

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 (x_1), lifecycle costing (x_2), target costing (x_3) and activity based costing (x_4) strategies have positive relationship with the return on equity of quoted cement manufacturing firms with correlation coefficient: $Rx_1 = 0.090$; $Rx_2 = 0.119$, $Rx_3 = 0.429$ and $Rx_4 = 0.438$ 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.*

Indexed Terms- *Target, Lifecycle, Throughput, Profitability and Activity Based Costing*

I. 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 (Oluwugbemiga, Olugbenga and Zaccheaus, 2014). 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 (Umo, 2022). Fadare and Adegbeie, (2020) added that cost management strategy is inevitable in the process of budgetary planning and control in any business setting. Umo (2022) stressed that future looking firms embrace cost management strategy as an integral part of strategic business management to secure cost efficiency, boost business growth and maintain profitability trend. He added that cost management strategy is a tool for optimal product pricing: a necessity for maintaining a steady body of satisfied customers, increasing turnover and high profitability. Cost should not only be incurred but must be managed in modern businesses based on well designed and goal oriented strategies. According to Erasmus (2021), 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 (Umo, 2022). 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 (Erasmus, 2021).

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. Erasmus (2021) argues that profitability is "the net result of a large number of policies and decisions". However, Oyedokun, Tomomewo and Owolabi (2019) state that profitability is the relationship of income to some balance sheet measures which indicates the relative ability to earn income on assets employed. Profitability indicates how well an enterprise is managed to generate earnings by using the resources at its disposal (Umo, 2022). 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 (Charles & Uford, 2023).

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. Simultaneously, only a stable economy with high profitability can provide enough financial resources for sustainable development, therefore, strategies must be designed to ensure business survival, and also attract attention and investment from internal and international investors. Not only being a reliable basis for evaluating business performance, profitability also is a useful tool for forecasting the performance of businesses in the future. It reflects shareholders' wealth, and accordingly, appeals to investors. It has become an essential research theme in today's strategic management relative to cost, efficiency and business operations. It was from the said background that the researcher found it expedient to study the relationship between cost management strategies and profitability firms using quoted cement manufacturing companies as the organisations of study.

- 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. Poor cost management system made factory overheads much higher than the basis of allocation. If businesses must survive it must adopt the strategies that will enhance their success. Thus the importance of cost management strategies cannot be overemphasised.

Over some time, various attempts have been made to evaluate the importance of cost management strategies in achieving the profit maximization objective of firms. Various studies have yielded different results. Moreover, various studies have also been made on cost management strategies on the profitability of selected industries like banks and insurance other than manufacturing firms; yet most literature reviewed on cost management strategies and profitability of firms were not associated with cement manufacturing 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:

1. to determine the relationship between throughput accounting strategy and return on equity of quoted cement manufacturing companies in Nigeria.
2. to assess the relationship between Life-cycle costing strategy and return on equity of quoted cement manufacturing companies in Nigeria.
3. to ascertain the relationship between target costing strategy and return on equity of quoted cement manufacturing companies in Nigeria.
4. 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:

- H₀₁: Throughput accounting strategy does not significantly relate to return on equity of cement manufacturing companies.
- H₀₂: Life cycle costing strategy does not have any significant relationship with return on equity of cement manufacturing companies.
- H₀₃: Target costing strategy does not have any significant relationship with return on equity of cement manufacturing companies.
- H₀₄: Activity based costing strategy does not have any significant relationship with return on equity of cement manufacturing companies.

II. REVIEW OF RELATED LITERATURE

• Conceptual framework

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

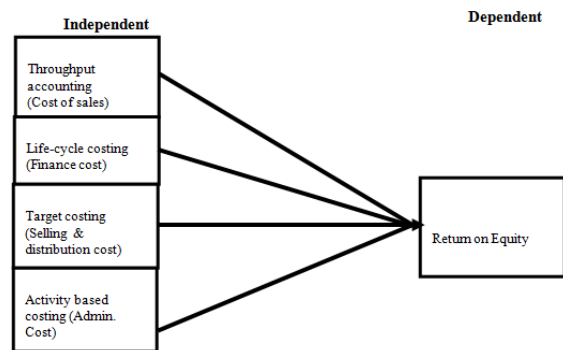


Figure 2.1: Diagrammatical Representation of the Variables

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).

