

Inventory Ownership Analysis And Its Influence On Performance Of Manufacturing Firms In Kenya

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Abstract- The study sought to establish the influence of inventory ownership analysis on the performance of manufacturing firms in Kenya. The study was anchored upon the theoretical foundation of the transaction cost theory. The study reviewed both theoretical and empirical literature and then proposes the research methodology that addressed the gaps identified in literature as well as to validate the research hypotheses. Descriptive and cross-sectional research designs were adopted. The researcher preferred this method because it allows an in-depth study of the subject. The 2020 KAM directory has listing of members (firms) by sectors which contains a register of 12 sectors of those in manufacturing firms spread all over the country. KAM membership comprises of small, medium and large enterprises. The size is measured by their total assets. The population of the large sized registered members as per the directory is 461. This study employed Cochran's formula to sample 160 large manufacturing firms from the total population. A semi-structured questionnaire was administered to collect qualitative and quantitative data. Secondary data was collected from firm's reports and websites. Quantitative data was analyzed using both descriptive and inferential statistics and with the help of SPSS. Multiple regression model was used to show the relationship between the dependent variable and the independent variable. The findings revealed that Inventory ownership analysis influenced the performance of the manufacturing firms in Kenya. The study concluded that through adoption of inventory ownership analysis, the operational costs were reduced as well as the reduction of lead time.

Index Terms- Inventory Ownership Analysis, Supply Chain Alignment, Manufacturing Firms

I. INTRODUCTION

1.1 Background to the Study

Inventory ownership analysis is the process of establishing all lifecycle costs that follow from inventory ownership. Besides obvious purchase costs, these can also include substantial costs for installing, deploying, operating, and maintaining the same inventory. Inventory ownership analysis often finds large differences between purchase price and total life cycle costs (Mokadem, 2016). According to Milligan (2012) inventory

ownership analysis involves continuous delivery of materials, component or subassemblies in a supply chain is very different and much more demanding than the total cost of ownership of equipment (for example computers and printers). In these cases, inventory ownership analysis is essentially a lifecycle cost computation adding to the acquisition cost of the equipment, the expected amount of operation and maintenance costs in order to compare better different alternatives.

The concept of inventory ownership analysis is well developed and widely used (Ellram, 2013), in particular in some industries, such as information technology, where the purchasing cost can be very low if compared to maintenance, service and all other costs occurring during the life time of the system. However, evaluating TCO remains a delicate task, which requires both recognizing hidden costs and gathering enough data to estimate them (Hines, 2015). At the same time, since more and more transactions involve both goods and services, a simultaneous evaluation of the complete package cost is required. Furthermore, inventory ownership analysis is becoming not only a purchasing tool, but also a selling one, since vendors are using it to demonstrate how their products, which are more expensive if compared to competitors, in the long-run imply a lower inventory ownership analysis (Rezaei et al., 2017).

Moreover, because of supply chains complexity, today transactions do not often involve only a buyer and a seller, but also a third or even a fourth party, who can be intermediaries, service providers, end users, value added resellers, etc. (Milligan, 2012). If it is the case, inventory ownership analysis can result in different values for each of the actors involved. As a consequence, it would be of great interest being able to evaluate inventory ownership analysis, in order to help buyer doing the right choice and sellers improving their product offering (Swenson, 2014).

Inventory ownership analysis is an aspect of supply chain alignment, which is the process of integrating the activities in a supply chain framework to incorporate all the main stakeholders ranging from customers, employees and the suppliers (Melnyk, Stewart & Swink, 2014). Through inventory ownership analysis as a component of supply chain alignment, consistency and fit in strategic goals, metrics and activities between firms is enhanced through the interlinked upstream and downstream processes of supply chain.

The manufacturing sector being the third biggest industrial sector, contributes significantly to GDP in Kenya. The growth in the Kenyan manufacturing industry has declined to 3.3 per cent in 2011 as compared to 4.4 per cent in the year 2010 mainly due to a challenging operating environment (KNBS, 2012). Furthermore, the manufacturing sector has high yet untapped potential to contribute to employment and GDP growth. Embracing inventory ownership analysis remains integral in enhancing the success of the manufacturing sector.

