

# Cost Management Strategies and Profitability of Quoted Cement Manufacturing Firms in Nigeria

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**Abstract:** *Cost management strategies are considered as useful means of increasing revenue for the successful operations of manufacturing firms in which cement manufacturing companies are inclusive. The study examined the relationship between cost management strategies and profitability of quoted cement manufacturing firms in Nigeria. It used ex post facto research design with three quoted cement manufacturing firms as population of the study based on the years 2013-2022. Content analysis research method was adopted. The findings of this study were; Throughput costing (x1), lifecycle costing (x2), target costing (x3) and activity based costing (x4) strategies have positive relationship with the return on equity of quoted cement manufacturing firms with correlation coefficient:  $Rx1 = 0.090$ ;  $Rx2 = 0.119$ ,  $Rx3 = 0.429$  and  $Rx4 = 0.438$  respectively. Based on the findings of the study, it was concluded that target, lifecycle, throughput and activity based costing have a combined positive relationship with the return on equity of quoted cement manufacturing companies in Nigeria. But specifically, throughput accounting has weak and insignificant positive relationship. The researcher recommended that firms should confine the output to the extent of customers' demand to locate approaches of raising customers demand to a higher level. Cement firms should exercise the inputs of specialists within and outside the organisation in pursuit of economic life-cycle cost and profitability determination of products. Firms should facilitate the identification of how individual customer influences the cost of supply so as to provide the business with better information to make value-based and more effective decisions.*

**Keywords:** *Lifecycle, Throughput, Profitability and Activity Based Costing*

## Introduction

Cost management strategies are the means adopted for classification and division of costs in order to determine the final price of the products and services of the enterprises, adjustment and providence of relevant information appropriately

in a way that it would be usable for the guidance of managers and the owners of the enterprises to control its operations. They are considered as critical factors in increasing profitability margin in firms. Therefore, a company will be more

successful if it develops and implements effective and efficient cost management strategies directed towards better resource allocation and competitive advantage. Before a project is undertaken, objectives must be defined to avoid cost over-runs, over estimation or underestimation of cost. Thus, profitable projects are associated with proper cost management strategies. With good cost management strategy, unexpected costs can be dealt with easily as and when they occur. Cost management strategy is undoubtedly required for the success of any business, especially manufacturing firms. When the scope for cost is defined and relatively becomes bearable in the businesses. This will permit goal setting and effort directing towards goal realization. It promotes better planning and financial management as well as more security and budget visibility, which allows for decisions to be made before getting into debt. Cost management strategy helps to compare the actual cost incurred to the budgeted to know if any component of business spends more than expected; It enhances the control of specific project cost and also the overall business cost; With good cost management strategy, one can easily foresee the future expenses or costs and this in turn helps in working towards the expected revenues. One of the important objectives of financial management is to maximize the shareholders' wealth. Profitability is an important determinant of organizational performance and the shareholders' value.. Profitability indicates how well an enterprise is managed to generate earnings by using the resources at its disposal. It is an issue of much concern, as it shows the ability of the firm to stand better in order to withstand negative shocks and contribute to the stability of the system. It is a ratio of earnings to the funds used. It represents profit which is deflated by the size of the unit and indicates the efficiency with which organisation deploys its total resources to maximise its profit. The word 'profitability' is a modulation of two words namely profit and ability. The accounting profit is the difference between total revenue and explicit cost incurred in the process of doing business. According to economic perspective, profit is the

difference between total revenue and total cost, both implicit and explicit. The term ability indicates the earning power or operating performance of a firm. The business ability points towards the financial and operational performance of the firm. Thus, profitability is the ability of a firm to earn profit from all the activities of an enterprise by efficient utilisation of its resources. As an index of performance evaluation, the profitability of cement manufacturing firms in Nigeria has arisen due concern because, it shows the proportion of profit in comparison with asset investment, equity, or sales. Improving profitability has become one of the key tasks for enterprises, especially in the context of international economic integration today.

### **Statement of the Problem**

Some companies employed different cost management strategies to achieve the objective of profit maximization yet recorded limited amount of success. This was in view of the fact that some of these strategies are no more effective following the complexities of business environments coupled with global challenges of high cost of doing business. The traditional cost management system failed to effectively manage the cost of operations in order to enhance profitability of companies. Moreover, it is observed that some traditional costing methods such as marginal costing and absorption costing failed to take into consideration the time value of money. Over some time, various attempts have been made to evaluate the importance of cost management strategies in achieving the profit maximization objective of firms. This study attempts to overcome the identified research gap, through the topic: Cost management strategies and profitability of quoted cement manufacturing firms in Nigeria.

### **Objectives of the Study**

The main objective of the study was to examine the relationship between cost management strategies and profitability of quoted cement manufacturing companies in Nigeria. However, the specific objectives of the study include:

- To determine the relationship between throughput accounting strategy and return

on equity of quoted cement manufacturing companies in Nigeria.

- To assess the relationship between Life-cycle costing strategy and return on equity of quoted cement manufacturing companies in Nigeria.
- To ascertain the relationship between target costing strategy and return on equity of quoted cement manufacturing companies in Nigeria.
- To examine the relationship between activity based costing strategy and return on equity of quoted cement manufacturing companies in Nigeria.

### Research Questions

In order to effectively address the objectives of the study, the following research questions were postulated:

1. How does throughput accounting strategy relate with return on equity of quoted cement manufacturing companies in Nigeria?
2. What is the relationship between Life-cycle costing strategy and return on equity of quoted cement manufacturing companies in Nigeria?
3. How does target costing strategy relate with return on equity of quoted cement manufacturing companies in Nigeria?
4. What is the relationship between activities based costing strategy and return on equity of quoted cement manufacturing companies in Nigeria?

### Hypotheses of the study

In order to answer the above research questions, the following hypotheses (in null form) were formulated for the study:

**H<sub>01</sub>:** Throughput accounting strategy does not significantly relate to return on equity of cement manufacturing companies.

**H<sub>02</sub>:** Life cycle costing strategy does not have any significant relationship with return on equity of cement manufacturing companies.

