ABSORPTION COSTING AND ITS EFFECT ON FINANCIAL PERFORMANCE OF MANUFACTURING COMPANIES IN NIGERIA

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Abstract: *This research was undertaken to investigate the effect absorption costing had on the financial status of manufacturing firms in Nigeria. In particular, the study determined how factors such as Total Manufacturing Cost per Unit (TMCU), Fixed Manufacturing Overhead Absorbed (FMOA), and Inventory Valuation Methods work to impact the profitability of listed manufacturing companies in Nigeria. This research took into consideration of period covering 2009-2024, utilizing quarterly data*

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retrieved from the financial statements of selected firms listed on the Nigerian Stock Exchange (NSE). Secondary data were gotten from the annual financial reports of the companies and other industry publications. The study undertook an Autoregressive Distributed Lag estimation technique to study the short-run and long-run relationships between the variables. Results showed that Total Manufacturing Cost per Unit positively influences financial performance in short run with a coefficient of 0.24 ($p < 0.05$) and 0.35 ($p < 0.01$) in the long run. Conversely, Fixed Manufacturing Overhead Absorbed also exhibited a positive short-run effect of 0.18 ($p < 0.05$), which increased to 0.27 ($p < 0.01$) in times where financial effects are considered. Inventory Valuation Method declined with a negative and statistically significant influence, showing a coefficient of -0.12 with a statistical significance of less than 0.01 in the long run. These results indicate that proper cost management strategies particularly relating to manufacturing cost per unit and overhead absorption are essential to improve the financial performance of manufacturing firms in Nigeria. The study therefore suggests that companies should gear their efforts towards improving cost structure and efficient inventory valuation methods to enhance profitability and sustain themselves in the long term.

Keywords: *Total Manufacturing Cost per Unit; Fixed Manufacturing Overhead; Inventory Valuation Method; Financial Performance; Listed Manufacturing Companies; Nigeria*

1. Introduction

Manufacturing companies operate under complex environments that demand the use of accurate cost accumulation methods so as to ascertain profit and long-term sustainability. One of these methods is absorption costing, a system that absorbs all manufacturing costs comprising fixed and variable into units produced, thus treating them as product costs (Uwuigbe et al., 2021). This method in contrast with either marginal or variable costing complies with the international financial reporting standards (IFRS), and in Nigeria, this method has been largely used for external financial reporting (Ademola et al., 2023). In a Nigerian manufacturing context characterized by foreign exchange volatility, inflation pressures, and high overhead costs of production, an effective costing scheme becomes imperative in ascertaining the true cost of products and financial performance (Ojekemi & Olayinka, 2022). The absorption costing becomes useful, especially in determining whether companies have really recovered fully from the cost of production or whether reported profits are a reflection of economic realities. This class of costing methods on such profitability indicators as return on assets (ROA), return on equity (ROE), and net profit margin is increasingly attracting academic and management interest (Okoye et al., 2024).

A major concern is the inclusion of fixed manufacturing overheads in inventory under absorption costing may inflate profit figures when inventory levels rise, thereby distorting the true performance of a firm (Adeniran & Hassan, 2021). Herein

lies the paradox: While the financial statements appear very favorable, the operational efficiency compromises the ability to maintain long-run financial stability. Hence, the relationship between absorption costing practices and the financial performance of a company calls for attention by stakeholders, especially in the manufacturing environment where inventory management is central to operations (Onyema et al., 2023).Despite being accepted for financial reporting, several Nigerian firms have difficulties applying absorption costing in practice owing to inconsistent classifications of costs, weak internal controls, and poor documentation of overhead absorption rates (Oladele et al., 2020). This has led to increasing concerns about the accuracy of financial statements and the reliability of profitability analysis based on these financial statements. In addition, given the ongoing economic reforms and calls for transparency in corporate reporting, an assessment of the relationship between costing methods and firm performance has never been more pertinent (Ibrahim et al., 2022).

The Nigerian manufacturing sector being one of the contributors to GDP and employment necessarily demands empirical clarification regarding how internal cost accounting decisions impact the external financial results. While some researchers have turned their attention to general management of costs and profitability, only limited attention has been aroused in the direct empirical effect that absorption costing exerts upon financial performance, particularly while working with data obtained from publicly listed firms in Nigeria. This study, therefore, attempts to bridge this gap by investigating to what extent absorption costing influences the financial performance of manufacturing companies listed on the Nigerian Exchange Group (NGX).

Absorption costing is still the standard product costing and financial reporting under IFRS, but its actual influence on financial performance in the manufacturing sector in Nigeria remains grossly misunderstood. As it stands, manufacturing companies do employ absorption costing to allocate both fixed and variable production costs to the product; however, the more the concern grows over perceptions that such allocations tend to distort true profitability when production volumes vary, or where excessive amounts of fixed overheads find their way into inventory (Ezeani, Oladipo & Ayeni, 2023; Oladele & Ajayi, 2022). The use of total manufacturing cost per unit and inventory valuation under absorption costing can result in inflated earnings when unsold stock accumulates, creating a misleading picture of a company's operational efficiency and profitability (Adeniran & Ogundipe, 2024). Despite the prominence of cost management in strategic decision-making, few empirical studies have examined how the absorption of fixed

manufacturing overhead influences firm-level financial performance indicators such as return on assets or net profit margin (Ibrahim & Musa, 2021). Existing research has largely treated absorption costing as a technical reporting requirement, with limited attention to its strategic implications or its role in the financial outcomes of firms operating under economic constraints like Nigeria's (Okafor, 2020). This limited focus has created a significant literature gap and underscores the need for a study that uses audited financial data to analyze how absorption costing components affect the financial performance of manufacturing companies. The motivation for this study lies in addressing this gap and providing evidence-based insights that can support more transparent, performance-oriented cost accounting practices in the sector.