1.2 Statement of the Problem

Despite the complexity and length of manufacturing firms' supply chains, continuous improvement and alignment to the overall organizational goals is integral to the sustainability and overall performance of the firm in a competitive environment. However, this desired optimality in alignment and performance is seldom attained (World Bank, 2013). Inventory ownership analysis as one of the components of supply chain alignment is therefore paramount to any organization since it leads to improved product design, quality and cost consciousness, which means an improvement in the performance of a firm.

Large scale manufacturers operating in Kenya have been continuously registering stagnation and declining profits for the last five years due to a turbulent operating environment as well as non-alignment of their respective supply chains. There has been a rise in complaints by the public, professionals and other stakeholder's about the manufacturing firms' performance (Mohiuddin & Su, 2013; Muthoni & Nyakagwa, 2014; Mwirigi & Were, 2014). Several studies have shown the need for properly managed inventory and aligned supply chain processes through inventory ownership analysis in order to enhance the performance of the manufacturing industry (Skipworth & Julien, 2015; Kaplan & Norton, 2014; Attia, 2015; Mokadem, 2016). These studies, however, have focused on different contexts, and their findings may not be generalized to manufacturing sector in Kenya. This study therefore sought to assess the role played by inventory ownership analysis on the performance of manufacturing industry in Kenya.

1.3 Study Objectives

2.2 Conceptual Framework

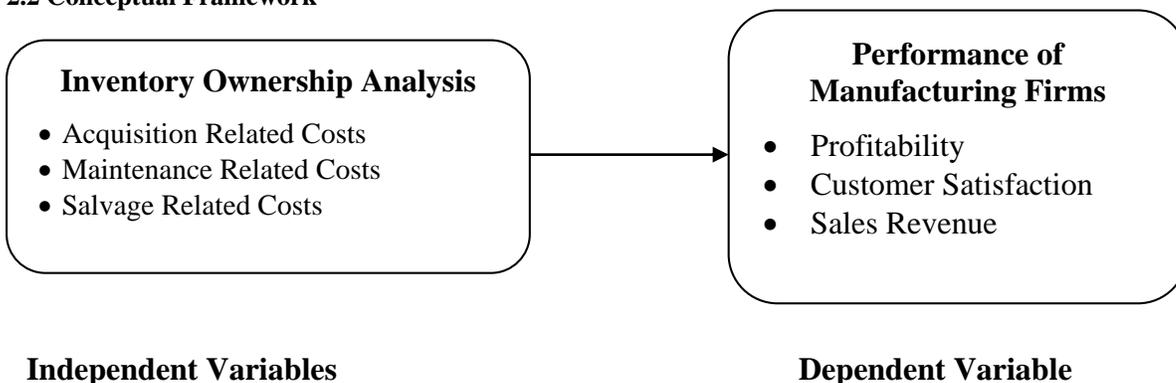


Figure 1: Conceptual Framework

The aim of this study was to examine the influence of inventory ownership analysis on performance of manufacturing firms in Kenya.

II. LITERATURE REVIEW

2.1 Theoretical Review

This paper was anchored on transaction cost theory. This theory was put forward by Coase (1998) where he specified that in procurement these costs may include among others; life cycle related costs of inventory, equipment or property. Transaction cost theory tries to explain how companies compete cost-wise and why companies expand or source out activities to the external environment (Bharadwaj & Matsuno, 2012). Transaction cost theory supposes that a company will try to minimize the cost of exchange with the environment and the bureaucratic cost of exchange within the company. This may entail minimizing acquisition related costs (Carr & Smeltzer, 2012).

When external transaction costs are higher than the company's internal costs then the company will grow because the company is able to perform its activities more cheaply than if the activities were performed in the market place (Luzzini, Caniato, Ronchi & Spina, 2012). This means keeping the maintenance and acquisition related costs at a minimum. According to Gonzalez-Benito and Spring (2010) transaction cost arises every time a product or service is being transferred from one stage to another where new sets of capabilities are needed to make the products or services. Here acquisition and salvage costs may arise.