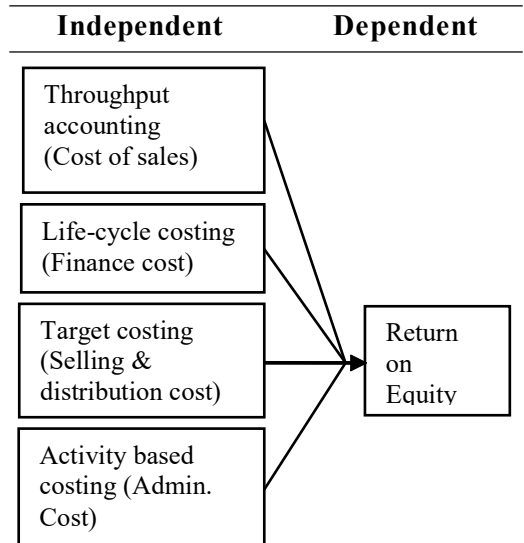
**H<sub>03</sub>:** Target costing strategy does not have any significant relationship with return on equity of cement manufacturing companies.

**H<sub>04</sub>:** Activity based costing strategy does not have any significant relationship with return on equity of cement manufacturing companies.

## Literature Review

### Conceptual framework

The conceptual framework of this study is presented in figure 2.1 below;



**Figure 2.1:** Diagrammatic Representation of the Variables

**Source:** Researchers' design (2023)

### The Concept of Cost management Strategies

Cost management strategies are the means of appropriate classification and division of costs in order to determine the final price of the products and services of the commercial unit and adjustment and providence of relevant information appropriately in a way that it would be usable for the guidance of managers, the owners of commercial units to control its operation (Oluwugbemiga, Olugbenga and Zaccheaus, 2014). Cost management strategy helps in managing costs and aligning the business strategy of an entity. In order to gain advantage in this increasingly modern

competitive market, cost management and strategies are critical for any enterprise (Erasmus, 2021). Before a project is taken up, it is essential to define the objectives to avoid any sort of cost over-runs. It helps in keeping away the over or underestimation of costs. A well-defined business help in facilitating proper management of costs making the project profitable. With cost management strategy unexpected costs can be dealt with easily as and when they occur. Cost management strategy is undoubtedly required for the success of any business, especially manufacturing firms (Umo, 2022).

### **Components of Cost Management Strategies**

#### **i. Target Costing (Selling and Distribution Cost)**

Target costing is a cost management tool for minimizing the general cost of a product over its product life cycle (Erasmus, 2021). It is basically a product development process that manipulates equations and develops costs based on prices, and then works backward to design the product and then the production process. Target costing is a costing system that emphasis improved understanding of competition, markets and consumer requirements in terms of quality, products, functions, delivery time and price. The main purpose of target costing is to facilitate profitable management of business in firms that employ its uses, and enhance survival of such business in a competing environment. Fridh and Borgernas, (2003) maintained that target costing seeks to reduce a products' life cycle cost before production commences in order to attain the desired profitability.

#### **ii. Lifecycle Costing (Finance Cost)**

Life cycle costing (LCC), or whole-life costing, is the process of estimating how much money you will spend on an asset over the course of its useful life (Erasmus, 2021). Whole-life costing covers an asset's costs from the time you purchase it to the time you get rid of it. Buying an asset is a cost commitment that extends beyond its price tag. For example, think of a car. The car's price tag is only part of the car's overall life cycle cost.

You also need to consider expenses for car insurance, interest, gas, oil changes, and any other necessary maintenance to keep the car running. Not planning for these additional costs can set you back. The costs include the purchase price, cost to install it, cost to operate it, maintenance and repair, and upgrade cost (if any). In short, we can say the costs would include initial investment, any further investment, recurring expenses, and disposal expenses. A straightforward example of LCC is buying a car. The purchase price is not the only price that you pay for the car. During the car's lifetime, you also need to pay insurance, road tax, repairing, maintenance, and petrol or diesel costs.

#### **iii. Throughput Accounting (Cost of sales)**

Throughput accounting (TA) is one of the fastest growing practices in accounting which requires lot of investigation from empirical perspective. Throughput Accounting emerged as a result of the development of the Theory of constraint by Goldratt.

Throughput is the amount of a product or service that a company can produce and deliver to a client within a specified period of time. The term is often used in the context of a company's rate of production or the speed at which something is processed. Businesses with high throughput levels can take market share away from their lower throughput peers because high throughput generally indicates that a company can produce a product or service more efficiently than its competitors. It is designed to support management decision making. Throughput accounting is particularly useful for identifying products that are generating the most cash flow for each incremental unit of production (Erasmus, 2021).

#### **iv. Activity Based Costing (Administrative Cost)**

It can be considered as the modern alternative to absorption costing, allowing managers to better understand product and customer net profitability. This provides the business with better information to make value-based and

therefore more effective decisions. ABC focuses attention on cost drivers, the activities that cause costs to increase. Traditional absorption costing tends to focus on volume-related drivers, such as labour hours, while activity-based costing also uses transaction-based drivers, such as number of orders received. In this way, long-term variable overheads, traditionally considered fixed costs, can be traced to products (Budugan & Georgescu,2009).

### **Cost Control Applications**

A complex business requires frequent information about operations in order to plan for the future, to control present activities, and to evaluate the past performance of managers, employees, and related business segments. To be successful, management guides the activities of its people in the operations of the business according to pre-established goals and objectives.

Management’s guidance takes two forms of control:

1. The management and supervision of behaviour, and
2. The evaluation of performance. Behavioural management deals with the attitudes and actions of employees. While employee behaviour ultimately impacts on success, behavioural management involves certain issues and assumptions not applicable to accounting’s control function. On the other hand, performance evaluation measures outcomes of employee’s actions by comparing the actual results of business outcomes to predetermined standards of success. In this way management identifies the strengths it needs to maximize and the weakness it seeks to rectify. This process of evaluation and remedy is called cost control. Cost control is a continuous process that begins with the proposed annual budget.

