firm's Profitability:

Profitability is a concept that explains the ability to make profit from all the business activities of an organization. It reflects the level of efficiency of an organization in using the available resources to achieve the predetermined profit goal. Ultimately profitability stands as the primary aim of any business venture, without which survival on the long run could be a mirage. Profitability as a concept is made out of two terms namely: profit and ability. While the word profit connotes return of a set of activities making use of the available resources, ability connotes the power of an enterprise to earn profit or performance capability of an organization. Profitability is the surplus from business activities after deducting the expenses from revenue. Much difficulty and confusion comes home while interpreting the absolute figures of profit in case of historical or inter-firm comparisons due to variation in the size of investment or volume of sales etc. Such problems are handled by relating figures of profit either with the volume of sales or with the level of investment. A quantitative relationship is thereof established either in the form of ratios or percentages.

Such ratios are names as profitability ratios. Thus, profitability may be regarded as a relative term measurable in terms of profit and its relation with other elements that can directly influence the profit. Profitability stands as an index of efficiency of a company and is often time regarded as management guide to greater efficiency. The net profit figure of a company reveals the balance between values receive and value given. Sometimes, the terms 'Profit' and 'Profitability' are used interchangeably. Butin real sense, there is a difference between the two. Profit is an absolute term,whereas, the profitability is a relative concept. However, they are closely related and mutually interdependent, having distinct roles in business.Profit refers to the total income earned by the enterprise during the specifiedperiod of time, while profitability refers to the operating efficiency of theenterprise. It is the ability of the enterprise to make profit on sales. It is theability of enterprise to get sufficient return on the capital and employees usedin the business operation.

Empirical Review:

Mohamad, Suraidi, Rahman and Suhaimi (2016) in a case study of a textile chain storein Malaysia, examined the relation between inventory management and company performance and found that there inventory days was significantly related to return on assets (used proxy for company performance). The study identified that the textile chain store company had unorganized inventory arrangement, large amount of inventory days and lacked accurate stores balances due to unskilled workers. Victoire (2015) investigated the impact of inventory management on profitability in Rwanda using a manufacturing company as case study. The findings indicate that inventory management had significant impact on the company's financial performance. Prempeh (2015) studied the impact of efficient inventory management on the profitabilityof manufacturing firms in Ghana, using raw material inventory management and profit as variables. Cross sectional data from the annual reports of four manufacturing firms listed on the Ghana Stock Exchange were analyzed using Ordinary Least Squares (OLS) and multipleregression techniques. The study found a significantly strong and positive relationship between raw material inventory management and profitability.

In a related study, Sitienei and Memba (2015) using similar analysis techniquesexamined the effect of inventory management on the profitability of cement manufacturing companies in Kenya. Findings revealed that inventory turnover, inventory conversion period, and inventory storage costs were negatively related to profitability. Also in Kenya Budambula (2014) in a case study of a tea trading company examined the effect of working capital management on profitability. The study adopted profitability as the dependent variable, and inventory, debtors, creditors and overdraft management practices were the independent variables. The study found that inventory was the third independent variable that had significant effect on profitability. Using a case study of a dairy company in Kenya, Keitany, Wanyoike and Richu (2014) examined the effect of raw materials management on performance. Employingdescriptive statistical tools as method of data analysis, the study found materials management influenced increased organizational performance.

Ogbadu (2009) carried out a study to determine the impact of effective management of materials on profitability of the Benue Breweries Limited. The study made use of survey method for data collection and random sampling technique for sample size determination. Research questions were analyzed using simple percentages. The hypotheses were tested using Ch-square test statistics. The result confirms a significant relationship between materials management and profitability.

Nagib (2016) examined the effects of inventory management on business performance of electronic companies using Mogadishu as a case study. Questionnaire was used as instruments to collect data to measure the variables and the characteristics. Based on the findings of this study, the following conclusions were drawn. The results reveal that inventory planning, inventory recording and profitability have significant and positive effects on organizational performance in the Electronic business in bakara market mogadishusomalia. Stepwise regressions revealed that inventory determinants of profitability including planning and evaluation explained statistically significant portion of the variance associated with the extent of profitability of the Electronic business in bakara market Mogadishu Somalia

Edwin and Florence (2015) The Effect of Inventory Management on Profitability of Cement Manufacturing Companies in Kenya: A Case Study of Listed Cement Manufacturing

Companies in Kenya. A cross-sectional data from 1999 to 2014 was gathered for the analysis of the annual reports for the three sampled firms listed at Nairobi Securities Exchange (NSE). The ordinary least squares (OLS) stated in the form of multiple regression models was applied in the data analysis to establish the relationship between inventory management and firm's profitability. The variables used include inventory turnover, inventory conversion period, Inventory levels, storage cost, size of firm, gross profit margin, Return on assets and growth of the firm. The results provide a negative relationship between inventory turnover, inventory conversion period and storage cost with the profitability of the company. In addition, inventory level was found to be directly related to firm's size and storage cost.

