ISSN: 7881 - 7563
Volume 8, Number 3, 2022
Advanced Journal of Accounting, Management and Marketing

KAIZEN COSTING AND FINANCIAL PERFORMANCE OF LISTED FOOD PRODUCT MANUFACTURING COMPANIES IN NIGERIA.

Adamu Audu Jibrin Ph.D and Maccarthy, Macclugard Ine-Tonbarapa Ph.D
Department of Accounting, Faculty of Business Studies,
Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, Nigeria

Email: adamunavy1984@gmail.com, maccfederalz@gmail.com

ABSTRACT

In recent years, the cost of doing business in Nigeria has been very expensive. This has equally affected cost of raw materials and production cost of manufacturing firms. Consequently, entities are obliged to find the management system, which allows them to be competitive and efficient in using the resources at the lowest costs possible. Thus, the study "examined kaizen costing and financial performance of listed food product manufacturing companies in Nigeria. The specific objectives examined the relationship between kaizen costing and return on asset of listed food products manufacturing companies in Nigeria and also evaluated the relationship between kaizen costing and return on equity of listed food products manufacturing companies in Nigeria. The study adopted triangulation and correlational research design. The target population for the study is nine (9) listed food products manufacturing companies on the floor of the Nigerian Stock Exchange (NSE) as at 31 August 2021. The unit of respondent of the study were three hundred and thirty-six (336) knowledgeable and competent staff within the production, marketing and finance departments of the nine (9) listedfood products manufacturing companies. The sample size was therefore determined by using the Taro-Yame sampling techniques to be 183. The instrument of the study is triangulation (primary data and secondary data). The formulated research questions were analyzed with descriptive statistics. The hypotheses were tested using the multiple regression analysis with the aid of E-view (10). The findings of the study were that: there is an insignificant relationship between kaizen costing (KAC) and return on asset (ROA) of listed food products manufacturing companies in Nigeria. Also, there is a significant relationship between kaizen costing (KAC) and return on equity (ROE) of listed food products manufacturing companies in Nigeria. The study recommends that more accountants, production managers and top managers should learn from the kaizen costing training institutes in Nigeria where they offer training and knowledge about Kaizen costing system and how to adopt and use the same to the benefit of the company. The study further recommended that to determine the actual performance of the Kaizen system, organizations should bridge the bureaucratic barriers and allow the top management to interact freely with the lower hierarchy members of the organization and build a proper rapport to enhance effective communication, efficient development of ideas, proper adoption of generated ideas and avoid dismissing the simple little ideas given by the junior staff about improvement of the organization.

Keywords: kaizen costing, financial performance, return on assets and return on equity

INTRODUCTION

In recent years, the cost of doing business in Nigeria has been very expensive. This has equally affected cost of raw materials and production cost of manufacturing firms. For business to maintain its presence in local and global trends and make enough profit, it must design its structure to meet customers' demands with qualitative products, cheapest price as well as short delivery time. Consequently, entities are obliged to find the management system, which allows them to be competitive and efficient in using the resources at the lowest costs possible. kaizen costing system has emerged in order to respond exactly to customers' demands with least amount of resources. Therefore, management of corporate organization employ kaizen costing that theoretically minimize waste in production and operations in the organization.

Perera et al (2011), kaizen costing is important in lean manufacturing principle based on a Japanese operations philosophy that emphasizes continual improvement. Japans term, kaizen, meaning continuous or permanent improvement, stands in front of innovation which focuses on major improvements, productivity or quality through major changes in production or processes. In the kaizen, emphasize is on series of continuous improvements and small incremental steps that can be used at all levels of the organization. At senior executive level, Kaizen is focused on changes in the procedures and processes, at middle management level on connection of internal departments, and in lower levels of management and workers on the jobs, duties and specific departments. According to Cooper and Kaplan (2011), kaizen costing utilizes a bottom up approach in which the employees who perform tasks are empowered to create and manage their own portions of the business process. Each task is defined using a task model that indicates the input-output relationships between tasks. This approach is essential for creating and improving business processes that are large and complex. This kaizen costing reengineering approach was successfully applied at a major automotive manufacturing company and was awarded the Charles F. Boss Kettering Award for technological innovation in 2000. The implementation of kaizen cost management philosophy stems from the need companies have to increase productivity, reduce costs, increase flexibility, create more value for the consumer, and increase results, cash flows and stock value (Maskell & Kennedy, 2017).

Financial performance of food product companies can be measured through variety of ratios of which return on asset, return on equity and net interest margin are the major ones (Alexandru, 2018). return on asset (ROA) is a financial ratio that refers to how much profit a company earned compared to the total amount of assets invested or found on the balance sheet. Return on Equity (ROE) is what the shareholders look in return for their investment. A business that has a high earning per share is more likely to be one that is capable of generating cash internally. Thus, the higher the ROE the better the company is in terms of profit generation. It is further explained by Khrawish (2011), that ROE is the ratio of net income after Taxes divided by total equity capital. It represents the rate of return earned on the funds invested in the pharmaceutical by its stockholders. ROE reflects how effectively food product company's management is using shareholders' funds. Thus, it can be deduced from the above statement that the better the ROE the more effective the management in utilizing the shareholder's capital.

Statement of Problem

The cost of running business in the country has risen dramatically in recent years. This has had an equal impact on manufacturing companies' raw material costs and production costs. As a result of the cost challenges, many products manufactured in the country are less patronized by consumers due to their high prices, and as a result, they expire in the hands of the sellers (Ine-Tonbarapa, 2017). Aziz, et al. (2017), claim that in an effort to reduce production costs and increase profit, some manufacturing companies use inferior materials in their products. Which Nigerians are currently bearing the consequences of substandard products flooding the market? This is due to a lack of adoption or implementation of better cost-cutting management strategies by many manufacturing firms.