Good financial decisions come from an effective cost-management strategy designed to maximize value and minimize both initial and on-going costs. These includes, but are not limited to, decisions such as whether to lease or buy vehicles, equipment, outsource certain operations and add or drop a product line. A number of different cost-management strategies exist to help businesses make these important decisions. The customers are continuously demanding high quality and better performance products/services and at the same time, they want the price to be reasonably low. The shareholders are also demanding a required rate of return on their investment from the company. Thus cost has become a residual. The challenge is being able to manufacture products or provide services within the acceptable cost framework.

Akao, (1990) posited that cost and profit in business determines its financial position. An increase in turnover expands production capacity (cost), this demand effective cost management. Delmar and Wiklund, (1997) discovered product/service cost, quality and performance managements as surviving triplet for any company today. Customers continuously demand for high quality products/services and better performance, at a low price just as shareholders demanding for high return on their investment. Nevertheless, cost has become the determinant to performance and the challenge is being able to manufacture products or provide

services within the acceptable cost framework. Cost occurs as a result of the project steering core of its activities, such as the salaries of managers, accountants, phone costs and rent, sales costs that occur as a result of the sale of products such as sales transfer, storage, distribution costs, sales commissions, and production costs. The greater the cost the higher the price of the product but decrease in the rate of turnover will negatively affect the profitability of the companies especially on cement industry in Nigeria (Delmar & Wiklund, 1997).

- 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. It provides opportunity for managing a business' expected profits through the integration of strategic variable in other to plan concurrently how to meet the customers need, capture market shares, generate profits plan and control costs. In other words, it is a philosophy in which product development is based on what the market is ready to pay instead of production cost. This means that market price becomes the determinant of cost and not the other way round. This study described target costing as a method of efficient cost management system that minimizes product's cost through cost planning and control at the sizes of products design development. Akinyomi, (2014) observed that firms that have adopted target costing do devote a great deal of their time talking comprehensive market research including surveys and focus on groups to

determine what functions and attributes consumers want and the price they are willing to pay for them.

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.

Alternatively, whole-life costing in businesses takes into account all the costs that will be paid during the lifespan of the product. The product life cycle commonly has four stages: introduction, growth, maturity, and disposal. It will add up all the costs including costs of market research, designing the product, marketing it, selling, operating costs, after-sale costs (warranties), and safe disposal. Life cycle costing is most commonly used by businesses as a method of manufacturing cost control. It also helps in the analysis of the long-term profitability of an investment or acquiring an important asset. The discounted values are used for the analysis and finding the ROI. (Erasmus, 2021)

The capital budgeting techniques extensively employ life cycle costing for the comparison of different alternatives. It helps identify the best option with the least cost and most profit in the long run.

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. When cost accounting was developed in the 1890s, labour was the largest fraction of product cost and could be considered a variable cost. Workers often did not know how many hours they would work in a week when they reported on Monday morning because time-keeping systems were rudimentary. Cost accountants therefore, concentrated on how efficiently managers used labour since it was their most important variable source. Now however, workers who come to work on Monday morning almost always work 40 hours or more, their cost is fixed rather than variable. However, today many managers are still evaluated on their labour efficiencies and many "downsizing" "rightsizing" and other labour reduction campaigns are based on them.

However, there is significant literature on throughput accounting but all of them are simply view point of the practitioners which are published in trade magazines or lower ranked journals. The TA was proposed by Goldratt *et al.* (1992). Since, then the TA has evolved as one of the emerging accounting practices, which aims at improving profitability by considering the constraints that prevent the organisation to achieve its desired throughput (Boyd & Gupta, 2004; Ali & Dubey, 2010). While traditional cost accounting mainly focuses on external reporting. There are many managerial accounting techniques available to assist managers in their decision-making on various planning, assessment and control activities (Cokin *et al.*, 2001). One part of the managerial accounting involves collecting the cost data and allocates them under various heads. There are various methods for cost assignment such as activity-based costing, process costing, standard costing, kaizen accounting, TA (Boyd & Cox, 2002). All these cost accounting methods are not competing with each other but these cost accounting methods give a different perspective of the costs and are to be applied in combination at times for better decision-making. Managers are concerned with selecting the appropriate managerial

accounting technique which shall provide them with accurate product cost information, maximum profit and customer service and profitable product mix decisions.