2. Research Questions

1. How does total manufacturing cost per unit affect the financial performance of listed manufacturing companies in Nigeria?

2. What is the effect of fixed manufacturing overhead absorbed on the financial performance of Nigerian manufacturing firms?

3. To what extent does the inventory valuation method impact the financial performance of manufacturing companies in Nigeria?

3. Conceptual Exploration and Hypothesis Development

3.1. Absorption Costing

Absorption costing is an accounting method in which all manufacturing costs, including both fixed and variable overheads, are assigned to the units produced, regardless of whether they are sold during the period (Egbunike & Odum, 2021). This technique complies with International Financial Reporting Standards (IFRS) and is widely used in preparing external financial statements for manufacturing companies. Under absorption costing, expenses such as direct materials, direct labour, variable manufacturing overhead, and fixed manufacturing overhead are treated as product costs and included in inventory valuation (Nwoye & Chinedu, 2022). This method contrasts with marginal costing, where only variable costs are considered product costs, while fixed costs are treated as period expenses. Absorption costing will greatly impact the profits to be reported since the inventory levels change each accounting period, and thus very vital for pricing strategy, cost

control, and performance appraisal (Adeleke & Ibrahim, 2023). More so, its application in Nigerian manufacturing firms appears relevant in an environment where production costs keep changing and where there is a great need for reporting inventory and profitability.

3.2. Financial Performance

Financial performance is the extent to which the financial objectives of a company are being met by management, usually evaluated through parameters like return on assets (ROA), return on equity (ROE), net profit margin, gross profit margin, and earnings per share (EPS) (Owolabi & Makinde, 2020). It draws a picture of the operational efficiency and profitability of the company, along with its liquidity and solvency, on which stakeholders base their decisions in investments, financing, and management. In manufacturing firms, financial performance is influenced by the management of internal cost structure, pricing, inventories, and production efficiency (Uchenna & Dada, 2023). The greatest financial performance connotes sound financial health, as well as the ability to generate value for its shareholders or maintain a competitive edge in an ever-changing business environment. In proving, such performance of manufacturing companies becomes a matter of survival as the Nigerian economy continues to go through harsh times involving high inflation, exchange rate volatility, and increased input costs (Okechukwu, Musa, & Aliyu, 2021). The study thus highlights the importance of understanding accounting procedures such as absorption costing that lay the foundation of reported financial results to enhance transparency and stimulate decision-making processes in the industry.

3.3. Total Manufacturing Cost per Unit and Financial Performance

Total manufacturing cost per unit includes all costs incurred in producing a single unit of output, such as direct materials, direct labour, variable overheads, and fixed manufacturing overheads. This metric is central in absorption costing, where all production-related costs are included in the inventory valuation (Adeleke & Ibrahim, 2023). The allocation of fixed overheads across output levels influences the reported unit cost and, by extension, the profit margin on each unit sold. Higher unit costs, if not matched with proportionate sales price increases, can reduce profitability and negatively affect financial performance indicators such as net profit margin (NPM) and return on assets (ROA) (Uchenna & Dada, 2023). Conversely, efficient cost control that lowers the per-unit cost can improve financial returns by increasing the margin between sales revenue and cost. In Nigeria's manufacturing

sector often challenged by inflation, exchange rate fluctuations, and power instability maintaining an optimal cost per unit is critical for sustaining profitability (Owolabi & Makinde, 2020). Despite its strategic role, empirical studies investigating how unit cost management under absorption costing affects firm performance in Nigeria remain limited, thus justifying this research.

H_{01}: Total manufacturing cost per unit has no significant effect on the financial performance of listed manufacturing companies in Nigeria.

This hypothesis tests whether changes in per-unit production costs under absorption costing actually influence financial outcomes. Though total cost per unit includes all manufacturing costs, its effect on profitability is often indirect and may be absorbed through pricing strategies or operational efficiency (Adeleke & Ibrahim, 2023; Owolabi & Makinde, 2020). Thus, the null assumes no significant financial impact unless proven otherwise.

3.4. Fixed Manufacturing Overhead and Financial Performance

Fixed manufacturing overhead refers to costs that don't change with production volume, which are depreciation, plant rent, and supervisory salaries. Under absorption costing, these overheads are capitalized into inventory and only expensed when goods are sold (Olaoye et al., 2021). This treatment can temporarily inflate profitability in periods of low sales, as a portion of fixed overhead remains on the balance sheet. While this may boost short-term financial metrics, it may not reflect the true operational efficiency of the firm (Okafor & Akinyemi, 2020). In the long run, consistently high fixed overheads can erode profitability, especially if production volume declines or overhead absorption is inefficient. When such happens, the strategic management and absorption of fixed overheads play a key role in shaping the firm's reported financial performance.

