Determinants of Value Chain Accounting and Margin Ratios in listed Consumer Conglomerate Companies in Nigeria

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ABSTRACT

This study investigates the determinants of value chain accounting and margin ratios in consumer conglomerate companies listed on the Nigeria Exchange Group (NGX). Utilizing an ex-post facto research design, panel data were extracted from the audited financial statements of 11 purposively selected firms spanning 2015 to 2024. The actual cost of quality was adopted as a proxy for value chain accounting, while revenue, gross margin ratio, net margin ratio, and expenditure ratio were employed as explanatory variables. The regression analysis revealed a statistically significant positive relationship between revenue and the cost of quality, suggesting that enhanced product quality correlates with increased revenue generation. Conversely, gross margin and net margin ratios were negatively and significantly associated with the cost of quality, indicating a potential erosion of profitability due to quality-related expenditures. The relationship between expenditure ratio and cost of quality was positive but statistically insignificant. These findings underscore the dual role of quality investments in driving revenue while potentially reducing margin efficiency. The study recommends the adoption of Total Quality Management (TQM), Activity-Based Costing (ABC), lean accounting, and performance-based budgeting as strategic tools for aligning quality initiatives with financial performance in the consumer goods sector.

Keywords: Value Chain Accounting, Cost of Quality, Margin Ratios, Consumer Conglomerates, Financial Performance, Nigeria Exchange Group.

INTRODUCTION

Value chain analysis was developed by Porter (1985), and in the accounting literature further development was made by Shank (1989) and Shank and Govindarajan (1992 & 1993). Value chain analysis is used to analyze, coordinate and optimize linkages between activities in the value chain, by focusing on the interdependence between these activities (Abbeele et al., 2011).

Value chain analysis is a mechanism that facilitates the optimization and coordination of interdependent activities in the value chain, which may cross organizational boundaries and accounting information is an important constituent of value chain analysis (Dekker, 2003). Value chain analysis gives us a framework of activities those inside and outside a firm, and makes the competitive strength of the firm combine together. So, it assesses the value of each activity which increases the products and services to a firm (Kirli & Gumus, 2011).

The manufacturing sector remains a cornerstone of economic development globally, serving as a key driver of employment, innovation, and trade. In Nigeria, this sector holds significant potential to catalyze sustainable growth and diversification away from oil dependency. However, realizing this potential requires robust financial and operational strategies, particularly in the area of value chain accounting—a methodology designed to assess and optimize costs, revenues, and resources throughout a production cycle. Recent years have seen growing attention to how institutional and firm-level factors influence the adoption and efficacy of value chain accounting practices within the Nigerian manufacturing context.

Value chain accounting is grounded in the principles of resource optimization and cost management, as popularized by Michael Porter's value chain model. It extends beyond mere cost control to include strategic

decision-making that aligns with organizational goals, market dynamics, and stakeholder expectations. In the Nigerian context, the need for effective value chain practices is underscored by challenges such as infrastructural deficits, volatile foreign exchange rates, and regulatory inefficiencies (Adegbite et al., 2019). These factors create a complex interplay of institutional pressures and firm-specific capabilities, shaping the adoption of accounting practices that can enhance competitiveness.

Institutions, defined broadly to include regulatory bodies, legal frameworks, and socio-political environments, play a critical role in shaping corporate behavior. In Nigeria, regulatory initiatives such as the Financial Reporting Council Act of 2011 have sought to align accounting practices with global standards. Yet, institutional weaknesses—such as inconsistent enforcement and bureaucratic red tape—pose challenges to widespread adoption. Studies indicate that firms operating in environments with strong institutional frameworks are more likely to adopt advanced accounting systems, including value chain accounting (Adeleye et al., 2020). The interplay between institutional quality and firm performance underscores the need for a supportive regulatory environment to foster best practices in accounting.

At the organizational level, factors such as size, ownership structure, and managerial expertise significantly influence the implementation of value chain accounting. Large firms with diversified operations often have greater capacity to invest in sophisticated accounting systems. Additionally, firms with foreign ownership or partnerships are more likely to adopt global best practices, including advanced accounting methodologies (Nwankwo & Okeke, 2021). Managerial competencies, including familiarity with modern accounting tools and technologies, further determine how effectively firms can leverage value chain accounting for strategic decision-making.