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)

Activity-based costing is an approach to the costing and monitoring of activities, which involves tracing resource consumption and costing final outputs. Resources are assigned to activities and activities to cost objects. The latter use cost drivers to attach activity costs to outputs. ABC was first defined in the late 1980s by Kaplan & Bruns. 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).

Activity-based costing provides a more accurate method of product/service costing, leading to more accurate pricing decisions. It increases understanding of overheads and cost drivers; and makes costly and non-value adding activities more visible, allowing

managers to reduce or eliminate them. ABC enables effective challenge of operating costs to find better ways of allocating and eliminating overheads. It also enables improved product and customer profitability analysis. It supports performance management techniques such as continuous improvement and scorecards. Activity-based costing is an accounting method that assigns costs to products or services based on the activities and resources that make up the overhead of manufacturing a product or providing a service, whereas traditional methods allocate production costs based on specific factors, such as labour, materials, marketing and other sources of overhead. Activity-based costing is more logical and efficient for companies making customized products because overhead costs are not spread evenly across all products. For example, a low-volume product may necessitate minimum machine hours as well as multiple indirect costs and a high-volume product may require maximum machine hours with no indirect costs (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,

Management compares actual results with those projected in the budget and incorporates into the new plan the lesson learned from its evaluation of current operations. Control refers to management's effort to influence the actions of individuals who are responsible for performing tasks, incurring costs, and generating revenues. Planning refers to the way that management plans and wants people to perform, while control refers to the procedures employed to determine whether actual performance complies with these plans. 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. Examples include accounting departments, human resources departments, and similar areas of the business that provide internal services. Profit centres accept responsibility for both revenue and expenses. For example, a product line or an autonomous business unit might be considered profit centres. If the profit centre has its own assets, it may also be considered an investment centre, for which returns on investment can be determined. The use of responsibility centres allows management to design control reports to pinpoint accountability, thus aiding in profit planning in one hand and facilitating budget implementation. A budget also sets standards to

indicate the level of activity expected from each responsible person or decision unit and the amount of resources that a responsible party should use in achieving that level of activity. 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.

Management's role is to feed forward a futuristic vision of where the company is going and how it is to get there, and to make clear decisions coordinating employee activities. Management also oversees the development procedures to collect record, and evaluate feedback. Therefore, effective management controls result from leading people by force of personality and through persuasion, providing and maintaining proper training, planning, and resources; and improving quality and result through evaluation and feedback.

- 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. It indicates how well management of an enterprise generates earnings by using the resources at its disposal. The profitability of a firm is a key concern, as it is the ability to better 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 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 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

The expected relationship between cost management strategies and financial performance can be seen from the point of view that proper adoption of cost management practices will lead to reduction in operating costs thereby leading to increase in profitability. This implies that when the management of any entity is concerned about meeting its profit maximisation objective, it should concentrate its efforts in ensuring that costs are properly managed. The researcher anticipates either a positive or negative relationship of cost management strategies and financial performance. One school of thought argues that cost management strategies are considered as critical factors to increase revenue for the success of manufacturing companies. 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).

Cost reduction refers to an attempt to attain lower current fixed costs and variable costs associated with an essential activity (Groth & Kinney, 1994). As a result of this total output of assets is low compared to the resulting income generated. 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. Another approach which indicates a negative relationship of cost management to financial performance measurement advocates for supplementing traditional cost accounting measures with a diverse mix of non-costing measures that are expected to capture key strategic performance dimensions that are not accurately reflected in short term accounting measures.

