

Cost Components and Performance of Firms in the Nigerian Industrial Sector

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Abstract: This paper examined the linkage between cost components (CMS) and the Nigerian industrial sector's performance. Various cost practices proxies considered are: (i) direct material cost (DMC); (ii) direct labour cost (DLC), and overhead cost (OVC) while firm performance proxied by Return on investment (ROI). The study sourced information for the annual reported of the Nigerian industrial sector from 2011 to 2020. The study used the panel methodological approach to the inclusion of fixed effect, random effect and Ordinary least square. The result evidenced that efficient CMS have high statistical significant effect on the performance of the Nigerian industrial sector. Hence, we can now conveniently conclude that efficient CMS is critical to the attainment of the industrial sector's central objective of profit maximization. To this end, for Nigeria firms to amass more wealth, they must place more emphasis on DMC; DLC, and OVC. Lastly, cost reduction strategies must be upheld in the Nigerian industrial sector.

Keywords: Cost components, Performance, Return on Investment, Nigerian Industrial Goods Sector

1. Introduction

In recent time, business analysts, investors, academicians, management, and the like are somewhat worried at rate prices, goods and services are on the increase without commensurate increase income sources. Again, staying profitable admits intense competition, economic recession, product proliferation, low capacity utilization, and high production cost remains another major issue of concern to management. Meanwhile, investors prefer firms with higher Return on Investment than firms with lower ROI.

Popesko (2016) noted that cost component is one of the most paramount issues which affect ROI both in boom and downturns. However, this is not without shortfalls. Sijak (2020) maintained that marginal costing though is an effective cost control technique and also facilitate organizational decision making process but is not devoid of shortfalls. Various shortfalls mentioned include difficulty to analyze overheads, it ignores time element; has unrealistic assumptions, it does not give complete financial information; it is for internal use only, unrealistic stock valuation and lots more.

Although, scholars have examined the construct in time yet there are no universally accepted theories and findings. Hence, this study was targeted at filling this missing link (gap) which has long existed between policy makers and academics. As such, the present paper will contribute to the body of extant knowledge as well covers the dearth of scholarly write-ups on the subject matter in Nigeria. Again, this paper will help firms' management in their quest to find the most feasible ways of reducing operational cost reduction. Therefore, it will be of great important to accounting students in that it will serve as both an eye opener and a resource material to them

Primarily, this paper examined various cost components vis-à-vis (i) direct material, (ii) direct labour, and (iii) overhead costs. More so, these marginal cost components were used as a yardstick to evaluate the performance (return on investment) of the Nigerian industrial sector from 2011 to 2020.

2. Literature Reviews and Hypotheses Development

2.1. Conceptual Clarification/Linkages

Cost Component

The term cost components better still known as cost volume profit analysis (CVPA) entails the impact a product cost supposing an extra unit is added to the production cost structure (Drury, 2021). Further, the major tenant of this costing technique is that in reality manufacturing cannot actually take place without non-current assets such as equipment and plant facilities. Hence, fixed product costs must be incorporated into the manufacturing cost structure. However, marginal costing is used for internal decision making only and that it does not present true and fair value of the state of affairs of the firm since it does not consider all production costs. Therefore, marginal costing ensures that all indirect costs are incorporated into the cost structure (Hansen & Mowen, 2021; Okunbor, 2021; Popesko, 2016).

On the other hand, optimal corporate performance appraisals are targeted at satisfying its stakeholders' needs. Specifically, ROI according to Investopedia (2022), is financial metrics proxy that is used to assess whether a particular investment is efficient or not. Again, it compares different investment outlays. More so, ROI measure the returns relative to investment cost. On the overall, most investors prefer firms with high ROI than those with low ROI. To achieve this, it is germane for such firm to reduce its overall cost.