Adeyemi and Salami (2010) carried out a study to determine whether inventory management is a tool of optimizing resources in Manufacturing Industry, using Coca-Cola Bottling Company, Ilorin Plant as a study area. The tools used in analysis of the data collected were variance analysis, Economic order quantity model and the Chi-square method. The result confirms that there is significant positive relationship between inventory management and survival of manufacturing organization. In a similar study

Ogbo, Onekanma and Wilfred (2014) carried out a study on the effect of the effective system of inventory management on organization performance in the seven-up bottling company, Nile Mile Enugu. A total of eighty-three respondent constitute the sample for the study. Four research questions and Four hypotheses were generated and tested at 10% (that is 0.10) significant level using descriptive statistics and a non-parametric test (chi-square that is, X^2). The result of the analysis showed that flexibility in inventory control management is an important approach to achieving organizational performance.

Methodology

This study covered manufacturing firms quoted on Nigeria stock exchange. five firms sampled in the study included Guinness Nigeria Plc,ChellaramsPlc, PZ CussonPlc, Nigerian Breweries Plc, and AG LeventisPlc covering a period of five years (2011 to 2015)**.** The study measured profitability using profit after tax, while explanatory variables used to measure inventory cost include raw materials, finished goods and work in progress. Hence model estimated in the study is presented in functional and linear forms below:

$$PAT = f(RM, FG, WIP, U)$$

The model can as well be specified in linear form as:

$$PAT_{it} = \alpha_0 + \alpha_1 RM_{it} + \alpha_2 FG_{it} + \alpha_3 WIP_{it} + \varepsilon_{it}$$

Where:

PAT=Profit after Tax

RM=Raw material

FG=Finished Goods

WIP=Work in progress

U=Stochastic error term

i = cross-sectional variable from 1,2, 3,…… 5

t = time series variable form 1, 2, 3, …… 5

α_0, α_1, α_2, α_3 are parameter estimates corresponding to the explanatory variable and the constant term, μ_i is the cross sectional unit effect, while ε_{it} is the idiosyncratic error term

Sources of Data and Method of Analysis

Data used in the study were sourced from the annual reports of the selected manufacturing companies over the period covered in the study 2011 to 2015**.** The study employed both descriptive and inferential statistical analyses. The Descriptive analysis shows measure of central location and measure of dispersion, normality status, skewness, kurtosis of all the variables included in the model of the study. However panel estimations including pooled OLS estimation, fixed effect estimation and random effect estimations, alongside restricted F-test and Hausman post-estimation test will be conducted in the study

Data Analysis and Interpretation:

Table 1:*Correlation Matrix*

	PAT	RM	FG	WIP
PAT	1.0000			
RM	-0.0949	1.0000		
FG	0.1204	0.4394	1.0000	
WIP	0.2807	0.1248	0.7810	1.0000

Sources: *Author's Computation, (2018)*

Table 1 reported correlation between variables used in the study. From the table it can be observed that there is negative correlation between profit after tax and raw material with very weakcorrelation coefficient of -0.0949, while correlation between finished goods, work

in progress and profit after tax is positive with reported coefficient of 0.1204 for PAT and FG, and 0.2807 for PAT and WIP reflecting that there is also weak correlation between finished goods, work in progress and profit after tax of the sampled manufacturing firms. Result showed that there is positive correlation between other pairs of variables with specific correlation coefficient of0.4394 for raw materials and finished goods, 0.1248 for raw materials and work in progress, 0.7810 for finished goods and work in progress. Observably resultreflects that the positive correlation between finished goods and work in progress is relatively stronger that correlation between other pairs of variables.

Models Estimation Results

This section presents analysis of the impact of changes in inventory level of raw material, finished goods and work-in-progress on the profitability of manufacturing company measured in terms of profit after tax. presentation of result entails pooled OLS estimation result, fixed effect estimation, and random effect estimation. Estimation results are presented in tables below and interpreted accordingly.

