

Drivers of Operating Profit: A Focus on Selected Firms' Costs

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Abstract

The study evaluates how selected firms' costs predict the directionality of operating profits of public listed consumer goods firms in Nigeria. Accordingly, the research intends to determine the effect of selling and distribution costs, cost of inventory and cost of labour on the operating profit ratio of the sampled firms. To achieve these objectives, the study adopts the ex-post facto research design. A total of 13 consumer goods firms was purposively sampled out of a population of 20 consumer goods firms that are listed on the floor of the Nigerian Exchange Group. Secondary data obtained from the 2011-2020 annual reports of the selected firms were analysed using descriptive statistics, correlation analysis and ordinary least square regression technique at 5% level of significance. Findings made showed that cost of inventory is positive, but does not significantly drive the operating profit ratio of public listed consumer firms in Nigeria, cost of labour is positive and significantly drives the operating profit ratio of public listed consumer firms in Nigeria, while selling and distribution costs are negative, but do not significantly drive the operating profit ratio of sampled firms. Based on these findings, the research concludes that when an effective costing system or technique has been established in the firm, there are efficient allocation and utilization of resources, which lead to minimization of costs and maximization of profit. It was therefore recommended that managers of consumer goods companies should strengthen envisaged control procedures to eliminate waste in their selling and distribution costs.

Key terms: consumer goods firms, cost of inventory, cost of labour, selling and distribution costs, operating profits

JEL Classification: D24, M21, L29

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1. Introduction

Primarily, corporate operations usually focus on the maximum potential profit. A common approach to achieving this is by way of costs control, which is expected to produce the greatest overall financial performance (Akeem, 2017). Efficiency of a firm's costing technique is reputed to generate value to the firm because, once there is a greater control of cost of production activities ensured by proper costing strategies, it will result in better quality of procedures and lower the unit cost of goods and cost variance.

In other words, the primary objective of firm's costing techniques is to provide managers with information considered useful to them in making decisions and retaining effective control over corporate resources (Ditkaew,

2018). This portends that the use of costing techniques is to classify and divide costs more efficiently towards determining the final price of products and services of a defined commercial unit (Njeri, 2021). Consumer goods firms, just like similar and non-similar other firms in other industries, deploy costs management techniques to help boost the chances of their survival in the ever changing, dynamic and competitive business world. This is more as an effective costing technique provides essential advantages for consumer goods firms in order to guide managerial actions, motivate behaviours, support and create the cultural values necessary to achieve the firms' strategic and economic objectives (Erasmus, 2021).

Customers of consumer goods firms tend to demand for high quality products at a low price. It is currently an enormous challenge in the Nigeria business environment to manufacture products or provide services, given the ever-increasing cost of production. The greater the costs, the higher the price of the product and consequent decrease in the rate of turnover. This, no doubt, negatively affects the financial performance of the companies, especially in the consumable goods industry. Suffice it to say that one of the major objectives of a corporate entity is profit maximization (Nworie & Mba, 2022; Nworie *et al.*, 2023). Thus, improving on sales level therefore becomes pertinent as this is the surest way to boost and maximize profit. However, when sales level is increased, the level of activity also increases, with accompanying costs implications such as inventory, labour and distribution costs (Ezejiofor *et al.*, 2015). Increment in firm costs, on its own, is a reduction in profitability (Nworie & Ofoje, 2022). This entails that firms that truly want to remain profitable through increase in or high turnover must as well adopt effective costing technique that best minimize inventory, labour and distribution costs.

The after effect of the harsh economy in Nigeria has also posed greater challenge on the operational efficiency of the manufacturing industries such that the cost of production and general operations have continued to increase indiscriminately. Fadare & Adegbe (2020) equally believe that the highly unstable state of the economy in Nigeria has adversely influenced the financial competitiveness and capacity of most manufacturing firms. As a consequence, the high cost of production also comprising inventory, selling and distribution and labour costs has made some firms in the household products industry to either curtail or entirely cease their scale of operation (Oyedokun *et al.*, 2019).