- 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 & Adegbe, 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. It is a system that is effective in managing cost in new view product design and development stages, that is, allowing production cost of a proposed product to be identified so that when sold it can generate the desired profit level (Adeniyi, 2012). Industries such as industrial goods firms have very intense competition where prices are determined by supply and demand in the market and the producer may not be able to effectively control selling prices, but can only, perhaps, control their costs, so management will only focus on influencing every component of the product,

service or operational cost. Controlling cost involves providing clear cut information on what cost should be incurred and what cost was actually incurred and taking action to ensure that the actual occurrences agree with the target, thereby, allowing normal reference for revaluation of performance, through the preparation and use of target cost and measurement at the points of incidence. This will enable firms to present target cost of materials and processes while employees are compelled to the cost which enhances productivity, cost minimization and employee efficiency. However, even with these benefits achieved by a firm from using target costing technique for cost control and cost management, it still has some draw backs such as; Setting unattainable targets, operating managers' negative attitudes towards the set target, variation in labour rate per hour among different organizations which depends on the economic variables, political instability and changes in government, frequent changes in the level of technology, the problem of identifying the special needs of customers and changes in macroeconomic policies. Hence, the need for a research to empirically test the effect of target costing on firm's profitability.

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. Thus a firm should earn profit in order to stay, survive and grow over a long period of time. The ability of company, organization, firm or an enterprise to make profit from its business activities is referred to as profitability. This can be achieved when the management is efficient in using all the resources (human and material) available in the market. Profitability is derivable through efficiency, thus, it is a measure of efficiency and management guide to greater efficiency. Efficiency combined with factors such as the degree of competition that a firm face, the state and strength of demand, market competition, advertising, campaign substitutes, costing methods to the efficiency of the firm, affects the profitability of the firm. The firm calculates gross profit by subtracting their manufacturing costs from revenue generated after

sales. Thus, the gross profit is the money difference between the costs of goods sold and net revenue generated.

- Life-Cycle Costing and Profitability

For sustained efficiency in production, accurate prediction/estimate of resources required in procuring, operating, maintaining and ultimately disposing a product is strategic cost management in a manufacturing enterprise. Understanding the total costs incurred throughout a product lifecycle and identifying areas where cost reduction can be achieved in the lifecycle of a product are key to profitability in a manufacturing firm. 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. Implementation of LCC therefore is a means of directing management; attention to the cost of a variety of components and the end products. A reduction in the variety means larger runs with fewer changes on the production line, higher production and lowers unit costs. With LCC, quality tends to be more consistent and inspection or quality ascertainment from design simple and cheaper. 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).

Product life cycle costing therefore is an exercise requiring the inputs of specialists such as managers, accountants, analysts, engineers, marketers and other specialists within and outside an organisation. The expertise of these people is required in a manufacturing business in pursuit of economic lifecycle cost and profitability determination of a product.

- **Throughput Accounting and Profitability**

Throughput Accounting is a modern technique that has taken 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 view is that output should be confined to the extent of customers' demand and focal point of recreation need so as to locate approaches of raising customers demand to a higher level. Any accounting system that does not take into account these constraints cannot exactly propel the functioning of an organization. This would possibly lead to administration taking wrong choices of product pricing. Make or purchase decision, discontinuance of a product or division and a host of different key managerial problems thereby affecting managerial effectiveness. It is in opposition to this

backdrop that this learns to check out the extent to which throughput accounting enhances fantastic managerial choices in commercial enterprise organizations. The idea of throughput accountability with its recent applications has contributed extensively through offering a facts gadget in assisting financial gadgets when confronting tough stipulations and problems. This thinking has a modern understanding about the price structure with the aid of focusing directly on the cost of materials, solely as variable costs while all other costs are fixed, and this is what made them gorgeous to the cutting-edge manufacturing surroundings. This is due to the low contribution of the human element upon their dependence on computerized work. In addition, throughput accounting in phrases of records is beneficial for supporting the administration in planning for profitability through choosing different combinations that can achieve its easiest profitability.

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. This may include the cost of raw materials consumed, freight, commission on sales, etc. Throughput accounting does not include direct labour costs under variable costs of production. It assumes that the workers are paid on a fixed rate basis or salary basis and not as per piece-rate basis. In the real world, it is not possible to employ workers as per the production schedule or on a need-basis, nor usually is the payment made on a piece-rate basis. An organization has to incur a fixed cost on its workers in order to retain and maintain them. Hence, labour charges are not variable in the true sense.

