European Journal of Business and Management
ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online)
Vol.13, No.10, 2021

Empirical Assessment of Performance of Dangote Cement Plc: An End-Users' Perspective

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Abstract
End-users, who are the focus of this assessment of performance in respect of Dangote Cement Plc, have been regarded as the most important stakeholder of any business activity. Previous works have not showcased an assessment of performance based on an end-user's perspective which is why this study sets out to resolve the problem concerning how end-users react to market changes when patronizing the Nigeria cement manufacturing industry. Simple regression model was used to test the hypotheses – to show the relationships between the dependent variable - Cement Production Level (CPL) and the independent variables - Annual Average Price per bag of Cement (AAPC) and Turnover (TO). The study found that the explanatory variables portrayed significant positive relationships with CPL. In both cases, this relationships were very strong because the correlation coefficients (R) were above 97% and the adjusted coefficients of determination (adjusted R^2) which are the explanatory variables showed that there was more than 62% significance in their relationships with CPL. This means, that over 97% of Dangote Cement Plc's production (supply of cement) succeeded in keeping prices up 62% of the time. The paper found that end-users increasingly continue to patronize products of necessity even when they are produced by a firm quite monopolistic in nature because they have no near substitutes. As a result, there is a policy implication that even though end-users expect quality products, great value, or a compelling brand and would equally avoid products of companies that fail to deliver on customer service, they (end users) may have no succor other than a regulatory regime set by the Government especially where monopolistic goods of necessity (such as cement) are concerned. Accordingly, the study recommends that government (or its agency) should set up minimum production volume benchmarks, regulate margins and establish price ceilings to protect the end-user.
Key terms: Assessment of performance, Cement, End-user, Cement Production Level, Annual Average Price per bag of Cement, Turnover.
DOI: 10.7176/EJBM/13-10-15
Publication date: May 31st 2021

1.0 Introduction

As stakeholders in any business, which affects their interests, end-users encounter uncertainties and are usually able to judge how such uncertainties have affected them by assessing past business activities in order to be better prepared for future dealings. As a result, end-users can benefit from assessing business performance by clarifying such uncertainties and demand for better performance where there is a shortfall in expectation. Fontaine, Haarman and Schmid (2006) in their review explained that Johnson and Johnson (1947) identified customers, employees, managers and the general public as the stakeholders to a business while Sears Company in 1950 named the four (4) parties to any business in order of their importance as customers, employees, community and other stakeholders. Friedman (2006) also indentified stakeholders as mainly customers, employees, local communities,

suppliers and distributors, and shareholders. LSM (2017) explained that customers (by extension, end-users) want easy access to good quality products and services at competitive prices.

Other stakeholders such as government, shareholders, creditors, debtors, competitors, management and employee have different expectations. Each stakeholder group has needs and expectations (LSM, 2017) and thus experience different uncertainties. The government is concerned about price control especially where one player dominates the market or the commodities and services being rendered have no close substitutes. Government may also be concerned about taxes. Investors want a higher turnover and dividend per share. Creditors are concerned about liquidity issues, which can show the ability of a company to remain a going concern. Competitors want a just business environment so they are not edged out from the market. Debtors want fair prices even as they pay later. Management may want a higher turnover and profit after tax in order to earn higher commissions based on their performance or may even be interested in cutting down on taxes and employee usually look out for higher pay and better job security in the face of pay-cut risks and unexpected job losses.

Cement is a "hydraulic binder, which hardens when water is added….as a material with adhesive and cohesive properties which makes it capable of bonding mineral fragment into a compact whole" (Nigeria's Cement Manufacturing Report [NCMR], 2008). The history of cement in Nigeria dates back to 1957 when the regional government of the then Eastern Region of Nigeria commissioned a cement plant at Nkalagu - Enugu State to cater for local needs of cement. Then, the Northern Regional Government established the CCNN in 1962. Overtime, several cement companies were established and included Ashaka cement in Gombe, Benue Cement Company (BCC) in Benue, and the West African Portland Cement Company (WAPCO). Later they were joined by other companies some of which included Edo Cement Company limited, Calabar Cement Company and Lafarge Cement Company, which created a consortium of independent subsidiaries already in the business. The subsidiaries included CCNN (Sokoto Cement), United Cement Company (Unicem), Ashaka Cement, Calabar Cement and Atlas Cement. Lafarge eventually had a merger with WAPCO to become Lafarge-WAPCO in 2015. In the year 2010, the Dangote business group acquired Obajana Cement Plc which had been founded since 1992 and named it Dangote Cement Plc.

