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IN KENYA**

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IN KENYA**

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Accepted: May 11, 2018

ABSTRACT

This study aimed at investigating the inventory management and financial performance in the manufacturing firms listed in Nairobi Stock Exchange in Kenya. The research objectives were to determine if inventory holding costs affect the performance of the firm, to establish if inventory conversion period has an influence on the performance of manufacturing firms, to determine the effect of actual inventory on the performance of manufacturing firms and to study the effect of optimal inventory orders on the performance of these firms. This study was carried out through a descriptive and quantitative research design. The population of interest in this study constituted all manufacturing companies quoted at the NSE for the period of five years from 2012 to 2016; since the population was small a census was be done. The quantitative research approach was employed to arrive at the findings. The study applied panel data analysis with the aid of the STATA, 13. The study used coefficient of determination to evaluate the model fit of which it was found that the adjusted R² was 0.776. This implied that 77.6% of the variations in financial performance are explained by the independent variables under study (Inventory Conversion Period, Inventory Holding cost, Actual Inventory per annum, and Optimal Inventory Orders) at a confidence level of 95%. The R value which was the correlation coefficient was 0.881 which showed that there was a strong correlation between the study variables Inventory Conversion Period, Inventory Holding cost, Actual Inventory per annum, and Optimal Inventory Orders. The study recommended that other studies should be done on the effect of inventory management practices and inventory forecasting techniques and how this can influence the financial performance of manufacturing firms and also other industry sectors.

Keywords: Financial performance, Inventory, inventory management.

INTRODUCTION

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 (Ashok, 2013). According to Stevenson (2010), Inventory Management is defined as a framework employed in firms in controlling its interest in inventory. Mohammad (2014) assert that a manager should consider ordering costs, carrying costs and stock out costs of inventory in defining the inventory level of a firm.

A substantial share of an organization's investment is in the inventories. Inventories, often represent as much as 40% of total capital of industrial organizations (Moore, Lee & Taylor, 2003). It may represent 33% of an organization's total assets and as much as 90% of working capital (Sawaya & Giauque, 2006).

According to a report by the Kenya Association of Manufacturers (KAM), on any given year the sector contributes between 10 and 11 percent to Kenya's gross domestic product, which stands at more than \$62 billion. Therefore it can be drawn from this that manufacturing is an important sector in Kenya's economy since it makes a substantial contribution to the country's economic development.

Statement of the problem

In Kenya, more and more institutions including small and medium firms are increasingly adopting inventory management systems with the aim of achieving competitive advantage and enhancing their performance (Swaleh & Were, 2014). However, the main challenge today among firms in Kenya is about the need to enhance of efficiency and improving on effectiveness at the same time. Kenyan firms are known to have a poor inventory management techniques which has negatively affected the firm's ability to service and satisfy their customers (Thogori & Gathenya, 2014). Thus, the need to study effects of inventory management on profitability.

Johnson & Mattsson, 2015, Atrill, 2006, Mwangi and Thogori,(2015),Rogers (2005) and Kihara (2013) have all conducted studies on how inventory management especially inventory levels can lead to scrap, outdated products, increased inventory carrying costs and warehousing costs. Munyao et.al (2015) brings in the aspect of inventory Practices on inventory management. This study, therefore, aimed at establishing how a number of inventory variables like optimal inventory orders, holding cost, average inventory and inventory conversion period influence the financial performance of manufacturing firms in Kenya.

Objectives of the study

The general objective of the study was to establish the relationship between inventory management and financial performance of manufacturing firms in terms of profits recorded. The specific objectives were:-

- To ascertain the effect of inventory holding costs on the financial performance of manufacturing firms.
- To assess the effect of inventory conversion period on the financial performance of manufacturing firms.
- To assess the effect of inventory held on the financial performance of manufacturing firms.
- To ascertain the effect of optimal inventory orders on the financial performance of manufacturing firms.

LITERATURE REVIEW

Theoretical Literature Review

Cash conversion cycle theory

The CCC theory approach was developed by Richards and Laughlin (1980). The theory of the CCC centres on explaining a cycle that begins from the payment for the purchase of raw materials, through to its transformation and the emergence of new product, to the collection of receivables from the buyers and possible debtors of the interaction as a result of the stock sale.

Lean Theory

Lean theory is an augmentation of thoughts of Just In Time. The theory expounds on how manufacturers adaptability in their requesting choices, diminish the supplies of stock aimed at eliminating costs associated with the transportation of inventory.