Extant literatures such as Erasmus (2021), Njeri (2021), Fadare & Adegbe (2020), Oyedokun *et al.* (2019), Mamidu & Akinola (2019), Adigbole & Osemene (2019), Olayinka (2019), Egbunike & Adeniyi (2017), Ezejiofor *et al.* (2015), Oluwagbemiga *et al.* (2014), et cetera addressed the issue above, but failed to measure corporate performance using operating profit ratio. It is against this observation that this study evolves to examine how firm costs drive the operating profits of listed consumer goods firms in Nigeria. Specifically, the study determines the effect of selling and distribution costs, cost of inventory, and cost of labour on the operating profit ratio of consumer goods firms listed in Nigeria.

2. Literature review

2.1. Conceptual issues

■ Firm costs drivers

Firm costs drivers refer to the various factors that influence a firm's cost structure and impact the amount of costs the firm incurs. Amidst the numerous cost drivers in a firm, which include production volume, input costs, technology costs and others, as we have specified above, this study focuses on selling and distribution costs, cost of inventory, and cost of labour. Asaolu *et al.* (2012) submitted that inventory are industrial goods that represent the major component of business cost and profitability. To increase profitability, the imminent need to reduce the cost of inventory that will eventually lead to a reduction in manufacturing cost should be one of the focal points of any firm (Oyedokun *et al.*, 2019). In addition to the desired level of mark-up expected

by the manufacturer, the determination of selling price for many consumer goods is often a function of the costs that were incurred during the manufacturing process.

Labour cost is the expenses incurred on manpower involved in the production process. Accordingly, labour cost is the amount of resources expended or sacrificed on manpower that helped to produce the specific goods or services. To Olayinka (2019), it is simply the monetary valuation of labour spent in producing goods or services. Labour cost can be fixed or variable components. Fixed labour cost remains unchanged in relation to a given level of output, while variable labour cost is directly proportional to the level of activity. Labour cost can also be classified into direct and indirect components. Direct labour costs are traceable to the unit of goods or services produced, but indirect labour costs are not. To a commendable extent and unlike the indirect labour costs, which most manufacturing companies have controlling problems, the direct labour cost can be managed and easily controlled.

Selling and distribution costs are the costs which are incurred in the process of delivering manufactured products from the production unit to the wholesaler, retailer or end user. These expenses are incurred for the warehousing, storage of goods and loading/offloading of goods for safe delivery to the customers. Sule *et al.* (2013) argued that these costs are incurred in the process of ensuring that the product is available to its target market. Selling and distribution are both important and inseparable marketing functions which are used to get the right quantity of the right product to the right market segment at the right time. Right products that are not available at the point of purchase cannot be bought. This is why firms incur additional costs to make the right quantity of the right product available to buyers. Selling and distribution expenses refer to expenses that are incurred for the promotion of sales of goods and rendering of services to different categories of customers (Olayinka, 2019).

■ **Operating profit ratio**

Firm profitability entails the ability of a firm to grow its earnings and minimize its cost profile (Oyedokun *et al.*, 2019). Firm profitability influences the survival of any business entity, which makes it of utmost significance to stakeholders (Nworie & Ofoje, 2022). Operating profitability is the extent to which a firm increases its effectiveness and efficiency in transforming the usage of its assets into profits. Profit is the excess of revenue generated over the cost in the production process within a definite period. It means the excess of revenue over net operating expenses.

However, aside the profit realised from the normal day-to-day activities of the firm, there are other incomes together with expenses such as interest and tax which are usually incorporated in the financial statements to arrive at the year-end profit after-tax. Operating profit refers to the profit that a company earns from its business operations before taxes and interests are deducted. It is alternatively known as earnings before interest and tax. Operating profit is calculated by deducting operating expenses and cost of goods sold from revenues. Operating profit margin is measured as the ratio of operating profit to net turnover.

■ **Development of hypotheses**

In today's business world, the importance of costing practices is underscored by the present-day competitive business environment requiring efficient utilization of resources (Fadare & Adegbe, 2020). More so, firms that attain high profitability are perceived to apply effective costing techniques, such as marginal costing, standard costing, absorption costing, activity-based costing, life cycle costing, kaizen costing, et cetera, through which the firm is able to control costs of inventory, labour, selling and distribution to its barest minimum (Erasmus, 2021). Costing techniques are vital to the success of every firm (Ayvaz & Pehlivanl, 2017), since it is used to cut cost and further deployed by firm managers as a response to decreasing profitability.

