



RESEARCH ARTICLE

CAPITAL STRUCTURE AND PROFITABILITY OF CONSUMER GOODS MANUFACTURING COMPANIES IN NIGERIA

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Abstract

The manufacturing sector in Nigeria is characterized by liquidity challenges due to the rising cost of energy, multiple taxations, high-interest rates, poor accessibility to loans and foreign exchange instability which affect profitability. However, the right mix of capital structure is said to correlate with profitability. This study, therefore, determined the effect of capital structure on the profitability of selected manufacturing companies in Nigeria. Employing ex-post facto design, secondary data from 10 manufacturing firms were captured. The Hausman test determined the suitability of random effects panel regression to estimate the effect of capital structure variables on ROE and ROA. The four hypotheses of the study were tested at the 5% level of significance. Results of the study showed that capital structure has a significant effect on return on equity (ROE) with an Adjusted R-squared value of 0.876871 and F- statistics of 236.0122, on return on asset (ROA) with an Adjusted R-squared value of 0.080555 and F-statistics of 3.891215. The study concluded that although the capital structure is vital to the profitability of firms it is not adequately planned in manufacturing firms in Nigeria and has hampered the profitability. The study recommended that manufacturing firms must make good decisions relating to their capital structure if earnings must improve.

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Introduction:-

Profitability is considered a crucial objective to conduct a business without which manufacturing firms will not be in business. With good profit figures, manufacturing companies can enhance the confidence of their stakeholders, maximize shareholders wealth as well as being able to stay competitive in the business environment.

Chandy (2012) defined profitability as a measure of the operating efficiency and financial performance of an organisation. He emphasized that users of financial statements like management, shareholders, suppliers and customers are interested in the profit position of firms; shareholders require profitability information because it is an indicator of the growth prospects and survival of the company in which they have invested. Moreover, for owners of the company a good profitability ratio forms the nucleus through which shareholders are rewarded.

Historically, the growth in manufacturing output has been a key element in the successful transformation of most economies that have seen sustained rises in their per capita incomes and gross domestic product (GDP). However, in Nigeria, the performance of manufacturing companies in this area has been poor over the last decades. Nigeria has

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only about 5 percent of its GDP coming from the manufacturing sector which is low compared to 20 percent levels for South Africa and Mauritius. Over time, the performance of manufacturing companies is evidenced by poor profitability, very low turnover growth and poor assets tangibility which have led to a dwindling contribution of the manufacturing sector to the Nigerian economy. Furthermore, lack of access to long term funding and wrong capital structure decisions have limited the sector's growth potentials and the sector's impact on the Nigerian economy (Nwaolisa & Chijindu, 2016).

The concept of capital structure is generally described as the combination of debt and equity that make up the total capital of firms. The proportion of debt to equity is a strategic choice of a corporate manager. The main thrust of the capital structure issue revolves around the optimal capital structure mix. Capital structure in finance and accounting literature defines the relationship between the firm's structure, its economic performance and value. It can be described as the mix of debt and equity of a firm that maximises the shareholders' wealth. Rahman, Sarker and Uddin (2019) stated that the capital structure choice of firms is the most significant decision taken by the management of the firm to maximize profits and at the same time to minimize costs of capital which leads to the maximization of shareholder's wealth. From the foregoing, it is obvious that there are two main types of financing available to any form of business which is debt and equity financing. Debt financing is the type of financing received in form of a loan that is repayable over time to a zero-sum balance without any further obligation to the lender. Equity financing on the other hand consists of contributions from outside investors in form of money in anticipation to receive money or stocks or some other form of equity in exchange, with no monthly payment requirements to investors (Mahmud & Bukar, 2016).

The capital structure represents a firm's financial framework which consists of the amount of debt and equity employed by firms to fund its operation and finance its asset. In financial terms, capital structure refers to the method used by firms to finance their assets through the mixture of equity, debt, or hybrid securities (Saad, 2015). In a nutshell, capital structure is a mixture of a company's debts (long-term and short term), common equity and preferred equity. The capital structure represents the proportion of funds attributed to the firm through different sources, which may comprise internal and external financiers. The goal of capital structure is to minimise the cost of capital and maximise the firm's value. This suggests that an optimal capital structure decision is essential for a firm's survival. Consequently, poor decisions on the composition of debt and equity and the wrong mix of debt and equity can result in a high cost of capital which increases financial risk thus lowering the profitability and in the long run can lead to corporate failure (Akintoye, 2008).