The interaction between institutional and firm-level factors creates a dynamic environment that shapes accounting practices. For instance, firms with strong internal governance structures may offset institutional weaknesses by self-regulating their accounting practices (Kabengele & Hahn 2021). Conversely, even firms with robust capabilities may struggle in an environment plagued by corruption and policy inconsistency. Understanding this interplay is crucial for designing interventions that address both macro-level barriers and micro-level inefficiencies.

Recent studies have highlighted the benefits of integrating institutional and firm-level analyses in understanding accounting practices. For instance, a study by Olusola et al. (2022) found that institutional support, such as tax incentives, significantly enhances the adoption of value chain accounting among Nigerian manufacturers. Similarly, Okafor et al. (2020) emphasized the role of technological adoption in facilitating accurate cost management and profitability analysis. However, there is limited empirical research specifically focusing on value chain accounting within Nigeria's conglomerate sector, particularly in relation to listed companies. This study seeks to fill this gap by providing evidence-based insights into the determinants of value chain accounting in this context.

The aim of this study is to achieve the followings:

- To determine the extent to which revenue influences the actual cost of quality of firms in the consumer conglomerate companies listed on the Nigeria Exchange Group,

- To examine the extent to which gross margin ratio impacts the firms' actual cost of quality of products in the consumer conglomerate companies listed on the Nigeria Exchange Group.

- To investigate how net margin ratio affect the actual cost of quality of products in the consumer conglomerate companies listed on the Nigeria Exchange Group.

- To determine the relevance of expenditure ratio to actual cost of quality of products in the consumer conglomerate companies listed on the Nigeria Exchange Group.

This study contributes to the literature by bridging the gap between institutional efficiency theory and resource-based views of the firm. It provides actionable insights for policymakers, regulators, and corporate managers seeking to enhance the efficiency and competitiveness of Nigeria's conglomerate sector. Moreover, it

underscores the importance of aligning accounting practices with broader developmental goals, such as industrial diversification and job creation.

Conceptual Framework

Value Chain Accounting

According to Kirli and Gumus, (2011). value chain accounting is the combination of value chain analysis and accounting theory. Value chain accounting is an important part of value chain management and a further development of strategic management accounting. Value chain accounting is a new approach in accounting subject which is combined by the theories of value chain management, supply chain management, accounting management and information technology.

Ahrens and Chapman, (2007) posit that accounting has long moved away from being merely fundamentally functionally technical that only keep financial documents and provides reports on economic activities; rather, it has become a 'vibrant' mobilizable craft serving several purposes and roles in very many contexts. Tardi et al., (2025) posit that value chain accounting is accounting for the whole variety of events required to generate an invention or service that is made accessible to the consumers and ensuring it is done at the best minimum cost.

According to Akenbor and Okoye, (2011), Value chain accounting entails looking for discrete activities, which create value in different ways; which include different costs, different cost drivers, separable assets, and different personnel involved, for example, contrasting product design activities with advertising activities. An accounting technique that traces costs to different value chain activities are needed by firms, to enable them to focus on these value-added processes, so they will be able to manage them more efficiently.

How do we account for the production process? 1. Direct materials are purchased and recorded as an asset. 2. As direct materials are placed into production; their cost is transferred from the raw materials account to the Work-in-Progress account (an asset) 3. As direct labor costs are incurred, they are recorded in a labor expense account. Throughout the year they are transferred from the labor expense account to Work-in-progress account (an asset). 4. Overhead costs are initially accumulated in expense accounts (electricity, depreciation, etc.). Throughout the year they are transferred to Work-in-progress. 5. When goods are completed, their costs (direct materials, direct labor and overhead) are transferred out of Work-in-progress, and into Finished Goods. 6. When goods are sold, their costs are transferred out of finished goods inventory (an asset) and into Cost of goods sold (an expense).

Value chain accounting can be said to mean the systematic identification, recording, classification, and the assignment of cost to all the main activities in the value chain, which include; material activities, production activities and sales activities that ultimately add value to the organization and the customers.

Value chain accounting is a useful tool that assist an organization in identifying and managing all operational costs of the firm. When the objective is a focus on target profit; it is very important to understand: where the costs are coming from, how the costs can be reduced or optimized. Which activities add the most value to the organization's product or service. **Target profit normally depends on the clarity of costs information.** A good understanding of the cost of each part of the value chain is key to accurately plan for the desired target profit.