Kinyugo (2014) and Oyadonghan & Ramond (2014) noted that these techniques of costing support decision making and readily improves on the competitive advantage of firms, which also results in a better and efficient resource allocation and utilization. To this end, it is essential to state that a firm's costing techniques are integral feature of overall effectiveness of firm management. Its relevance is pronounced more since it helps in determining near-accurate cost estimates before commencing the process. This equally contributes largely to cost forecast occurrences in the future (Alsoboa *et al.*, 2015). Perhaps, it is believed that when costing technique is effective, it permits firms to finish its production and distribution activities using least allocated resources.

Firms' costing technique addresses the internal needs of management and is oriented toward evaluation of firm performance by developing estimates for the future. Profitability, which indicates the firm's capacity to grow its earnings and reduce its cost of production and distribution, apparently depends on how well the firm minimizes its cost of materials, labour and other costs. In the past, Oyedokun *et al.* (2019), Mamidu & Akinola (2019), and Egbunike & Adeniyi (2017) found that firm cost structure exerts significant effect on the performance of the firm, whereas Fadare & Adegbe (2020) found no significant effect. Therefore, this study hypothesis that:

✓ *H1: Cost of inventory significantly and negatively drives the operating profit ratio of consumer goods firms listed in Nigeria.*

✓ *H2: Cost of labour significantly and negatively drives the operating profit ratio of consumer goods firms listed in Nigeria.*

✓ *H3: Selling and distribution costs significantly and negatively drive the operating profit ratio of consumer goods firms listed in Nigeria.*

2.2. Theoretical framework

■ *Resource-based view theory*

Edith Penrose propounded *resource-based theory* in 1959. According to the theory, firm-specific factors are seen as a bundle of resources combined to create organizational capabilities with which it can earn above average profitability (Fadare & Adegbe, 2020). Firms tend to develop their competencies from these resources and, when they are well developed, these become the source of the firm's competitive advantage (Gichuki, 2014).

Resource-based view theory stresses that the resources necessary for increased firm profitability are rare, valuable, hard or impossible to imitate or duplicate, and difficult to substitute (Ditkaew, 2018). This theory illustrates how to establish sustainable competitive advantages of firms from these scarce and irreplaceable resources. Firms that have the requisite resources, capability, unity, and specialty over rivals attain more financial success than others who do not have. An effectively installed costing system and technique are a viable resource which helps a firm to attain its economic objectives (Mamidu & Akinola, 2019).

The theory is relevant to the present study since costing techniques used to measure cost drivers provide useful information for managers of consumer goods sector. Such costing information act as a vital resource in the firm as they contribute towards attainment of competitive advantages by the firm. Installation and optimization of an effective costing technique help managers to control costs using information provided by the costing systems. It is based on this that resource-based view theory is the theoretical underpinning of the study.

2.3. Empirical review

Erasmus (2021) empirically investigated the relationship between cost management practice and financial performance of listed deposit money banks in Nigeria. Cost management practice was measured by activity-based costing, target costing and standard costing, while financial performance was measured by profit before tax. The population of the study consisted of 15 listed deposit money banks in Nigeria. The study adopts judgmental

sampling techniques to select 10 banks as sample size for the study. The study adopted methodological triangulation research methodology. Primary data was obtained through a five-point Likert scale structured designed questionnaire to elicit response from the respondents. Secondary data was obtained from annual financial reports of listed deposit money banks in Nigeria from 2010-2018. Hypotheses were tested using ordinary least square regression, which showed that activity-based costing, target costing and standard costing have significant effect on the financial performance of listed deposit money banks in Nigeria.