Companies will therefore look at the inventory ownership analysis of the entire process. Based on this theory, Fredikind (2014) argues that supply chain alignment lowers the cost of inventory ownership through looking at the total costs involved. Chae, Yen and Sheu (2015) says that transaction costs relating to procurement are those costs that enterprises incur in trying to acquire inventory and the overall procurement costs involved. This theory supports the variable inventory ownership analysis by linking the values of acquisition, maintenance and salvage costs to essential metrics that can be managed to ensure achievement and effective supply chain alignment.

2.3 Review of Empirical Literature

According to Carr and Ittner (2012) in their study, they used a questionnaire to enumerate the major cost factors that affect the inventory ownership analysis of the companies surveyed. This questionnaire was sent to members of the Institute for Supply Management. In summary, their study reported that the criteria for the selection of suppliers who are total cost of ownership compliant are divided into thirteen categories: operating costs, quality, customer-related costs, logistics, technological advantages, starting price, opportunity cost, capacity and reliability, maintenance, inventory costs, transaction costs, lifecycle costs, and others.

Dumond and Siferd (2010) opine that inventory ownership analysis facilitates companies in dealing with pressure in their own customer markets and making the purchasing function more value oriented. Inventory ownership analysis also can be viewed as extending ABC to a boundary-spanning context, where the firm is reliant on cooperation and information provided by suppliers, or inferences drawn from alternative prices quoted by suppliers for changes in their market offerings (e.g., changes in materials in the core offerings, changes in supplementary services, programs, and systems).

Cliff and Siferd (2013) conclude that for accounting to support sourcing decisions, the “value chain perspective of strategic cost management with its focus on ‘cost of ownership’ rather than supplier price is essential.” Milligan (2012) discusses that accounting information is one of the inter-organizational design instruments that must be considered to stimulate cooperation between firms in the supply chain.

According to Swenson (2014), organizations are largely in the dark when it comes to making total cost calculations. Ellram (2013) identified some factors that act as barriers to the adoption of inventory ownership analysis, such as user resistance and complexity of cost data. The intent of inventory ownership analysis analyses is to improve mutual profitability for the supplier and customer by modifying how they do business together (such as, which firm undertakes certain activities, or what the effects are of using certain materials).

III. RESEARCH METHODOLOGY

3.1 Research Design

The study used descriptive and cross-sectional research designs. Descriptive research enabled collection and analysis of quantitative and qualitative data, while giving the study an ability to intensively answer the research questions. Cross-sectional research design was on the other hand used to establish the relationship between the study variables.

3.2 Population of the Study

The study targeted large manufacturing firms in Kenya. There are 461 large manufacturing firms in Kenya according to KAM (2020). The unit of observation is selected because they are the ones involved in execution of the firms’ supply chain management practices and thus stands high chances of providing reliable information on influence of supply chain alignment on performance of manufacturing firms in Kenya.

3.3 Sampling

Using Cochran (1977) formula, a sample size of 160 respondents was obtained from the 461 firms. The respondents

were picked through stratified random sampling, where the 12 sub-sectors of the manufacturing firms were the strata. A proportionate number was picked from each of the stratum and the respondents picked randomly.

3.4 Data Collection and Data Analysis

The research utilized a structured questionnaire to collect data. The collected data was analysed through SPSS. This study adopted a descriptive data analysis and inferential data analysis. Descriptive data analysis was adopted for this study because descriptive analysis was used to describe the basic features of the data in a study. Inferential statistics through multiple regression model was used to test for the hypothesis.

IV. RESEARCH FINDINGS AND DISCUSSIONS

4.1 Response Rate

The number of questionnaires that were administered to all the respondents was 160. A total of 127 questionnaires were properly filled and returned from the manufacturing firm’s employees. This represented an overall successful response rate of 79.4%, which was considered adequate for analysis.