Research in this area in Nigeria has focused attention majorly on the impacts of capital structure on the financial performance of deposit money banks but the impact on the profitability of firms in the manufacturing sector is scanty in the literature. Why is this so? To fill this important void in the literature, this research work aims at examining the impact of capital structure on the profitability of manufacturing companies in Nigeria.

Despite the efforts pulled together by the regulatory authorities to revitalize the manufacturing companies, the Nigerian manufacturing sector continues to witness unsteady growth in its financial position coupled with distress and failure occasioned by low profit. Furthermore, the manufacturing sector is characterized by liquidity challenges due to the rising cost of energy, multiple taxations, high-interest rates, poor accessibility to loans and foreign exchange instability. The implication is that the probability of making a profit in the manufacturing sector is on the decline as a major portion of the profit is taken by the high cost of energy and loan interest. The banking industry in recent times has witnessed a higher degree of non-performing loans from the manufacturing sector; this can be traced to dwindling revenue, illiquidity and low profitability in the subsector. Quite a good number of manufacturing companies in Nigeria have ceased to operate, and more prominent companies have acquired many or at best, merged with more prominent manufacturing companies. Many studies have established the relationship between capital structure and profitability.

However, the majority of the researches were sector-based like the studies by Ojo (2012) concentrated on insurance companies in Nigeria, Bassey, Aniekan, Ikpe and Udo (2013) focused on agro-based companies in Nigeria, Ong and Teh (2011) concentrated on construction companies in Malaysia, Berger and Wharton (2002) focused on the U. S. banking industry and Abdul (2010) focusing on the engineering sector in Pakistan. Nonetheless, most of the researches were carried out in emerging economies with little research focusing on manufacturing companies in the Nigerian context. Thus, this study seeks to examine the effect of capital structure on the profitability of selected manufacturing companies in Nigeria.

Objectives of the Study:-

To examine the effect of capital structure on return on equity (ROE) of selected manufacturing firms in Nigeria.
To determine the effect of capital structure on return on asset (ROA) of selected manufacturing firms in Nigeria.

Research Questions

What is the effect of capital structure on return on equity (ROE) of selected manufacturing companies in Nigeria?
To what extent does capital structure affect the return on asset (ROA) of selected manufacturing firms in Nigeria?

Hypotheses

H₀₁: Capital structure does not have any significant effect on the return on equity (ROE) of selected manufacturing firms in Nigeria

H₀₂: There is no significant effect of capital structure on the return on asset (ROA) of selected manufacturing firms in Nigeria.

Review of Related Literature:-**Profitability**

The concept of profitability is based on the comparison of the cash outflows required for implementing a strategic alternative with the cash inflows that this alternative is expected to generate. Profitability measured as determined by Pandey (2006) included profitability about sales and profitability concerning investment. Profitability can be defined as a firm's capability to make a profit from all its business lines. This is important for maximizing shareholders wealth, paying corporation tax like any other company, paying interest to depositors, salaries to the staff, dividends to shareholders and meeting other expenses necessary to keep the firm in business. Therefore, unless firms in the manufacturing sector make a profit, they cannot perform their role effectively.

According to Aburime (2008), profit means the difference between the revenue generated from the sale of output and the full opportunity cost of the factor used in the production of that output. Profitability is the potential of a venture to be financially successful, the ability of an investment to make a profit or the state or condition of yielding a financial profit or gain.

Also, optimizing profit involves two variables revenue and cost. The issue of profitability is a continuous issue that a company has to consistently make because it is essentially concerned with the level of turnover that must be achieved to cover costs and make a surplus. According to Casu, Girardone and Molyneux (2006), the strength of the financial position of an organization is measured through profitability. Financial analysis is the process of identifying the financial strengths and weaknesses of the firm by properly establishing the relationship between the items of the balance sheet and the profit and loss account. In financial analysis, ratios are used as a benchmark for evaluating the financial position and performance of a firm. The ratio is defined as the indicated quotient of two mathematical expressions and as the relationship between two or more things, ratios help to summarize large quantities of financial data and to make a qualitative judgment about the firm's financial performance.