Dangote Cement Plc, which was listed on the Nigeria Stock Exchange (NSE) in October 2010, is believed to have accounted for 20% of the total market capitalization in the same year. Prior to 2010, Dangote Cement was in its formative years and it is believed that Dangote Cement invested over US$6.5billion into its business between 2007 and 2012 making it shoot rapidly into the lead in cement production in Nigeria. Dangote Cement is acclaimed to have accounted for 80% of the Dangote Group's business turnover in the year 2011 and as at December 2016, Dangote Cement had a production capacity of 29.25million metric tonnes and produced 14.97 million metric tonnes, which was a 51.19% cement production level. In the same year, it had a turnover of over N426b, a profit after tax of over N368b and EPS of N21.61 (Dangote Cement Financial Report, 2016).

The problem of this study revolves around one single research question; do end users react to market changes when patronizing cement manufacturing industries? The justification for this is because end-users have been considered as a group of vulnerable stakeholders (Financial Conduct Authority [FCA] UK, 2015); termed as the most important stakeholders (Fontaine, Haarman and Schmid, 2006); and left out in previous works that studied the performance of the cement industry in Nigeria in relation to various stakeholders. Therefore, the problem of this study is about understanding 'how end-users react to market changes when patronizing the Nigeria cement manufacturing industry'.

The scope of this paper, therefore, is limited to Dangote Cement Plc (as the study sample) and its financial report figures over a four-year period (2013 to 2016). The justifications for these are that; Dangote Cement Plc is Nigeria's largest cement producer (Edwin, 2014) with an over 60% share of the market (Ekeke, 2016), while the four year period covers the most recent years of Dangote Cement's operations in the industry for which records of the cement production volume and cement production capacity which are very vital for the study analysis are available. These figures are indeed vital for the study because without either or both, the cement production level (which is the study dependent variable) cannot be computed. The objective of this study is to discover how end-users react to market changes (particularly, supply and price) when patronizing (that is, demand) the cement industry and thus provide a framework for further studies in the area of end-users' assessment of a business's performance which should naturally focus on the end-users' desire for competitive pricing and quality products.

The variables for this study are cement production level (CPL) which is the dependent variable and the independent variables are the annual average price per bag of cement (AAPC) and turnover (TO). These variables are explained in more details under the methodology section.

In accordance with the study objective, the following hypotheses provided direction for data collection and analysis.

$H_{0\,1}$: Annual Average Price per Bag of Cement (AAPC) has no significant relationship with Cement Production Level (CPL)

$H_{0\,2}$: Turnover (TO) have no significant relationship with Cement Production Level (CPL)

2.0 Literature Review

This review begins with conceptual clarifications. It examines an empirical framework which ends with the identification of the research gap and concludes with a theoretical framework.

2.1 Conceptual Clarifications

In all relevant literature reviewed during the course of this study, it was noted that the term end-user was not commonly used in financial or business language. For this reason, the definitions from several online dictionaries and business websites were studied to arrive at an end-user concept that would explain the context within which the term is used. According to dictionary.com, an end-user is the ultimate user for whom a machine - such as a computer or product – such as a computer program is designed. This definition specifically describes end-user as a term for the computer technology industry. Similarly, the website yourdictionary.com explains the term end-user as "the ultimate user of a product or service, especially of a computer system, application, or network….the end-user is at the bottom of the hierarchy, yet is (or should be) the focus of all attention". The foregoing definition signifying that an end-user (individual or organisation) is he/that who/which makes the purchase decisions and ultimately pays the price for a product even though producers and vendors may be mindless of this fact. Relating both definitions above to the financial and business world, it is not difficult to see that an end-user is the ultimate consumer of a finished product or the person who will eventually use a product (merriam-webster.com) and as investopdia.com rightly puts it, in order to create a successful product or service, the people who create, develop, test and market it must think not of their own needs, but of the end-user's. For the purpose of this study, end-users are those customers or consumers, individuals or organisations that make the final use of a product or service and often times make assessment of the performance of the business they patronise.

A company's performance can influence its profitability and an assessment of such performance can be made in two main ways. Markgraf (undated) explains these to be "by comparing the results of initiatives with set targets or by comparing financial indicators of one business with another. Markgraf further explains that a company with substantial market share and ranks in the top two suppliers would have market influence on pricing and are more likely to be profitable. When assessing the performance of any business, the characteristics of the business, which relate to the kind of assessment being made, are to serve as key variables. According to Misankova (undated), "the first and also the simplest method is to evaluate the performance by one selected indicator" another is "to chose a set of indicators, which are based on financial analyses". However, a combination of both methods can be used. In the light of this study, therefore, an assessment of performance is the test of fulfillment of expectations and the consequences thereof. This study is assessing the end-users reaction to market changes in supply and price. Hence, what happens to demand?

2.2 Empirical Framework

Ayatse (2012) studied the impact of information communication technology (ICT) on corporate performance of cement manufacturing firms in Nigeria. He used questionnaires to gather data and analysed them using simple percentages for the descriptive statistics, which were presented in tabular form. With this model, he drew conclusion that ICT had positively contributed to corporate performance and recommended improved investments and control in ICT as a way forward. His study did not seem to consider corporate performance as the area of business intelligence that focus on the important parameters of finance, stakeholders and market share.