4.2 Inventory Ownership Analysis

The study sought to assess the relationship between inventory ownership analysis and performance of manufacturing firms in Kenya. The main aspects of inventory ownership analysis focused on the study were: acquisition related costs, maintenance costs, and salvage related costs. The results as shown in Table 1 revealed that majority of the respondent (3.76) agreed that their respective organizations had a framework for reducing the costs of acquiring inventory. The results were varied as shown by a Standard deviation of 0.84. Further results indicated there were limits set on the levels of acquisition costs for the companies’ inventory as evidenced by a mean of 3.54 and a standard deviation of 0.99. The results further indicated that most of the companies had put measures to ensure any additional cost of acquiring inventory is justifiable as evidenced by a mean of 3.76 and a standard deviation of 0.84. According to Semchenkova, Chulkova, and Lukashva (2019), putting the appropriate measures for controlling inventory ownership costs is essential for maintaining a proper flow of inventory and reducing costs. The findings imply that the maintenance of inventory is a cost that most of the companies incurred and felt the urge of minimizing this cost as a way of ensuring minimal costs of owning inventory. Tinkham et al. (2018) alludes that the inventory maintenance is essential for organizational performance but it is essential to minimize the costs of maintaining the inventory in order to reduce the entire cost of owning inventory.

The findings imply that inventory ownership has been upheld by most of the surveyed manufacturing firms and this could be a significant driver to their performance. The findings are in line with those by Dobos and Vörösmarty (2019) who found out that through enhanced means of reducing the costs of inventory ownership, companies are able to save on the costs of operation and this significantly contributes to firm performance and competitiveness.

Table 1: Descriptive Results on Inventory Ownership Analysis

Statement	N	Mean	Std. Dev.
The organization has a framework for reducing the costs of acquiring inventory	1273.76	0.87	
There are limits set on the levels of acquisition costs for the company's inventory	1273.54	0.99	
The company has put measures to ensure any additional cost of acquiring inventory is justifiable	1273.76	0.84	
There are significant costs incurred in maintaining inventory in our company	1273.81	0.89	
The company has put measures to control and minimize the inventory maintenance costs	1273.69	0.94	
Audits are carried out to establish which inventory should be maintained and those that should be disposed	1273.97	0.80	
The company has at times incurred costs on recouping its inventory	1273.83	0.81	
There have been strategies by the company to minimize the costs of salvaging inventory	1273.83	0.92	
Measures have been taken to reduce incidences where the company is at risk of losing inventory	1274.09	0.88	

4.3 Performance of Manufacturing Firms

The study sought to establish the performance of the manufacturing firms in Kenya. The respondents were asked to indicate their level of agreement on specific statements regarding the performance of their respective firms. This was based on a five-point Likert's scale. The findings as shown in Table 2 revealed that majority of the respondents disagreed that their company has been committed to reduce the costs of operations in all its activities. Majority of the respondents disagreed that the customer waiting time had been reduced continuously over the

years in their respective firms, and a further majority disagreed that the positive customer feedbacks had been increasing in their respective companies for the past five years (Mean =2.51; standard deviation = 1.28). It was further established that most of the organizations recorded high returns from their customers, as a result of not meeting the needs and specifications of the customers (35.7%; disagree = 21.6%). The respondents further disagreed that there were stable revenue flows in their respective companies' operation framework over the years.

Table 2: Descriptive Results on Organizational Performance

Statement	Mean	Std. Dev.
Our company has been committed to reduce the costs of its products	2.61	1.35
The customer waiting time has been reducing continuously over the years in our firm	2.46	1.35
The positive customer feedbacks have been increasing in our company for the past five years	2.51	1.28
There are fewer returns/rejections by our customers than it was in the past	2.39	1.47
The company has been recording sustainable profit margins in the past five years	2.41	1.46
The attained profits have been adequate for re-investment in other ventures by our company	3.21	1.27
There are stable revenue flows in the company's operation framework over the past five years	2.18	1.29

4.4 Correlation Analysis

Correlation analysis was used to determine both the significance and degree of association of the variables and predict the level of variation in the dependent variable caused by the independent variables. Table 3 shows the findings. The correlation analysis to determine the association between inventory ownership analysis and performance of manufacturing firms in Kenya, Pearson correlation coefficient computed and tested at 5%

significance level. The results indicate that there was a positive relationship and strong relation as shown by Pearson correlation coefficient of 0.642 between Inventory Ownership Analysis and performance of manufacturing firms in Kenya. In addition, the researcher found the relationship to be statistically significant at 5% level (p=0.000, <0.05).