The budget helps:

- i. To organize and coordinate production, and the selling, distribution, service and administrative functions;

- ii. To take maximum advantage of available opportunities. As the fiscal year progresses,

Through the budget process and accounting control, management establishes overall company objectives, defines the centre of responsibility (accountability) centre, and designs procedures and standards for reporting and evaluation. A budget segments the business into its components or centres where the responsible party initiates and controls action. Responsibility (accountability) centres represent applicable organizational units, functions, departments, and divisions. Generally, a single individual heads the responsibility centre exercising substantial, if not complete, control over the activities of people or process within the centres and controlling the results of their activity. Cost centres are accountable only for expenses, that is, they do not generate revenue. A budget establishes the responsibility centre, delegates the concomitant responsibility, and determines the decision points within an organization. The planning process provides for two types of control:

1. Feed forward- Providing a basis for control at the point of action (the decision point); and
2. Feedback- Providing a basis for measuring the effectiveness of control after implementation.

### **Profitability**

Uford (2017) opined that one of the important objectives of financial management is to maximize the shareholders’ wealth value and profitability is a very important determinant of organizational performance and the shareholders’ value. Erasmus, (2021) argues that profitability is “the net result of a large number of policies and decisions”. However, Oyedokun, Tomomewo and Owolabi (2019) states that profitability is the relationship of income to some balance sheet measure which indicates the relative ability to earn income on equity employed.

The business ability points towards the financial and operational ability of the business

(Inseng&Uford, 2019). So, on this basis profitability is the ability of a firm to earn profit from all the activities of an enterprise by efficient utilisation of its resources. Profitability of cement manufacturing firm in Nigeria is one of the vital elements for performance evaluation, showing the proportion of profit in comparison with asset investment, equity, or sales (Oyedokun, Tomomewo&Owolabi, 2019).

### **Cost Management Strategies and Profitability Relationship**

Another positive relationship is that cost containment techniques such as standard costing, sourcing and budget system limit the highest cost that could be incurred and as a result for the same level of income, the expenses are lower which results to increase in profitability (Zengin&Ada, 2010).

These results to rising of (ROE) ratio hence increase in profitability. Cost avoidance which refers to the eliminated activities that generate costs of non-added values has a positive impact on profitability in that costs which increase expenditure with no future income generation are done away with hence reducing the negative impact on income. Positive elevation of income leads to increase in (ROE) and in profitability as well which is the measure of financial performance in this study.

### **Target Costing and Profitability**

Target costing (TC) is a management technique in which prices are determined by market conditions, taking into account several factors; homogenous products, level of competition, no or low switching costs for the customer etc. When these factors come into the picture, management wants to control cost as they have little or no control over the selling price. CIMA defined TC as “a product cost estimate derived from a competitive market price.

Mathematically;  $TC = SP - PM$

Where; TC = Target Cost

SP = Selling Price

PM = Profit Margin

In the context of this research study, target costing is measured using selling and distribution cost (Fadare&Adegbie, 2020).The technique required that managers change how they think about the relationship between cost, price and profit. Generally, the approach is to develop a product, determine the production cost of that product, and set a selling price, with a resulting profit. Profit is the difference between revenues and expenses over a given period of time (basically one year) Pandey, (2010). Every business organization would want to make sufficient profit; even the on-for-profit business organization can only stay in business if and only if it can take care of its expenses with a left over profit not a loss.

### **Life-Cycle Costing and Profitability**

Total cost management through the instrumentality of lifecycle costing (LCC) has been the secret behind the success story of many manufacturing firms in most developed nations of the world (Boateng&Thomas, 2015). For instance, in China, Japan and Germany,Fasheyi and Tolu (2018) discovered that manufacturing firms in these countries have been recording tremendous successes in managing their product for sustained profitability over the last decades. Similarly, Babaye, (2018) observed that using LCC tool, manufacturing firms in countries such as UK, USA and Russia have been accurately predicting costs of developing and making new products, identify costs incurred in all stages of manufactured products and identifying areas where cost savings can be achieved for efficiency, quality and profitability. In implementing LCC, managerial attention is normally directed towards three (3) key areas particularly in respect to product utilisation namely:

- (i) Accurate determination of proportion of time the product is capable of functioning competitively
- (ii) Product maintainability which usually requires manufacturers’ responses to the affirmative or otherwise as to whether the products can be maintained for patronage and

(iii) Consideration of the disposal costs of the product and associated environmental problems. These three key areas require technical, engineering, scientific and production experts that accountants cannot assess alone (Fasheyi&Tolu, 2018).

**Throughput Accounting and Profitability**

Throughput Accounting is a modern technique that has took shape to meet management specifications for implementing continuous improvement concepts, as it provides needed insight into the development of operational performance by focusing on bottleneck areas and reducing completion times, as well as attempting to link throughput and operational resources expended. Intuitively we all know that generating greater revenues via sales need to be the principal focus of agencies in profit maximization. In line with this, emphasis has shifted in recent instances from cost-based accounting models such as managerial costing to a revenue-based accounting system recognized as throughput Accounting. Throughput Accounting is a vital development in present day accounting that approves managers to apprehend the contribution

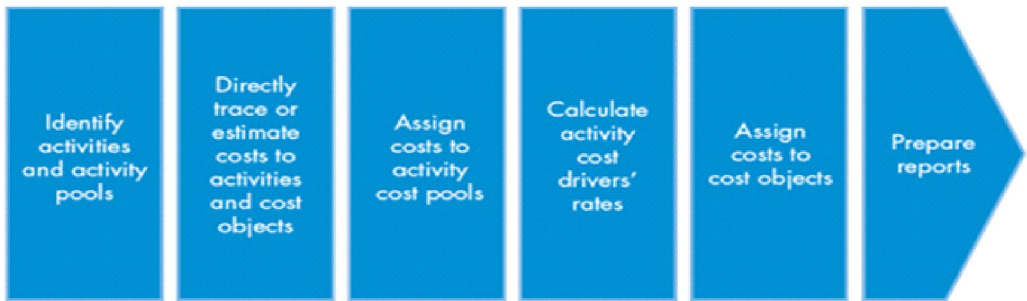
of restrained sources to the common profitability of the commercial enterprise (Bragg, 2007).