Table 2: *Pooled OLS Parameter Estimates*
Series: *PAT RM FG WIP*

Variable	Coefficient	Standard Error	T-Test Values	Probability
C	111806.7	132748.9	0.84	0.409
RM	-5.186834	20.4493	-0.25	0.802
FG	63.25118	25.30047	2.50	0.002
WIP	64.05363	51.81946	1.24	0.230

R-square=0.6066
Adjusted R-square=0.5811
F-statistics=10.83
Prob(F-stat)=0.0097

Pooled OLS panel estimation presented in table 2 reported coefficient estimate of -5.186834, 63.25118, 64.05363 for raw materials, finished goods and work in progress respectively with corresponding probability values of 0.802, 0.002, and 0.230. The result showed that raw material cost exert negative insignificant impact on profit after tax of the sampled manufacturing firms, finished goods exerts significant positive impact on profit after tax, and the impact of work in progress on profit after tax is positive and significant. R-square value reported in table 2 revealed that about 61% of the systematic variation in the profitability of the selected manufacturing firms measured in terms of profit after tax can be

explained by raw materials inventory cost, finished goods inventory cost and work-in-progress cost. Reported f-statistics of 10.83 and the probability value of 0.0097 validate the fact that all the included explanatory variables jointly and significantly influence the profitability of manufacturing firms sampled in the study.

Table 3: *Fixed Effects Estimates (Cross Sectional and Period Specific)*

CROSS-SECTIONAL SPECIFIC EFFECT			**TIME SPECIFIC EFFECT**		
Variables	**Coefficients**	**Prob**	**Variables**	**Coefficients**	**Prob**
C	50.10278	0.999	C	214095.4	0.235
RM	7.912884	0.354	RM	-27.88186	0.351
FG	34.81571	0.000	FG	-12.9064	0.640
WIP	-24.62591	0.506	WIP	63.83469	0.265
Effects			**Effects**		
CHELLARAMS	-74333.8	0.095	2012	82628.89	0.338
PZ CUSSON	-49392.52	0.120	2013	45502.41	0.557
NIG BREWERIES	218453.9	0.000	2014	109977.7	0.286
AG LEVENTIS	-59703.74	0.198	2015	115439.1	0.227
R-square=0.9085 Adjusted R-square=0.8709 F-statistics=24.12 Prob(F-stat)=0.0000			R-square=0.7890 Adjusted R-square=0.7649 F-statistics=20.57 Prob(F-stat)=0.0034		

Sources: *Author's Computation, (2018)*

Table 3: presents results of the fixed effect estimation (cross-sectional and period specific effect). Notably result presented in table 3 showed that when cross sectional effect is incorporated into the model the impact of raw material on profit after tax is positive but no significant, impact of finished goods remain positive and significant while work in progress exert negative insignificant impact on profit after tax. On the other when period specific effect was incorporated into the model, both raw material and finished goods exert negative insignificant impact on profit after tax, while impact of work in progress is negative and insignificant.

Deviation intercept terms reported in table 3 stood at-74333.8(p=0.095), -49392.52 (p=0.120), 218453.9(p=0.000), -59703.74(p=0.198) for ChellaramsPlc, PZ CussonPlc, Nigerian Breweries Plc, and AG LeventisPlc respectively, with the intercept term of the reference firm being Guinness Plc recorded to be 50.10278(p=0.999). Deviation intercept terms for period effects stood at:82628.89 (p=0.338), 45502.41(p=0.557), 109977.7(p=0.286),

115439.1(p=0.227) for 2012, 2013, 2014, and 2015 respectively, with intercept term of the reference years being 2001 recorded to be214095.4(p=0.235).Reported R-square values stood at0.9085 for cross section specific estimation and 0.7890for period specific estimation, reflecting that about 91% of the systematic variation in profit after tax can be explained by raw materials, finished goods and work in progress when heterogeneity effect across firms is incorporated into the model, while 79% of the systematic variation can be explained when period heterogeneity effect is incorporated into the model.

Table 4:*Random Effect Estimation*
Series: *PAT RM FG WIP*

Variable	Coefficient	Standard Error	Z-Test Values	Probability
C	974.7714	81741.59	0.01	0.990
RM	8.011223	8.399025	0.95	0.340
FG	33.948196	11.95359	2.84	0.003
WIP	-15.30534	34.70542	-0.44	0.659

R-square=0.5135
Wald chi2(5)=33.89
Prob> chi2 =0.0094

Table 4 presents the random effect estimates. Result showed that the impact of raw materials on profit after tax is positive and insignificant when heterogeneity effect is incorporated into the error term of the model. Finished goods exert significant positive impact on profit after tax, while impact of work in progress on profit after tax when heterogeneity is incorporated into the error term is negative and insignificant. Specifically coefficient estimates reported for raw materials, finished goods and work in progress stood at 8.011223, 33.948196, and -15.30534 with probability values of 0.340, 0.003, and 0.659 respectively. R-squarestatistics reported in table 4 stood at about 0.5135which connote that about 51% of the systematic variation in profit after taxof manufacturing company sampled in the study can be explained jointly by variation in inventory cost of raw materials, finished goods and work-in-progress respectively incorporating heterogeneity effect across firms over time into the error term.