Awen (2004) conducted a study to assess the performance of cement companies quoted on the Nigerian stock exchange. The study was intended to verify a perceived trend that despite the indispensable role of the cement industry in the Nigerian economy, the industry was yet to attract much needed investment. The study selected four (4) quoted companies for a detailed performance analysis. The companies were Ashaka Cement, Benue Cement, Sokoto Cement and West African Portland Cement Company. To resolve the problem, the assessment was carried out through the application of the known financial risk indices (FRI) with a view to highlight the efficiency of the various aspects of the operation of the sample cement companies. Using Osaze's version of the Discriminant Analysis Model which it considered more suitable for developing countries like Nigeria, the study adopted the cement companies financial statements covering a ten-year period (1993 – 2002) as the main source of data and found that the performance of cement companies in Nigeria had not been attractive to investors and went on to

recommend that the industry players have to inject more capital into their businesses and introduce better management methods while government too should assist the cement companies to operate at full capacity instead of allowing imported products. Awen made no assessment of performance from the perspective of cement end-users. Indeed having considered all other stakeholders and leaving out the end-users who are the most important stakeholders, an obvious research gap is yet to be filled.

Longe (2014) conducted a study on the effect of changes in leadership styles on organizational performance in a cement-manufacturing firm in Ogun state, Nigeria. The study sample was selected using stratified random sampling technique while questionnaires and in-depth interview were used as means of data collection. The quantitative data were analyzed using descriptive and inferential statistics while the interviews (qualitative data) were analyzed using content analysis. The hypotheses were tested using chi-square and spearman's correlation co-efficient. The results of the empirical test revealed significant relationship between changes in leadership style and organizational performance – being inhibitive of performance when restrictive but allowing for better performance with post-change democratic leadership. Longe, did not relate organisation performance to the possible benefits or expectations derived by various stakeholders but focused mainly on workers in relation to their managers.

Agrawal (2013) during a paper presentation argued that since the backward integration policy of government in 2012 and the ban on importation of cement, massive investments had been witnessed in the cement industry. He highlighted his facts using tables, charts and graphs pointing out that Local production capacity had increased from 3mmt to 28mmt over a ten-year period ending 2012 and production volume had equally increased from 2mmt to 16mmt. The paper, technically pointed out that for so long, the Nigeria cement industry had not been producing optimally and that the per capita consumption of cement in Nigeria was very low as compared to other African countries. His conclusion that investments in the cement industry had improved indeed overshadowed the real fact that there could be a possibility of high prices or exploitation due to unbalanced cement production volume vis-à-vis cement production capacity.

Presented above are areas that have been studied concerning the performance of the cement industry in Nigeria. The outcomes mostly revealed that the Nigeria Cement Industry needs to drive improved performance by injecting or attracting significant investment but in the particular assessment of performance by Awen, it was made from the perspective of various stakeholders showing how these stakeholders would evaluate (assess the performance) of the industry but, by whatever design, a very important stakeholder (the end-user) was not discussed. In view of these observations, this study focuses on assessment of performance from an end-users perspective in the cement industry in Nigeria within the period 2013 to 2016 as a gap deserving of a generous research effort. Accordingly, Dangote Cement Plc was selected as the sample by means of purposive sampling technique justified by the need to study a dominant size of the market within the workable limits the study was carried out. The study adopted an empirical approach using Simple Regression Model to determine the relationship between the variables of the hypotheses. The secondary data used was Dangote Cement's financial data and the AAPC obtained from major distributors.

2.3 Theoretical Framework

The theory of demand and supply demonstrates "how buyers and sellers interact to determine transaction prices and quantities" (Easton and Arbogast, 2011). Rationally, it is expected that the relationship between the study variables (CPL, AAPC and TO) can explain why when supply (production capacity) is restrained or unutilized, supply (production level) has the ability to drive prices up. To what extent, however, shall be determined by way of statistically testing the variables. This idea is the basic explanation of the theory of demand and supply, which is that as supply, rises in relation to a fixed demand, prices drop and vice-versa. The demand and supply theory has two components when dealing with individual economic units (microeconomics). The components (or groups) are the firm and the consumer (that is, the end-user sometimes referred to as household). Accordingly, there are two theories, thus, the consumer theory (or theory of the consumer) and the theory of the firm. Easton and Arbogast (2011) explain that, theory of the consumer deals with consumption by utility maximization of present and future satisfaction while the theory of the firm deals with the supply of goods and services by profit maximization.