Throughput accounting takes into account two factors: Sales or revenue and total (truly) variable cost of production. Total (truly) variable costs of production are those costs that vary with the production or output level exactly in the ratio of 1:1 per unit.

**Activity Based Costing (ABC) and Profitability**

It can be considered as the modern alternative to absorption costing, allowing managers to better understand product and customer net profitability. This provides the business with better information to make value-based and therefore more effective decisions. Furthermore, the refined treatment of overhead cost by using ABC system can facilitate the identification of how individual customer influences the cost of supply (Innes & Mitchell 2009).

Nevertheless, Activity-based costing (ABC) is the determination of product cost based on the activity needed for producing a product. The activities required to produce a product or render service consume a cost.



**Figure 1: The Activity-Based Costing Process**

Source: Researcher’s Design, (2023).

**Research Method**

**Research Design**

The study adopted the ex post facto research design, as recommended by (Uford, Charles &Ekong, 2022), for studying past events. This was because of the fact that the data for the study

was drawn from the published financial statements of quoted cement manufacturing firms in Nigeria using contents analysis. It was based on the criteria of identifying the items as disclosed in the financial statements.

**Population of the Study/Area**

The population of the study consist of three cement manufacturing companies that were listed on the floor of the Nigerian Exchange Group from

2013 - 2022 as at June,2023. This was possible as all the companies identified have the required data which were useful in the study.The three identified areas of the study as quoted on the floor of Nigerian Exchange Group Ltd., within the period under review were as follows;

**Build Up Area (BUA) Cement:** BUA Cement PLC is a publicly listed firm with headquarters in Lagos, Nigeria. It is the second largest producer of cement in Nigeria after Dangote and was founded in 2008 by Abdul SamadRabiu from Kano. The company’s entry into the cement market began in 2008 when government gave it the licence to import cement to selected group of entrepreneurs. (buagroup.com)

**Dangote Cement:** Dangote cement Plc is a Nigerian publicly traded multinational cement manufacturer founded in 1981 by AlikoDangote with the headquarters in Lagos. It has Mr. Michael Puchercos as the Chief Executive Officer since February 1, 2020 and a total employee of four thousand four hundred and seventy-seven staff. The parent organisation is Dangote Group with its subsidiaries in Tanzania, Ethiopia, Sierra Leone, Congo, Cameroon, etc. just to mention

but few. Their initial focus was on importation of bagged cement and other commodities such as rice, sugar, flour and salt. Over time, the group began to import bulk cement into the Apapa and Port Harcourt terminals, which it then bagged for distribution and throughout1990s; the Group made a strategic decision to transition from a trading based business to a fully-fledged integrated manufacturing operation which has made them to spread their products in the whole of Africa.

**Lafarge Africa Plc:**Lafarge Africa Plc is a member of Holcim Group founded in 1833 by Joseph-AugustePavinfrom Paris, France. It is a publicly quoted company on the Nigerian Exchange Group Ltd and serves Nigeria with wide range of building and construction solutions designed to meet housing and construction needs from small projects like individual home buildings to major construction and infrastructure projects with plants in Ewekoro and Sagamu in the south-west, Mfamosing in the south-south and Ashaka in the North-East of Nigeria. Currently, the plants are now located in Lagos, Port Harcourt, Abuja and Ewekoro, all in Nigeria.

**Table 1: List of Study Population**

S/N	GROUP NAME	COMPANY NAME	FACILITY NAME	CITY
1	BUA Cement	Edo Cement Coy. Ltd.	Edo Okpella	Okpella
2	BUA Cement	BUA Cement	Sokoto Kalambaina	Kalambaina
3	Dangote Group	Dangote Cement Plc, DangCem	Obu I & II	Okpella
4	Dangote Group	Dangote Cement Plc, DangCem	Benue	Gboko
5	Dangote Group	Dangote Cement Plc, DangCem	Ibese	Ibese
6	Dangote Group	Dangote Cement Plc, DangCem	Obanjana	Obanjana
7	Lafarge Holcim Ltd	Ashaka Cement Plc	Ashaka	Gombe
8	Lafarge Holcim Ltd	Lafarge Africa Plc (WAPCO)	Ewekoro I & II	Ewekoro
9	Lafarge Holcim Ltd	Lafarge Africa Plc (WAPCO)	Sagamu	Sagamu
10	Lafarge Holcim Ltd	United Cement Coy. of Nig. Ltd (UNICEM)	Mfamosing	Calabar

**Source:** Nigerian Exchange Group Ltd, (2023)



## Sample Size and Sampling Technique

The study adopted all the three quoted cement manufacturing companies in the population as sample size from 2013 – 2022. Thus, given a total number of thirty observations; simply because they have their financial statements published with the specific required data within the period under review.

## Sampling Technique

The sampling technique adopted for the study was census sampling technique. The method was adopted because those were the only quoted cement manufacturing companies whose financial statements contained specific required-data needed within the period under consideration.

## Sources of data collection

Secondary data was the main source of data for the study. The data were extracted from Nigerian Exchange Group Fact Books and linked Companies' Annual Financial Reports selected for the study within the period under consideration. The other relevant data for the study was collected from various books, journals, magazines and websites.

## Method of data collection

This study uses the contents analysis method. In this method, data from financial reports were obtained through an in-depth examination with the aid of measurement check-list based on the identified independent variables which consists of target costing (TC), life-cycle costing (LCC), throughput accounting (TA) and activity based costing (ABC). Also the dependent variable, profitability was measured by returns on equity (ROE) which was computed from data extracted from the financial statements.

## Model specification

Based on the theoretical literature and earlier empirical studies on cost management strategies and profitability, the model captured cost management strategies and profitability of quoted cement manufacturing firms in Nigeria. Thus, the study adapted the model specified by

Fadare&Adegbe (2020), which was modified for the purpose of establishing the relationship between the dependent variables and the linear combinations of several determining variables captured in the study. The independent variable for the study was cost management strategies (CMS) which was decomposed to target costing strategy (TCS), life-cycle costing strategy (LCS), throughput accounting strategy (TAS) and activity based costing strategy (ABC) while the dependent variable was proxied by return on equity which was computed as Net profit for the year divided by total equity.