Post Estimation Test

Table 5:*Restricted F Test of Heterogeneity (Cross-Sectional and Time Specific)*

	F-statistics	**Probability**
Cross sectional	37.26	0.0000
Time specific	0.43	0.7837

Source: *Author's Computation, (2018)*

Table 5 reveals result of the heterogeneity test conducted with respects to both cross-sectional and period specific effect. Reported in table 5 are f-statistics values of 37.26 and 0.43 with probability values of 0.0000, and 0.7837 for cross sectional and period specific effect respectively. Hence the table revealed that there is enough evidence to reject the null hypothesis that all differential intercept corresponding to the cross sectional specific units are equal to zero, but otherwise for the period specific intercepts. Therefore it can be concluded that there is only cross sectional heterogeneity/uniqueness effect among the selected manufacturing companies. Thus pooled OLS estimator restriction is not valid as cross-sectional heterogeneity effect is too significant to be ignored.

Table 6:*Hausman Test*

Null hypothesis	**Chi-square stat**	**Probability**
Difference in coefficient not systematic	123.57	0.0203

Source: *Author's Computation, (2018)*

Table 6 reveals a chi-square value of 123.57alongside a probability value of 0.0203. The result shows that there is enough evidence to reject the null hypothesis that differences in coefficients of fixed effect estimator and random effect estimation is not systematic. Therefore given the fact the difference between fixed effect estimates and random effect estimates is significant, the most consistent and efficient estimation for the investigation conducted in the study is the fixed effect cross section estimate presented in table 6 above.

Discussion of Findings

In the quest to analyze the impact of inventory cost on the profitability of manufacturing firms, the study conducted estimations such as pooled OLS, fixed effect cross and random effect estimation, and validated the estimators for consistency and efficient using restricted f-test and hausman test. It was observed that the most consistent and efficient estimation is the fixed effect cross sectional specific estimation result presented in table 3. Overview of the result showed that raw material exert insignificant positive impact on profit after tax with coefficient estimate7.912884($p=0.354> 0.05$). This result revealed that increase in the raw materials inventory cost of manufacturing firms will culminate into increase in profit

after tax. In specific term a million increase in raw materials inventory cost will culminate into about 7.912884 million increase in profit after tax. This result reflects that increase in raw material inventory has the capacity to spur the profit after tax of manufacturing firms in Nigeria. It was discovered in the study that finished goods has significant positive impact on profit after tax of, given coefficient estimate of 34.81571(p=0.000). The study established that increased finished goods inventory will culminate into significant increase in the profit after of manufacturing firms in Nigeria.

Result revealed that work in progress exert negative insignificant impact on profit after tax, with coefficient estimate of-24.62591 (p=0.506) reflecting that profit after tax tends to decline by about 24 million for every million increase in work in progress inventory. Notably the decline is considered to be statistically insignificant meaning work in progress cannot be considered to significantly erode profitability prospect of manufacturing firms in the country. In summary the study established that inventory cost will engender positive impact on profit after tax when such cost increases due to increase in the finished goods and raw material, while increase in inventory cost will post negative influence on profit after tax of manufacturing firm in Nigeria when its due to increase in the level of work in progress inventory. The result underscore that increasing inventory cost via increase in the levelof finished tends to significantly spur the profitability of manufacturing firms in Nigeria

Conclusion and Recommendations

Investigation conducted in the study to ascertain the effect of inventory cost on profitability of manufacturing firms in the country, using panel based estimation techniques established that inventory cost influences profitability of firms depending on the dominating component of the firms inventory be it raw material, finish goods or work in progress with the observed positive influence of raw materials and finished goods on profitability as against the negative impact of work in progress. The result showed that among the components of inventory captured in the study, only finished goods exert significant impact on the profitability of manufacturing firms in the country. Hence this study conclude that the connection between inventory cost and profitability of manufacturing firms varies depending on the subset of inventory cost focused on, with much significant accorded to the dominance of finished goods inventory. There Inventory cost should carefully managed

by management of manufacturing firms to set the tone of its influence on the prospect of improved profitability.There is need for management of manufacturing firms to organize stock taking practice at intervals to reduce the possibility of excessive inventory cost that can erode the profitability of the firm. Manufacturing firms should further strive to automate the inventory management procedure, harnessing the power of technological advancement so as to increase their operational effectiveness and efficiency