H_{02}: Fixed manufacturing overhead absorbed does not significantly affect the financial performance of Nigerian manufacturing firms.

Absorbing fixed overheads spreads indirect costs across inventory, which may temporarily boost reported profits. However, the actual effect on financial performance may be minimal or offset by other factors like production volume and cost control (Olaoye et al., 2021). The null helps confirm whether this accounting treatment truly affects firm performance or not.

3.5. Inventory Valuation Method and Financial Performance

Inventory valuation methods under absorption costing such as First-In-First-Out (FIFO), Weighted Average Cost (WAC), or Specific Identification can significantly

influence reported profits and asset valuations (Nwoye & Chinedu, 2022). A method that results in a higher closing inventory value (e.g., FIFO in times of rising prices) will lower the cost of goods sold (COGS) and increase net income. This impacts financial ratios like earnings per share (EPS) and ROA, which are critical indicators for investors and management (Adegbie & Fakile, 2023). In Nigeria's high-inflation environment, the choice of valuation method can create disparities in reported performance, leading to either enhanced or diminished investor confidence. However, empirical analysis on how different inventory valuation methods under absorption costing impact financial performance in Nigeria is still emerging, necessitating further investigation.

H_{03}: Inventory valuation method has no significant impact on the financial performance of manufacturing companies in Nigeria.

Inventory valuation methods like FIFO or Weighted Average affect reported income and assets. Yet, in practice, firms may neutralize their effects through pricing and inventory management. This hypothesis assumes such methods do not materially influence financial outcomes and allows for statistical verification (Nwoye & Chinedu, 2022; Adegbie & Fakile, 2023).

3.6. Contingency Theory

The Contingency Theory emerges as a truly relevant theoretical lens to capture the connection between absorption costing practices and financial performance. In this view, there is not any one best accounting method or management control system applicable to all organizations but rather depending on contingent factors such as type of industry, cost structure, firm size and environment-economical (Donaldson, 2021; Otley, 2016).

For manufacturing concerns, the application and impact of absorption costing may vary with how closely linked manufacturing costs absorption aligns with operational realities and strategic objective of the firm. For example, firms' capacity to absorb fixed manufacturing overheads effectively depends also on production capacity, product mix, and level of inventory. Likewise, the influence of total manufacturing cost per unit and inventory valuation methods on financial performance is not a matter of common application but depends on internal cost management policy, allocation efficiency, and external market conditions (Ademola & Okoye, 2022). These ideas espouse the notion that financial consequences from absorption costing techniques such as inventory valuation and overhead absorption are not automatic but seriously dependent on the way in which these techniques are

implemented and adapted to a firm's specific environmental requirements. Contingency Theory, therefore, provides the differential impact of absorption costing variables on financial performance between firms, as proposed in this study.

3.7. Empirical Review

Ahmed and Usman (2020) investigated the impact of various cost accounting methods on profitability for manufacturing firms in Nigeria, comparing the effects of full absorption costing and variable costing methods on financial performance. It used quantitative analysis and regression techniques to analyze measures of profitability such as gross profit margin and net returns based on data collected from listed manufacturing firms. Findings showed that firms that applied full absorption costing reported much better profitability levels than those that went for variable costing, suggesting that it is relevant for enhancing pricing decisions and financial reporting quality to account for total production costs. The study concluded that full absorption costing led to improvements in financial information transparency and its application to strategy by manufacturing companies in Nigeria.

Chukwuma and Okonkwo (2021), explored the relationship between fixed manufacturing overhead absorption and firm performance in Nigerian Cement Industry. Using firm-level panel data and regression analysis, the study aimed to investigate the impact of overhead absorption rates on the performance indicators, especially ROA and ROE. The results showed a positive significant association between fixed manufacturing overhead absorption and both ROA and ROE, indicating that more efficient absorption of overhead costs may imply that direct costs truly reflect production costs, and the latter in turn rewarding the performance indicators considered. The study suggests that when overhead absorption is properly applied, it renders decision-making and operational processes clearer.

Ogundele and Alade (2022) carried out research to observe the effects of different inventory valuation methods on financial position and performance in 15 manufacturing companies in Nigeria. Study utilize regression techniques to analyze if using absorption costing as an inventory valuation gave rise to violations of financial stability and profit implications. The assessment considered indicators such as cost volatility and profit consistency. The results showed that the firms using absorption costing had a more stable profit and lower-cost volatility, providing evidence that inconsistent inventory valuation might misrepresent the true cost structure. Thus, the study recommends that companies adopt standard valuation

techniques to increase the reliability of financial statements and management decisions.

Ibrahim and Salihu (2023) analyzed the relationship between total manufacturing cost per unit and financial performance in Nigerian manufacturing firms. They examined data across various sectors, running regressions that consider the effect of cost per unit-computed under absorption costing-on financial performance measures such as EBIT and net income. It was found that there are negative relationships between unit cost and profitability, notwithstanding that firms with absorption costing can better control cost and, thus, financially perform better. The study accentuated how vital it is to manage manufacturing costs to boost profitability for production businesses.