Similarly, Brealey and Myers (2003) posit that profitability can be measured through ratio analysis, breakeven analysis, marginal analysis, cost control or through financial control. It is therefore necessary to mention at this juncture that whether an organization is planning for profit or taking steps to improve its profitability, it must ensure that it has an optimal mix of debt and equity to achieve steady growth in its earning capability. Therefore, if the organization plans to improve or increase profitability by increasing the income level, the organization must be able to determine the mix of debt and equity that will maximize shareholders' wealth.

Return on equity:

Return on equity which is often referred to as a firm's equity multiplier indicates the return to shareholders on their equity and it is equal to return on assets multiplied by the total assets-to-equity ratio. Soyemi, Akinpelu, and Ogunleye (2013) defined ROE as profit before taxation (PBT) divided by Shareholders' Fund. Return on equity displays how effective the management of a firm is using investors' funds. It approximates the net benefit that the stockholders have received from investing their capital in the firm. Return on equity (ROE) indicates the earning power of firms since funds are placed at risk with the hope of earning a suitable profit.

The return on equity (ROE) is computed as the net profit after tax divided by total equities. It measures the income

earned on each unit of shareholders' capital. This measure has a shortfall of generating higher ratio for firms with high financial leverage which is normally associated with higher risk; this is true because with any level of profit after tax, as firms become highly leveraged or equity falls, the ROE is bound to increase due to the lower denominator (equity).

Return on Assets:

Net income gives an idea of how well a firm is doing, but it suffers from one major drawback: It does not adjust for the firm's size, thereby making it difficult to compare how well one company is doing relative to another. A basic measure of profitability that corrects for the size of the firm is the return on assets (ROA). It is calculated by dividing net income by the value of its assets. That is profit before tax / total assets. ROA is a useful measure of how well a manager is doing on the job because it indicates how well a firm's assets are being used to generate profits. Brealey and Myers (2003) affirmed that managers often measure the profitability of a firm by the ratio of net income to total assets, otherwise referred to as Return on Asset (Brealey & Myers, 2003). Although ROA provides useful information about profitability, it is not the most important to equity holders.

Capital structure:

capital structure of a firm is the mix of debt, equity and other sources of finance that management of a firm uses to finance its activities. Different firms use different proportions or mix. A firm may adopt to use all equity or all debt. All equity is preferred by investors as they are not given conditions on the type of investment and usage of funds from providers. All debt is preferred by investors in a country where debt interest is tax-deductible. Firms use a mix of debt and equity in various proportions to maximize the overall market value of the firm (Rahman, Sarker & Uddin, 2019).

Capital structure is a mix of debt and equity capital maintained by a firm. Capital structure is also referred to as the financial structure of a firm. The capital structure of a firm is very important since it is related to the ability of the firm to meet the needs of its stakeholders. Modigliani and Miller (1958) were the first ones to landmark the topic of capital structure and they argued that capital structure was irrelevant in determining the firm's value and its future performance.

Theoretical Review**The Trade-Off Theory**

The trade-off theory originated from the debate that followed the Miller and Modigliani theory when the tax component was introduced in 1963. The trade-off theory which is an advancement of irrelevance theory claims that a firm's optimal financing mix is determined by balancing the losses and gains of debt (Babalola, 2014). While Modigliani and Miller showed that the benefit of debt is primarily the tax-shield effect that arises due to the deductibility of interest payments; basically, he combined this model with the bankruptcy cost framework. Financial distress forms an integral part of these bankruptcy costs. The assumption from the static trade-off theory herein is that firms with a greater risk of experiencing financial distress tend to borrow less than firms having lower financial distress risk. Further, financial distress costs are not the same for each firm, since these costs depend primarily on a firm's assets.