Dixon, Freeman and Toman (2010), explained that end-users buy or stop buying from a company when it 'delivers quality products, great value, or a compelling brand' or 'it fails to deliver on customer service'. They further explained that the best way to retain customers is not by trying to delight the customers but to actually rid the customer of his challenges such as which are: reducing the customers' efforts to obtain service; making deliberate efforts to improve customer service turnaround experience and time; and reducing service costs and decreasing customer churn (or rate of attrition) which, is the practical loss of customers and patronage when any of these challenges the end-user faces are not attended to.

The stakeholders theory helps understand the scope of the study better as it implies that; an organisation itself should be thought of as a group of stakeholders and the purpose of the organisation should be to manage the stakeholders interests (Friedman, 2006). A stakeholder can also be seen as any group or individual that affects or may be affected by an organisation's goals. This view was purported by Freeman (1984). The idea of a stakeholder is complex and its definitions have changed over time. In 2004, Freeman redefined stakeholders as "those groups who are vital to the survival and success of the corporation". Managers are at the centre of the stakeholder's theory. They manage a business as agents on behalf of their principal (agency theory) and ensure their principals (investors) make a good return on their investments by applying sound and ethical business decision-making skills. Conversely, managers are also expected to ensure consumers are satisfied within set regulatory and ethical standards.

3.0 Methodology

This part of the paper defines the variables, explains the model of the study, the research design and data resources used, the population and sample of the study. Other areas discussed are data analysis techniques, methodological issues and the statistical test used.

3.1 Definition of variables

CPL: Cement production volume as a percentage of cement production capacity is referred to as the cement production level (CPL). It is chosen as the response variable because of its ability to explain or determine the behaviour of the independent variables. As such, Cement Production Level is considered the best choice as a response variable for performance assessment in this study.

AAPC: Annual Average Price per bag of Cement (AAPC) which is taken as the market price of cement in this study was obtained from major distributors of cement. This was the easiest and most reliable means of sourcing AAPC because Staff at Dangote Cement Plc warehouse were not willing to give out such information they termed as 'classified'. It is considered a useful variable since consumers rationally seek to buy at lower prices time and again.

Turnover: This is the revenue from sale of cement which represents the net amount of goods delivered to customers (in this case, distributors). As an explanatory variable, it is expected to show a relationship with changes in the CPL thereby explaining Dangote Cement Plc's sales activities (and possibly, distributor activities) that would eventually affect the end-user.

3.2 Research design and Data resources

The paper adopts a time series deign (which is a variant of the panel longitudinal design) by making use of periodic financial report data obtained from secondary sources. This study depends on secondary source of data, which is inclusive of the review of available literature, statistical analyses of financial data obtained from the Annual Financial Reports of Dangote Cement Plc for the years under study and the AAPC obtained from major distributors.

3.3 Population and Sample of the study

The study population is the seven cement manufacturers in Nigeria. According to information obtainable on the website of the Cement Manufacturers Association of Nigeria, the major players in the cement industry are:

1. Lafarge-WAPCO Cement Plc;
2. Cement Company of Northern Nigeria;
3. Ashaka Cement Plc;
4. Dangote Cement Plc; and
5. United Cement Company

These are the five that meet the 250,000 tonnes production capacity requirement without which cement producers in Nigeria cannot be registered as members of CMAN. Other players in the industry are:

6. Calabar Cement Plc; and
7. Atlas Cement Plc

The Sample was obtained by way of a purposive technique and the justification was because Dangote Cement Plc's production volume as at December 31 2016 was well over 60% of the total Nigerian cement production

output (Ekeke, 2016) as against 2006 market share figures of 55% to WAPCO, 31% to Ashaka Cement and 14% to CCNN and BCC combined (www.proshareng.com).

3.4 Research Model, Methodological Issues and Data Analysis Techniques

The study adopts a basic linear model by expressing changes in the dependent variable (CPL) as a function of changes in the independent variables (AAPC and TO) as follows:

$$\Delta CPLit = f(\beta 1 \Delta AAPCit + \beta 2 \Delta TOit)$$

That is,

$$\Delta CPLit = \alpha + \beta 1 \Delta AAPCit + \beta 2 \Delta TOit + eit$$

Where:

Δ	= is the change that occasions as a result of the variables influencing each other
α	= the constant term
βs	= are the coefficient of the explanatory variable, that is; β1 for AAPC, β2 for TO
i	= is the firm, Dangote Cement Plc
t	= is the time (the year 2013, 2014, 2015 or 2016)
eit	= the composite error term
CPLit	= is Cement Production Volume as a fraction of Cement Production Capacity by a hundred, of the firm (Dangote Cement Plc), at a specific time (the year 2013, 2014, 2015 or 2016)
AAPCit	= is Average Annual Price per bag of , of the firm (Dangote Cement Plc), at a specific time (the year 2013, 2014, 2015 or 2016)
TOit	= Turnover (revenue from sale of cement in naira, of the firm (Dangote Cement Plc), at a specific time (the year 2013, 2014, 2015 or 2016)