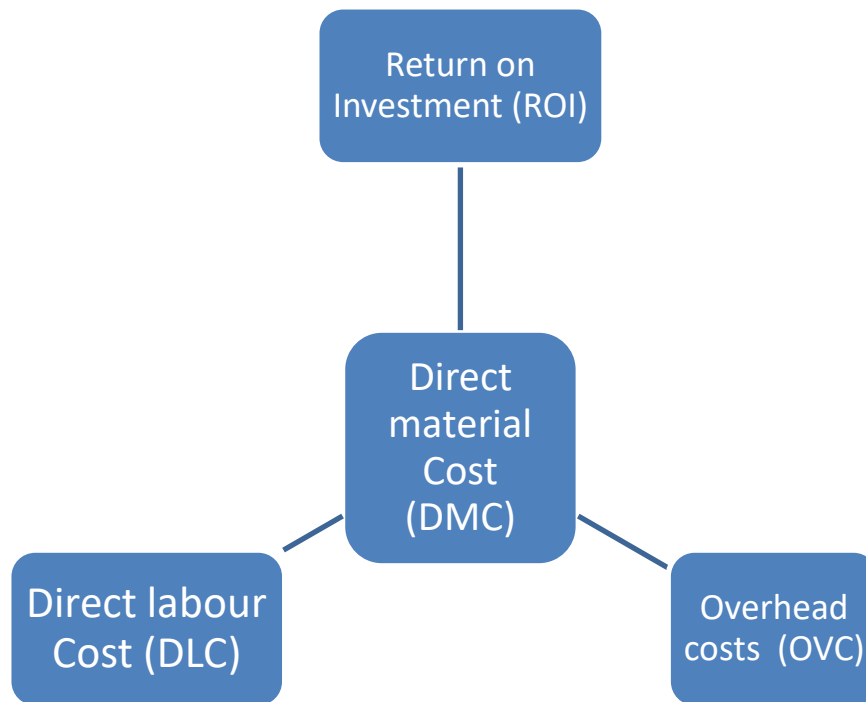


Figure 1: Linkage between ROI and Marginal Cost (MC) Components

Source: Researcher's Model (2022).

The model above link ROI with DMC, DLC, and OVC together. In figure 1, MC components consist of DMC, DLC, and OVC. The model assume that DMC, DLC, OVC, and ROI are expected to move in same direction or otherwise.

2.2. Theoretical Underpinning

The modern portfolio theory (MPT), efficient structure hypothesis (ESH), and resource dependency theory (RDT) were used to underpin this study. They are therefore explained in the foregoing paragraphs:

The MPT was first pioneered by Harry Markowitz in 1952 based on the findings of Tobin (1954). This theory explains that portfolio cancels unsystematic components which are inherent in investments. More so, this theory explains how risk averse investors combine various assets at a given level of risk so as to maximize expected rate on investment (Markowitz, 1952). This simply means that investors cannot go for a risky portfolio unless it is compensated by a higher expected return.

Again, the resource-based view (RBV) theory emphasizes how firms use their takes advantage of their intangible assets such as organizational processes, skills, capabilities, information, and knowledge. Grant (1991) noted that this theory views the firm as a bundle of resources that are combined together to create firm capabilities with the ultimate intention to achieve high profit margin. However, one major setback of this theory is that it only considers how intangible assets such as affects firm performance.

2.3. Extant Studies/Critiques

In this sub-section, all past studies on the subject matter were reviewed alongside the vacuum that was to be filled in this study. Recently, Mamidu and Akinola(2019)evidenced that efficient CMS (DMC, DLC, & OVC) have high statistical significant impact on the performance of the Nigerian manufacturing industry from 2014-2017. Hence, they advocated for the institutionalization of this strategy in the industry.

Similarly, Gitau (2019) reported that CMS strategy had significant influence on ROI of the Agribusiness enterprises in Kenya from 2009 to 2019. Hence, the researchers suggested that, all farmers must be educated on cost management.

Using the multivariate analysis, Oden (2018) reported that CMS (DMC, DLC, & OVC) strategy had significant influence on ROI in the Nigerian brewery. Hence, the researcher advocated for the need for firms in Nigeria to use this technique in their decision making process.

In another study, Novák, Dvorský, Popesko, and Strouhal (2017) reaffirmed that OVC had high effects on decision-making using the multivariate analysis.

Using the descriptive survey research design, Akeem(2017) evidenced that cost control and reduction are the most feasible way through which firms experience improved profit having used 50 research questionnaires.

Oluwagbemiga, Olugbenga, and Zaccheaus(2014) affirmed that all the CMP proxies were highly statistical significant in determining operating profits of 40 manufacturing companies in Nigeria from 2003-2012. Hence, they suggested that for Nigeria firms to maximize profit and also to amass more wealth, they must place more emphasis on administrative and production overhead cost.