The theory assumes that a firm has an optimum capital structure based on the trade-off between costs and benefits of using debt. This theory does not explain the conservative nature of firms when using debt finance, while leverage is consistent in most countries yet they have divergent taxation systems. A firm's optimal debt ratio is determined by a trade-off between the bankruptcy cost and tax advantage of borrowing and it is achieved at the point when the marginal present value of the tax on additional debt is equal to the increase in the present value of financial distress costs (Owolabi & Inyang, 2013).

In support of this theory, Sharma (2014) emphasized that the trade-off theory created a benefit for debt in that it served to shield earning from taxes which implies that there is an advantage for corporations to be financed with debt because of the balance between the tax benefits gained by corporations and costs of bankruptcy due to the risk of taking more debts. The tax benefit occurs because of the interest deducted from before interest and tax earnings (EBIT), which brings about a tax advantage because taxable income becomes less and hence less corporate tax payment for the company.

Critics of this theory such as Black and Scholes (2004), Mahendra (2013) and Dumont and Svensson (2014) challenged the trade-off theory on the ground that it assumes market efficiency and asymmetric information which is unrealistic.

To the study, the theory postulated that gearing ratios are adjusted when there is a need for external funds which results from the imbalance between internal cash flow net of dividends and real investment opportunities. Hence, this theory is relevant to this study as it shows the link between debt capital, equity capital and profitability.

Agency Cost Theory

The agency theory was initially developed by Berle and Means (1932), who argued that due to a continuous dilution of equity ownership of large corporations, ownership and control become more separated. This situation allows professional managers to pursue their interests instead of that of shareholders. This is a theory concerning the relationship between the principal (shareholders) and the agent of the principal (company's managers), this suggests that the firm can be viewed as a nexus of contracts (loosely defined) between resource holders. An agency relationship arises whenever one or more individuals, called principals, hire one or more other individuals, called agents, to perform some service and then delegate decision-making authority to the agents.

Pratomo and Ismail (2006) suggested an optimal debt level in capital structure by minimizing the agency costs arising from the divergent interest of managers with shareholders and debt holders. They suggest that either ownership of the managers in the firm should be increased to align the interest of managers with that of the owners or the use of debt should be motivated to control managers' tendency for excessive extra consumption. They suggested that the free cash flow problem can be controlled by increasing the stake of managers in the business or by increasing debt in the capital structure, thereby reducing the amount of free cash available to managers. Therefore, firms that are mostly financed by debt gives managers less decision power and thus debt can be used as a control mechanism, in which lenders and shareholders become the principal parties in the corporate governance structure.

Perrow (2006) criticized that positivist agency researchers have only concentrated on the agent side of the 'principal and agent problem', and opined that the problem may also happen from the principal side. He observed that this theory is unconcerned about the principals, who deceive, shirk and exploit the agents.

The agency theory is relevant to this study as it emphasizes that an optimal debt level in capital structure can be achieved by minimizing the agency costs arising from the divergent interest of managers with shareholders and debt holders.

Theoretical Framework

This study reviewed two relevant theories in the literature. These theories include Trade-off theory and Agency theory. Considering the capital structure and profitability of manufacturing companies in Nigeria, this study focused on trade-off theory and agency theory. These theories support the existence of an optimal capital structure with the consideration for bankruptcy cost which affects the overall valuation of the firm and as such enhances the firm's profitability.

Empirical Review

Several authors have examined capital structure and profitability in both developed and developing economies using different methodologies. However, few studies are known in Nigeria. Thus, this section examines a few of these studies in line with the set objectives of the study with emphasis on capital structure and profitability of manufacturing companies in Nigeria.

Capital Structure and Return on Equity

Kusuma, Mursalim and Mallisa (2017) did research on capital structure determinants and firms' performance: empirical evidence from Thailand, Indonesia and Malaysia. The study investigated the capital structure determinants of the firms in Indonesia, Malaysia and Thailand. The variables were profitability, firm size, growth opportunity, volatility, gross domestic product (GDP), inflation rate and corporate governance. The work used path analysis of two-multiple regression to examine 94 Indonesian firms, 153 Malaysian companies, and 74 Thailand firms for the period 2008 to 2012. The study showed that profitability, firm size and volatility have dominant and consistent roles in explaining the variations in the capital structure. However, growth opportunity, gross domestic product, inflation

rate and corporate governance in general influence the variation of the capital structure. Furthermore, the capital structure of firms was significantly related to the firms' performance. However, the coefficient signs of the variables results were a mixed-the relationship between the capital structure and firm's performance were positive for Thailand (0.231) and Malaysian firms (0.187) but it (-0.116) was negative for Indonesian firms. The study supported both the trade-off theory and the pecking order theory of capital structure.