The study used simple regression model (SRM) as a method of testing the hypotheses while considering a 5% level of significance and Micro Soft Excel Data Analysis Tool was used to run the statistical tests. SRM is a linear model often referred to as simple linear regression. It is a statistical method that allows the summarization and study of relationships between two continuous quantitative values. It is used for this study because given the few years being studied a multiple regression model was tested several times but it returned error values which definitely could not be interpreted and thus was not useful for understanding the data. Also the simple regression analysis is very suitable for the research design which is a time series. The Multiple Regression Model, however, is more suitable for a panel research design because such a design is appropriate for the collection and study of information on a group of similar entities or entity at different points in time, and when the waves of information collected overtime are studied longitudinally it is called a longitudinal panel research design. Panel data are multi-dimensional, involve measurements over time, and contain observations of multiple phenomena obtained over multiple time periods for the same entities or individuals. In the case of this study, however, the time series research design was adopted. The time series is a variant of the panel design and was used to study one panel member or individual of the cement manufacturing industry (in this case Dangote Cement Plc) in one dimension only. Very importantly too, percentages were used to express the growth rate of the profitability and the level of production figures from year to year and to show the nature of relationship between the turnover and profit after tax figures in order to show the percentage money a company actually earns per monetary unit of revenue. The study mainly presents its data using tables and compares the financial report figures to show the relationship between the independent (explanatory) variables and the dependent (response) variable. Thus, the research design is also descriptive.

4.0 Results and Discussions

This section comprises of the test of correlation, the data presentation and the data analysis. Like any other study, this is the section that portrays the researchers understanding of the work and his ability to draw out clear findings from the results.

4.1 Test of Correlation

This test is to determine how the dependent variable responds to each of the independent variables thus helps in discovering if any of the relationships are similar. First, while looking at the CPL column, it is clear that the level or degree of relationship between the variables vary significantly when being correlated with CPL. But a second look at the CPL column along with the TO column, it becomes clear that other previously intended independent variables for the study were not necessary because of their near perfect correlation with TO.

Table 1: Result of test of correlation

	CPL (%)	*AAPC (N)*	*TO (N'000)*	*PBT (N'000)*	*PAT (N'000)*	*ATPM (%)*	*EPS (N)*
CPL (%)	1						
AAPC (N)	-0.585494304	1					
TO (N'000)	-0.214906626	0.910107936	1				
PBT (N'000)	-0.16551597	0.835133718	0.967169614	1			
PAT (N'000)	-0.003633322	0.775179347	0.963575063	0.982968009	1		
ATPM (%)	0.054410241	0.735211874	0.946348673	0.973402488	0.998128732	1	
EPS (N)	-0.003354934	0.775094552	0.963568122	0.982895258	0.999999911	0.998138688	1

Notes to the correlation table:

1. CPL - Cement Production Level
2. AAPC - Annual Average price per bag of Cement
3. TO - Turnover
4. PBT - Profit before tax
5. PAT - Profit after tax
6. ATPM - After tax profit margin
7. EPS - Earnings per share

The statistical test of correlation result above showed that all independent variables had different levels of correlation with the dependent variable (CPL) except the Earnings Per Share and Profit After Tax which actually expressed very similar correlation with CPL. This suggests that significance in the relationships between the independent variables and the dependent variable differs and the reason for this may not be unconnected to the fact that end-users are more concerned about prices being fair and do not directly bother much about any of the other independent variables as the test of correlation shows.

4.2 Data presentation

Percentage Analyses (Percentage growth of TO vs. growth of PAT)

In 2016, the turnover per 50kg bag of cement produced by Dangote Cement Plc fell by 2.13% to N1,422.99 against 2015 turnover of N1,453.92. On the contrary, rather than witness a similar fall in the profit figures, the profit figures increased in 2016 by over 50% in comparison to 2015 figures. One logical reason for this is that the operating expenses in 2015 had been successfully cut down in 2016 as can be seen in table 2 below that the difference of the 2016 TO and PBT figures as compared to those of 2013 to 2015.

Table 2: Percentage growth (TO, PBT & PAT)

	TO (N)		**PBT (N)**		**PAT (N)**	
FY	**PER 50KG BAG**	**Growth (%)**	**PER 50KG BAG**	**Growth (%)**	**PER 50KG BAG**	**Growth (%)**
2016	1,422.99	(2.13)	1,250.24	51.74	1,229.56	54.41
2015	1,453.92	1.75	823.93	0.56	796.31	11.43
2014	1,428.87	0.71	819.32	7.28	714.61	(11.00)
2013	1,418.79		763.75		802.90	

Source: see Appendix II

Even though, operating expenses had been cut down, end-users did not enjoy the opportunity of buying cheaper cement in 2016. The prices went higher. This indeed was an exploitative situation.