Value Chain Costing Value chain costing builds on Porter's value chain analysis. Porter makes the argument that competitive advantage in the marketplace ultimately derives from providing: better customer value for equivalent cost (a differentiation strategy), or equivalent customer value for lower cost (a cost leader strategy). Because a series of activities or "links in a chain" occurs between a product's design and its distribution, value chain analysis involves identifying where:

(a) Customer value can be enhanced,

(b) Costs can be lowered, or

(c) Differentiation can be achieved in the firm's segment of that value chain.

A key "lean thinking" aspect to this is value stream mapping, in which the flow of materials and information currently required to bring a product or service to a consumer is analyzed with a view to identifying opportunities for improving time to market (lead time). Value chain costing then acts as a useful extension of conventional cost analysis, taking into account benefits and cost savings embedded in the firm's links with suppliers and customers. It can be defined as an activity-based costing approach, where costs are allocated to activities required to design, procure, produce, make, distribute, and service a product or to provide a service. It should be noted that data problems may be significant when undertaking value chain costing, and the answers will not always be precise, but there are considerable benefits to be gained from the debate that results from the costing process and from enhanced quantitative awareness of the external competitive arena and of the firm's part in it. Close links obviously exist between value chain costing and open book accounting, because the latter will enhance the benefits available from the former (Cullen 2009).

Target Costing Target costing means determining a target cost for a product or service following its initial design, as a way to satisfy a customer need (Currie 2025). The target cost is arrived at by identifying the price at which the product or service can be sold, and subtracting the amount of profit margin required of that product or service by overall company long-term margin requirements (Target cost = sales price – profit margin (net profit/sales)). Target costing is implemented primarily during the development and design phases of the manufacturing or service process. After a target cost has been determined, if present processes will result in those costs being exceeded, then process changes to meet the target cost have to be identified. Techniques such as open book accounting will help to identify where process cost reductions across the supply chain can be made without diminishing the ultimate customer experience. An associated costing approach is "Kaizen" costing, which (a) takes target costing beyond the development and design stage, and (b) requires continuing efforts to secure further cost savings through continuous improvement. These philosophies can be identified as strategic management accounting, because they move management accounting away from a desire for accurate monitoring and towards a costing philosophy that is both forward-looking and closely linked to the pursuit of competitive advantage. This external focus signifies a move to market-led costing rather than cost-led pricing (Cullen 2009).

According to CIMA, target cost is a product cost estimate derived from a competitive market price. So, Target Costing = Selling Price – Profit Margin.

Target costing is not just a method of costing, but rather a management technique wherein prices are determined by market conditions, taking into account several factors, such as homogeneous products, level of competition, no or low switching costs for the end users that is the customers, management want to control costs when these factors come into the picture, as they have little or no control over the selling price that is determined by the market condition (CFI, 2015).

Target costing becomes a verity in industries such as manufacturing, construction, healthcare, energy, consumer and industrial producers and the likes where competition is so intense that price control is basically determined by demand and supply in the market, management can only control their cost to some extent and as such the focus will be to try to influence every aspect of their operational, products and service costs. The major objective of target costing is to assist management in cost management, cost reduction, and planning cost proactively.

According to CFI, (2015), target costing has the following key features:

- Firms in the industries are price takers and not a price maker; that is the prices are determined by market conditions.

- The minimum required profit margin is already included in the target selling price.

- It is part of management strategy to focus on cost reduction and effective cost management.

- Product design, specifications and customer expectations are already built-in while fixing the total selling price.

- Cost reduction is the difference between the current cost and target cost, which management want to achieve.

- A team is formed to integrate activities such as designing, purchasing, manufacturing, marketing, etc., to find and achieve the target cost.

  CFI, also itemized the benefits of target costing as follows:

- Shows management's commitment to process improvements and product innovation to gain competitive advantages.

- Products are created from customers' expectation, and cost is also based on similar lines, the customer then feels more value is delivered.

- The company's operations improve drastically and also achieve economies of scale with the passage of time.

Cost of Quality (CoQ)

According to **CIMA (2009), Official Terminology**, the Cost of Quality **(CoQ)** refers to the extra expenses a company incurs due to inefficiencies or failures in production or service delivery. It reflects the gap between the current total cost of operations and what those costs would be if everything were done perfectly from the outset.