The changes the study made were; Fadare&Adegbe (2020) examined the effect of Cost Management and Financial Performance of Consumer Goods Companies in Nigeria with a purposive sampling technique within a period of ten years from 2009 – 2018. While this study examined the relationship between Cost Management Strategies and Profitability of Quoted Cement Manufacturing Firms in Nigeria with census sampling technique within a period of ten years from 2013 – 2022.

The first model which showed the relationship between dependent and independent variables was expressed as

$$ROE = f(CMS) \quad \text{-----} \quad (i)$$

The second model indicated the relationship among the independent variable as follows;

$$CMS = TCS, LCS, TAS, ABC \quad \text{---} \quad (ii).$$

Then from there, the correlation matrix models which captured the relationship between the dependent and independent variables were developed as follows:

$$ROE_{kt} = \hat{a}_0 + \hat{a}_1 TCS_{kt} + \hat{a}_2 LCS_{kt} + \hat{a}_3 TASA_{kt} + \hat{a}_4 ABC_{kt} + e_t$$

Where:

$\hat{a}_0, \hat{a}_1, \hat{a}_2, \hat{a}_3, \hat{a}_4$  = Coefficients which were determined from the analysis of data.

$ROE_{kt}$  = Return on equity for cement firm k in year t

$TCS_{kt}$  = Targets costing strategy for cement firm k in year t

$LCS_{kt}$  = Life-cycle costing strategy for cement firm k in year t

$TAS_{kt}$  =Throughput accounting strategy for cement firm k in year t

$ABC_{kt}$  =Activity based costing for cement firm k in year t

CMS = Cost management strategies

$e_t$  = Error term in year t was included to measure other variables which affect performance but was not captured in the model.

Descriptive and inferential statistical methods were employed to analyse the data in the study. The secondary data collected was analysed using descriptive statistics, regression analysis and correlation matrix analysis through E-view Statistical Package. The descriptive statistics was used to evaluate the characteristics of the data: mean, minimum, maximum and standard deviation and also checked for normality of the data.

Robust regression was used in this study to test the hypotheses since the pool OLS regression result has heteroscedasticity problem.

**Table 2: Operationalization of the variables**

S/N	Variables	Measurements	Apriori Sign
1	Return on Equity	Return on equity is measured as the ratio of profit after tax to total equity	
1	Throughput accounting	Throughput accounting is measured as Cost of sales	+
2	Life-cycle costing	Life cycle costing is measured as Finance cost expense	-
3	Targets costing	Targets costing is measured as Selling and distribution expense	+
4	Activity based costing	Activity based costing is measured as administrative cost	-

Source: Fadare & Adegbe (2020)

## Data Analysis

### Data Presentation

The data set of the study were total equity, profit for the year, activity-based costing strategy (measured using Administrative cost), target costing strategy (measured using selling and distribution cost), throughput costing strategy (measured using cost of sales) and life cycle costing strategy (measured using finance cost). The data were extracted through content analysis from the financial statements of quoted cement manufacturing firms in Nigeria. The measurement

was adapted from the model specified by Fadare & Adegbe, 2020. The data set is presented as an appendix to this work (Appendix 1).

### Descriptive Statistics

The descriptive statistics of this study is presented in Table1. The statistics were mean, maximum, minimum, standard deviation. The mean measures the average value of each of the variables. The maximum value indicates the highest value of the variables within the period under review. The minimum value on the other hand shows the least value among the variables within the period under study. The standard deviation measures the degree of dispersion.

**Table 3: Descriptive statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
ABC (ADMIN COST) X1	30	2498823.00	2266338231.00	291848390.0333	681588655.51361
TARGET COST (SELLING AND DISTRIBUTION) X2	30	869993.00	928730786.00	100846297.7333	181231065.96641
(THROUGHPUT (COST OF SALES) X3	30	11839546.00	10772305881.00	1533669104.5333	3396769163.35812
LIFE CYCLE(FIN COST) X4	30	388162.00	424257930.00	70895828.7333	116090149.39285
ROE (Y)	30	1.63	35.43	13.2256	8.33533
Valid N (listwise)	30				

**Source:** Researcher's Computation (2023).

It was noticed in Table 3, that the minimum activity-based cost of quoted cement manufacturing companies was N2,498,823.00 while the maximum value was N2,266,338,231,000. The result also showed the mean of N291,848,390.0333 against the standard deviation of N681,588,655.51361. Also, the minimum target cost of quoted cement manufacturing companies was N 869,993.00 while the maximum value was N928,730,786.00. The result also showed the mean of N 100,846,297.7333 against the standard deviation of N181,231,065.96641. Considering throughput cost of quoted cement manufacturing companies a minimum and maximum values of N11,839,546.00 and N10,772,305,881.00 (1.08E+10) respectively was observed. The result also showed a mean and standard deviation of 1533669105 and 3396769163 respectively. The minimum amount of life cycle cost of quoted cement manufacturing companies was N388,162.00 with a maximum value of N424,257,930.00. Life cycle cost had a mean of

N70895828.73 and a standard deviation of 116090149.4.

It is observed that, the mean ABC is the greatest and the mean of throughput cost is greater than that of target cost. Life cycle cost has the smallest mean per year. However, throughput cost has the highest deviation closely followed by ABC and then the target cost. Life cycle cost still maintained the lowest.

### Test for Assumptions of the Least Square Regression Model

Preliminary investigations revealed that the linearity assumption was violated. In view of the development, the original data was transformed using the logarithm approach. Hence, the assumptions of linearity, homogeneity of variances, multiple collinearity, normality and autocorrelations were carried out on the transformed data. The various tests and analysis were carried out using a statistical package (SPSS)

**Table 4: Test for Linearity**

		Sum of Squares	df	Mean Square	F	Sig.	
Response factor	Between Groups	(Combined)	1099.401	4	274.850	566.044	.000
		Linearity	530.854	1	530.854	1093.275	.000
		Deviation from Linearity	568.547	3	189.516	390.300	.000
	Within Groups		70.407	145	.486		
Total			1169.807	149			

**Source:** Researcher's Computation (2023).

This revealed that there exists a linear relationship between the dependent and the independent

variables. This is true since the p- value of 0.000 was less than the significance level of 0.05 used in the test.