From related studies analysis, kaizen costing and financial performance of manufacturing companies' studies and literature are few, enhance is very scarce in Nigeria and other African countries to the best of our knowledge and as thus may not be adequately reflect or represent the actual result in Nigeria. The study is also unique as the analytical scope cover 10 years' time lag (2011 - 2020) to fill the problem of obsolesce of empirical information data. Thus, it is on the above premise that cited the researcher in writing on kaizen costing and financial performance of listed food products manufacturing companies in Nigeria.

Conceptual Framework

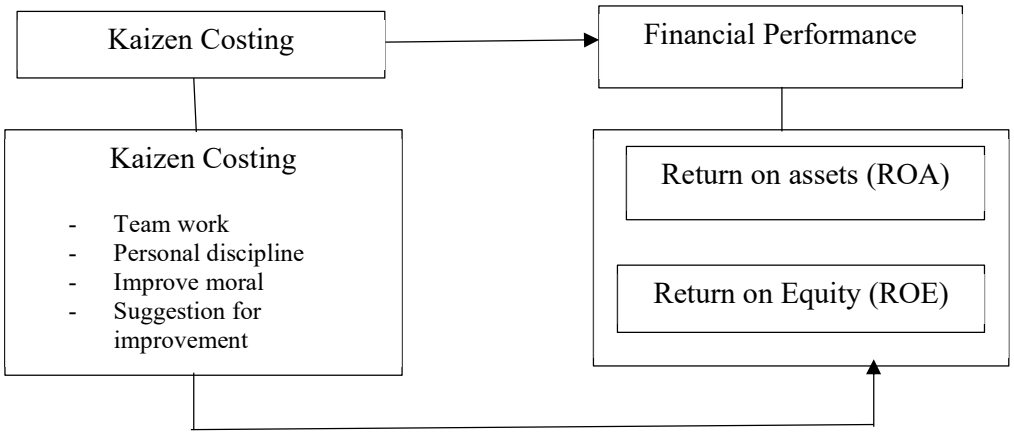

Figure 1.1. Conceptual Framework Model
Sources: Cooper and Kaplan (2011) and researcher's input

Aim / Objectives of the Study

The main aim of the study is to determine the relationship between kaizen costing and financial performance of listed food products manufacturing companies in Nigeria, specific objectives are to:

1. examine the relationship between kaizen costing and return on asset of listed food products manufacturing companies in Nigeria.
2. evaluate the relationship between kaizen costing and return on equity of listed food products manufacturing companies in Nigeria.

Research Hypotheses

HO_1: There is no relationship between kaizen costing and return on asset of listed food products manufacturing companies in Nigeria.

HO_2: There is no relationship between kaizen costing and return on equity of listed food products manufacturing companies in Nigeria.

Conceptual Framework

Kaizen Costing

Kaizen is a term that has its origins in Japan which was popularized by Masaaki Imai and it is a concept of two Japanese words, KAI means change and ZEN means better (Rof, 2012). Kaizen is defined as continuous and in a process that involves the whole organization. Imai (1986), knows Kaizen as fundamental philosophical concept according to the best Japanese management and it is in the concept of an umbrella which covers most of Unique Japanese management practices which has helped to start from zero and overcome upscale Global competitors since 1950s to 1980s. Concepts such as customer satisfaction, Kanban, total quality control, quality improvement, robots , just-in-time systems, quality control cycle, zero waste, suggestions system, small group activities, equipment, collaborative labor management relations, new product development, etc. can be considered among the concepts covered by Kaizen. Kaizen Management has two major components, including the improvement and maintenance of standard operating procedures. Maintaining standards includes training and discipline. Kaizen is representative of small improvements in the current system while innovation shows Substantial improvements as a result

of major changes such as investment in technology or new equipment. All organization members are involved in Kaizen, from the Chief Executive Officer who are responsible for introduction, support and creation of systems to workers who participate in kaizen activities through suggestion system and small group activities. Kaizen meaning continuous improvement is based on three dimensions. Improving the quality of products and services, zero waste, and customer satisfaction through collaborative management based on staff suggestions in the quality control department are dimensions of continuous improvement (Alborzi, 2002).

According to Sani & Allahverdizadeh, (2012), Kaizen philosophy is based on the belief that human's family life, employment and society are interrelated and must be improved continuously through required activities. The key for continuous improvement in kaizen is in small innovations and creativities not in great dramatic and revolutionary innovations. Kaizen focuses on small reductions of cost in product life cycle. The focus of this approach is on reducing the target cost and giving power to employees. The purpose of Kaizen is to reduce actual costs below the standards set by Innovation. In kaizen system, goal management determines cost reduction and usually compares it with real results every month. Thus, kaizen is used not only for maintaining standard but also it is used to enhance them. Kaizen, or continuous improvement is short-term planning system and employees are the source of problem solving in this approach. Kaizen approach is used for cost reduction at production level. Kaizen culture and its interaction between various social layers and organizations in Japan has caused to change company to university, and university to company; workers learn from manager and manager uses workers' ideas.

Kaizen costing is a system of cost reduction via continuous improvement. It tries to maintain present cost levels for products currently being manufactured via systematic efforts to achieve the desired cost level. The word kaizen is a Japanese word meaning continuous improvement. It has two dimensions. One dimension considers product (narrow perspective) and another dimension covers asset and organization (broader perspective). Asset and organization specific kaizen costing activities planned according to the exigencies of each deal. However, product model specific costing activities carried out in special projects with added emphasis on value analysis. It is applied to products that are already in production phase. Prior to kaizen costing, when the products are under development phase, target costing is applied. After targets have been set, they are continuously updated to display past improvements, and projected (expected) improvements. Adopting Kaizen costing requires a change in the method of setting standards. Kaizen costing focuses on "cost reduction" rather than "cost control"(Titu, 2010).