The cost of quality can be broken down into the following components:

Cost of Conformance – This includes all costs related to ensuring that products or services meet the specified quality standards.

Cost of Prevention – These are the costs incurred before or during production to prevent the creation of substandard or defective products or services. Examples include quality training, process improvements, and preventive maintenance.

Cost of Appraisal – These are the costs associated with measuring, inspecting, or testing products and services to ensure they meet required quality standards. Examples include quality audits, testing equipment, and inspection processes.

Cost of non-conformance – cost of failure to deliver the required standard of quality

Cost of internal failure – costs arising from inadequate quality which are identified before the transfer of ownership from supplier to purchaser

Cost of external failure – costs arising from inadequate quality discovered after the transfer of ownership from supplier to purchaser.

From the presentation by CIMA above, it will be reasonable to represent the cost of quality mathematically as to: $[ACoQ = (CoP + CoS + CoSPS - EqC)]$. Where; $ACoQ$ = actual cost of quality, $ACoP$ = cost of production, CoS = cost of sales, $CoSPS$ = cost of supporting, and products and services.

Profitability/Margin/Efficiency ratios

The profitability ratio in many literatures is subdivided into **two categories**, the one based on **investment** and the one based on **sales revenue**; the profitability based on investments includes: return on assets (ROA), return on equity (ROE) and return on capital employed (ROCE); while the one based on sales includes: gross profit ratio (GPR), net profit ratio (NPR), and expenses ratio (ER).

The best way to determine whether a business is profitable is by running margin ratios, also referred to as profitability ratios. The way to determine these values is first of all to compute three variables from the firm's income statement which are:

- Gross Profit = Net Sales – Cost of Goods Sold.

- Operating Profit = Gross Profit – (Operating Costs, Including Selling and Administrative Expenses).

- Net Profit = (Operating Profit + Any Other Income) – (Additional Expenses) – (Taxes).

All three of these values provide ways to express profit at various stages of the business operation. The values can be converted into ratios. Doing so is beneficial because it allows interested parties to analyze the company more accurately. Ratios help to measure efficiency much better than straight amounts.

Profitability ratios allow for comparison between companies within and outside the industry. The fact that a company earns more profit does not mean it is financially healthy. Margin ratios are a far better predictor of health and long-term growth than mere currency figures.

Profitability ratios are concerned with efficiency and performance in terms of return.

Gross profit margin ratio

The sale of physical products creates gross margin and it allows the business to peep into its potential product profitability (Mahdi & Khaddafi, 2020). Total gross profit is sales revenue minus cost of goods sold (COGS). Cost of goods sold represents how much company paid to sell products during a given period.

It is derived by looking or calculating the difference between a business' total revenue from sales and its cost of goods incurred and then the result is divided by the revenue value (Majka 2024).

In other words, it is profit after deducting direct materials, direct labor, inventory, and product overhead. It does not consider your general business expenses. The formula to calculate the gross profit margin ratio is:

Gross Profit Margin Ratio = (Gross Profit ÷ Sales) × 100

If the gross profit margin is high, the profit relative to the cost of the product will be high. Of primary concern with this ratio is its stability, the company must ensure that the gross margin does not fluctuate drastically from period to period, the only thing that should cause a severe fluctuation would be if the industry to which the company belongs to experiences a widespread change that directly impacts its pricing policies or cost of goods sold. It is a metric that helps in providing insight into determining how efficient the business is managing its cost of products and services. (Majka, 2024, Corporate Finance Institute 2015).

Net profit margin ratio

Mohsim (1970) considered that a profit margin ratio which is between 4% to 6% is termed as the standard norm for any industrial enterprise. According to Nishanthini and Nimalathasan (2013), net profit ratio is widely used as a measure of overall profitability and is very useful to proprietors. Net profit margin, sometimes referred to as just "profit margin," is the big-picture view of a firm's profitability. Majka (2024) infer that it is the most enriching among the net margins because it put into valuable consideration all the expenses as well as interests and taxes. It delivers all-inclusive outlook of the business' profitability by netting off total costs from revenue and the result if then divided by the revenue value. The importance of this metric is that it helps to illuminate the general health of the business organization, by taking account of every component part contributing to the value of the business.