**Table 5: Test for Homogeneity of Variance**

Levene Statistic	df1	df2	Sig.
5.157	4	145	.001

**Source:** Researcher’s Computation (2023).

The table above showed that the variances are equal. The validity of the assumption holds

because the Levene statistic of 5.157 was significant at 5% level of significance ( $p\text{-value} < 0.001 < 0.05$ ).

**Table 6: Test for Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Response	.417	150	.000	.238	150	.000

**Source:** Researcher’s Computation (2023).

The two test statistic; Kolmogorov-Smirnov and Shapiro-Wilk were significant at 5% level of

significance since the p-values for both statistic were less than 0.05. hence, the error terms associated with the variables were normally distributed.

**Table 7: Model Summary and Autocorrelation<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.678 <sup>a</sup>	.459	.373	.26547	1.995

- a. Predictors: (Constant), LOGX4, LOGX2, LOGX1, LOGX3
- b. Dependent Variable: LOGY

**Source:** Researcher’s Computation (2023).

From the table above, the Durbin-Watson statistic of 1.995 was observed. It is necessary to note

that the Durbin-Watson statistic of below 2.00, 2.00 and above 2.00 signifies the presence of positive autocorrelation, no auto correlation and negative autocorrelation. Hence, 1.995 by approximation means that there exists no serious autocorrelation,

**Table 8: Regression Coefficients and Collinearity Statistics<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.465	.750		-.620	.541		
	LOGX1	-.841	.400	-1.852	-2.105	.015	.028	3.776
	LOGX2	.410	.107	.998	3.817	.001	.316	3.162
	LOGX3	.781	.448	1.648	1.746	.093	.024	4.204
	LOGX4	-.239	.157	-.555	-1.528	.139	.164	3.086

- a. Dependent Variable: LOGY

**Source:** Researcher’s Computation (2023).

Using the Variance Inflation Factor(VIF), it noticed that the VIF values were all less than 5 which is the accepted region for the absence of collinearity. Values above 10 implies a stronger degree of collinearity among the independent

variables which means the variables are dependent. Hence, the independent variables used in this work are truly independent in relation to the dependent variable.

### Test of Hypotheses

The research hypotheses were tested at 5% level of significance.

**Table 9: Test for ADEQUACY of the Fitted Model.<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.496	4	.374	5.306	.003 <sup>b</sup>
	Residual	1.762	25	.070		
	Total	3.258	29			

a. Dependent Variable: LOGY

b. Predictors: (Constant), LOGX4, LOGX2, LOGX1, LOGX3

**Table 10: Correlation Coefficients**

		LOGY	LOGX1	LOGX2	LOGX3	LOGX4
LOGY	Pearson Correlation	1	.438	.429	.090	.119
	Sig. (2-tailed)		.038	.018	.635	.530
	N	30	30	30	30	30
LOGX1	Pearson Correlation	.438	1	.537	.658	.736
	Sig. (2-tailed)	.038		.000	.000	.000
	N	30	30	30	30	30
LOGX2	Pearson Correlation	.429	.537	1	.659	.532
	Sig. (2-tailed)	.018	.000		.000	.000
	N	30	30	30	30	30
LOGX3	Pearson Correlation	.090	.658	.659	1	.700
	Sig. (2-tailed)	.635	.000	.000		.000
	N	30	30	30	30	30
LOGX4	Pearson Correlation	.119	.736	.532	.700	1
	Sig. (2-tailed)	.530	.000	.000	.000	
	N	30	30	30	30	30

**Test of Hypothesis 1**

**H<sub>0</sub><sup>1</sup>:** There is no significant relationship between throughput accounting strategy and return on equity of cement manufacturing companies.

**H<sub>1</sub><sup>1</sup>:** There exists a significant relationship between throughput accounting strategy and return on equity of cement manufacturing companies.

From the analysis in Table 4.6, it is noticed that return on equity (ROE) has a positive but insignificant relationship with throughput accounting strategy. This is true since the p-value of 0.093 is greater than the significant level of 0.05. From Table 4.8, the degree of the positive relationship as measured by the correlation coefficient of 0.090 is weak and positive. This confirmed that the positive relationship is weak and insignificant. Hence, the null hypothesis (**H<sub>0</sub><sup>1</sup>**) is accepted. This implies that, there is no significant relationship between Throughput

Accounting Strategy and Return on Equity of cement manufacturing companies.

**Test of Hypothesis 2**

**H<sub>0</sub><sup>2</sup>:** There is no significant relationship between life cycle costing strategy and return on equity of cement manufacturing companies.

**H<sub>1</sub><sup>2</sup>:** There exists a significant relationship between life cycle costing strategy and return on equity of cement manufacturing companies.

From the analysis in Table 4.6, it is observed that return on equity (ROE) has a negative and insignificant relationship with life cycle costing strategy. This is true since the p-value of 0.130 is greater than the significant level of 0.05. From Table 4.8, the degree of the relationship as measured by the correlation coefficient of 0.119 is weak, positive and insignificant. This confirmed that the negative relationship is weak and insignificant. Hence, the null hypothesis (**H<sub>0</sub><sup>2</sup>**) is accepted. This implies that, there is no significant relationship between life cycle costing strategy

and return on equity of cement manufacturing companies in Nigeria.

### Hypothesis 3

$H_0^3$ : There is no significant relationship between target costing strategy and return on equity of cement manufacturing companies.

$H_1^3$ : There exists a significant relationship between target costing strategy and return on equity of cement manufacturing companies.

From the analysis in Table 6, it is observed that return on equity (ROE) has a positive and significant relationship with target costing strategy. This is true since the p-value of 0.001 is less than the significant level of 0.05. From Table 4.8, the degree of the relationship as measured by the correlation coefficient of 0.429 is weak, positive and significant. This confirmed that the positive relationship is weak and significant. Hence, the null hypothesis ( $H_0$ ) is rejected. This implies that, there exist a significant relationship between Target Costing Strategy and Return on Equity of cement manufacturing companies in Nigeria.