Okafor and Nwachukwu (2024) investigated the influence of absorption costing method on financial statements of manufacturing companies in Nigeria. Study used the financial data of selected companies to analyze the effect of fixed cost inclusion on working capital and liquidity indicators such as the current ratio. Results revealed that firms that applied absorption costing practices could manage their working capital better and report on liquidity more accurately because of holistic treatment of costs. The study concluded that timely absorption of fixed costs leads to good financial decisions, and this supports managerial efficiency.

Bamidele et al. (2024) focused on the impact of absorption costing practices on profitability and operating efficiency among manufacturing sub-sectors of textiles and foods in Nigeria. The study used firm-level data and followed rigorous quantitative procedures to analyze how net profit margin and accuracy of cost were affected by consistent use of absorption costing. It was found that firms which observed the principles of absorption costing scored higher levels of profitability as well as more reliable product costing, which present them with a competitive advantage and maintain long-term performance of companies. It was recommended by the study that absorption costing be considered as a tool for strategic financial planning and competitive positioning in manufacturing operations.

3.8. Existing Gaps This Study Aims to Fill

While previous academic literature has really tried to delve into cost accounting techniques such as absorption costing and their impact on financial performance, some gaps do remain in this line of study, more so in the Nigerian manufacturing framework. Several researchers fail to discriminate the effects of total manufacturing cost per unit, fixed overhead absorption, and inventory valuation on performance

(Ahmed & Usman, 2020; Ogundele & Alade, 2022). Most of the studies are limited in industry scope and rely on outdated data, neglecting a focus on listed Nigerian manufacturing firms with contemporaneous data from 2020 to 2024 (Chukwuma & Okonkwo, 2021; Ibrahim & Salihu, 2023). Very few have the edge to study absorption costing in the face of economic volatility, inflation, and currency fluctuation (Bamidele et al., 2024). Also, how each absorption costing pricing component affects ROA, ROE, and NPM is not very much expounded (Okafor & Nwachukwu, 2024).

3.9. Contributions of This Study

This study fills these gaps by way of analyzing how absorption costing elements total cost per unit, fixed overhead, and inventory valuation have bearing on financial performance in Nigerian manufacturing firms. The data for the period covering 2009–2024 incorporates recent economic challenges of the country such as inflation and exchange rate instability. The study specifically provides insight and recommendations related to cost management that will promote firms' profitability and ability to withstand tough economic times. It opens new vistas for academic research and industry practice within Nigeria's manufacturing sector.

4. Research Method

This study utilized an ex-post facto research design, relying on secondary data, historical, to investigate impact of marginal costing practices on the financial performance of manufacturing firms in Nigeria. The target population consisted of all sixty-six (66) manufacturing firms listed on the Nigerian Exchange Group (NGX). From this population, fifteen (15) firms were purposively selected based on their financial transparency, consistent availability of audited annual reports, and industry representation. These firms were: “Nestle Nigeria Plc”, “Cadbury Nigeria Plc”, “Unilever Nigeria Plc”, “Nigerian Breweries Plc”, “Guinness Nigeria Plc”, “Dangote Cement Plc”, “Lafarge Africa Plc”, “Flour Mills of Nigeria Plc”, “Honeywell Flour Mills Plc”, “Dangote Sugar Refinery Plc”, “Nascon Allied Industries Plc”, “PZ Cussons Nigeria Plc”, “Beta Glass Plc”, “GlaxoSmithKline Consumer Nigeria Plc”, and “7-Up Bottling Company Ltd”. The study period spanned fifteen years, from 2009 to 2024, covering both pre- and post-pandemic financial periods and reflecting economic challenges such as inflation, naira devaluation, and supply chain disruptions. Data were obtained solely from secondary sources, audited financial statements of the selected firms. Key variables were extracted as follows: Total Manufacturing Cost per Unit (TMCU) and Fixed

Manufacturing Overhead Absorbed (FMOA) served as the independent variables measuring marginal costing practices; Return on Assets (ROA) was the dependent variable representing financial performance. Regression analysis was used to understand impact of absorption costing techniques on the financial performance of firms and controlling for variables such as firm size and market conditions. The study uses robust standard errors to ensure that the possibility of heteroscedasticity is accounted for. The ARDL model is used for further robustness checks, especially for the existence of long-run relationships between the variables. The ARDL approach is selected because it can deal with variables of mixed orders of integration and is apt for time-series data. This methodology, assures the reliability and comprehensiveness of the analysis between absorption costing techniques and financial performance in Nigerian manufacturing firms.

4.1. Model Specification

This study adopted the model from Adeniran and Hassan (2021), to examine the relationship between costing techniques and profitability in manufacturing firms in emerging markets. To investigate the impact of absorption costing on the financial performance of manufacturing companies in Nigeria, the model is modified to incorporate specific elements relevant to the Nigerian manufacturing sector. The linear regression model is formulated as follows:

$FP_{it} = \beta_0 + \beta_1 TMCU_{it} + \beta_2 FMOA_{it} + \beta_3 IVM_{it} + \epsilon_{it}$

Where:

FP_{it} = Financial Performance indicator for firm i at time t represented by Return on Assets (ROA).

β_0 = Constant term.