PBT figures as a percentage of TO (Before Tax Profit Margin – BTPM)

It was noted that the greater the PBT as a percentage of TO, the lesser the net operating expenses (%). The Net Operating Expenses (NOE) referred to in this case is in recognition of the fact that there are other financial costs and financial incomes that need to be deducted or added to turnover respectively, before PBT figures are ascertained. In any case, the expectation that market price of cement ought to reduce as a result of enhanced operations by way of cost-cuts did not happen.

Table 3: Profit before tax vs. net operating expenses

FY	TO (N'000)	PBT (N'000)	PBT/TO (%)	NOE (%)	TO (100%)
2016	426,129,000	374,396,000	88	12	100
2015	389,215,000	220,567,000	57	43	100
2014	371,534,000	213,040,000	57	43	100
2013	371,552,000	200,011,000	54	46	100

Source: see Appendix I

Table 3 shows clearly how the turnover figures over the years continued to increase in favour of profits before tax. Profits before tax as a percentage of turnovers compared with net operating expenses as a percentage of turnovers suggest that the company has been more efficient in cutting down its costs of operations in order to boost its profits. This is even more clearly understood while looking at table 2 where the turnover per bag of cement has remained quite constant for the years studied.

4.3 Data analysis

Test of hypotheses using Simple Regression Method

The simple regression method used to test the hypotheses was based on the rule that a null hypothesis is rejected if the calculated p-value is less than or equal to 5% (0.05) and if the significance value is less than or equal to 5% (0.05) while the same null hypothesis will be accepted if the calculated p-value is greater than 5% (0.05) and if the significance value is greater than 5% (0.05). The table below shows the results of the regression statistics.

Table 4: Results of testing hypotheses using simple regression method (SRM)

Hypotheses	Variable	R	Adjusted R^2	calculated P-value	Sig.	Result
$H_{0\,1}$:	AAPC (N)	0.9795	0.62605	0.0035	0.0138	rejected
$H_{0\,2}$:	TO (N)	0.9805	0.62807	0.0034	0.0131	rejected

According to the decision rule stated above and based on the SRM, the null hypotheses $H_{0\,1}$ and $H_{0\,2}$ are hereby rejected and their alternates accepted given that the calculated P-values are all less than 5% and their various significance levels are also all less than 5%. Therefore, the meaning of the table above is as follows:

1. AAPC has a significant relationship with CPL. This relationship is very strong because the correlation coefficient (R) is 97.95% and the adjusted coefficient of determination (adjusted R^2) which is the AAPC explains 62.61% volatility in CPL. This means, that 97.95% of Dangote Cement Plc's production (supply of cement) succeeded in keeping prices up 62.61% of the time. Technically speaking, should Dangote Cement improve its production level by increasing its production volume while production capacity remains the same, prices of the cement product shall, expectedly, shrink and the correlation co-efficient (R) would decrease as a result.

2. Also, the independent variable – TO – reveals a similar relationship with CPL as is the case with AAPC.

4.4 Descriptive Results

The study finds that there is a significant relationship between the dependent variable (cement price level) and all the independent variables (the explanatory variables) because, though Dangote Cement Plc had the potential to cut-down its operating expenses in 2016 the reduction in its selling price did not reflect such huge cost-cuts, however, the company turnover suggests it received greater patronage in 2016 than in the previous years. This fact

is more glaring when, the 'TO' from 2013 to 2016 are divided by their respective 'TO per bag of cement' and the figures arrived at (the number of bags sold for each year) are studied alongside the CPL as follows:

	Year	Approx no. of bags sold	CPL
a.	2016	299,460,000	51.19%
b.	2015	267,700,000	45.76%
c.	2014	260,019,000	44.45%
d.	2013	261,879,000	68.02%

This result suggests that, end users continue to patronize products of necessity which have no near substitutes and even when they are produced by a firm quite monopolistic in nature and there is no satisfaction of their expectations.

4.4 Policy implication of the finding

Despite the fact that end-users are expected to: demand quality products, great value, or a compelling brand; and equally avoid products of companies that fail to deliver on customer service, they (end users) may have no succor in the wake of a monopolistic good of necessity other than a regulatory regime set by the Government.