Nassar (2016) carried a study titled, the impact of capital structure on the financial performance of the firms: Evidence from Borsa, Istanbul. The research concluded that there is a negative significant relationship between capital structure (Debt Ratio) and firms' performance. The study was carried out on 136 industrial companies in Turkey listed on the Istanbul Stock Exchange for a period of eight years from 2005-2012. A multivariate Regression Analysis was applied to test the relationship between capital structure and firms' performance.

Hasanudin, Achsani and Sasongko (2016) investigated the behaviour of the capital structure and its impact on financial performance on Indonesian listed mining companies for the period of five years (2011-2015) using unbalanced Panel Data. The study concluded that there is a negative relationship between capital structure and financial performance based on the pecking order theory because higher debt will impact lower profitability. Furthermore, a positive relationship exists between capital structure and financial performance based on the trade-off theory which shows that firms with higher debts will generate higher profitability levels to avoid default risk. The above findings, therefore, show that there is no specific capital structure theory for explaining the relationship between capital structure and financial performance.

Berkman, Iskenderoglu, Karadeniz and Ayyildiz (2016) carried out a study to determine the factors that affect the capital structure of corporations operating in the energy sector in Europe. A panel data analysis of 79 European energy companies from 2009 to 2012 comprising 13 countries was carried out. The study employed descriptive statistics, the pooled regression analysis and panel data fixed effect methodology for the empirical analysis. According to the results of the study, diminishing leverage rate caused by increased liquidity in European energy companies can be explained with the pecking order theory, while escalating leverage rate caused by increased tangible fixed assets or equity turnover would be defined by the trade-off theory. Further findings established that the asset structure positively affects the leverage ratio and this is under the trade-off theory which states that the companies leverage increased as the share of fixed assets in total assets increased. The current ratio hurts the leverage ratio; as liquidity increases, leverage decreases.

Capital Structure and Return on Asset

Rahman, Sarker and Uddin (2019) explored the impact of capital structure on the profitability of publicly traded manufacturing firms in Bangladesh. The paper was analysed using the fixed effect regression to find out the correlation among independent variables (debt ratio, equity ratio and debt to equity ratio) and dependent variables (return on asset, return on equity and earnings per share). A sample of 50 observations of selected 10 manufacturing companies listed in the Dhaka Stock Exchange was analysed for 2013 to 2017. The research revealed that the debt ratio and equity ratio have a significant positive impact but the debt to equity ratio has a significant negative impact on ROA. The paper also reflected that the equity ratio has a significant positive impact but the debt to equity ratio has a significant negative impact on ROE. The researchers concluded that firms raise debt finance to reduce the cost of capital and enjoy tax advantage but debt level over the optimum capital structure has a significant negative impact on ROA, ROE, and EPS.

Revathy and Santhi (2018) investigated the impact of capital structure on profitability of the manufacturing companies in India and attempt to establish the hypothesized relationship as to how far the capital structure variables affect the business revenue of companies and the interrelationship between capital structure variable and profitability. This study was carried out after categorizing the selected manufacturing companies into three categories based on stages and periods. In terms of phases, manufacturing companies were grouped into a pioneering stage, growth stage, and consolidation stage. Second, in terms of the period, these companies were classified into pre and post-merger. A sample of seventy companies was chosen by multi-stage sampling techniques. The study showed that capital structure variables have a significant impact on the profitability of manufacturing companies in India. The study further revealed that there has been a strong one-to-one relationship between capital structure variables and profitability and an increase in debt-equity ratio inversely affects the profit of the manufacturing companies listed in the Bombay Stock Exchange in India.