Njeri (2021) evaluated the impact of cost management on the performance of agribusiness enterprises in Kenya with the use of descriptive panel research design. Secondary data over a 10 year-period covering 2009-2018 were collated and analysed using multiple panel regression models. The study findings showed that cost management has a significant influence on return on investment of agribusiness enterprises in Kenya. The study by Fadare & Adegbe (2020) assessed how cost management influences financial performance of listed Nigerian consumer goods firms. A sample frame of 10 companies was selected for a period of 10 years (2009-2018). Data were obtained from the audited financial statements and the accounts and analysed using regression analysis, which revealed that cost of sales and administrative cost positively, but insignificantly affect the net profit margin of firms, while selling and distributing costs have a negative non-significant effect on net profit margin.

Furthermore, Oyedokun *et al.* (2019) examined the impact of cost control on profit before tax of manufacturing companies in Nigeria. A sample frame of 23 companies were studied over a period of 10 years (2008-2017). The data obtained from the audited financial statements were analysed using regression, which found that cost of raw materials negatively affects profit before tax of manufacturing companies in Nigeria. In the same hand, Mamidu & Akinola (2019) studied the impact of cost management on the performance of manufacturing companies in Nigeria. The secondary data were obtained from annual reports and analysed using ordinary least square model. The findings were that direct material cost, direct labour cost and production overhead significantly and negatively influence the profits generated from production operations.

The study carried out by Adigbole & Osemene (2019) examined the effect of activity-based management, life cycle costing and target costing on accuracy of cost information of listed manufacturing firms in Nigeria. The sample of the study consisted of 325 respondents in 65 randomly selected manufacturing firms. Primary data used were collected through questionnaire administration. Data analysis was done using structural equation modelling, which showed that activity-based management and target costing positively affect cost information accuracy and life cycle costing does not affect cost information accuracy.

Olayinka (2019) examined the impact of indirect costs on firms' performance using data of five conglomerate manufacturing companies in the food and beverage sector of Nigeria from 2008 to 2017. The result of the ordinary least square regression revealed that a positive significant relationship exists between indirect costs and profitability in the manufacturing companies. The study carried out by Egbunike & Adeniyi (2017) to assess how cost reduction strategy determines bank profitability in Nigerian first-generation banks from 2006 to 2016 using regression analysis showed that reduction of staff salary negatively affects bank profitability. More also, Ezejiofor *et al.* (2015) carried out a study to determine the impact of cost management on the operating performance of manufacturing firms in Nigeria. The regression analysis used to analyse the data collected from five food and beverages firms showed that cost management is significantly related to operating profit and earnings per share. Oluwagbemiga *et al.* (2014) examined the influence of cost management practice on the performance of manufacturing firms in Nigeria. Data were sourced from 40 manufacturing companies from 2003 to 2012 and the regression analysis showed that direct material cost, direct labour cost, production overhead cost and administrative overhead cost positively affect firm's performance.

3. Methods

To achieve the objectives of the study, *ex-post facto* research design is adopted. The focus of the study is on public companies listed in the consumer goods sector of the Nigerian Exchange Group, category from which the 20 companies forming the population of the study were selected (using 2022 NSE Daily Stock List), as follows: Cadbury Nigeria Plc., Champion Breweries Plc., Dangote Sugar Refinery Plc., DN Tyre and Rubber Plc., Flour Mills Nigeria Plc., Golden Guinea Breweries Plc., Guinness Nigeria Plc., Honeywell Flour Mills Plc., International Breweries Plc., McNichols Plc., Multi-Trex Integrated Foods Plc., Nascon Allied Industries Plc., Nestle Nigeria Plc., Nigerian Breweries Plc., Nigerian Enamelware Plc., Northern Nigeria Flour Mills Plc., PZ Cussons Nigeria Plc., Unilever Nigeria Plc., Union Dicon Salt Plc., Vitafoam Nigeria Plc.

The study employed a variant of non-probability sampling, namely the purposive sampling technique, to select the firms in the consumer goods sector for the sample. In order to arrive at the sample size for the study, two-point filter was used. The criteria are that the firm must be listed before the year 2011, must not have been delisted during the period of the study (2011 to 2020) and must have required data for the study. As a result of the above criteria, 12 firms meet the requirements to form the sample size of the study, namely: Cadbury Nigeria Plc., Champion Breweries Plc., Dangote Sugar Refinery Plc., Guinness Nigeria Plc., Honeywell Flour Mills Plc., Nascon Allied Industries Plc., Nestle Nigeria Plc., Nigerian Breweries Plc., Northern Nigeria Flour Mills Plc., PZ Cussons Nigeria Plc., Unilever Nigeria Plc., Vitafoam Nigeria Plc.