5.0 Conclusion and Recommendations

5.1 Conclusion

The CMAN on its website stated its aim as "advancing the interests of all its stakeholders with particular reference to consumers of the cement product". These consumers (end-users) are desirous of easy access to good quality products and services at competitive prices, they do not have definite control of the matter and are, in this case, still at the mercy of cement producers. They will remain as patrons of companies that deliver quality products, great value, or a compelling brand and would equally avoid products of companies that fail to deliver on customer service. However, where the product (cement) is a necessity and it is being produced by a firm quite monopolistic in nature then, even when there is no satisfaction, patronage will continue to increase. This can be seen from the difference between the annual average price per bag of cement (AAPC) and the turnover (TO) per bag of cement. The difference is high and the logical reason why this is can be attributed to the distribution and wholesale system seeking to optimize profits at the expense of the end-users. This means that distributors and wholesalers are able to sell at whatever prices they decide and end users' have no alternative but to pay such high prices. In addition, the statistics show that Dangote cement continued to make huge profits even as it was able to shrink its net operating expenses. Probably, government may need to step in to curb this sort of exploitation. Quite obviously too, the demand for cement continues to rise and this may not be unconnected with the fact well known that Nigeria is a developing economy experiencing rapid population growth alongside infrastructural development where the use of cement is essentially unavoidable.

5.2 Recommendations

Based on the finding, the following recommendations are hereby made:

a. Since Dangote Cement plc can be said to have monopolistic tendencies as seen from the figures that continually showed profit optimization even when operating expenses were reduced, government (or its agency) can set up benchmarks (minimum production volumes) for the company. The benchmark must be a percentage of cement production capacity, which for all intentions, is to reduce the company's ability to monopolize the cement market. The supply (production volume) of cement given the available production capacity of the company if increased can prevent scarcity of the product, which in turn keeps prices low.

b. Government may need to consider a margin regulation, which could be used to ensure Dangote Cement sells his products to distributors and wholesalers at a percentage margin on the total sum of its production and operating expenses. This, though technical and would require a continuous real-time logging of business (financial) activities and balancing of accounts in order to establish selling prices at any given time, would serve as an ultimate panacea to cement price hike in Nigeria.

c. A price ceiling should be placed on cement product at the retail end of the market. This can further entrench the prevention of exploitation. By enforcing the retailing of cement at a markup on the cost at which wholesalers make the goods available in their shops, price can be stabilized and uniform for longer periods of time thus, putting an end to sudden increase in prices.

d. There is need for further studies on the subject to focus on the entire cement industry to test if the findings are particular or general, and there is a need to develop and use questionnaires to gather information not readily available as secondary data (for example, cement production volume and cement production capacity figures prior to 2013) – such information would provide the opportunity to conduct more robust statistical tests for a greater span of years. Also, other industries producing or rendering near monopolistic services (such as power generation and telecommunications) need to be studied for possible policy implications and recommendations.

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APPENDIX I

FINANCIAL, PRODUCTION AND EPS FIGURES OF DANGOTE CEMENT PLC FOR THE PERIOD UNDER STUDY

	INDEPENDENT VARIABLES						DEPENDENT VARIABLES		
FY	**AAPC (N)**	**TO (N'000)**	**PBT (N'000)**	**PAT (N'000)**	**ATPM (%)**	**EPS (N)**	**CPC (MMT)**	**CPV (MMT)**	**CPL (%)**
2016	3,000	426,129,000	374,396,000	368,205,000	86.41	21.61	29.25	14.97	51.19
2015	2,900	389,215,000	220,567,000	213,171,000	54.77	12.51	29.25	13.39	45.76
2014	2,800	371,534,000	213,040,000	185,814,000	50.01	10.90	29.25	13.00	44.45
2013	2,700	371,552,000	200,011,000	210,263,000	56.59	12.34	19.25	13.09	68.02
2012	2,600	285,635,000	138,089,000	146,016,000	51.12	8.57			#DIV/0!
2011	2,500	241,406,000	113,780,000	110,488,000	45.77	9.57			#DIV/0!
TOTAL	16,500	2,085,471,000	1,259,883,000	1,233,957,000	344.67	75.50	107.00	54.45	#DIV/0!
AVERAGE	2,750	347,578,500	209,980,500	205,659,500	57	13	18	9	#DIV/0!

NOTES:

FY	FINANCIAL YEAR
AAPC*	ANNUAL AVERAGE PRICE PER BAG OF CEMENT - IN NAIRA
TO	TURNOVER (REVENUE FROM SALE OF CEMENT) - IN NAIRA
PBT	PROFIT BEFORE TAX - IN NAIRA
PAT	PROFIT AFTER TAX - IN NAIRA
ATPM	AFTER TAX PROFIT MARGIN - IN PERCENTAGES
CPC	CEMENT PRODUCTION CAPACITY - IN MILLIONS OF METRIC TONNES
CPV	CEMENT PRODUCTION VOLUME - IN MILLIONS OF METRIC TONNES
CPL	CEMENT PRODUCTION LEVEL - IN PERCENTAGES
EPS	EARNINGS PER SHARE, BASIC AND DILUTED

FY	**TO PER 50KG BAG**	**PBT PER 50KG BAG**	**PAT PER 50KG BAG**
2016	1,422.99	1,250.24	1,229.56
2015	1,453.92	823.93	796.31
2014	1,428.87	819.32	714.61
2013	1,418.79	763.75	802.90
2012	#DIV/0!	#DIV/0!	#DIV/0!
2011	#DIV/0!	#DIV/0!	#DIV/0!