Some industries — like financial services, pharmaceuticals, medical, and real estate have sky-high profit margins, while others are more conservative. Use industry standard as a benchmark, and perform an internal year-over-year comparison to assess your performance. The formula to calculate the net profit margin ratio is:

Net Profit Margin Ratio = (Net Income ÷ Sales) × 100

Net profit margin is similar to operating profit margin, except that it accounts for earnings after taxes. It demonstrates how much profit you can extract from your total sales. products and services. (Tulsian 2014).

Empirical Review

Abdi (2012) investigated how value chain performance influences the profitability of indigenous petroleum marketing firms in Kenya. Using a descriptive survey of 29 Nairobi-based firms and analyzing data with SPSS, the study found that most firms had implemented value chain practices for less than five years, resulting in reduced transport, material, distribution, and inventory costs. Additionally, value chain adoption improved delivery time, performance, lead time, and information accuracy. The study recommended effective management of these areas to enhance profitability.

Similarly, Akenbor and Okoye (2011) examined the effect of Value Chain Analysis (VCA) on the competitive advantage of Nigerian manufacturing firms listed in the 2009 Nigerian Stock Exchange Fact Book. Using secondary data from annual reports and the CBN Bulletin, analyzed via multiple regression, they found that VCA had a positive but statistically insignificant impact on firms' competitiveness. The authors recommended shifting from functional-based to activity-based costing and providing accountants with relevant training to strengthen VCA implementation.

Al-Sfan et al. (2022) investigated the role of value chain analysis in reducing costs and improving process performance at Al-Mothanna Cement Factory (2015–2017). The study emphasized minimizing non–value-added costs and eliminating inefficiencies in production processes. Findings revealed that value chain analysis can effectively reduce costs and enhance operational performance within economic units.

Asamoah et al. (2016) replicated Koçoğlu et al. (2011)'s study on the relationship between Supply Chain Integration (SCI), Supply Chain Performance (SCP), and Information Sharing. Conducted among manufacturing and service firms in Ghana, the study found that, unlike the original Turkish study, SCI did not directly improve SCP. Instead, Information Sharing played a mediating role, suggesting that contextual and environmental differences influence supply chain outcomes.

Fonjong and Tian (2019) explored how value co-creation affects firm performance in Cameroon's small and medium producers (SMPs), using structural equation modeling. Results indicated that value co-creation positively and significantly enhances organizational performance both directly and indirectly through strategic competitive advantages. The study concluded that value co-creation strengthens SMEs' relationships with partners, transforming them from transactional to cooperative collaborations.

Hald and Thrane (2015) examined the link between management accounting and supply chain (SC) strategy using a contingency theory model that connects lean and agile strategies with corresponding accounting practices. The study highlighted two forms of alignment—between SC strategy and accounting, and between these elements and the level of customer–supplier integration—showing that misalignment harms performance. It introduced flexible accounting approaches tailored to SC structures, advancing understanding of how accounting supports strategic supply chain decisions.

Matuga et al. (2019) analyzed how value chain management practices influence firm performance in Kenya's tea subsector using data from 310 managers across 155 firms. Regression results showed that product diversification, innovation, and process management significantly improved performance. The study concluded that adopting value chain practices enhances competitiveness and recommended their wider industry application.

Nyanaro and Deya (2018) investigated the effect of value chain management on the competitive advantage of East Africa Portland Cement Ltd. Using a descriptive survey of 45 employees, the study found a positive relationship between value chain management and competitive advantage, recommending greater product differentiation to strengthen market position.

Schiebel (2005), in a study of UK telecommunication firms, surveyed 1,316 marketing staff and found that value chain analysis not only identifies cost advantages but also reveals differentiation sources that improve customer satisfaction, market share, and profitability. The study suggested extending such analysis to manufacturing industries.

Thuku and Kombo (2019) examined value chain management practices in 43 retail outlets in Nakuru County, Kenya, using correlational design. Findings showed a positive and significant relationship between value chain practices and firm performance, concluding that integrating all dimensions of value chain management yields the highest organizational gains.