Kaizen costing is the process of continual cost reduction that occurs after a product design has been completed and is now in production. Cost reduction techniques can include working with suppliers to reduce the costs in their processes, or implementing less costly re-designs of the product, or reducing waste costs. These reductions are needed to give the seller the option to reduce prices in the face of increased competition later in the life of a product (Kr, 2011).

What Are the Five "S" in Kaizen?

Kaizen is another important lean manufacturing principle based on a Japanese operations philosophy that emphasizes continual improvement. Kaizen can be summarized in five principles that all start with the letter "s" (Kr, 2011).

i. Sort: With its strong emphasis on keeping inventory levels to a minimum, lean manufacturing relies on the Kaizen principle of sorting, or identifying items that are no longer useful and getting them out of the way. This practice eliminates clutter and cuts down on the time your team has to spend cataloging and rotating stock that may not even be used. Lean accounting measures the time you save here by evaluating the efficiency of your systems overall once you've gotten unnecessary stock out of the way.
ii. Set in order: Once you've identified which inventory items you'll keep versus those you'll discard, the Kaizen approach emphasizes creating order among the stock you still have on hand. The process of organizing seems on the surface to interfere with productivity because you're spending time arranging rather than producing. However, lean accounting's

observations demonstrate that spending this extra time actually saves time in the long run because you don't spend unnecessary hours looking for what you need in a chaotic warehouse.

iii. Shine: Like setting items in order, keeping your work space clean makes the most of your resources by allowing your business to operate smoothly and without clutter, unnecessary accidents or equipment malfunctions due to improper care. The net gains from this extra care show up in your lean accounting numbers in the form of increased efficiency and lower repair bills.

iv. Standardize: Every manufacturing operation has elements in common with other operations and elements that are unique to its specifications and processes. Lean manufacturing identifies and standardizes best practices, drawing on general industry knowledge and also proprietary information developed by your staff. By assembling these insights into operations manuals and training staff effectively, you'll lower labor costs by minimizing mistakes and maximizing efficiency. You'll also increase customer satisfaction through increased consistency. Your lean accounting system will capture these improvements with data that shows strong sales and efficient use of labor hours.

v. Sustain: Once you've put the necessary energy and resources into the first four stages of the Kaizen process, you must also develop systems and sensibilities that encourage your staff to sustain and maintain the improvements they've made and even continue improving on them. Lean accounting can track your ability to sustain these efforts by following your progress over time and spotting emerging problems if your systems start to slip.

Financial Performance

Liargovas and Skandalis (2018), indicate financial performance as the level of performance of a business over a specified period of time, expressed in terms of overall profits and losses during that time. Evaluating the financial performance of a business allows decision-makers to judge the results of business strategies and activities in objective monetary terms. A subjective measure of how well a firm can use assets from its primary mode of business and generate revenues. Lumpkin and Dess (2019), argued that there are many different ways to measure financial performance, but all measures should be taken in aggregation. Some popular ratios or indicators of financial performance are: return on asset (ROA), return on investment (ROI), return on equity, return on sale (ROS), revenue growth, market shares, stock price, sales growth, liquidity and operational efficiency (Mainelli & Giffords, 2014).

The Kaizen costing remarkable characteristic is the clear linkage between the improvement results and the financial gains (Harry & Schroeder, 2000). However, the actual financial performance measurement system (FPMS) of most organizations can be a barrier to implement such quality improvement program. Many organizations around the world have extensive performance measurement system (PMS's) but they are based on traditional Managerial Accounting. They fail to support the attainment of strategic goals and do not also help to promote a sustainable continuous improvement because of poor relationship between financial and non-financial performance measures (Bititci et al., 2007). Nevertheless, the proof that lean works for the broad spectrum of manufacturing firms is specious. Even as practitioners attest that proof exists, studies by both operations management (OM) and finance researchers have proven inconsistent in establishing a significant positive relationship between lean practices and archival business financial performance. Most research studies find a positive association with at least one or two financial measures. Reductions in some form of inventory consistently occur in lean implementations. Yet measures of return on assets (ROA), return on sales (ROS), return per employee, and profit margin prove inconsistent (Emiliani, et al., 2007).

Return on Assets (ROA)

Lee (2006) defined return on asset as a means of ascertaining how successful a firm has been in terms of profitability. Return on Assets (ROA) is an indicator of how profitable a company is relative to its total assets. ROA gives an idea as to how efficient management is at using its assets to generate earnings. Calculated by dividing a company's annual earnings by its total assets, ROA is displayed as a percentage. ROA gives a manager, investor, or analyst an idea as to how efficient a company's management is at using its assets to generate earnings. Return on assets is displayed as a percentage. The formula for return on assets is: Net Income / Total Assets.

ROA tells you what earnings were generated from invested capital (assets). ROA for public companies can vary substantially and will be highly dependent on the industry. This is why when using ROA as a comparative measure, it is best to compare it against a company's previous ROA numbers or the ROA of a similar company.

Return on Equity (ROE)

The return on equity ratio (ROE) is considered a key ratio in equity evaluation because it addresses a question of prime importance to investors, which is what kind of return that the company is generating in relation to its equity. A company's ROE is a valuable indicator of both how effectively the organization is utilizing its equity investors. The importance of ROE in analyzing brewery companies stems from the basic fact that brewery companies must expend massive amounts of capital to bring their products to market. Therefore, how efficiently they employ the capital that equity investors provide is indeed a key indicator of the effectiveness of the company's management and of the company's ultimate profitability. ROE is calculated by dividing a company's net income by total shareholders' equity. Although a higher ROE figure is generally a better ROE figure, investors should exercise caution when a very high ROE is a result of extremely high financial leverage. This is one reason why it's also important to consider a pharma company's debt and liquidity situation.