A similar study carried out by Ahmad (2017) examined capital structure effect on the performance of Malaysian Consumer and Industrial sectors. The study used return on asset (ROA) and return on equity (ROE) as proxies for performance; and short-term debt (STD), long-term debt (LTD) and total debt (TD) as proxies for capital structure. Four variables found by literature to influence firms' operating performance, namely, size, asset growth, sales growth and efficiency were used as control variables. 58 firms were identified as the sample firms and financial data from the year 2005 through 2015 were used as observations for this study, resulting in a total number of observations of 358. A series of regression analyses were executed for the models. Lag values for the proxies were also used to replace the non-lag values to ensure that any extended effect of capital structure on firms' performance was also examined. The result revealed that short term debt and total debt have a significant relationship with ROA. However, the analysis with lagged values shows that none of the lagged values for short term debt, total debt and long term debt has a significant relationship with performance.

Ashraf and Shahzadi (2017) investigated the impact of capital structure on a firm's profitability and explore the optimal capital structure of the cement industry of Pakistan. The data were collected from 18 companies listed on Karachi Stock Exchange (KSE) for 10 years from 2006 to 2015. The firm's profitability was measured by ROA and ROE, while the capital structure was proxied by debt to equity ratio, interest coverage ratio, debt ratio, short term debt ratio, and long term debt ratio. The data were analyzed using descriptive, correlation and panel least square methods. The result of the findings established that debt ratio and long term debt ratio have a significantly negative relationship with return on asset (ROA) and return on equity (ROE), while short term debt has a significantly positive link with ROA and ROE.

Nauman and Fateh (2016) carried out a study on the impact of capital structure on the profitability of automobile firms in Pakistan. The research evaluated the impact and nature of the relationship of capital structure with the profitability of automobile companies listed in the Karachi stock exchange from 2006 to 2016. 19 companies were selected as samples. The study made use of the regression analysis and correlation test to predict the result. The findings revealed that capital structure (Debt/Equity) harmed profitability, which implies that an increase in debt capital caused a decrease in the profitability of the firms and vice versa.

Besies, Anup and Suman (2016) worked on the impact of capital structure on the value of firms in the context of the Bangladesh economy by gathering secondary data of publicly listed companies traded in Dhaka Stock Exchange (DSE) and Chittagong Stock Exchange (CSE) using share price as a proxy for firm's value and different ratios for capital structure decision. It was found that maximizing wealth for the shareholders required a perfect combination of debt and equity and the cost of capital was negatively correlated with the value of firms. The study concluded that the cost of capital should be reduced to the minimum level to improve the value of firms in Bangladesh.

Awuah-Agyeman (2015) assessed the impact of capital structure on profitability of manufacturing industry in Ghana using some selected firms as the case study for a period of eight (8) years; 2005-2012. Fifteen (15) firms were selected from different sub-sectors of the manufacturing industry. Thirteen (13) of them were firms listed on the Ghana Stock Exchange (GSE) whilst the other two were from the private sector. Data for the study were obtained from the audited financial statements of the selected firms from the GSE and the individual firms. Return on equity (ROE) or profit after interest and tax was used to represent profitability, while the capital structure was represented by the natural logarithms of short term debt (STD), long term debt (LTD) and equity (EQ). Panel data regression method using both the fixed effects and the random effects was used for the data analysis. Descriptive statistics and correlation analysis were also employed in the study. The result shows that short term debt and long term debt were negatively related to profitability but the effect of the long term debt was insignificant while equity was positively related to profitability. The study recommended that manufacturing firms in Ghana should use equity such as retained earnings to expand their business instead of debt. Where debt has to be taken, the study recommended that it has to be a long term debt.

Methodology:-

This study adopted an ex-post facto research design. Ex post facto design attempts to identify a natural impetus for specific outcomes without actually manipulating the independent variable. The adoption of this research design is based on the fact that the study used historic data obtained from the relevant publications and as such the data already are in existence. Secondary data was extracted from the financial statements of the selected manufacturing companies.

Population of the Study

The population of the study includes all the twenty-one (21) consumer goods manufacturing companies in Nigeria listed on the Nigerian stock exchange as of 31st December 2019.