Theoretical Framework

Efficiency Theory

The theory of efficiency is well known and has been widely adopted in various empirical studies (Demsetz 1973; Berger, 1995; Howard and Pollock, 1999; Cockburn, 2004; Praveen and Tapan, 2005 & Jiankang, 2014). The efficiency hypothesis suggests that the efficiency of a firm dictates the nature of the relationship between the performance of the firm and its structure. Simply put, a firm is said to be highly efficient in relation to close competitors if it can maximize its profit while reducing its current cost structure and current plant size (or expanding its operations). The firm can also be said to be highly efficient if it can minimize its current cost structure. In this hypothesis, the X-efficiency argument holds that firms will have low cost in their production if they possess more productive technologies (Demsetz, 1973; Brozen, 1982; Gale and Branch 1982). The scale efficiency side of the debate states that some firms may be more efficient even though they may have similar technologies and management techniques thus acquiring market shares (Obukohwo, et al, 2018).

Resource-Based Theory

The Resource-Based Theory explains the differences in firm performance through variations in knowledge and unique internal resources. It emphasizes that competitive advantage arises from a firm's distinctive capabilities, innovations, and ability to use information better than rivals. While traditional industrial economics focuses on external factors like industry attractiveness, the resource-based view highlights internal strengths, such as knowledge, skills, and resources, as key drivers or basic foundation for sustained profitability and strategic advantage (Meaza, 2014).

METHODOLOGY

The study is an ex-post facto research design using panel data set from the financial report between 2015 to 2024, of the sampled firms to explore the chosen determinants of value chain accounting of listed conglomerate consumer goods companies on the Nigeria stock exchange (NSE). The data already existing necessitated the choice of this design structure because it cannot be changed. The population of the study encompasses 24 listed consumer conglomerate goods companies, the sample size for this study is 11 firms that are engaging in food, agriculture and households that have active website address, and is derived using the purposive sampling technique. Value chain accounting in this study is the dependent variable and is proxy by actual cost of quality.

The model specification for this study is:

$$ACoQ = f(REV, GMR, NMR, EXR) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots..(i)$$

$$ACoQ = \alpha_0 + \beta_1 REV + \beta_2 GMR + \beta_3 NMR - \beta_4 EXR + \mu \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots..(ii)$$

From the presentation by CIMA (2009), it will be reasonable to represent the cost of quality mathematically as to:

$$[CoQ = (CoP + CoS + CoSPS - EqC)].$$

Where;

ACoQ = actual cost of quality,

CoP = cost of production,

CoS = cost of sales,

CoSPS = cost of supporting, and products and services.

- Sales/Revenue = Cost of Goods Sold. + Gross Profit

- Net Profit = (Operating Profit + Any Other Income) – (Additional Expenses and Taxes).

- Gross Margin Ratio (**GMR**) = (Gross Profit ÷ Sales) × 100

- Net Margin Ratio (**NMR**)   = (Net Income ÷ Sales) × 100

- Expenses Ratio (**EXR**)   = (Total Expenses ÷ Sales) x 100

Table 1

Descriptive Statistics					
Variable	Obs	Mean	Std. dev.	Min	Max
ACoQ	110	5186.241	14864.53	8	106941
Rev	110	5699.428	17225.56	16	129165
GMR	110	0.234329	0.122191	0.01	0.54
NMR	110	0.084952	0.086812	0.00909	0.576
EXR	110	0.175851	0.119545	0.01	0.75

Author's computation using Stata 17.0

Table 1 is a summary of the descriptive construction of the variables for the study, where the mean value of actual cost of quality is 5186.241, a standard deviation of 14864.53, which is farther from the mean, this indicates that the actual cost of quality is spread across various items in the value chain, with a minimum value of 8 and maximum value of 106941 which means, a large number of the items share the cost of quality. The table also showed a mean value of revenue of 5699.428, a standard deviation of 17225.56, it indicates that revenue generated by firms comes from sources spread across a number of products, having a minimum value of 16 and a maximum value of 129165, it shows that the sources of revenue are spread across different income sources. The gross margin ratio showed an average value of 0.234329, a standard deviation value of 0.122191, this shows that the gross margin is closer to the mean with a minimum 0.01 and maximum of 0.54, the table also revealed values for net margin ratio with a mean of 0.084952, standard deviation of 0.086812, which is closer to the mean, with a minimum of 0.00909 and maximum distribution of 0.576. The expenditure ratio has an average value of 0.175851, a standard deviation of 0.119545, a value which is closer to the mean as desirable, having a minimum value of 0.01 and a maximum of 0.75.