Based on the above reviewed articles, the following hypotheses were formulated:

H0₁: DMC does not statistically improve the ROI of firms in the Nigerian industrial sector.

H0₂: DLC does not statistically improve the ROI of firms in the Nigerian industrial sector.

H0₃: OVC does not statistically improve the ROI of firms in the Nigerian industrial sector.

3. METHODOLOGY

Both the descriptive and inferential statistics were used to investigate the effect of marginal costing practices on performance of ten (10) selected firms in the Nigerian industrial goods sector from 2011 to 2020. This approach was deemed suitable for the study since it measures how a particular variable (say regressor-marginal costing practices) affects another variable (say regressed-firm performance). Data sourced were extracted from both the security and exchange commission (SEC) fact-book and annual reports of then ten (10) selected firms. The ten (10) selected industrial goods sector firms are: Unilever, nestle, may and baker, PZ Cusson Nigeria Plc, Cadbury Nigeria Plc, Gunnies Nigeria Plc, UAC Plc, Dangote Cement, and Lafarge. The study used the panel methodological approach to the inclusion of fixed effect, random effect and Ordinary least square.

Econometrically, the model used for the study is generally specified as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \mu_t$$

Where:

Y = Performance measured by ROI;

X1 = Direct Material Cost;

X2 = Direct Labour Cost;

X3 = Overhead Cost;

β_0 = Constant term

$\beta_1 - \beta_3$ = Coefficient

μ_t = Error term.

4. Results and Discussions

This section takes into account the regression results and the various discussions alongside their policy implications.

4.1 Correlation Matrix

In this paper, we used the multiple correlation analysis to measure the degree of linearity among the regressed (ROI) and the regressors (DMC, DLC, and OVC). More so, we also examined if the model is faced with issue of Multicollinearity or not. The result is presented below:

Table 1: Correlation Matrix for all Variables under Study

DMC	DLC	OVC	ROI	
1.0000	0.5158	0.0772	-0.0197	DMC
	1.0000	0.0336	0.0409	DLC
		1.0000	-0.1563	OVC
			1.0000	ROI

Source: GRETL Statistical Package Output, 2022

Table 1 above contains the correlation values between the regressed (ROI) and regressor (DMC, DLC, and OVC) as well as between the regressor themselves. The values were gotten from the GRETL package. From the table, it was observed that DMC and OVC negatively correlate with ROI. Evidently, DMC and OVC reported negative correlation coefficient values of -0.0197 and -0.1563. Meanwhile, DLC positively correlated with ROI. Evidently, DLC reported a positive correlation coefficient value of 0.0409. Again, the correlations between the regressors are low as none of them were up to 70%. This implies that the model is valid and can be relied upon for precision. Hence, there is no problem of singularity of data.

4.2. Robustness Check

To ensure the adequacy of the model specified, the Ordinary Least Square (OLS) estimate was done and panel diagnostic tests were carried out to determine the adequacy of the OLS or otherwise. The result is therefore presented below:

Table 2: Robustness Check of Regression Result

Panel Diagnostic Test	T-Statistics: F(3, 100)	P(F(3, 100))
Joint Significance test	3.4216	0.0107427

Source: GRETL Statistical Package Output, 2022

The Joint Significant Test is designed specifically to test the sensitivity of each variable on each other. The result was estimated at 0.0107427 with p-value of 3.4216 which signifies that the Pooled OLS should be rejected in favour of the FEM.

4.3. Regression Results

This section presents the regression result of the regressed (ROI) and the regressors(DMC, DLC, and OVC). It follows with the analysis of the association between regressed and regressors collectively. FEM was employed as the measurement of the multiple regressions for the study. The summary of the FEM regression results obtained from the model of the study is presented below:

$$ROI_{it} = \beta_0 + \beta_1 DMC_{it} + \beta_2 DLC_{it} + \beta_3 OVC_{it} + U_{it}$$

The FEM is possibly interpreted as:

- DMC has negative statistical significant effect on ROI
- DLC has positive statistical insignificant effect on ROI
- OVC has negative statistical significant effect on ROI