REFERENCES

Abdulraheem, A., Yahaya, K. A., Isiaka, S. B. and Aliu, O. A. (20011). Inventory management in smallbusiness finance: Empirical evidence from Kwara State, Nigeria *British Journal of Economics, Financeand Management Sciences*,2(1) 49 – 57

Adeyemi, S. L. and Salami A.O (2010). Inventory Management: A Tool of Optimizing Resources in a Manufacturing Industry: A Case Study of Coca-Cola Bottling Company, Ilorin Plant. International Journal of Business, Humanities and Technology; 3(5): 75-85

Budambula, V. T. (2014) Effects of working capital management on profitability of tea trading companies– A case of Chai Trading Company Limited, *Research Journal of Finance and Accounting*5(7) 86 – 93

Chinwuko, E.C, Nwakoby J.O & Asowo C.S (2016). Evaluation and Optimization of Inventory Control Systems in Small and Medium Scale Industries.*International Journal of Modern Studies in Mechanical Engineering,* 2(1), 1-13

Coyle A.O. (2012). It's Impact on Government Developmental Effort (A Study of Selected Local Council in Kogi East Senatorial District). *Global Journal of Management and Business Research Administration and Management*, 13(4), 12-26

Ebenezer, A. B. and Asiedu, M. K. (2013). The relationship between working capital management andprofitability of listed manufacturing companies in Ghana, *International Journal of Business and SocialResearch,*3(2), 25 – 34

Edwin S and Florence M (2015) The Effect Of Inventory Management On Profitability Of Cement Manufacturing Companies In Kenya: A Case Study Of Listed Cement Manufacturing Companies In Kenya, International Journal Of Management And Commerce Innovations 3(2) 111-119

Etale, L.M & Bingilar, P.F (2016). The Effect of Inventory Cost Management on Profitability: A Study of Listed Brewery Companies in Nigeria. International Journal of Economics, Commerce and Management, 4(6), 446-455

Keitany, P. J., Wanyoike, D. M and Richu, S. (2014) Assessment of the role of materials management on organizational performance – A case of New Kenya Cooperative Creameries Limited, *European Journalof Materials Sciences,*1(1) 1-10.

Kotler P. (2002). Marketing Management 2nd Edition, The Millenium Edition. New Delhi, Prentice Hall India

Mohamad, S. J. A. N., Suraidi, N. N., Rahman, N. A. and Suhaimi, R. D. S. (2016) A study on relationship between inventory management and company performance: A case study of textile chain store, *Journalof Advanced Management Science,*4(4) 299 – 304

Murtala L. A. & Sani A. A (2016). Adoption of international public sector accounting standards in Nigeria: Expectations, benefits and challenges. *Journal of Investment and Management*,3(1), 21-29

Ogbadu C. L. (2009). *Corporate Governance and Dividend Payout in India*, Journal of Emerging Market Finance,5(1): 15 – 58.

Okwo, I. M. and Ugwunta, D. O. (2012). Impact of firm's input costs on firm profitability: Evaluation of theNigerian brewery industry, *Research Journal of Finance and Accounting,* 3(6), 78 -89

Panigrahi, A. K. (2013). Relationship between inventory management and profitability: An empiricalanalysis of Indian cement companies, *Asia Pacific Journal of Marketing and Management Review*,2(7), 107 – 120

Prempeh, K. B. (2015). The impact of efficient inventory management on profitability: Evidence fromselected manufacturing firms in Ghana, *Munich Personal RePEc Archive MPRA Paper No, 6788: 91-6*

Sitienei, G. and Memba, F. (2015) The effect of inventory management on profitability of cement manufacturing companies in Kenya: A case study of listed cement manufacturing companies in Kenya, *International Journal of Management and Commerce Innovations*, 3(2) 111 – 119

Stevenson (2010). The effect of inventory management on profitability of Cement Manufacturing Companies in Kenya: A case study of listed cement manufacturing companies in Kenya,*International Journal of Management and Commerce Innovations*, 3(2), 111 – 119,

Victoire, M. (2015) Inventory management techniques and its contribution on better management of manufacturing companies in Rwanda Case study: Sulfo Rwanda Limited, *European Journal of AcademicEssays*, 2(6) 49 – 58