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

For more than decades now, the traditional system of costing suffers from certain limitations. It fails to precisely assign the overhead costs into product units. Therefore, activity-based costing system has recently been developed to overcome the limitations of traditional costing system. ABC was first defined in the late 1980s by Kaplan and Bruns. 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. The activity based costing system is based on premise that activities make a product. Prior to the introduction of ABC system, a number of companies, particularly manufacturing sectors, used a traditional costing system called volume-based costing system, which is volume-based cost driver such as direct-labour hours, direct labour cost, or machine hours. 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). An overhead allocation based on activity centres avoids a common consequence of traditional output-based costing system particularly under cost low volume products by overheads based on activity centres facilitate the targeting of unnecessary wasteful, resource usage and the costly effects of over complex ways of running a business process (Innes & Mitchell, 2009).

This technique, which is popularly known as Activity-Based Costing (ABC), is a system that focuses attention on the cost of various activities required to produce a product or service (Baird *et al*; 2010). This system is in favour of many organizations in order to provide true cost information for their strategic decision making. Activity Based costing is a system that will reduce the level of arbitrary cost allocations associated with traditional costing systems and result in more accurate product cost (Baird *et al* 2010). 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. Therefore, an insight into the expenses consumed by all those activities performs for the manufacturing of finished products and sale is very important. A number of researched studies have shown the increasing utility of activity-based costing on overheads allocation and apportionment for product cost determination. Product cost determination under activity-based costing is made on the basis of cost driver required for producing goods or delivering services. Activity-based costing is becoming more effective in costing of multi-products produced by industries and executing customers' orders. Activity-

based costing (ABC) is an effective management approach for distributing and controlling the overhead costs.



Figure 1: The Activity-Based Costing Process
Source: Researcher's Design, (2023).

- Theoretical Framework

Resource based view theory by Edith Penrose (1959)

Resource based-view theory was propounded by Edith Penrose in 1959. It states that a firm's sustained competitive advantage is based on its valuable, rare, inimitable, and no substitutable resources. Penrose (1959) explains the importance of resources to include organizational processes, assets, capabilities, information and knowledge controlled by the firm. These resources improve efficiency and effectiveness that will lead to higher financial performance of firms.

Pearce and Robinson, (2011) defined the resource-based view (RBV) as a method of analysing and identifying a firm's strategic advantages based on examining its distinct combination of assets, skills, capabilities and intangibles as an organization. This theory views the firm-specific factors and their effect on performance. Grant, (1991) views the firm as a bundle of resources which are combined to create organizational capabilities which it can use to earn above average profitability. Firms develop competencies from these resources and when they are well-developed, these become the source of the firm's competitive advantage.

The desire to understand the effect of firm's characteristics on financial performance has been so controversial in the research field. One side argues that the firm financial performance is influenced by structural characteristics of the industry (Bain, 1959) and on the other hand others argue that it is influenced by firm specific resources. Recently much focus has been given to firms' level characteristics as opposed to the industry level characteristics since it

forms the basis upon which the firms compete. For the purpose of the study cost management strategies was the main focus since they are part of structural characteristics of firms. The theory which explains the effect of firm's characteristics which are internal factors to the organization with respect to financial performance is the resource-based view RBV. In this study we looked at cost management strategies and their relationship on the financial performances of manufacturing companies. However, the criticism put across on the use of RVB is that researchers only concentrate on one resource type: that is intangible assets within a single industry and examined its effect on firm's performance (Kapelko, 2006).

The theory is very important in explaining how cost in an organisation could be managed to achieve the maximum benefit. Managers of organisations are entrusted with resources with which they are to properly manage in order to achieve the desired profit. This can only be made possible by applying the strategies that will reduce the cost of the resources applied which at the same time will lead to increase in the profit of such an entity. The resources available are costly and when not properly managed may lead to depletion of resources thereby leading to wastages which will ultimately affect the profit.