Fixed Effects Result on Marginal Cost Management Strategies and Firm Performance

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
Constant	-1.7526	0.1663	-10.5398	<0.0000	***
DMC	-0.8060	0.2689	2.9974	0.0033	***
DLC	0.2327	0.1355	1.7168	0.0884	*
OVC	-1.8993	0.9338	2.0340	0.0440	**
Mean dependent var.	-1.522267 S.D. dependent var.				1.076534
Sum squared resid.	119.5957 S.E. of regression				0.959149
R-squared	0.302734 Within R-squared				0.095252
F(18, 130)	3.135700 P-value(F)				0.000086
Log-likelihood	-195.0446 Akaike criterion				428.0891
Schwarz criterion	485.1641 Hannan-Quinn				451.2777
Rho	0.089849 Durbin-Watson				1.628200

Source: GRETL Statistical Package Output, 2022

Note:

*** 1% significant level

** 5% significant level

* 10% significant level.

Table 3: Summary of Hypothesis Testing

Regressors	Expected Sign	Reported Sign	Significant or not Significant	Remarks
Test of Hypothesis One				
Direct Material Cost (DMC)	Negative	Negative	Significant @ 1%	H ₀₁ was rejected
Test of Hypothesis Two				
Direct Labour Cost (DLC)	Positive	Positive	Significant @ 5%	H ₀₂ was rejected
Test of Hypothesis Three				
Overhead Cost (OVC)	Negative	Negative	Significant @ 10%	H ₀₃ was retained

Source: Author’s Compilation, 2022

4.4. Discussion of Results

The FEM result in table 2 above shows that all the targeted variables were significant at 1%, 5% and 10%. The F-statistics stood at 3.135700 with P-value of 0.000086 indicating that the regressors on the overall are highly statistically significant. The Durbin Watson stood at 1.628200 indicating that the model is not auto-correlated.

The result shows that the R² is approximately 0.302734. This signifies that 30.27% variation in ROI is attributed to change in DMC, DLC, and OVC while the remaining 69.75% is attributed to the error term. This indicates that the model is weak. This may be due to paucity of panel data.

The FEM result in table 2 above shows that if all the regressors on the overall are held constant, the regressed will still be negative and statistically significant. More so, DMC and OVC have negative coefficients. This connotes that if DMC and OVC is reduced by 1%, ROI will increase by 0.8060 and 1.8993. It may also mean that if DMC and OVC rise by 1%, ROI will decrease by 0.8060 and 1.8993 respectively. More so, both cost drivers affected ROI significantly since their estimated p-value (0.0033 and 0.0440) is below 5%. This indicates that both H₀₁ and H₀₂ are rejected while H_{A1} and H_{A2} are accepted. This suggests that if both DMC and OVC are reduced to the barest minimum, firms in the Nigerian industrial sector would experience high ROI. Further, both cost elements are significant drivers of ROI. This result agreed the findings of Mamidu and Akinola (2019); Oden

(2018) in terms of statistical significant but differs in terms of relationship. For example, Oden (2018) reported that DMC impacted on ROI in a positive direction as against the negative relationship which existed between both construct based on our findings. Lastly, DLC have positive coefficient. This connotes that if DLC reduces by 1%, ROI will decrease by 0.2327. It may also mean that if DLC rise by 1%, ROI will rise by 23.27% (0.2327). However, it failed to affect ROI significantly since its estimated p-value (0.0884) is greater than 5%. This indicates that H_{03} is sustained. This suggests that if DLC is increased or reduced, firms in the Nigerian industrial sector would not still experience high ROI. Further, DLC is not significant driver of ROI. This result agreed the findings of Mamidu and Akinola (2019); Oden (2018) in terms of relationship but differs in terms of statistical significant. For example, Oden (2018) reported that DMC impacted on ROI in a positive direction as against the negative relationship which existed between both construct based on our findings.

5. Conclusion and Recommendation

Based on the regression results, the paper conveniently concludes that MCE is critical to the attainment of the industrial sector's central objective of profit maximization. To this end, we recommended that for Nigeria firms to maximize profit and also to amass more wealth, they must place more emphasis on direct material cost; direct labour cost, administrative and production overhead cost. Furthermore, firms in the Nigerian industrial sector should adopt value analysis so as to reduce overhead and material cost. Lastly, cost reduction strategies must be upheld in the Nigerian industrial sector.

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