Sources: Dangote Cement Plc, Consolidated and Separate Financial Statements 31 December, 2007 to 2016. *Major distributors.

APPENDIX II

ANALYSES OF DANGOTE CEMENT PLC PROFITABILITY FIGURES							
FY		**TO/tp (N'000)**	**% G**	**PBT/tp (N'000)**	**% G**	**PAT/tp (N'000)**	**% G**
2016		28.46	(2.13)	25.00	51.74	24.59	54.41
2015		29.08	1.75	16.48	0.56	15.93	11.43
2014		28.58	0.71	16.39	7.28	14.29	(11.00)
2013		28.38		15.28		16.06	
		TO (N)		**PBT (N)**		**PAT (N)**	
FY		**PER 50KG BAG**	**% G**	**PER 50KG BAG**	**% G**	**PER 50KG BAG**	**% G**
2016		1,422.99	(2.13)	1,250.24	51.74	1,229.56	54.41
2015		1,453.92	1.75	823.93	0.56	796.31	11.43
2014		1,428.87	0.71	819.32	7.28	714.61	(11.00)
2013		1,418.79		763.75		802.90	
KEY:							
FY		FINANCIAL YEAR (ENDING 31 DECEMBER)					
TO		TURNOVER (REVENUE FROM SALE OF CEMENT)					
PBT		PROFIT BEFORE TAX					
PAT		PROFIT AFTER TAX					
G %		GROWTH RATE					
TO/tp		TURNOVER (REVENUE FROM SALE OF CEMENT) PER TONNE PRODUCED					
PBT/tp		PROFIT BEFORE TAX PER TONNE PRODUCED					
PAT/tp		PROFIT AFTER TAX PER TONNE PRODUCED					

Source: Dangote Cement Plc. Consolidated and Separate Financial Statements 31 December, 2007 to 2016

APPENDIX III

ANALYSES OF DANGOTE CEMENT PLC PRODUCTION FIGURES

FY		CPC (tonnes)	% G	CPV (tonnes)	% G	CPV/CPC (%)
2016		29,250,000	-	14,973,000	11.86	51
2015		29,250,000	-	13,385,000	2.95	46
2014		29,250,000	51.95	13,001,000	(0.71)	44
2013		19,250,000		13,094,000		68
***						

KEY:

FY		FINANCIAL YEAR (ENDING 31 DECEMBER)
CPC		CEMENT PRODUCTION CAPACITY
CPV		CEMENT PRODUCTION VOLUME
CPV/CPC (%)		CPV AS A PERCENTAGE OF CPC
***		CPC and CPV data for periods prior to 2013 were not published

Source: Dangote Cement Plc. Consolidated and Separate Financial Statements 31 December, 2007 to 2016

APPENDIX IV

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.979481341
R Square	0.959383698
Adjusted R Square	0.626050364
Standard Error	12.37806355
Observations	4

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	10857.21961	10857.21961	70.8619675	0.013820079
Residual	3	459.6493715	153.2164572		
Total	4	11316.86898			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
AAPC (N)	0.018266298	0.002169921	8.417955067	0.003517354	0.011360641	0.025171955	0.011360641	0.025171955

RESIDUAL OUTPUT

Observation	*Predicted CPL (%)*	*Residuals*	*Standard Residuals*
1	54.79889379	-3.609150202	-0.336683332
2	52.972264	-7.211580238	-0.672739767
3	51.14563421	-6.697770958	-0.624808533
4	49.31900441	18.70177481	1.744614524

PROBABILITY OUTPUT

Percentile	*CPL (%)*
12.5	44.44786325
37.5	45.76068376
62.5	51.18974359
87.5	68.02077922

APPENDIX V

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.980516853
R Square	0.9614133
Adjusted R Square	0.628079966
Standard Error	12.06483363
Observations	4

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	10880.18835	10880.18835	74.74699515	0.013115839
Residual	3	436.6806315	145.5602105		
Total	4	11316.86898			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
TO (N'000)	1.33645E-07	1.5458E-08	8.645634456	0.003254987	8.44502E-08	1.82839E-07	8.44502E-08	1.82839E-07

RESIDUAL OUTPUT

Observation	*Predicted CPL (%)*	*Residuals*	*Standard Residuals*
1	56.94986077	-5.760117177	-0.551289028
2	52.01650218	-6.255818421	-0.59873158
3	49.65353114	-5.20566789	-0.498223821
4	49.65593674	18.36484248	1.757661494

PROBABILITY OUTPUT

Percentile	*CPL (%)*
12.5	44.44786325
37.5	45.76068376
62.5	51.18974359
87.5	68.02077922