Relationship between Kaizen costing and Financial Performance

Kaizen has become a global activity spread by multinational companies and their employees. It has become popular not only in the manufacturing sector but also in the service sector. However, proliferation of kaizen in Africa is still very small due to the limited number of players who bring in the practice. However, there are some leading multinational and local companies operating in Kenya which are bringing in kaizen methods. Furthermore, the Kenya Association of Manufacturers (KAM), which has approximately 600 members, has been actively involved in organizing seminars and training to upgrade the capacity of its members. KAM has partnered with the Kaizen Institute in Mauritius since 2005 and has been inviting experts for seminars and consultations Liker and Hoseus (2017). Since the demand for training on kaizen is growing, the Kaizen Institute is offering regular training courses of its own in around the country. The relationship between kaizen system and performance of the manufacturing firms is the added profitability due to regular and gradual improvement from staff ideas about firm. Profitability of the firm and especially manufacturing companies can only be realized by subscribing to strategies that promote production practices that considers the reduction on expenditure of resources for any goal other than the creation of value for the end customer. This has come to be known as lean practices. With lean practices, manufacturer can reduce lead times through lower level of inventory (Bayou & Korvin, 2008). The dominant principle of lean practices is waste elimination. Fullerton and Wempe, (2009) classified wastes into 7 types as follows: defects, overproduction, waiting for the next step, unnecessary transport or materials, unnecessary movement of workers, inappropriate processing, and excess inventory.

A study carried out by Demeter & Matyusz (2011), examined the relationship between inventory leanness and performance in Kaizen System with focus to enhancement of financial performance of manufacturing firms. It was found that the relationship is strong. First, lean inventory shrink wastes and costs involved in inventory management, improving a firm's financial performance.

Inventory accompanies the interest on money, space, labor, and equipment for warehousing and handling, inventory shrinkage and obsolescence. Second, the implementation of lean management permeates throughout the organization and embeds the philosophy of effectiveness into the fabric of an organization and supply chains. Thus, lean management has been introduced as an agent of organizational change and transformation (Womack & Jones 2013).

Theoretical Framework

Theory of Lean Management

The theory of lean management developed by John Krafcik in (1988) posits that, companies are in business to make a profit. If they don't, they won't survive. There are two ways to increase profits; raise prices and lower costs. Competitive pressures often limit the ability to do the former, so companies tend to focus on cutting costs. One of the more popular ways for companies to reduce costs is through lean management. Lean management focuses on improving processes. Every step a product takes from raw materials to final assembly is reviewed. Waste or duplication of effort is identified and eliminated to the maximum extent possible. As mentioned above, the focus is on creating benefit" (lower costs, quicker turn times, etc.) for the customer. A system of continuous improvement is established to monitor the results on an ongoing basis. The goal is to create the perfect process.

Related Empirical Studies

Olabisi et al. (2012), investigate the relationship between the Kaizen cost-cutting technique and the profitability of small and medium-sized businesses in Ogun State, Nigeria. It evaluates the nature of the Kaizen cost management technique and how it can be adopted to reduce and control the operational costs of SMEs. The study used primary data, and a sample of 269 respondents from the Agro-allied, confectionery, general trading, and transportation industries in Ogun State, Nigeria, were chosen at random. The study population comprised 2,685 enterprises obtained through a preliminary survey of SMEs in the three senatorial districts of Ogun State, namely Ogun West, Ogun East, and Ogun Central. The Statistical Package for Social Sciences (SPSS) was adopted to analyze the questionnaire. The result of the statistical test of the hypothesis shows that there is a significant relationship between Kaizen cost management technique and the profitability of SMEs. A further test of the significant relationship between cost components and profitability of SMEs using regression analysis shows that only fixed costs reliably predict the average annual profit by a factor of 0.099. Key-words-: Kaizen, cost management, technique and Profitability.

Oyewo (2014), determined whether strategic cost management (SCM) techniques are practically used by Nigerian companies and the extent of their utilization, particularly in the Nigerian manufacturing and financial services industries, identifies the factors influencing the adoption of strategic cost management, and investigates whether strategic cost management can be used as a competitive strategy for survival in recessionary times. A major instrument for data collection, the questionnaire, was used as a major instrument for data collection. The research found out that although Nigerian companies are receptive to the philosophies of SCM, there are challenges inhibiting their adoption and implementation in the Nigerian environment.

Timothy et al. (2013), examined the impact of inventory management practices on the financial performance of sugar manufacturing firms in Kenya in eight operating sugar manufacturing firms. The primary data was collected using structured and semi-structured questionnaires administered to key informants in the organizations. Secondary data was obtained. Descriptive statistics were used to test the impact of inventory management practices and Correlation analysis was used to determine the nature and magnitude of the relationship among inventory management variables. The results indicate that there exists a positive correlation between inventory management and Return on Sales (r=0.740) and also with Return on Equity (r=0.653), which were found to be statistically significant at 5% level.

Alaaraj and Bakri (2019), examined the effect of lean manufacturing on financial performance from the perspective of managers in the industrial sector in South Lebanon. The methodology of this study was quantitative in which 152 self-administered questionnaires were distributed randomly among managers. The data was analyzed using SPSS software. Descriptive statistics were identified and proposed hypotheses were tested using Pearson correlation and regression analysis. The results showed that lean manufacturing has a significant and positive effect on financial performance. Future studies are encouraged to expand the research to other regions in Lebanon over a longer time horizon and apply different quality improvement tools.