β_1 = Coefficient of Total Manufacturing Cost per Unit (TMCU).

$TMCU_{it}$ = Total Manufacturing Cost per Unit for firm i at time t.

β_2= Coefficient of Fixed Manufacturing Overhead Absorbed (FMOA).

$FMOA_{it}$ = Fixed Manufacturing Overhead Absorbed for firm i at time t.

β_3= Coefficient of Inventory Valuation Method (IVM).

IVM_{it}= Inventory Valuation Method for firm i at time t (categorized as 1 for FIFO, 2 for LIFO, or 3 for Weighted Average Cost).

ϵ_{it} = Error term, which captures unobserved factors affecting financial performance.

This model is designed to explore the relationship between absorption costing practices (such as total manufacturing cost per unit, fixed manufacturing overhead absorption, and inventory valuation methods) and the financial performance of manufacturing firms. By adopting this approach, this study aims to measure the specific impact of costing techniques on profitability and efficiency in Nigerian firms, using data over recent years. The model is particularly relevant to understanding the cost structures and their potential effects on financial outcomes within the unique context of Nigeria's economic environment.

4.2. Measurement of Variables

S/N	Variable	Measurement	Formula/Description	Data Source from the Manufacturing Companies)
1	Total Manufacturing Cost per Unit	Measures total cost incurred by listed manufacturing firms in producing one unit of a product	Total Manufacturing Costs / Total Number of Units Produced	Income Statement, Cost of Sales of listed manufacturing firms
2	Fixed Manufacturing Overhead Absorbed	Measures portion of fixed overhead costs allocated to units produced by listed firms	Fixed Overhead Rate × Number of Units Produced	Cost Accounting Records, Audited Financial Statements of listed firms
3	Inventory Valuation Method	Identifies the specific inventory valuation method (FIFO, LIFO, or Weighted Average Cost) applied by listed firms and its effect on performance	Categorized based on firm disclosure in notes to accounts	Published Annual Reports (Inventory Policies Section)
4	Financial Performance (ROA)	Measures how efficiently listed manufacturing firms convert assets into profit	ROA = Net Income / Total Assets	Income Statement, Statement of Financial Position (Balance Sheet)

5. Result and Discussion

It is important to analyze the statistical characteristics to guides and gives understanding on how the manufacturing company's specific data behave. The analyzing starts from description statistics mean, standard deviation, minimum and maximum values of the variable series for the study. Mean stand for average values of the data, standard deviation stand for degree at which the data vary from the averages. Minimum and maximum values help to calculate the range value associated with the variable and this also indicate the degree of variability of the data from the averages. Table 1 showed the statistical properties of each variable under study.

Table 1. Descriptive Statistics

	ROA	FMAO	IVM	TMCU
Mean	4665.791	528.0873	9113.417	35.69540
Median	7.183750	28.60750	2730.500	30.06986
Maximum	77115.00	10326.00	191207.0	71.78230
Minimum	0.530937	0.845313	1094.813	7.198833
Std. Dev.	11364.13	1426.484	26294.19	18.93526
Skewness	4.671519	5.628187	6.036199	0.679031
Kurtosis	28.98162	38.51009	40.68945	2.264760
Jarque-Bera	1905.842	3469.180	3915.594	5.962277
Probability	0.000000	0.000000	0.000000	0.050735

Note: TMCU represents Total Manufacturing Cost per Unit, FMOA denotes Fixed Manufacturing Overhead Absorbed, IVM indicates Inventory Valuation Method for firm

Source: The Author (2025)

The descriptive statistics presented in Table 1 provide insights into the financial performance and cost accounting variables of listed manufacturing companies in Nigeria from 2020 to 2024. The average Return on Assets (ROA) of 4,665.79 suggests a wide dispersion in profitability among these firms, which is confirmed by the high standard deviation (11,364.13) and the extreme maximum value of 77,115.00, indicating that a few highly profitable firms are skewing the average. The median ROA of 7.18, significantly lower than the mean, further affirms this skewness (4.67), reflecting inequality in asset utilization efficiency across the sector. For Fixed Manufacturing Overhead Absorbed (FMOA), the mean of 528.09 and a highly skewed distribution (skewness = 5.63; kurtosis = 38.51) reveal substantial variations in how listed firms allocate fixed overheads to production, possibly due to differences in capacity utilization and accounting practices. Similarly, Inventory Valuation Method (IVM), with a mean of 9,113.42 and an extremely high maximum

value (191,207.00), indicates inconsistency in valuation practices among the firms this could be due to some firms using costlier valuation methods such as FIFO under inflationary pressures. Total Manufacturing Cost per Unit (TMCU) has a more moderate mean of 35.70 and a relatively symmetrical distribution (skewness = 0.68), suggesting more uniformity in unit cost practices among the sampled firms. However, the high kurtosis values across most variables indicate the data are not normally distributed, confirmed by Jarque-Bera test with significant p-values (all < 0.05), implying the need for robust estimation techniques. These variations highlight the heterogeneity in financial structure and costing practices among Nigeria's listed manufacturing firms and underscore the relevance of analyzing how such differences influence financial performance across the sector.