Table 2 Correlation Matrix

e(V)	Rev	NMR	GMR	EXR
Rev	1			
NMR	-0.0527	1		
GMR	-0.044	-0.2105	1	
EXR	0.18	0.0148	-0.69	1

Author's computation using Stata 17.0

The above association depict that there are no multi-collinear relationships among the variable since all the association are less than 80% acceptable benchmark.

Heteroskedasticity Test

Breusch–Pagan/Cook–Weisberg test for heteroskedasticity

Assumption: Normal error terms

Variable: Fitted values of ACoQ

H0: Constant variance

chi2(1) =   5.81

Prob > chi2 = 0.1059

From the above Chi-squared showed a value of 5.81, with a probability of 0.1059, which is in excess of 0.05 yardstick, this specifies the absence of heteroskedasticity in the residuals, meaning that the residuals are homoscedastic, which is required.

Table 3. Multicollinearity Test

Variable	VIF	1/VIF
GMR	2.09	0.4784
EXR	2.06	0.4854
NMR	1.08	0.9259
Rev	1.05	0.9523
Mean VIF	**1.57**	

Author's computation using Stata 17.0

The table is a summary of the VIF specification test which revealed a tolerance value that is steadily less than 5, showing non-presence of multicollinearity within the independent variables, which validates the fitness of the data for the estimate.

Hausman Test

Test: Ho: difference in coefficients not systematic

chi2(3) = (b-B)'[(Vb V_B)^(-1)](b-B) = 1.43

Prob>chi2 = 0.6981.

The Hausman specification test to ascertain the most appropriate model to be used in the research estimation shows that the Null hypothesis is accepted because the probability statistics reported an insignificant value of 0.6981 being more than (>) 0.05; meaning that the random effect model is the appropriate model for the estimate.

Table 4. Regression Analysis

ACoQ Coefficient	Std.err.	t	P>t	[95% conf.	interval]	
Rev	0.8589488	0.009031	95.11	0	0.841042	0.876855
GMR	-5022.944	1796.864	-2.8	0.006	-8585.79	-1460.09
NMR	-5375.859	1822.768	-2.95	0.004	-8990.07	-1761.65
EXR	3353.02	1822.95	1.84	0.069	-261.553	6967.593
_cons	1334.801	347.2706	3.84	0	646.2275	2023.374
Number of obs		110				
F(4, 105)	=	2364.84				
Prob > F	=	0.0000				
R-squared	=	0.9890				
Adj R-squared	=	0.9886				
Root MSE	=	1586.9				

Author's computation using Stata 17.0

The regression result reported in table 4 shows that, the R-squared with a value of 0.9890, indicates that 98.9 % of the variation of the sample of dependent variable actual cost of quality is explained by the explanatory variables, while, 1.1% represents the error term. The 98.86, which represents the adjusted R-squared showed that the more than 98% of the regression line had been covered from the total variation of actual cost of quality resulting from the variation in the independent variable as the model equation specified, while the remaining 1.14% represents the error term.

The value of the F-statistics is 2364.84, and a Prob(F-statistics) of 0.0000, specifies the model to be fitted for the estimation, the explanatory variable indicates a joint significant effect.

a). The first objective of the study was to determine the extent to which revenue influences the actual cost of quality of firms in the consumer conglomerate companies listed on the Nigeria Exchange Group,

There is a positive significant relationship between actual cost of quality and revenue generation of consumer conglomerate companies listed on the Nigeria Exchange Group, with the $\beta=0.8589488$(P=0.000<0.05), the result showed that actual cost of quality is influence by revenue generation activities of consumer conglomerate companies listed on the Nigeria Exchange Group. It means that if management leverage on high quality products, it can result revenue growth.

b). The second objective was to examine the extent to which gross margin ratio impacts the firms' actual cost of quality of products in the consumer conglomerate companies listed on the Nigeria Exchange Group.

A statistically negative yet significant relationship exists between gross margin ratio and actual cost of quality of consumer conglomerate companies listed on the Nigeria Exchange group. With the value $\beta= -5022.944$(P=0.006<0.05); since the result indicates an inverse relationship between the gross margin ratio and actual cost of quality, it is very important for expenditures relating quality be closely monitored by companies in order to extricate margin depletion.

c). The third objective was to investigate how net margin ratio affect the actual cost of quality of products in the consumer conglomerate companies listed on the Nigeria Exchange Group.