Temitope et al (2020), explored the potential of kaizen costing strategy to engender effective cost management within construction project delivery systems in developing countries. Data collected during this study was analysed using the analytic hierarchy process (AHP) and systems thinking approaches to determine the criticality of the factors influencing the effective implementation of kaizen costing. Seven (7) archetypes leading to the final causal loop diagram identified the incorporation of the plan–do–check–act approach to project and cost planning, the budgeting system of the construction companies, overhead cost reduction during construction, and the overall procurement process. Executing these archetypes will potentially reduce high overhead costs, project cost and time overruns, as well as enhance the construction industry's sector growth policies and construction organization corporate governance.

Siyanda (2017), evaluates whether implementing kaizen costing will improve cost management at the water and electricity departments in the kwini municipality. Studies have shown that there are a lot of unexploited benefits which can be gained by South African municipalities as well as other organisations by implementing kaizen costing. This is a quantitative descriptive case study of the water and sanitation and electricity departments in the kwini Municipality where data was collected from the target respondents using questionnaires. The 320 questionnaires, which consisted of predominantly closed-ended questions, were self-administered to the target respondents. The results were analysed using the IBM Statistical Package for Social Sciences (SPSS) version 22.0. The findings of this study revealed that the adoption of kaizen costing may be successful in improving the cost management inefficiencies faced by South African municipalities. Based on the findings, the majority of the respondents indicated that they would embrace and support the application of kaizen at the water and sanitation and electricity departments in the eThekwini Municipality. The study recommends that the Water and Sanitation and Electricity Departments in the eThekwini Municipality should consider implementing kaizen costing to improve their cost management.

METHODOLOGY

The study adopted triangulation and correlational research design. The target population for the study is nine (9) "listed food products manufacturing companies on the floor of the Nigerian Stock Exchange (NSE) as at 31 August 2021. The unit of respondent of the study were three hundred and thirty-six (336) knowledgeable and competent staff within the production, marketing and finance departments of the nine (9) listedfood products manufacturing companies. The sample size was therefore determined by using the Taro-Yame sampling techniques to be 183. The instrument of the study is triangulation (primary data and secondary data). The formulated research questions were analyzed with descriptive statistics. The hypotheses were tested using the multiple regression analysis with the aid of E-view" (10).

Model Specifications

According to Nmesirionye et al. (2019), regression analysis is concerned with the study of how one or more variables affect changes in another variable. Thus, on the basis of the theoretical framework, the study adopted the regression formula adopted in the work of with some modifications. The model is specified as:

$Y = f(ao + bX_1) + Et$.....3.1

Where; the kaizen costing (KAC), and financial performance measures of return on assets (ROA) and return on equity (ROE).

FINPER $= f(ao + KACP_1 + Et)$ 3.2

Thus:

HO_1: ROA $= \beta o + \beta$KAC $+ \upsilon$.....3.3

HO_2: ROE $= \beta o + \beta$KAC $+ \upsilon$.....3.4

Where;

β_0 = Constant Term (y intercept)

β = Coefficient of the independent variable

υ = Error term (causes of market share or profitability not explained by variables in the model)

To make the data uniform and easy to regress and analyses, Data were converted to natural logarithm (log) form as follows:

$NLROA_{it} = \beta o + \beta_1(NL\text{KAC})_t + + \upsilon$ (.05) 3.5

$NLROE_{it} = \beta o + \beta_1(NL\text{KAC})_t + \upsilon$ (.05) 3.6

Where;

*NL*KAC =Natural log of kaizen costing

NLROA = Natural log of Return on Assets

$NLROE_{it}$ = Natural log of Return on Equity

Gillette and Robert (1992), suggested that in a linear regression equation where both the explained variable and the explanatory variables are in natural logs. Elasticity is a popular tool among empiricists because it is independent of units and thus simplifies data analysis.

Data Analyses and Results Interpretations

	KAC	ROA	ROE
Mean	3.303	460.29	67.854
Median	1.809	388.00	40.000
Maximum	5.000	768.06	143.200
Minimum	1.400	144.00	22.8000
Std. Dev.	0.703	12.717	72.081
Skewness	3.7261	5.4285	1.0944
Kurtosis	5.1918	1.4533	2.9410
Jarque-Bera	8.3727	2.678	4.0196
Probability	0.7000	1.5200	1 .0295
Sum	18.06	1.9843	2.3750
Sum Sq. Dev.	2.3708	5.1711	1.582

Source: Statistical Computation result from Researcher's E-view (v.12), 2022

The table shows the descriptive statistics of the data collected for the criterion variable's dimensions of the study. The kaizen costing (KAC) mean value of 3.303. The maximum and minimum values were kaizen costing (KAC), 5.000 and 1.400. Also, the standard deviation values of 0.703, signify that the data deviates from the mean values of the three study dimensions, which implies that there is a wide dispersion of the data from the mean because the standard deviation is close to the mean.

On the other hand, Skewness and Kurtosis calculated mean values, which is a measure of the departure of a distribution from symmetry above, kaizen costing (KAC) show a positive skewness value that is greater than 1. This indicates that the dimensions is normally distributed. The Kurtosis result, which measures the extent of flatness or peakedness of a distribution in relative terms to a normal distribution, confirms that kaizen costing (KAC), is normally distributed and are not platykurtic (not having negative values/flattened curved) as their kurtosis coefficient is more than 3.0. Also, the p-value for Jarque-Bera statistics [(JB (PValue > 0.05) = Accept Ho (Normal Distribution) and JB (P Value 0.05) = Reject Ho (Non-Normal Distribution)]. Thus, the values of

0.700 for kaizen costing (KAC) of Jarque-Beta and its statistical probabilities is accepted. The result strengthens the normality test of variables normally distributed.