### Hypothesis 4

$H_0^4$ : There is no significant relationship between activity based costing strategy and return on equity of cement manufacturing companies.

$H_1^4$ : There exists a significant relationship between activity based costing strategy and return on equity of cement manufacturing companies.

From the analysis in Table 4.6 also, it is revealed that return on equity (ROE) has a negative and significant relationship with activity based costing strategy. This is true since the p-value of 0.015 is less than the significant level of 0.05. From Table 4.8, the degree of the relationship as measured by the correlation coefficient of 0.438 is weak, positive and significant. This confirmed that the negative relationship is weak and significant. Hence, the null hypothesis ( $H_0$ ) is rejected. This implies that, there exist a significant

relationship between Activity Based Costing Strategy and Return on Equity of cement manufacturing companies in Nigeria.

### Fitted Regression Model

From the information captured in Table 6, the fitted regression model is given as;

where  $Y$  represents activity based cost, target cost, throughput cost and lifecycle cost respectively.

The adequacy of the model was tested at 5% at level of significance and the model was found to be adequate as captured in Table 4.7. This implies that for every additional increase in  $X$  will lead to a corresponding 0.841 decrease, 0.410 increase, 0.781 increase and 0.239 decrease in ROE(Y) respectively. The overall correlation coefficient R of 0.678 revealed a strong and positive relationship between the dependent and the independent variables. The coefficient of determination of 0.459 indicated that about 46% of the variation in ROE is explained by the independent variables. However,  $\beta_1, \beta_2, \beta_3$  are insignificant, hence the fitted model is  $\hat{Y} = 0.841X_1 + 0.410X_2 + 0.781X_3 + 0.239X_4$ . This implies that activity based cost and target cost really contribute to return on equity of cement manufacturing companies in Nigeria.

### Discussion and Findings

The study adopted the *ex post facto* research design. This was because of the fact that the data for the study was drawn from the published financial statements of quoted cement manufacturing firms in Nigeria using contents analysis. It was based on the criteria of identifying the items as disclosed in the financial statements. Activity based cost strategy, target cost strategy, throughput cost strategy and lifecycle cost strategy were considered as independent variables while return on equity served as the dependent variable. The essence was to ascertain if there exist any significant relationship between the dependent variable and the independent variables. Multiple regression and correlation analyses techniques were adopted in order to achieve the set objectives. The data were transformed using logarithm approach. The result and findings revealed that

Return on equity (ROE) has a positive but insignificant relationship with Throughput Accounting Strategy since the p-value of 0.093 is greater than the significant level of 0.05. The degree of the positive relationship as measured by the correlation coefficient of 0.090 is weak and positive. This confirmed that the positive relationship is weak and insignificant. Hence, the null hypothesis ( $H_0$ ) was accepted. This implies that, there is no significant relationship between throughput accounting strategy and return on equity of cement manufacturing companies. This contradicts with the findings of Kadhim, Njam, and Kadhim, (2020) which showed that information provided by throughput accounting helps in measuring costs and evaluate the efficiency and effectiveness of performance in the organization.

The result also revealed that return on equity (ROE) has a negative and insignificant relationship with life cycle costing strategy. This is true since the p-value of 0.130 is greater than the significant level of 0.05. The degree of the relationship as measured by the correlation coefficient of 0.119 is weak, positive and insignificant. This confirmed that the negative relationship is weak and insignificant. Hence, the null hypothesis was accepted. This implies that, there is no significant relationship between life cycle costing strategy and return on equity of cement manufacturing companies in Nigeria. This is in consonance with the work of Can & Ntim (2020) on effect of life cycle costing on financial reporting quality (FRQ) which showed that both discretionary accruals and small profit decrease as the companies move forward in their life cycles, while, on the other hand, audit aggressiveness increases. A negative coefficient was observed, but it was insignificant for the other dependent variables. The findings provide insight into the effect of life-cycle stages on FRQ. Results show that the introduction and decline stages negatively affect FRQ, and in addition showed that the audit aggressiveness of Turkish companies decreases with increased listing duration.

In testing for any significant relationship between target costing strategy and return on equity of cement manufacturing companies, the study revealed that;

Return on equity (ROE) has a positive and significant relationship with Target costing strategy. This is true since the p-value of 0.001 is less than the significant level of 0.05. The degree of the relationship as measured by the correlation coefficient of 0.429 is weak, positive and significant. This confirmed that the positive relationship is weak and significant. Hence, the null hypothesis was rejected. This implies that, there exist a significant positive relationship between target costing strategy and return on equity of cement manufacturing companies in Nigeria.

Furthermore, the relationship between activity based costing strategy and return on equity of cement manufacturing companies negative and significant. This is true since the p-value of 0.015 is less than the significant level of 0.05. The degree of the relationship as measured by the correlation coefficient of 0.438 is weak, positive and significant. This confirmed that the negative relationship is weak and significant. Hence, the null hypothesis ( $H_0$ ) was rejected. This implies that, there exist a significant negative relationship between activity based costing strategy and return on equity of cement manufacturing companies in Nigeria. From the fitted regression model where represents activity based cost, target cost, throughput cost and lifecycle cost respectively. The adequacy was tested at 5% at level of significance The overall correlation coefficient R of 0.678 revealed a strong and positive relationship between the dependent and the independent variables. The coefficient of determination of 0.459 indicated that about 46% of the variation in ROE is explained by the independent variables. However, are insignificant, hence the fitted model is. This implies that activity based cost and target cost really contribute to Return on Equity of cement manufacturing companies in Nigeria.