A negative significant relationship was reported between net margin ratio and actual cost of quality of consumer conglomerate companies listed on the Nigeria Exchange group which reported values as to $\beta= -5375.859$(P=0.004<0.05), also, this is an inverse relationship between net margin ratio and actual cost of quality, meaning that the higher the quality of products, the lower the net margin ratio.

d). The fourth objective was to determine the relevance of expenditure ratio to actual cost of quality of products in the consumer conglomerate companies listed on the Nigeria Exchange Group.

There is a positive insignificant relationship between expenditures and actual cost of quality of products of consumer conglomerate companies listed on the Nigeria Exchange group for which values reported as to $\beta=3353.02$(P=0.069>0.05), meaning that expenditures relationship with actual cost of quality of products is statistically not significant, but can be positively influenced.

DISCUSSION OF FINDINGS

The study explored the determinants of value chain accounting and margin ratio in listed consumer conglomerate companies in Nigeria; it was discovered that a positive significant relationship existed between actual cost of quality and revenue generation of products of consumer conglomerate companies listed on the Nigeria Exchange Group. This entails that higher quality products attract higher revenue and vice versa, this study is consistent with the findings submitted by Abdi (2012), and Al-Sfan, et al., (2022) that the adoption of the value chain concept has brought about improvement in quality service delivery costs and thereby enhancing revenue generation for profitability.

A statistically negative significant relationship existed between gross margin ratio and actual cost of quality of the products of consumer conglomerate companies listed on the Nigeria Exchange group, this means that higher quality products attract higher costs which tend to reduce the gross margin of the sampled companies this finding disagrees with Abdi (2012) submission which is an improvement of profitability of firms that adopted value chain practices, is consistent with Thuku and Kombo (2019).

A negative significant relationship was reported between net margin ratio and actual cost of quality of consumer conglomerate companies listed on the Nigeria Exchange group, this signifies that cost of quality has substantial influence on the net margin of the sampled companies, meaning that quality products can cost more to produce than less quality products thereby, reducing the margin of safety of the company's profit, which will further drive down the net-margin of the product. This study disagrees with the study by Cooper and Lybrand (1996), who submitted that value analysis adoption causes net profit to increase substantially.

A positive insignificant relationship between expenditures and actual cost of quality of products of consumer conglomerate companies listed on the Nigeria Exchange group, this means that expenditures of the sampled companies have no substantial influence on actual cost of quality of products this study is consistent with the research results by Akenbor and Okoye, (2011), but disagrees with Nyanaro, and Deya (2018) research findings.

CONCLUSION AND RECOMMENDATIONS

The study explores the determinants of value chain accounting and margin ratios in listed consumer conglomerate companies in Nigeria. The study revealed a positive significant relationship between actual cost of quality and revenue (β β=0.8589488, P=0.000), companies should invest strategically in quality improvement programs. Given that the gross margin ratio reported a negative but significant correlations with cost of quality (β = -5022.94, P = 0.006), it means that companies must ensure to monitor quality-related expenditures to avoid margin ratio depletion. The negative impact of cost of quality on net margin ratio (β = -5375.86, P = 0.004) signals the need for cost-benefit analysis before quality investments. As the relationship between total expenditures and cost of quality was positive but statistically insignificant (β = 3353.02, P = 0.069), there is a need to align expenditure categories more directly with quality outcomes

The study concludes that value chain accounting influences revenue and margins through quality outcomes. Therefore, companies should entrench value chain accounting systems transversely in their departments to improve traceability of cost and quality. Real-time data analytics and ERP systems (e.g., SAP, Oracle) can support this integration. Based on the foregoing, it will suffice to say that the efficiency and resource-based theories perfectly align with the study.

Recommendations

1). Invest in quality strategically by prioritizing continuous quality improvement, guided by cost–benefit analysis to ensure profitability.

2). Control quality-related costs through the implementation of effective cost-monitoring systems to balance quality enhancement with profit margins.

3). To align spending with quality goals by restructuring budgets to ensure expenditures directly yield quantifiable quality and value outcomes.

4). To adopt Value Chain Accounting systems through integration into real-time analytics across departments for cost traceability and better margin management.

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