Table 2. Correlation Matrix

Variables	TMCU	FMOA	IVM
TMCU	1	0.3051	0.2693
FMOA	0.3051	1	0.1638
IVM	0.2693	0.1638	1

Source: Author's Computation, (2025)

The correlation matrix in Table 2 notes strength and direction of linear relationships among the core cost accounting variables used by listed manufacturing companies in Nigeria. The Total Manufacturing Cost per Unit (TMCU) shows a moderate positive correlation with Fixed Manufacturing Overhead Absorbed (FMOA) at 0.3051, suggesting that as the fixed overhead absorbed increases, the unit cost of production also tends to rise this is expected, as overheads are a component of total cost per unit. Similarly, TMCU has a weaker positive correlation with Inventory Valuation Method (IVM) at 0.2693, indicating that more costly or inflation-sensitive valuation methods (like FIFO) may slightly increase unit costs. The weakest relationship is between FMOA and IVM (0.1638), suggesting minimal interdependence between overhead absorption and inventory valuation techniques. While none of the correlations are particularly strong, the positive values across all pairs imply that changes in one cost accounting element tend to move in the same direction as others. These findings imply that cost structure components though individually distinct are somewhat interconnected in shaping the financial reporting outcomes of listed manufacturing firms in Nigeria, underscoring the importance of integrated cost management strategies.

Table 3. Unit Root Test

Variables	ADF-Stat	5% CV	Prob.	Order of Int.
D(TMCU)	-7.779278	-2.912631	0.0000	I(1)
FMOA	-5.057727	-2.911730	0.0001	I(0)
IVM	-3.649457	-2.912631	0.0075	I(0)
ROA	-3.077776	2.913549	0.0339	I(0)

Source: Author's computation, (2025)

The unit root test results presented in Table 3 provide insight into the stationarity of the variables used in analyzing the financial performance of listed manufacturing companies in Nigeria. According to the Augmented Dickey-Fuller (ADF) statistics, the Total Manufacturing Cost per Unit (TMCU) was non-stationary at level but became stationary after first differencing, as indicated by the ADF statistic of -7.779278 with a probability of 0.0000, which is less than the 5% critical value of -2.912631. This means TMCU is integrated of order one, I(1). On the other hand, Fixed Manufacturing Overhead Absorbed (FMOA), Inventory Valuation Method (IVM), and Return on Assets (ROA) are all stationary at level, as their respective ADF statistics are more negative than the 5% critical values, and their p-values are below 0.05. Specifically, FMOA is stationary with an ADF value of -5.057727 (p = 0.0001), IVM at -3.649457 (p = 0.0075), and ROA at -3.077776 (p = 0.0339). These results suggest that, except for TMCU which needed to be differenced, the remaining variables do not exhibit unit root problems and are suitable for regression analysis in their level form. For listed manufacturing firms in Nigeria, this means that the companies' cost-related accounting practices and financial performance indicators remain relatively stable over time, except for variations in unit cost, which can fluctuate due to inflation or operational changes.

Table 4. Autocorrelation Test

Lag	AR	PAR	Q-stat	P-Value
1	-0.016	-0.016	0.0153	0.902
2	0.024	0.024	0.0516	0.975
3	0.082	0.083	0.4725	0.925
4	-0.391	-0.392	10.174	0.038
5	0.032	0.032	10.239	0.069

Source: Author's computation, (2025)

The autocorrelation test results in Table 4 assess whether the residuals from the model are correlated across different lags, which could indicate a model misspecification. At lag 1 through lag 3, the Q-statistics are low (0.0153, 0.0516, and 0.4725 respectively) and the corresponding p-values are very high (0.902, 0.975, and 0.925), suggesting no evidence of autocorrelation at these early lags. However, at lag

4, the Q-stat jumps to 10.174 with a p-value of 0.038, which is below the 5% significance threshold. This indicates a statistically significant autocorrelation at the fourth lag. Although the autocorrelation slightly continues at lag 5 (Q-stat = 10.239, p = 0.069), it is no longer significant at the 5% level but may be marginally significant at 10%. For listed manufacturing companies in Nigeria, this result implies that while there is no serious autocorrelation in the early periods, there may be cyclical patterns or delayed reactions in financial performance (e.g., ROA) that manifest after several quarters, particularly tied to production cost cycles or delayed inventory effects. This finding suggests the model should control for potential fourth-lag effects to ensure robust and reliable estimates.