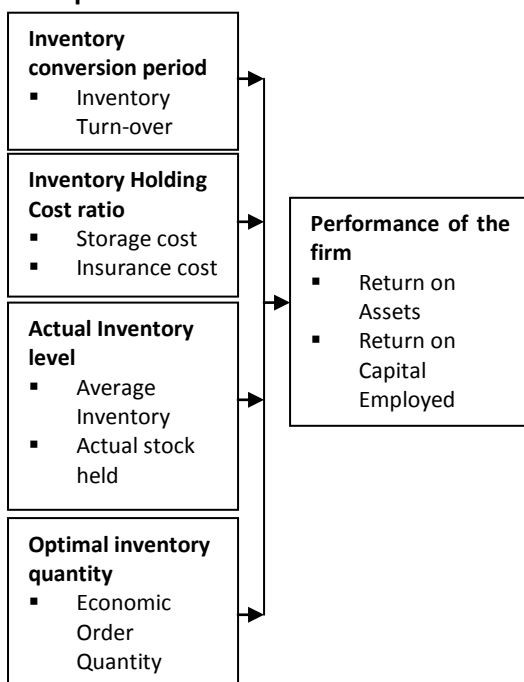
Agency theory

Theory was advanced by Jensen and Meckling in 1976. The relevance of agency theory to inventory management could be viewed from the perspective of financial manager, who in most cases is an agent of the owners of a firm, and who takes all the important decisions regarding all the short-term assets and liabilities of a business.

EOQ Model

EOQ was proposed by Haris (1913) explaining the optimal inventory level. The EOQ model is used to determine an optimal ordering size that will minimize the sum of ordering and carrying costs (Ziukov, 2015).

Conceptual framework



Independent Variables **Dependent Variables**
Empirical Review

Ng'ang'a (2013) conducted a study on inventory management systems concept. The study focused on effectiveness of inventory management in Ministry of State for Provincial Administration and internal security in Nairobi. The study concluded that delay in procurement and frequent stock outs affected the organization performance. The study conducted by Githendu *et al.*(2008) indicated that firms that have centralized stock holding have an advantage because they are able to control the stocks and avoid stock duplication in their subsidiaries.

Sitienei and Memba (2015) conducted a study on Effect of Inventory Management on profitability of Cement Manufacturing Companies in Kenya. In their study they concluded that Gross profit margin is negatively correlated with the inventory conversion period; Increase in sales, which denotes the firm size enriches the firm's inventory levels, which pushes profits upwards due to optimal inventory levels.

Brigham &Gapenski, (2010) have estimated by literature, that the savings on reduced inventories in terms of reduced storage fees, handling and waste would be in the range of 20 -30 percent (%) of profit realized. Additionally, they noted that in this competitive environment, Inventory Management was gaining more and more attention and awareness. The inventory management system supporters argue that surplus inventory will adversely interrupt the net cash flow in affirm. The main costs incurred in holding inventory, are the capital costs (interest or opportunity) and the physical cost (storage, insurance and spoilage).

Gaur and Bhattacharya (2011) attempted to study the linkage between the performance of the components of inventory such as raw material, work in progress and finished goods and financial performance of Indian manufacturing firms. The study revealed that finished goods inventory as inversely associated with business performance while raw material inventory and work in progress did not have much effect on same. They

emphasized that instead of focusing on total inventory, an attempt should be made to concentrate on individual components of inventory so as to adequately manage the same. They concluded that managers not paying heed to inventory performance may become weak in combating competitors.

METHODOLOGY

The nature of this study was a causal study. The cause was the inventory cost and the effect was the financial performance of a firm. There were nine (9) listed companies under the heading of manufacturing and allied companies as at December 2017. This formed the study population. Due to a small population size a census technique was employed and all the listed manufacturing firms made the study population. This study used secondary data, which is the data collected from the financial reports of the selected manufacturing companies for a five year period, 2012-2016. Descriptive statistics such as mean, median, mode and standard deviation were used to help in data analysis. Tables and other graphical presentations as appropriate were used to present the data collected for ease of understanding and analysis. Inferential statistics regression was done to examine the effect of inventory management on financial performance of companies listed at the Nairobi Securities Exchange. In addition, ordinary least squares regression analysis was used to establish the relationship between the variables of study. The regression analysis is as shown in equation 3.1:

$$Y = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \epsilon$$

Where;