On the other hand, Skewness and Kurtosis calculated mean values, which is a measure of the departure of a distribution from symmetry, for the measure of [(return on asset (ROA) and return on equity (ROE)] show a positive skewness value that is greater than 1. Meanwhile, the relevance value, which is also positive and also very close to 1. This indicates that all the distributions were positively skewed, indicating that they were not symmetrically distributed. The Kurtosis result, which measures the degree of peakedness or flatness of a distribution in relative terms to a normal distribution, confirms that the entire data series is normally distributed and is not platykurtic (not having negative values/flattened curves) as their kurtosis coefficient is greater than three. The p-value for all the variables is significant for the Jarque-Bera statistics [(JB (PValue > 0.05) = Accept Ho (Normal Distribution) and also JB (P Value 0.05) = Reject Ho (Non-Normal Distribution)]. Thus, the values of 1.5200 and 1 .0295 for the return on asset (ROA) and return on equity (ROE) respectively of Jarque-Beta and its statistical probabilities were accepted. The result strengthens the normality test of variables normally distributed.

Regression

The First Model: The first hypothesis test model; shows the relationship between return on asset and kaizen costing:

$H0_1$: NLROA = f(NLKAC)..... (i)

Dependent Variable: NLROA
Method: Least Squares
Date: 09/05/21 Time: 08:26
Sample: 2011 2020
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
KAC	33.58081	7.140005	4.703191	0.1601
C	25270.33	14711.56	1.717720	0.0952

R-squared	0.567512	Mean dependent var	56590.29
Adjusted R-squared	0.554407	S.D. dependent var	123371.7
S.E. of regression	82354.06	Akaike info criterion	25.53089
Sum squared resid	2.24E+11	Schwarz criterion	25.61977
Log likelihood	-444.7905	Hannan-Quinn criter.	25.56157
F-statistic	43.30275	Durbin-Watson stat	2.539359
Prob(F-statistic)	0.000000		

Source: Statistical Computation result from Researcher's E-view (v.12), 2022

From the table output above, the coefficient of KAC and ROA is 33.58081. This value implies that for every unit increase in ROA is predicted to be accompanied by a 33.58081unit decrease in KAC. The T-statistics is above 1, which is sufficient statistical evidence of significant @ 1% T-stat confidence level. The Prob value of KAC is 0.1601, which means the relationship between KAC and ROA is statistically insignificant at the 5 percent significant level.

The result also showed that the R2, which measures the goodness of fit, is 0.567512, meaning that 56 percent of the variation in the real gross domestic product can be explained by the dimension of the independent variables. The result indicates that the model is proper and adequate for the study. The model's goodness of fit and appropriateness is also supported by the outcomes of F-statistics and probability of F-statistics of 0.930275 and 0.000039 respectively. The Durbin-Watson statistics of 2.539359 also indicate the absence of serial autocorrelation.

The Second Model: The second hypothesis test model; shows the relationship between "return on equity and kaizen costing:

$H0_1$: NLROE = f(NLKAC)..... (iv)

Dependent Variable: NLROE
Method: Least Squares
Date: 09/05/21 Time: 08:29
Sample: 2000 2020
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
KAC	0.005484	0.001325	4.138777	0.0002
C	51.11951	9.471925	5.396951	0.0000

R-squared	0.574801	Mean dependent var	67.85714
Adjusted R-squared	0.458886	S.D. dependent var	7.208091
S.E. of regression	53.02303	Akaike info criterion	1.183478
Sum squared resid	92777.59	Schwarz criterion	1.092365
Log likelihood	-187.6086	Hannan-Quinn criter.	5.586546
F-statistic	0.883336	Durbin-Watson stat	2.517857
Prob(F-statistic)	0.000005		

Source: Statistical Computation result from Researcher's E-view (v.12), 2022

From the table output above, the coefficient of NLKAC and ROE is 0.005484. This value implies that for every unit increase in ROE is predicted to be accompanied by a 0.005484-unit decrease in KAC.

The T-statistics is above 1, which is sufficient statistical evidence of significant @ 1% T-stat confidence level. The Prob value of KAC is 0.0002, which means the relationship between KAC and ROE is statistically significant at the 5 percent significant level.

The result also showed that the R2, which measures the goodness of fit, is 0.574801, meaning that 95 percent of the variation in the consumer price index can be explained by the dimension of the independent variables. The result indicates that the model is proper and adequate for the study. The model's goodness of fit and appropriateness is also supported by the outcomes of F-statistics and probability of F-statistics of 0.883336 and 0.000005 respectively. The Durbin-Watson statistics of 2.517857 also indicate the absence of serial autocorrelation.

CONCLUSION

The study concludes that there is an insignificant relationship between kaizen costing (KAC) and return on asset (ROA) of listed food products manufacturing companies in Nigeria. There is a significant relationship between kaizen costing (KAC) and return on equity (ROE) of listed food products manufacturing companies in Nigeria. Thus, in light of the aforementioned findings, kaizen costing can be proposed as a 'new science and necessary tool' for achieving more accurate results in the preparation of financial performance of listed food products manufacturing companies in Nigeria. Despite the fact that kaizen costing is still in its infancy, there are signs that this method of accounting is becoming more standardized. The principles and procedures of kaizen costing are easily adaptable to the diverse needs of businesses and accounting requirements. Due to the demonstrated benefits of lean thinking and production, the use of traditional accounting is practicable when kaizen costing and production methods are implemented in businesses. By teaching kaizen costing to managers and those responsible for financial lists, it is possible to provide a tool for integrating lean thinking and production and presenting financial lists that are relevant, understandable, and in accordance with accounting standards.

RECOMMENDATIONS

The recommendations were;

1. The study recommends more accountants, production managers and top managers should learn from the kaizen costing training institutes in Nigeria where they offer training and knowledge about Kaizen costing system and how to adopt and use the same to the benefit of the company.
2. The study further recommended that to determine the actual performance of the Kaizen system, organizations should bridge the bureaucratic barriers and allow the top management to interact freely with the lower hierarchy members of the organization and build a proper rapport to enhance effective communication, efficient development of ideas, proper adoption of generated ideas and avoid dismissing the simple little ideas given by the junior staff about improvement of the organization.