- Portfolio Theory by Harry Markowitz (1952)

The theory states that investors are risk-averse; for a given level of expected return, investors prefer the less risky portfolio with higher returns. The theory of portfolio management describes the resulting risk and return of a combination of individual asset. A primary objective of the theory is to identify asset combinations that are efficient. Here efficiency means the highest expected rate of return on an investment for a specific level of risk. This simply means that they will not consider a portfolio with more risk unless it is accompanied by a higher expected rate of return. Modern Portfolio theory was largely defined by the work of Markowitz (1952) in a series of articles published in the late 1950s. This theory was extended and refined by Tobin (1941) in the subsequent decades. Portfolio theory integrates the process of efficient portfolio formation to the pricing of individual assets. It explains that some sources of risk associated with individual assets can be diversified by holding a proper combination of

assets. Prior to Markowitz work, investors focused on assessing the risks and rewards of individual securities in constructing their portfolios. Standard investment advice was to identify those securities that offered the best opportunities for gain with the least risk and then construct a portfolio from these. Markowitz has detailed the mathematics of diversification and proposed that investors focus on selecting portfolios based on their overall risk – reward characteristics instead of merely compiling portfolio from securities that each individually has attractive risk reward measures.

- Empirical Review

Adigbole, Adebayo and Osemene, (2020), examined strategic cost management practices and organizational performance: a study of manufacturing firms in Nigeria. Some of the Strategic Cost Management methods use in the study were; Activity-Based Costing, Target Costing, Life Cycle Costing, Balance Scorecard, and Total Quality Management. The implementation of the Strategic Cost Management system has led to improved product costing analysis and decision-making, production efficiency, and improved firm performance and market competitiveness. A survey research design is employed to collect primary data, which are analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) method. The study reveals that Strategic Cost Management practices positively impact organizations' performance. Therefore, it is recommended that manufacturing firms still using the traditional costing methods should consider employing the Strategic Cost Management methods to enhance their performance and competitiveness.

Fadare and Adegbe (2020), examined Cost Management and Financial Performance of Consumer Goods Companies, Quoted in Nigeria. The population of the study was 27 consumer goods companies listed on the Nigeria Stock Exchange. A sample frame of 10 companies was selected for a period of 10 years (2009 – 2018). The study adopted a purposive sampling technique. Data were obtained from the audited financial statement, and the accounts have already validated by regulatory authorities. The study took descriptive and inferential statistics. The result revealed joint insignificant effect

of cost management on, Net profit margin (R²=0.0185, F (4, 96) =0.55, pvalue=0.698. Moreso, the predictors were measured with four indicators Cost of Sales, Selling and distributing cost, Administrative cost and Finance Cost, out of these four some affect dependent variable (financial performance) positively while some exerted negative effect. The study concluded that the insignificant effect of cost management might be as a result of inconsistency dividend pay, inadequate cost information and inefficient cost control and ascertainment. Therefore, adequate management and quality cost ascertainment and control is highly recommended by these findings.

Kadhim, Najm, and Kadhim, (2020) Use throughput accounting as an approach for developing cost accounting systems in the modern manufacturing environment to evaluate the organization performance. The sample consists of (60) persons in organization for examining the hypotheses. The findings show that information provided by throughput accounting helps in measuring costs and evaluate the efficiency and effectiveness of performance in the organization. This approach supports planning and control processes to maximize throughput and reduce inventory levels. The use of Throughput Accounting under the Theory of Constraints leads to finding solutions to bottlenecks that affect the efficiency and effectiveness of performance.

III. METHODOLOGY

- 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 throughout 1990s; 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-Auguste Pavinfrom 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.

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

• Limitations to 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.

IV. DATA PRESENTATION, ANALYSIS AND INTERPRETATION

• 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 4.1: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 4.1, 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.

In the same vein, return on equity of quoted cement manufacturing companies recorded a minimum and maximum percentage of 1.63% and 35.43% respectively with a corresponding average of 13.23%. This implies that for everyone who invested in the equity of the quoted cement manufacturing companies in Nigeria, a return of 13.23% is expected.

- 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 4.2 Test for Linearity

Table 4.2: LINEARITY TEST

			Sum of Squares	df	Mean Square	F	Sig.
Response factor	Between Groups (Combined)		1099.401	4	274.850	566.044	.000
	Linearity	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 4.3 Test for Homogeneity of Variance

Table 4.3: Test of Homogeneity of Variances

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-value Of 0.001<0.05).

Table 4.4 Test for Normality

Table 4.4: Test of Normality

Kolmogorov-Smirnov ^a			Shapiro-Wilk		
Statistic	Df	Sig.	Statistic	Df	Sig.