Y = Financial performance,

β_0 = the regression constant,

$\beta_1, \beta_2, \beta_3$ and β_4 are the coefficients of independent variables,

X_{1it} = Inventory Holding cost of firm i at period t,

X_{2it} = Inventory conversion period of firm i at period t

X_{3it} = Actual inventory of firm i at period t

X_{4it} = Optimal Size of Orders of firm i at period t

Since the study specifically used secondary data, basic assumptions were made in testing the reliability of the data collected from the various sources. The tests were:-

- Hausman Specification Test
- Heteroscedasticity
- Multi-Collinearity
- Test of significance
- Analytical Framework and empirical model specification
- Measurement of variables

FINDINGS AND DISCUSSION

Descriptive Statistics of the response and independent variables

This study carried out a census of nine manufacturing firms listed in NSE Kenya and obtained data from all the financial statements of these firms hence a 100% response rate. The study also carried out a descriptive summary of the study variables. Table 1 showed the results obtained.

Table 1: Descriptive Analysis

	ROA	Inventory Conversion Period	Inventory Holding Cost Ratio	Actual Inventory Held ratio	Optimal Inventory Orders
Mean	5.08	22.54	1.93	1.87	18.39
Median	2.79	22.71	0.90	0.15	18.09
Maximum	128.71	27.25	55.56	50.24	25.93
Minimum	-90.06	0.00	-2.37	-5.51	13.07
Std. Dev.	22.08	2.35	4.71	28.09	2.54
Skewness	0.76	1.09	2.09	1.06	1.52

Kurtosis	2.27	2.62	2.86	3.05	3.00
Jarque-Bera	5.42	1.09	2.15	3.50	4.21
Probability	0.65	0.72	0.82	0.62	0.65
Sum	1616.78	7166.58	612.71	594.08	5848.64
Sum Sq. Dev.	154565.00	1749.85	7044.73	250055.40	2040.33
Observations	45	45	45	45	45

Descriptive analysis in Table 1 showed that the ROA was 5.08%, with a minimum of -90.06% and a maximum of 128.71%. Inventory Conversion Period, Holding Cost Ratio, Actual Inventory Held Ratio and Optimal inventory orders were normally distributed since the p value for Jarque Berra test was greater than 0.05. The average Inventory Conversion Period was 22.54, despite of this average there was a wide variation in Inventory Conversion Period.

Panel Diagnostic Tests

Stationarity Tests

Table 2: Unit Root Test at Levels

Variable	Test at levels	ADF Test			Philips Perrons (PP) Test		
		T statistic	Critical Value at 5%	P value	T statistic	Critical Value at 5%	P value
ROA	Constant	-4.12	-2.91	0.00	-4.30	-2.91	0.00
	Constant and Trend	-4.26	-3.48	0.00	-5.34	-3.48	0.00
Inventory Conversion Period	Constant	-4.40	-2.91	0.00	-4.36	-2.91	0.00
	Constant and Trend	-4.35	-3.48	0.00	-4.31	-3.48	0.00
Holding Cost Ratio	Constant	-3.90	-2.91	0.00	-3.27	-2.91	0.00
	Constant and Trend	-3.86	-3.48	0.00	-4.23	-3.48	0.00
Actual Inventory Held Ratio	Constant	-5.61	-2.91	0.00	-4.57	-2.91	0.00
	Constant and Trend	-4.60	-3.48	0.00	-3.57	-3.48	0.00
Optimal inventory orders	Constant	-3.65	-2.91	0.00	-3.67	-2.91	0.00
	Constant and Trend	-3.73	-3.48	0.00	-3.73	-3.48	0.00

Correlation Analysis

Correlation analysis showed the strength of association between the study variables and also served as linearity test. Results of the study revealed positive and significant relationship between size effect and stock return ($\rho = 0.58$, p

Data adopted in the study was panel in nature and there was need to evaluate its stationarity. In both tests the null hypotheses was that the data had unit roots against the alternative that there was no unit root. Since the p value for all variables were less than 0.05, then we can reject the null hypotheses and accept alternative hypotheses that inventory conversion period, holding cost, actual inventory levels and optimal inventory levels all were stationary and integrated at order zero.

value <0.05). This implies that an increase in size effect increases stock return. Secondly, there was a positive and significant relationship between value effect and stock return ($\rho = 0.72$, p value <0.05).