Sample Size and Sampling Technique

As a result of similar characteristics of consumer goods manufacturing firms, the purposive sampling technique was utilised to select quoted firms that have been in existence before the financial crisis of 2008. Purposive sampling techniques were adopted to select ten consumer goods manufacturing companies from the population. The purposive sampling technique was considered suitable for this study since it takes into consideration particular characteristics of a population that are of interest, which will best enable the researcher to answer the research questions. The ten (10) consumer goods manufacturing companies will be selected based on the market capitalization as of December 2019. The ten (10) consumer goods manufacturing companies with large market capitalization are Cadbury Nigeria Plc, Dangote Flour Mills Plc, Dangote Sugar Refineries Plc, Flour Mills Nigeria Plc, Guinness Nigeria Plc, Honeywell Flour Mills Plc, International Breweries Plc, Nestle Nigeria Plc, Nigerian Breweries Plc and PZ Cussons Nigeria Plc.

Model Specification

The model in this study followed the work of Rahman, Sarker and Uddin (2019) where they examined the effect of capital structure on the profitability of publicly traded manufacturing firms in Bangladesh. Specifically, the profitability variables were defined as return on equity, return on capital employed and earnings per share while the capital structure is captured by equity to total asset, short term debt to total asset and long term debt to a total asset. Taking cognizance of their models, the model for this study was coined and modified to the objectives of the study, the functional form of the model is as follows:

$$ROE_{it} = f(ETA_{it}, STD_{it}, LTD_{it}, DER_{it}) \quad (1)$$

$$ROA_{it} = f(ETA_{it}, STD_{it}, LTD_{it}, DER_{it}) \quad (2)$$

The regression models are specified below

$$ROE_{it} = \beta_0 + \beta_1 ETA_{it} + \beta_2 STD_{it} + \beta_3 LTD_{it} + \beta_4 DER_{it} + \mu_{it} \quad (3)$$

$$ROA_{it} = \beta_0 + \beta_1 ETA_{it} + \beta_2 STD_{it} + \beta_3 LTD_{it} + \beta_4 DER_{it} + \mu_{it} \quad (4)$$

Where:

β = Parameter estimates

e = Error term

i = Cross sectional data

t = time series data

Result and Discussion:-

Descriptive Analysis

Table 1 presents the descriptive result for the variables used in this study. The variables are Return on equity (ROE), Return on asset (ROA), Earnings to total asset (ETA), Short term debt to total asset (STD), and Debt to equity ratio (DER).

Table 1:- Descriptive statistics of the variables.

	Mean	Max.	Min.	Std. Dev.	Skewness	Kurtosis	J-Bera	Prob.
ROE	18.90281	100.2754	-372.344	45.11657	-6.41237	58.01793	13297.70	0.0000
ROA	8.477611	26.51654	-7.61083	7.264491	0.539456	2.848112	4.946342	0.0843
ETA	0.406395	0.665583	0.020440	0.140138	-0.19778	2.676179	1.088889	0.5801
STD	0.417953	0.738204	0.225956	0.111451	0.893578	3.351861	13.82388	0.0009
DER	2.305200	47.92299	0.502443	4.844765	8.540006	80.32104	26126.13	0.0000

Source: Researcher's Computation using E-views 9.0 Software

Return on Equity (ROE)

Return on Equity posits a mean value of 18.902 with a maximum value of a 100.275 and minimum value of -372.344. This indicates that the values of the mean lie within the maximum and minimum values. The standard deviation value of 45.116 depicts that there exist high variation around the data sets.

Return on Assets (ROA)

Return on Assets posits a mean value of 8.4776 with the maximum value of a 26.5165 and minimum value of -7.6108. This indicates that the values of the mean lies within the maximum and minimum values. The standard deviation value of 7.2644 depicts that there exists no high variation around the data sets.

Correlation Analysis

To check for multicollinearity, this study utilizes the correlation test. Multicollinearity occurs when two independent variables are highly correlated, which would violate one of the assumptions of the classical linear regression methodology. The decision rule states that if the correlation coefficient of two independent variables is higher than 0.7, then there is multicollinearity, and vice versa.