Data used in this study were obtained from the annual reports and accounts of the selected consumers' goods firms over the 10 years period mentioned above. The secondary data obtained for the purpose of the study were analysed using descriptive statistics, correlation analysis and ordinary least square technique. The functional relationship existing between the predictor variables and the index of dependent variable is shown below.

$$OPR = f(COI, COL, SDC, \dots)$$

Two control variables, firm size and firm leverage, were added to improve the goodness-of-fit of the model. Therefore, the multiple linear model used for the study is:

$$OPR_{it} = \alpha_0 + \beta_1 COI_{it} + \beta_2 COL_{it} + \beta_3 SDC_{it} + \beta_4 FSZ_{it} + \beta_5 FLV_{it} + \mu_{it}$$

Where:

OPR_{it} – operating profit ratio of firm i in period t ;

α_0 – constant;

β_{1-5} – coefficients of the predictors;

COI_{it} – cost of inventory of firm i in period t ;

COL_{it} – cost of labour of firm i in period t ;

SDC_{it} – selling and distribution costs of firm i in period t ;

FSZ_{it} – firm size of firm i in period t ;

FLV_{it} – firm leverage of firm i in period t ;

μ_{it} – error term of firm i in period t .

■ Measurement of variables

Cost of inventory refers to the expenditure on stock used during the manufacturing process. **Labour cost** is the expenses incurred on manpower that aid in the production process. **Selling and distribution costs** are the costs which are incurred in the process of delivering manufactured products from the production unit to the wholesaler, retailer or end user. **Operating profit** refers to the profit that a company earns from its business operations before taxes and interests are deducted. **Firm size** is the natural logarithm of the firm's total assets. **Firm leverage** is the ratio of total debt to total assets.

Table 1 below shows how the variables used in the study are operationalized.

Table 1. Measurement of variables

Variable	Type of variable	Measurement
COI	Independent	Natural logarithm of the firm's inventory costs
COL	Independent	Natural logarithm of the firm's labour costs
SDC	Independent	Natural logarithm of the firm's selling and distribution costs
OPR	Dependent	$\frac{\text{Earnings before tax}}{\text{Total revenue}}$
FSZ	Control	Natural logarithm of the firm's total assets
FLV	Control	$\frac{\text{Total liabilities}}{\text{Total assets}}$

Source: Researcher's compilation.

4. Results

4.1. Descriptive statistical analysis

The secondary data obtained for the purpose of the study were analysed using descriptive statistics and correlation analysis. The descriptive statistics of the variables are given in Table 2 below:

Table 2. Descriptive statistics

. summarize OPR COI COL SDC FSZ FLV

Variable	Observation	Mean	Standard deviation	Minimum	Maximum
OPR	120	0.082928	0.2230187	-1.080388	1.245964
COI	120	6.793782	0.5916781	5.372689	7.717856
COL	120	6.528108	0.5967421	5.247101	7.627369
SDC	120	6.354658	0.9685900	4.043519	7.890395
FSZ	120	7.649091	0.5672953	6.240489	8.647811
FLV	120	0.557566	0.1459835	0.193620	0.880996

Source: Researcher's computation using Stata 16.

From Table 2, the mean of OPR is 0.0829, with a standard deviation of 0.2230. This shows there is a wide dispersion in OPR. The minimum value and maximum value of OPR of -1.0803 and 1.2459, respectively, attest to the dispersion. The mean of COI is 6.7937, with a standard deviation of about 0.5917, with the range of 5.3727 to 7.7178. COL has the average of 6.5281 and a standard deviation of 0.5967. The smallest value of COL is 5.2471, while its highest value is 7.6274, which indicates that there is a very small amount of dispersion amongst the COL of the selected firms. The mean of SDC is 6.3547, with a standard deviation of 0.9686. SDC has a minimum and a maximum value of 4.0435 and 7.8904, respectively. Firm size averaged 7.6491, with a standard deviation of 0.5673. FSZ has a minimum value of 6.2404 and a maximum one of 8.6478. Finally, the average value of firm leverage is 0.5576, with a standard deviation of 0.1459. The minimum value of firm leverage is 0.1936, while the maximum value of firm leverage is 0.8809.