REFERENCES

Alaaraj, A. A., & Bakri, L. P. (2019). The effect of lean production on financial performance: The mediating role of inventory leanness. *International Journal of Production Economics, 13*(8), 242–253.

Alborzi, F. (2002). Analysing the impact of the implementation of lean manufacturing strategies on profitability'. *Journal of the Operational Research Society, 61*(5), 858-871.

Alexandru, H. (2018). The lean benchmark report: *Closing the Reality Gap, 1*(4), 1–45.

Aziz, K., Awais, M., Rahat, Q., Hasnain, S. S. U., & Shahzadi, I. (2017). Impact of outsourcing on lean operations in Pakistani Healthcare Industry. *International Journal of Engineering Information System, 1*(8), 116–123.

Bayou, P., & De-Korvin, S. (2008). *Lean accounting: Best practices for sustainable integration*. Wiley.

Bititci, J. L., Akintoye, I. R., & Akpan, E. P. **(**2007). The lean enterprise and traditional accounting – is the honeymoon over? *The Journal of Corporate Accounting & Finance, 3*(2), 63-74.

Cooper, C. T., & Kaplan, O. (2011). *Exploring the relationships between just-in-time technique and manufacturing performance:* Empirical evidence from selected Nigerian firms. Manager (University of Bucharest, Faculty of Business and Administration) 10:165-176.

Demeter, K., & Matyusz, Z. (2011). The impact of lean practices on inventory turnover, *International Journal of Production Economics, 13*(1), 154–163.

Emiliani, R. E., Adams, E., & Johnson, N. (2007). A phenomenological research design illustrated. *International Journal of Qualitative Methods, 3*(1), 42–55.

Fullerton, K., & Wempe, P. (2009). In defense of activity-based cost management, Management Accounting *74*(5), 58-63.

Gillette, F., & Robert, J. (1992). *The machine that changed the world*. Macmillan Publishing Company.

Harry, M., & Schroeder, R. (2000). Perceptual measures of performance: fact or fiction? *Journal of Operations Management, 2*(2), 247-262.

Imai, P. (1986). General, Target and accessible population: Demystifying the concepts for effective sampling. *The Qualitative Report, 22*(1), 1-14

Ine-Tonbarapa, M. M. (2017). Impact of inventory management on firm performance: A case study of listed manufacturing firms in Ghana*. International Journal of Finance and Accounting, 7*(4), 83-96.

John, K. (1988). The nexus between health workers' emotional intelligence and job performance Controlling for gender, education, tenure and in-service training. *Journal of Global Responsibility, 8*(1), 1-16.

Khrawish, J. (2011). The use of organic models of control in JIT firms: generalizing Woodward's findings to modern manufacturing practices. *Accounting, Organizations and Society, 24*(5), 1-30.

Kr, P. (2011). Validity and reliability in social science research. *Education Research and Perspectives, 38*(1), 105-123.

Lee, J. (2006). The process of change in management accounting: some field study evidence, Management Accounting Research *1*(2), 3-19.

Liargovas, E. R., & Skandalis, U. I. (2018). Lean-Based workforce management in Jordanian manufacturing firms. *International Journal of Lean Enterprise Research, 1*(4), 284-316. https://doi.org/10.1504/IJLER.2015.071744

Liker, H., & Hoseus, K. (2017). Value stream mapping: A study about the problems and challenges found in the literature from the past 15 years about application of Lean tools. *International Journal of Advance Manufacturing Technology, 7*(2), 779–790.

Lumpkin, H., & Dess, D. A. (2019). Determinants and barriers to lean implementation in food-processing SMEs – a multiple case analysis. *Production Planning Control, 2*(7), 1–23.

Mainelli, K., & Giffords, F. (2014). Accounting for accounting: towards the development of a dialectical view, Accounting, Organizations and Society, *12*(2), 437-456

Maskell, F. S., & Kennedy, J. (2017). Defining lean production: Some conceptual and practical issues. *The TQM Journal, 21*(2), 127-142

Nmesirionye, M., Granlund, M. & Lukka, K. (2019). Towards increasing business orientation: Finnish management accountants in a changing cultural context. *Management Accounting Research, 8*(9), 185-211.

Olabisi, D., Nowak, M., Pfaff, H., & Karbach, U. (2012). Does value stream mapping affect the structure, process, and outcome quality in care facilities? A systematic review. *Journal of Manufacturing Technology Management,* 6(7), 170-186.

Oyewo, M. N. (2014). Understanding the linkage between lean practices and performance improvements in Indian process industries. *Industrial Management & Data Systems, 11*(2), 346-364.

Perera, S., Harrison, G., & Poole, M. (2011). Customer-focused manufacturing strategy and the use of operations-based non-financial performance measures: A research note. *Accounting, Organisations and Society, 2*(2), 557-572.

Rof, F. H. (2012). Lean manufacturing: Costing the value stream. *Industrial Management & Data Systems, 4*(5), 647-668.

Sani, N. B., & Allahverdizadeh, S. H. (2012). Value stream mapping to reduce the lead-time of a product development process. *International Journal of Production Economics, 16*(9), 202–212

Siyanda, N. C. (2017). Applying lean six sigma in a small engineering Company: A model for change. *Journal of Manufacturing Technology Management, 20*(1), 113 -129.

Temitope, L., Egbunike, P. A., & Unamma, A. N. (2020). *Research methods for business students,* [5th Edition], Prentice Hall.