Table 4: Summary of Pearson's Correlations

		Performance
Performance		1
Inventory Ownership Analysis	Pearson Correlation	.642
	Sig. (2-tailed)	.000

4.5 Hypotheses Testing

H02: Inventory ownership analysis has no significant relationship with performance of manufacturing firms in Kenya

The third objective of the study was to examine the relationship between inventory ownership analysis and performance of manufacturing firms in Kenya. The linear

regression model analysis was carried out to establish the relationship between inventory ownership analysis and performance of manufacturing firms in Kenya and the output included the model summary, the ANOVA results and the regression coefficients. The model summary results are as shown in Table 5. As the findings portray, the R² for the variable was

0.412. This implies that inventory ownership analysis influences up to 41.2% variation of the performance of manufacturing firms in Kenya.

The ANOVA results are as shown in Table 5. As the results portray, the F-statistics for the model was 87.594 at a significant level of $0.000 < 0.05$. This implies that inventory ownership analysis significantly influences the performance of manufacturing firms in Kenya.

The regression coefficients on the other hand are as shown in Table 5. As the results portray, the Beta coefficient for inventory ownership analysis was 0.657. This implies that a unit change in inventory ownership analysis would lead up to 65.7% increase in

the performance of manufacturing firms in Kenya. The p-value was 0.000 which is less than the standard p-value of 0.05. This means that there is a significant influence of inventory ownership analysis on the performance of manufacturing firms hence the rejection of the null hypothesis that there is not significant influence of inventory ownership analysis on the performance of manufacturing firms in Kenya. The findings are in line with those by Lambert and Croxton (2015) who indicate that inventory ownership analysis is critical in enabling the company to establish how much inventory it owns, thus they are able to strategies for their management of the inventory for enhanced performance.

Table 5: Hypothesis Testing

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.642 ^a	.412	.407	.52326

a. Predictors: (Constant), Inventory Ownership Analysis

ANOVA Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.983	1	23.983	87.594	.000 ^b
	Residual	34.225	125	.274		
	Total	58.208	126			

a. Dependent Variable: Performance of Manufacturing Firms

b. Predictors: (Constant), Inventory Ownership Analysis

Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error			
1	(Constant)	1.089	.244		4.459	.000
	Inventory Ownership Analysis	.657	.070	.642	9.359	.000

a. Dependent Variable: Performance of Manufacturing Firms

V. CONCLUSION AND RECOMMENDATIONS

The study sought to determine the relationship inventory ownership analysis on performance of manufacturing firms in Kenya. The findings of the study revealed that the relationship between inventory ownership analysis and performance was significant at 5% level of significance. The p-value was 0.000 which indicated that the null hypothesis failed to be accepted at 5% level of significance hence inventory ownership analysis have a significant influence on performance of manufacturing firms in Kenya.

The study also concluded that inventory ownership analysis has a significant relationship with performance of manufacturing firms in Kenya. The sub-constructs of inventory ownership analysis namely acquisition related costs, maintenance related costs, salvage related costs influence performance positively.

The study recommends that manufacturing firms should invest in acquisition related costs, maintenance related costs, salvage related costs since it influences performance positively. Inventory ownership analysis being the ability to integrate, build and reconfigure internal and external expenses to address rapidly-changing customer needs, can also take the form of various ways apart from the ones discussed in the current study and hence the future scholars can seek to explore other measures of this factor.

The study findings can also be linked to the transaction cost theory. Transaction cost theory tries to explain how companies compete cost-wise and why companies expand or source out activities to the external environment. Transaction cost theory supposes that a company will try to minimize the cost of exchange with the environment and the bureaucratic cost of exchange within the company. This may entail minimizing acquisition related costs.

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