4.2. Correlational analysis

Pearson correlation was used to explore the association between costing techniques and the profitability of quoted consumer goods firms in Nigeria.

Table 3. Correlational analysis

	OPR	COI	COL	SDC
OPR	1.0000			
COI	0.2092*	1.0000		
	0.0219			
COL	0.2929*	0.3613*	1.0000	
	0.0012	0.0001		
SDC	0.1020	0.2360*	0.8594*	1.0000
	0.2678	0.0095	0.0000	

* Significant at 0.05 significance level.

Source: Researcher's computation using Stata 16.

The correlational analysis above reveals the strength of association between OPR and COI, OPR and COL, OPR and SDC. The results show that COI and COL are significantly related to OPR, but SDC is not.

4.3. Hypotheses testing

Hypotheses testing was carried out using ordinary least square technique at 5% level of significance. As we have mentioned earlier, the model utilised is:

$$OPR_{it} = \alpha_0 + \beta_1 COI_{it} + \beta_2 COL_{it} + \beta_3 SDC_{it} + \beta_4 FSZ_{it} + \beta_5 FLV_{it} + \mu_{it}$$

The regression result is given in Table 4 below.

Table 4. Regression result of hypotheses testing

. regress OPR COI COL SDC FSZ FLV, beta

Source	SS	df	MS
Model	1.07185512	5	0.214371025
Residual	4.84688683	114	0.042516551
Total	5.91874195	119	0.049737327

Number of observations = 120
F (5, 114) = 5.04
Prob. > F = 0.0003
R-squared = 0.1811
Adjusted R-squared = 0.1452
Root MSE = 0.2062

OPR	Coefficient	Standard error	t	p > t	Beta
COI	0.0128840	0.0385522	0.33	0.739	0.0341819
COL	0.2621624	0.0679740	3.86	0.000	0.7014810
SDC	-0.1520251	0.0487051	-3.12	0.002	-0.6602587
FSZ	0.0675789	0.0799550	0.85	0.400	0.1719013
FLV	0.0192477	0.1338304	0.14	0.886	0.0125991
_constant	-1.2776100	0.3429294	-3.73	0.000	

Source: Researcher's computation using Stata 16.

The regression result in Table 4 above is built on the model below.

$$\text{OPR} = -1.28 + (0.034 \times \text{COI}) + (0.702 \times \text{COL}) - (0.660 \times \text{SDC}) + (0.172 \times \text{FSZ}) + (0.013 \times \text{FLV}) + \mu$$

The $R^2 = 0.1811$ shows that only 18.11% of the total variation in OPR is explained by the independent variables, while the balance of 81.89% is explained by factors outside this study. At a level of significance of 0.05, the F-statistics is 5.04, while the p-value is 0.0003. The Prob. > F is less than 0.05 adopted level of significance. This implies that the independent variables (COI, COL, SDC, FSZ and FLV) are fit enough to significantly predict operating profit ratio of quoted consumer firms in Nigeria, at a level of significance of 0.05.

■ Hypothesis 1

Hypothesis 1 tested the effect of cost of inventory on the operating profit ratio of quoted consumer firms in Nigeria. The result of the regression analysis on Table 4 shows that COI measured by natural logarithm of inventory costs has a positive effect on OPR ($\beta_1 = 0.034$, t-value = 0.33). This shows that 1% increase in COI will increase OPR by 0.034 and 1% reduction in COI will reduce OPR by 0.034. The test of significance using t-value shows that Prob. > |t| = 0.739, which is greater than 0.05. Thus, the positive effect of COI on OPR is insignificant. This statistical insignificance indicates that the study will not reject the null hypothesis, which says that cost of inventory has no significant effect on the operating profit ratio of quoted consumer firms in Nigeria. Similar finding of a positive effect was realised in the study carried out by Fadare & Adegbe (2020) and Oluwagbemiga *et al.* (2014). However, the result of the present study disagreed with those of Mamidu & Akinola (2019).