Timothy, B., Gomes, G., Alfinito, A., & Albuquerque, H. (2013). The effect of competition, just in time production and total quality management on the use of multiple performance measures: an empirical study. *Journal of Economic and Social Research, 10*(1), 35-72.

Titu, S. G. (2010). Antecedents to management accounting change: A structural equation approach. *Accounting, Organisations and Society, 28*(8), 675-698.

Womack, F. H. (2017). The role of performance measurement in continuous improvement. *International Journal of Operations & Production Management, 19*(12), 1318 - 1334.

APPENDIXES

APPENDIX A

Please tick (✔) where applicable to you.

Response key:		Scale of Measurement
Strongly Agree	(SA)	5
Agree	(A)	4
Moderate Agree	(MA)	3
Disagree	(DA)	2
Strong disagree	(SDA)	1

Independent Variable dimensions

S/N	KAIZEN COSTING	SA	A	MA	DA	SDA
1	Kaizen lean manufacturing practice have reduce actual costs below the standards set.					
2	Kaizen lean manufacturing practice have helped sorting, or identifying items that are no longer useful and getting them out of the way to give continuous zero waste improvement.					
3	Kaizen lean manufacturing practice meets market demand forecasting and enhance timely delivery to customers.					
4	Kaizen lean manufacturing practice have achieved in total quality control and continuous quality improvement in products.					
5	Kaizen lean manufacturing practice has not effectively reduced the losses of theft, obsolescence, wastage, etc.					
6	The company use of lean manufacturing accounting practices has improved performance measurement, control and decision-making process.					

APPENDIX B

SECONDARY DATA FOR THE MEASURES OF THE DEPENDENT VARIABLES

RETURN ON ASSET

YEAR	CURD BURY ₦	DANG OTE R ₦	HONE Y WELL ₦	MC NICH OLS ₦	NASCO N ₦	NEST LE ₦	UNION SALT ₦	FLOUR MILL ₦	NORTHERN FLOUR MILL ₦
2012	0.0374 3	0.1294 1	-3.5923	0.0350 9	0.2589	0.0748 5	0.0233	0.0487	-0.0338
2013	0.0463 0	0.1555 2	-1.6991	0.0729 0	0.2361	0.0696 0	-0.0138	0.0392	-7.5693
2014	0.0114 8	0.1224 0	-0.0187	0.1815 9	0.1469	0.2096 4	0.0908	-0.0483	-1.81533
2015	- 5.5176 8	1.1868 0	0.0982	0.1172 6	0.12922	0.1991 0	0.2838	0.01174	-0.053799
2016	- 5.9867 6	0.0807 0	0.0894	0.1177 16	0.09816	0.0729 6	-0.0607	0.04265	0.05446
2017	- 78.723 9	1.9290 8	0.0278	0.0631 4	0.17739	0.2297 1	0.1061	0.03045	-0.02618
2018	- 0.0172 7	0.1446 9	0.1170	0.0494 7	0.14602	0.2649 3	0.1475	0.02722	-0.01103
2019	- 6.4325 1	0.1216 5	0.1046	-2.7979	0.04771	0.2362 4	0.0584	0.01478	-4.80241
2020	- 3.8012 1	0.1209 9	0.0739	0.0226 5	0.06071	0.1592 7	0.0257	0.22385	0.03898

Source: Nigeria Stock Exchange Commission and https://www.proshareng.com/report/Annual Reports/Audited

RETURN ON EQUITY

YEAR	CURD BURY ₦	DANG OTE R ₦	HONEY WELL ₦	MC NICHOLS ₦	NAS CON ₦	NESTL E ₦	UNIO N SALT ₦	FLOUR MILL ₦	NORTHER N FLOUR MILL ₦
2012	1.09	9.0	33.97	3.40	1.54	3.21	-	3.81	-12
2013	1.37	1.13	35.86	8.67	1.02	3.14	-	3.72	12.6
2014	7.5	9.9	42.26	38.39	7.0	28.05	-	4.37	13.1
2015	6.1	1.05	6.11	16.59	7.9	29.95	1.82	9.2	-11.2
2016	-1.6	1.18	6.29	17,12	9.1	2.76	-	3.97	-11.1
2017	1.6	3.15	2.17	10.42	2.02	42.55	4.37	3.75	-9
2018	4.4	2.15	9.10	12.50	1.67	54.26	-	3.52	-3.4
2019	5.7	2.01	8.52	6.20	7.0	57.63	-	1.13	-1.8
2020	5.0	2,58	6.72	4.95	1.02	49.47	-	2.05	-3.07

Source: Nigeria Stock Exchange Commission and https://www.proshareng.com/report/Annual Reports/Audited

APPENDIX C

APPENDIX

Table (3.1) Population Distribution of Respondents in the nine (9) listed food products manufacturing companies on the floor of the NSE as at 31 August 2021.

S/n	Listed companies	Sub-sector	Cities	Production Depart	Marketing Depart	Finance Depart	Total	Percentage
1	Cadbury Nigeria Plc	Food Products	Lagos	26	7	8	41	12
2	Dangote Sugar Plc	Food Products	Tunga Awe, Nasarawa St.	27	8	12	47	14
3	Mcnichols PLC	Food Products	Lagos	19	5	7	31	9
4	Northern Nigeria Plc	Food Products	Kano	27	6	7	40	12
5	Nestle Nigeria PLC	Food Products	Port Harcourt	21	7	9	37	11
6	Flour Mills NIG. PLC.	Food Products	Lagos	24	7	11	42	13
7	Nascon Allied PLC	Food Products	Port Harcourt	16	6	10	32	10
8	Union Dicon Salt Nig. PLC	Food Products	Lagos	17	6	8	31	9
9	Honeywell Flour Mill	Food Products	Lagos	19	7	9	35	10
	Total	9	4 Cities	196	59	81	**336**	100

Field Report", 2021