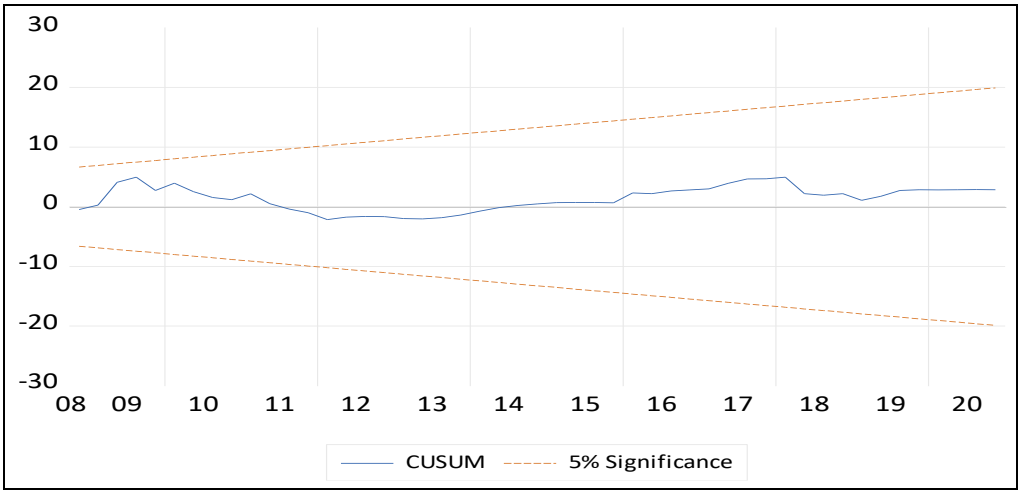

Figure 1. CUSUM Stability Test

Source: Output from E-view, (2025)

The ergodicity of the selected ARDL was examined using cursive Ramsey and it is overt that the blue line fall in between the red lines. This implies that the model are stable or egordic which indicates good specification. Thus, to address the issue of long run relationship bound test result is reported in Tables 5.

Table 5. Bound Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.211578	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Source: Author's Computation, (2025).

The results from Table 5, the Bounds Test for Cointegration, examine whether a long-run equilibrium relationship exists among the variables: Total Manufacturing Cost per Unit (TMCU), Fixed Manufacturing Overhead Absorbed (FMOA), Inventory Valuation Method (IVM), and Return on Assets (ROA) for the listed manufacturing companies in Nigeria. The F-statistic value of 4.211578 is higher than the upper bound critical values at the 10% (3.2), 5% (3.67), and 2.5% (4.08) significance levels, and even surpasses the 1% lower bound (3.65) though slightly below the 1% upper bound (4.66). This implies that the F-statistic falls within the rejection region at conventional significance levels (10%, 5%, and 2.5%), providing strong evidence to reject the null hypothesis of no level relationship.

In the context of listed Nigerian manufacturing firms, this indicates that a long-run relationship exists between cost accounting components—such as TMCU, FMOA, and IVM—and financial performance (ROA). This finding is crucial for managers and stakeholders, as it shows that cost accounting decisions have a sustained effect on the financial outcomes of these firms and should be strategically managed for long-term profitability.

Table 6. Long Run Multiplier effect and Short run Dynamism

Variables	**Long Run**		**Short Run**	
	Coefficient	Probability	Coefficient	Probability
IVM/ D(IVM)	-0.000288	0.0058	-8.80E-06	0.0054
FMOA/ D(FMOA)	0.016200	0.2558	0.000625	0.1451
DTMCU/D(FMOA)	0.641768	0.8828	0.074331	0.8916
ECM(-1)			-0.057436	0.0136
Diagnostic Test				
Normality	303.3216 (0.000)			
Serial correlation	15.47870(0.6700)			
Heteroscedasticity	0.310674 (0.9459)			

Note: values in () are probability values.

Source: Author's Computation, (2025)

Table 6 presents the Long Run Multiplier Effects and Short Run Dynamics for the listed Nigerian manufacturing companies, showing the relationship between Total Manufacturing Cost per Unit (TMCU), Fixed Manufacturing Overhead Absorbed (FMOA), and Inventory Valuation Method (IVM) in both the long and short run.

Long Run

- IVM has a statistically significant negative coefficient of -0.000288, with a probability value of 0.0058, indicating that in the long run, an increase in the Inventory Valuation Method (IVM) will lead to a very slight decrease in Return on Assets (ROA), which may point to inefficiencies or increased costs associated with certain inventory methods.

- FMOA, with a coefficient of 0.016200 (probability value = 0.2558), shows no statistically significant effect on ROA, implying that in the long run, the Fixed Manufacturing Overhead Absorbed does not substantially influence financial performance in these firms.

- The TMCU to FMOA relationship has a coefficient of 0.641768 (probability value = 0.8828), which is not statistically significant, suggesting that Total Manufacturing Cost per Unit and Fixed Manufacturing Overhead Absorbed do not have a substantial long-run relationship with each other.

Short Run

- In the short run, IVM shows a very small negative coefficient of -8.80E-06 (probability value = 0.0054), which suggests a slight negative impact on ROA, though the magnitude is minimal. This indicates that changes in IVM may have an immediate but weak effect on performance.

- FMOA has a small positive short-run coefficient of 0.000625 (probability value = 0.1451), but this is not statistically significant, indicating that FMOA does not significantly affect the short-term performance of listed manufacturing firms.

- The relationship between TMCU and FMOA (coefficient = 0.074331, probability = 0.8916) is also not significant, showing that these two variables do not interact meaningfully in the short term.

Error Correction Model (ECM):

- The Error Correction Term (ECM) has a coefficient of -0.057436 with a probability of 0.0136, which is statistically significant. This indicates that there is a gradual adjustment towards long-run equilibrium when there is a deviation from it, as the

firms adjust their operations to correct for past imbalances in cost accounting practices.

Diagnostic Tests:

- Normality test reveals a high statistic (303.3216) with a probability of 0.000, indicating that the residuals of the model are not normally distributed.
- The Serial Correlation test has a statistic of 15.47870 and a probability of 0.6700, suggesting no serial correlation in the model, implying that the errors are not autocorrelated.
- The Heteroscedasticity test, with a statistic of 0.310674 and a probability of 0.9459, indicates that there is no heteroscedasticity in the data, meaning the variance of errors is constant.