■ Hypothesis 2

Hypothesis 2 tested the effect of cost of labour on the operating profit ratio of quoted consumer firms in Nigeria. The result of the regression analysis on Table 4 shows that COL measured by natural logarithm of labour costs has a positive effect on OPR ($\beta_2 = 0.702$, t-value = 3.86). This shows that 1% increase in COL will increase OPR by 0.702 and 1% reduction in COL will reduce OPR by 0.702. The test of significance using t-value shows that Prob. > |t| = 0.000, which is less than 0.05. Thus, the positive effect of COL on OPR is significant. This statistical significance indicates that the study will reject the null hypothesis, which says that cost of labour does not significantly affect the operating profit ratio of quoted consumer goods firms in Nigeria. It is concluded therefore that cost of labour significantly and positively drives the operating profit ratio of consumer goods firms listed in Nigeria ($\beta_2 = 0.702$, t-value = 3.86, p-value = 0.000). This result is in disagreement with the findings of Oyedokun *et al.* (2019) and Mamidu & Akinola (2019), but validated the results found by Oluwagbemiga *et al.* (2014) and Fadare & Adegbe (2020), that realised positive effect.

■ Hypothesis 3

Hypothesis 3 tested the effect of selling and distribution costs on the operating profit ratio of quoted consumer firms in Nigeria. The result of the regression analysis on Table 4 shows that SDC measured by natural logarithm of selling and distribution costs have a negative effect on OPR ($\beta_3 = -0.660$, t-value = -3.12). This shows that 1% increase in SDC will reduce OPR by 0.660 and 1% reduction in SDC will increase OPR by 0.660. The test of significance using t-value shows that Prob. > |t| = 0.002, which is less than 0.05. Thus, the negative effect of SDC on OPR is significant. This statistical significance indicates that the study will reject the null hypothesis, which says that selling and distribution costs do not significantly affect the operating profit ratio of quoted consumer goods firms in Nigeria. It is concluded therefore that selling and distribution costs significantly drive the operating profit ratio of consumer goods firms listed in Nigeria ($\beta_3 = -0.660$, t-value = -3.12, p-value = 0.002). The results of this study are in agreement with those of Fadare & Adegbe (2020) and Mamidu & Akinola (2019), but invalidated the results by Oluwagbemiga *et al.* (2014) and Egbunike & Adeniyi (2017).

Overall, the findings equally support the theoretical foundation that costing techniques provide useful information for managers of consumer goods sector and such costing information act as a vital resource in the firm as they contribute towards attainment of competitive advantages by the firm.

5. Conclusion and recommendations

This study examined how firm costs influence the operating profit margin of listed consumer goods firms in Nigeria. The findings revealed that cost of inventory has a positive, but insignificant effect on operating profit ratio, while cost of labour positively and significantly influence operating profit ratio. It was also shown that selling and distribution costs have a negative and significant influence on the operating profit ratio of consumer goods firms in Nigeria. Firms that truly want to remain profitable by increasing its sales revenue must as well adopt effective costing technique that best minimize inventory costs, labour costs and distribution costs.

By way of conclusion, when an effective costing system or technique has been established in the firm, there is an efficient allocation and utilization of resources which leads to minimization of costs and maximization of profit. That is to say, when the chosen costing technique is developed in line with the changes in the internal and external environment of the firm, the profit maximization goal is better off achieved than when the costing technique does not meet the peculiarities inherent of any entity.

Based on the findings of the study, the following recommendations are hereby made:

1. Managers of consumer goods firms should ensure their firms use modern inventory cost management methods for effective operation and minimization of stock costs to enable them to be at advantage in competing with their contemporaries.
2. Consumer goods firms should ensure routine training and seminars for their staffs on new and modern cost management practice to enhance labour effectiveness and lead to increased firm profitability.
3. Managers of consumer goods companies should strengthen control procedure to eliminate waste in their selling and distribution costs.

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