Respon se	.417	150	.000	.238	150	.000
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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 4.5 Test for Autocorrelation

Table 4.5: Model Summary and Autocorrelation^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.678 ^a	.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 4.6 Test for Multicollinearity

Table 4.6: Regression Coefficients and Collinearity Statistics^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.465	.750		-.620	.541		
	LOGX1	-.841	.400	-.1852	-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. All the hypotheses are captured in Table 6 above. Tables 7 and 8 focused on the test for adequacy of the fitted and correlation coefficients respectively.

Table 4.7: Test for ADEQUACY of the Fitted Model.^a

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

a. Dependent Variable: LOGY

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

Table 4.8: 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_0^1 : There is no significant relationship between throughput accounting strategy and return on equity of cement manufacturing companies.

H_1^1 : 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_0^1) 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_0^2 : There is no significant relationship between life cycle costing strategy and return on equity of cement manufacturing companies.

H_1^2 : 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_0^2) 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_0^3) 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_0^4) 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;

$$\hat{Y} = -0.465 - 0.841X_1 + 0.410X_2 + 0.781X_3 - 0.239X_4$$

where X_1, X_2, X_3 and X_4 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_1, X_2, X_3 and X_4 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 R^2 of 0.459 indicated that about 46% of the variation in ROE is explained by the independent variables. However, X_3 and X_4 are insignificant, hence the fitted model is $\hat{Y} = -0.465 - 0.841X_1 + 0.410X_2$. This implies that activity based cost and target cost really contribute to return on equity of cement manufacturing companies in Nigeria.

- Discussion of the 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_0^1) was accepted. This implies that, there is no significant relationship between throughput accounting strategy and return on equity of cement manufacturing companies. This contradict 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 onequity 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. This was in consonant with the work of Matarneh& El-dalabeeh, (2016) in which the result showed that the application of target costing method leads to reduce costs in Jordanian industrial companies while on the other hand leads to rapid development of products. Also the work of Imeokparia&Adebisi, (2014) and Idowu, (2014) are in line with this objective. The result revealed a significant degree of target costing implementation in-the zone. It also showed a significant relationship between target costing adoption and production cost reduction; and a significant relationship between target costing implementation and improvement in financial performance.

Furthermore, the relationship between activity based costing strategy and return on equity of cement manufacturing companies *was* 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_0^4) 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. This is a contradiction to the work of Adigbole, Adebayo and Osemene, (2020) on strategic cost management practices and organizational performance. Some of the Strategic Cost Management methods use in the study were; activity-based costing, target costing, life cycle costing, balance scorecard, and total quality management. The study revealed that strategic cost

management practices positively impact organizations' performance. Adigbole,Adebayo and Osemene, (2020) did not state categorically the strategic cost management method that had the positive impact. From the the fitted regression model $\hat{Y} = -0.465 - 0.841X_1 + 0.410X_2 + 0.781X_3 - 0.239X_4$ where X_1, X_2, X_3 and X_4 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 R^2 of 0.459 indicated that about 46% of the variation in ROE is explained by the independent variables. However, X_3 and X_4 are insignificant, hence the fitted model is $\hat{Y} = -0.465 - 0.841X_1 + 0.410X_2$. This implies that activity based cost and target cost really contribute to Return on Equity of cement manufacturing companies in Nigeria.

V. SUMMARY, CONCLUSION AND RECOMMENDATIONS

• 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.

Recommendations

The recommendations of this study include the following

- (i) From the view point of return on equity having positive but insignificant relationship with throughput accounting; Cement manufacturing firms should confine the output to the extent of customers' demand to locate approaches of raising customers demand to a higher level. This is to identify bottleneck resources and remove them or, if this is not possible, ensure that they are fully utilized at all times.
- (ii) Since the returns on equity has a negative and insignificant relationship with life cycle costing strategy; cement manufacturing firms should

exercise the inputs of specialists such as managers, accountants, analysts, engineers, marketers and other specialists within and outside an organization. The expertise of these people is required in a cement manufacturing business in pursuit of economic lifecycle cost and profitability determination of products.

- (iii) The positive correlation between target costing strategy and return on equity shows that the use of target costing strategy will boost return on equity in cement companies as it improves understanding of competition, markets and consumer requirements in terms of quality, products, functions, delivery time and price. This will facilitate profitable management of business and enhance survival of such business in a competitive environment.

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