## Summary & Conclusion

### Summary

Cost management strategies are the appropriate classification and division of costs in order to determine the final price of the products and services of the commercial unit and adjustment and providence of relevant information appropriately in a way that it would be usable for the guidance of managers and the owners of commercial units to control its operation. This research work stands to achieve its set objectives because data collected were presented, analysis of the data was carried out and findings were discussed. The following were the major findings of the study in chapter four;

- (i) Return on equity (ROE) has a positive but insignificant relationship with throughput accounting strategy.
- (ii) Return on equity (ROE) has a negative and insignificant relationship with life cycle costing strategy
- (iii) Return on equity (ROE) has a positive and significant relationship with target costing strategy.
- (iv) Return on equity (ROE) has a negative and significant relationship with activity based costing strategy.

### Conclusion

This study examined the relationship between cost management strategies and profitability of cement manufacturing companies in Nigeria. The traditional cost management systems failed to effectively manage the cost of operations in order to enhance profitability of companies. Secondly, it was observed that some traditional costing methods or strategies such as marginal costing and absorption costing failed to take into consideration the time value of money. From the above analyses, the following conclusions are made: it can be concluded that there is positive correlation between cost manufacturing firms in Nigeria as evidenced from the following:

- (a) There is no significant relationship between return on equity (ROE) and throughput accounting strategy of cement manufacturing companies in Nigeria.

- (b) There is no significant relationship between return on equity (ROE) and life cycle costing strategy of cement manufacturing companies in Nigeria.
- (c) There exists a significant positive relationship between return on equity (ROE) and Target costing strategy of cement manufacturing companies in Nigeria.
- (d) There exists a significant negative relationship between return on equity (ROE) and activity based costing strategy of cement manufacturing companies in Nigeria.

### Limitations of the Study

Like every empirical research based on ex post facto research design, the study was not devoid of limitations. The population itself was subject to those that were quoted on the floor of Nigerian Exchange Group with specific required data in their financial statements published within the period under review. So we suggested that caution should be exercised in generalizing the result. Also, since the study was based on cement manufacturing industry only, any attempt in generalizing the result should be made carefully.

### References

- Adeniyi, A., (2012) *Simplified management accounting*. (2<sup>nd</sup>ed). Lagos, value analysis publishers
- Adigbole, E.A., Adebayo, A.O. & Osemene, O. F. (2020), Strategic cost management practices and organizational performance: a study of manufacturing firms in Nigeria. *Global Journal of Accounting and Finance*, 4(1), 142-157
- Akao Y. (1990). *Quality function deployment: Integrating customer requirements into product design*. Cambridge, MA: Productivity Press.
- Akinyomi, O.J. (2014). Influence of competition on activity based costing system. *EPRA International journal of research and development*, 3(4); 13-26 Analele Stiintifice ale University Alexandru Ioan Cuzadin. *Iasi-Stiinte Economic*, 56, 3-9.



- Babaye, I. S. (2018). Revitalizing ailing textile industry. A paper delivered at a workshop by Nigerian textile workers. Lagos. March 10<sup>th</sup>.
- Bain, J.S. (1994). Economies of scale, concentration and the condition of entity in twenty manufacturing industries. *American Economic Review*, 44; 15-39.
- Budugan, D., & Georgescu, I. (2009). Cost reduction by using budgeting via the Kaizen method.
- Can, G. & Ntim, C. G (2020). Effect of life cycle on financial reporting quality (FRQ). *cogent business & management journal*, 7(1), 23-41
- Cokins, G. (2001) 'A management accounting framework', *Journal of Corporate Accounting and Finance*, Vol. 50, No. 3, pp.79–98.
- Delmar, F. & Wiklund, J. (1997). The effect of entrepreneur's growth motivation on subsequent growth: A longitudinal study. Paper presented at the academy management meeting. Seattle
- Erasmus, E. G (2021). Cost management practice and financial performance of listed deposit money banks in Nigeria. *Journal of Accounting and Financial Management*, 7(2); 48-60.
- Fadare, T & Adegbe, F. (2020) Cost management and financial performance of consumer goods companies, quoted in Nigeria. *International Journal of Scientific and research Publications*, Vol 10, issue 8.
- Goldratt, E.M., Cox, J. & Whitford, D. (1992) *The Goal: A Process of On-going Improvement*, Vol. 2. North River Press, Great Barrington, MA.
- Groth, C. & Kinney, R (1994). *Cost Management and value creation. Management decision*.
- Idowill, A. S. (2014). Impact of target costing on competitive advantage in the manufacturing industries: a study of selected manufacturing firms in Nigeria. *International journal of academic research in accounting, finance and management sciences*, 4(3), 97-108.
- Kadhim, H.K., Najm, k.J., and Kadhim, H.N. (2020). Using Throughput Accounting for Cost Management and Performance Assessment: Constraint Theory Approach. *TEM Journal*. 9(2), 763-769.
- Kapelko, M. (2006). Evaluate efficiency in the framework of resource-based view of the firm: Evidence from Polish and Spanish textile & clothing industry. *Bellaterra*, 11-56.
- Markowitz, H., (1952). "Portfolio Selection". *The Journal of Finance*, 7(1), 77-91.
- Matarnach, G. F. & El-dalabeeh, A. (2016). The role of target costing in reducing costs and developing products in the Jordanian public shareholding industrial companies. *International Journal of academic research in accounting, finance and management sciences*, 6(4), 301-312.
- Oluwabemiga, O., Olugbenga, O. & Zaccheaus, S. (2014). Cost Management Practices and Firm's Performance of Manufacturing Organizations. *International Journal of Economics and Finance*, 6 (6), 234-239
- Oyedokun, G. A., Tomomewo, A. O. & Owolabi, S. A. (2019). Cost control and profitability of selected manufacturing companies in Nigeria. *Journal of Accounting and Strategic Finance*, 2(1); 14-33.
- Pandey, I. M (2010). *Financial management. (10<sup>th</sup> Ed)*. UBS publishers' distribution ltd.
- Penrose, E.T. (1959). *The theory of the growth of the firm*. Oxford: Basil Blackwell.
- Umo (2022) Essays in Human side of the enterprise: Management systems, financial planning and employees' reaction in a developing economy of 21<sup>st</sup> century. *European journal of business and management research*, 7(3): 1-2
- Zengin, Y. and Ada, E. (2010). Cost Management through product design: Target costing approach. *International Journal of Production Research*. 3(1): 53-61