Table 3: Correlation Matrix of financial performance and inventory variables

Variables	RoA	Inventory	Inventory	Actual	Optimal
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		Conversion Period	Holding Ratio	Cost	Inventory Held ratio	Inventory Orders
RoA	1.00					
Inventory Conversion Period	-0.31	1.00				
Inventory Holding Cost Ratio	-0.34	-0.16	1.00			
Actual Inventory Held ratio	0.29	-0.07	-0.02		1.00	
Optimal Inventory Orders	0.09	0.12	0.17		-0.06	1.00

Multi-collinearity test

From table 3 above and table 4 below, it can be seen that there was no multi-collinearity problem in this study.

Table 4: -collinearity statistics of independent variables

Statistic	RoA	Inventory Conversion Period	Inventory Holding Ratio	Cost	Actual Inventory Held ratio	Optimal Inventory Orders
Tolerance	0.75	0.77	0.78		0.89	0.90
VIF	1.30	1.23	1.28		1.01	1.07

Heteroscedasticity test.

Breusch-Pagan test is used to test for heteroscedasticity where the null hypothesis is

that the residuals have the same variance (homoscedastic). The output of the test is as represented in table 5 below:

Table 5: Chi-Square values for the Breusch –Pagan LM Test

Dependent variable	χ^2 -value	p-value
ROA	3.06	0.000

The study rejected the null hypothesis since the reported p-value is less than the critical value (0.05) and thus we conclude that the observations do not have a constant variance based on table 5 above.

A panel regression analysis was conducted to test the influence of predictor variables (Inventory Conversion Period, Inventory Holding Cost, Actual Inventory per annum and Optimal Inventory Order) on Financial Performance of manufacturing firms.

Panel Regression Analysis

Table 6: Fixed Effects Regression on the Effect of Inventory Management on Performance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
	28.93	34.76	0.83	0.41
Inventory Conversion Period	-1.36	0.56	2.43	0.00
Holding Cost Ratio	-0.69	0.25	2.76	0.00
Actual Inventory Held Ratio	-0.003	0.00	2.05	0.00
Optimal inventory orders	0.45	0.20	2.27	0.00
R-squared	0.776			
Adjusted R-squared	0.881			

S.E. of regression	22.21
Sum squared residuals	128744.10
Log likelihood	-1405.78
F-statistic	32.93
Prob (F-statistic)	0.00

The study used coefficient of determination to evaluate the model fit. The adjusted R^2 , also called the coefficient of multiple determinations, is the percentage of the variance in the dependent variable explained uniquely or jointly by the independent variables. The model had an average adjusted coefficient of determination (R^2) of 0.776.

CONCLUSION AND RECOMMENDATIONS

The study established a negative relationship between Inventory Conversion Period and Financial Performance listed manufacturing firms in Kenya.

On the Inventory holding cost, the study established a negative relationship between Inventory Holding costs (Storage costs and Insurance costs) and financial performance of listed manufacturing firms in Kenya.

Actual Inventory Held is the most significant variable influencing the Financial Performance of listed manufacturing firms in Kenya. The study established a negative relationship between Actual Inventory per Annum and Financial Performance of Listed Manufacturing Firms in Kenya.

The study found that Optimal Inventory Orders positively affects Financial Performance of manufacturing firms in Kenya.

Conclusion

The study concluded that there exists a negative relationship between inventory conversion period

and financial performance of listed manufacturing firms in Kenya.

On the inventory holding cost, the study established a negative relationship between individual inventory holding costs and financial performance of listed manufacturing firms in Kenya.

The study concluded that there exists a negative relationship between actual inventory held per annum and the financial performance of the manufacturing firms in Kenya.

The study concludes that optimal inventory orders positively affect financial performance of manufacturing firms in Kenya.

Recommendations

The study recommends that the managers of manufacturing firms should adopt current inventory forecasting techniques that will help them estimate the desirable inventory levels to hold at any given period of time.

Suggestions for Further Studies

The researcher recommends that other studies should be done on the effect of inventory management practices and inventory forecasting techniques and how this can influence the financial performance of manufacturing firms and also other industry sectors. Further the study also found that the variables explain only 77.6% of the variation in the dependent variable; firm financial performance hence other inventory variables that influence performance should be studied.

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