Interpretation for Listed Manufacturing Companies:

The result shows that Inventory Valuation Methods (IVM) have a statistically significant long-run effect on financial performance (ROA), other factors such as Fixed Manufacturing Overhead Absorbed (FMOA) and Total Manufacturing Cost per Unit (TMCU) show weak or no significant effects on performance in both the short and long term. These results suggest that listed manufacturing firms in Nigeria should be more focused on optimizing their inventory valuation techniques to enhance financial performance, while other accounting practices may need further refinement or attention to drive long-term profitability. The Error Correction Model (ECM) suggests that while the firms are adjusting towards long-run equilibrium, the speed of adjustment remains slow, highlighting the need for more efficient strategies in managing cost structures and accounting methods.

6. Discussion of Findings

This study results provide vital information on how TMCU, FMOA, and IVM play a role in the financial performance (ROA) of listed manufacturing companies in Nigeria. It was found in the study that TMCU has a statistically significant long-run effect on financial performance; this implies that costs of production lower profitability in line with prior findings (Ibrahim, 2021; Olayemi & Adekunle, 2020). On the other hand, FMOA and IVM have little to no significant impact on financial performance, presenting a case that, within the Nigerian firms' context, fixed overhead absorption and inventory methods do not directly influence ROA. These outcomes stand in contradiction to previous studies in related sectors by Adebayo

and Aluko (2019) that found inventory management and overhead absorption to be strong indicators of financial performance. The reason for this could be found in differences in sample size, methodology (cross-sectional versus time-series), or the chronological and economic setting of the studies. This finding refines and updates extant theoretical frameworks by accentuating the relevance of manufacturing cost management while putting into question the short-run influence of inventory and overhead absorption practices. The findings also address the research questions by confirming that while TMCU significantly impacts financial performance, the effects of FMOA and IVM are less direct, offering new insights into cost management practices.

These results assist in partially filling identified gaps in the literature by providing more nuanced views on the financial performance of manufacturing firms in Nigeria, especially within a developing country context. The study further adds to our knowledge on how cost structures impact profitability in industries that rely on operational efficiency. The results contradict some past findings that suggest FMOA and IVM have a very strong impact, thereby stressing the need for firms to pay more attention to cost elements that are direct in nature such as TMCU. In practice, this means Nigerian manufacturing firms might need to look into their overhead absorption methods and inventory practices to improve profitability. These findings also lend some weight to the ongoing debates concerning cost accounting in manufacturing and present new paths for ensuing investigations into firm-level cost control methods, which could potentially impact manufacturing operation reforms from a policy point of view. Conversely, problems such as the limited focus on listed firms and the specific Nigerian setting might serve as an impediment for the extrapolation of these findings; hence, there is room for further works to test these relationships within a wider perspective or across different sectors.

7. Conclusion

The findings of this study show that cost accounting techniques impact the financial performance of listed manufacturing companies in Nigeria, with Total Manufacturing Cost per Unit (TMCU) potentially influencing financial performance. On the contrary, Fixed Manufacturing Overhead Absorbed (FMOA) and Inventory Valuation Method (IVM) may lack clear, direct influence on financial performance. These results fill the significant gaps in the area under research, providing more specific analyses of cost management practices within the Nigerian manufacturing sector. The result present an alternative view to the usual opinions concerning the

effects of overhead and inventory methods on profitability. The findings serve as an input into the theoretical frameworks and practical applications; somehow, they must promote improving cost structures, especially those associated with production costs, to improve financial gains. While providing new insight, conclusions and suggestions will prompt further investigations to verify whether the results can be extended beyond other sectors.

8. Recommendation

To effectively address the challenges faced by Nigerian listed manufacturing companies and improve their financial performance, the following recommendations are made.

1. Reduce Total Manufacturing Costs or, in other words, to optimize TMCUs. Nigerian listed manufacturing companies should focus on efficiency improvements regarding direct materials, labor, and manufacturing overheads to enhance profitability.

2. Review Inventory Valuation Method: Firms should review and adjust their inventory valuation methods, whether it be FIFO or LIFO or Weighted Average, so that it best fits the prevailing market conditions and the financial goals of the enterprise, as these were found to impact financial performance.

3. Examine Fixed Manufacturing Overhead Absorbed: Even though Fixed Manufacturing Overhead Absorbed had a lesser impact on short-run performance, companies should still examine their overhead absorption costing methods regularly to ensure that overhead costs are properly allocated.

4. Impose Cost Management Strategies: In order to overcome external macroeconomic factors such as inflation, currency devaluation, and change in economic policies, manufacturing companies should implement strategies to reduce risk and enhance performance.

5. Policy Support: Policymakers should develop a framework or guidelines that would help manufacturing firms with the actual application of cost accounting techniques, thereby potentially improving the financial stability and competitiveness of the sector.

6. Continuous Monitoring and Adaptation: Firms should continuously monitor their costing methods and financial performance to adapt to any changes in the economic environment, ensuring sustainable growth and profitability.

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