The correlation table of the independent variables are shown below:

Table 2:- Correlation matrix of the variables.

	ROE	ROA	ETA	STD	DER
ROE	1.0000				
ROA	0.6252	1.0000			
ETA	0.1271	0.1010	1.0000		
STD	0.0200	0.0516	0.6151	1.0000	
DER	0.8194	0.2616	0.5106	0.2608	1.0000

Source: Researcher's Computation using E-views 9.0 Software.

The independent variables were earnings to total asset (ETA), short term debt to total asset (STD), and debt to equity ratio (DER). The correlation coefficient between the ETA and STD, ETA and DER, STD and DER were 0.615, -0.510, and 0.261 respectively. Since the correlation coefficients between the independent variables are less than 0.75, the study concluded that occurrence of multicollinearity problem in the analysis is minimal.

Unit Root Test

One of the assumptions of linear regression is that the variables must not contain unit root, that is, the variables employed in a model should be stationary. Employing a non-stationary variable in a model would yield spurious regression and invalid estimates.

For a panel study of this nature, the Levin, Lin & Chu panel unit root test is applied. The results are shown in the table below:

Table 3:- Result of Levin, Lin & Chu t* Panel Unit Root Tests.

Levin, Lin & Chu t*					
Variables	Level		1 st Difference		Order of Integration
	Test Stat	P-value	Test Stat	P-value	
ROE	-1.64871	0.0496	-	-	I(0)
ROA	-2.00511	0.0225	-	-	I(0)
ETA	-3.73965	0.0001	-	-	I(0)
STD	-1.63960	0.0505	-4.56261	0.0000	I(1)
DER	-0.85865	0.1953	-6.42536	0.0000	I(1)

Source: Researcher's Computation using Eviews 9.0 Software

Decision Rule:

If the p-value of the Levin, Lin & Chu t* statistic is less than 0.05, reject the null hypothesis of unit root, and conclude that the variable is stationary.

From the table above, the distributions of ROE and ROA were all stationary at level as the p-values of their respective Levin, Lin & Chu t* statistic were less than 0.05. From the result therefore, it is safe to conclude that the multiple regression analysis of the research models would not yield spurious results.

Test of Hypothesis One

Analysing the model one below, the study tests the following hypothesis:

$$ROE_{it} = \beta_0 + \beta_1 ETA_{it} + \beta_2 STD_{it} + \beta_3 DER_{it} + \mu_{it}$$

Capital structure does not have any significant effect on return on equity (ROE) of selected manufacturing firms in Nigeria H_{01} :

The result of the estimated model one is shown in the table below:

Table 4:- Random Effects Result for Model One.

Dependent Variable: ROE				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	108.0649	17.07616	6.328408	0.0000
ETA	0.134425	21.66868	6.203661	0.0000
STD	0.307630	20.09789	1.530660	0.1291
DER	0.094025	0.367560	25.58106	0.0000
R-squared	0.880602			
Adjusted R-squared	0.876871			
S.E. of regression	13.95994			
F-statistic	236.0122			
Prob(F-statistic)	0.000000			
Hausman Test	1.21555			
Chi. Sq. (Prob)	0.7493			

Source: Researcher's Computation using Eviews 9.0 Software

The estimated fixed effects regression result is given as:

$$ROE = 108.0649 + 0.1344*ETA + 0.3076*STD + 0.0940*DER$$

The Hausman test for random effects check if the random effect model is significant otherwise fixed effect model. The results is presented in lower portion of Table 5, the insignificant value of the test results [chi= 1.215554 P-value 0.7493] indicate that Random effect model is significant and appropriate for the studies.

Model Interpretation

In Table 4, Adjusted $R^2 = 0.8768$ indicates the explanatory strength of the model. This means that the independent variables (ETA, STD, DER) explained about 87.68% variation in return on equity. These are reliable evidences that the model is strong. The F-statistics = 236.012 and P - value = 0.000 indicated a statistically significant model at 5% level. This indicates that the earnings to total asset (ETA), short term debt to total asset (STD), and debt to equity ratio (DER) on Return on equity are jointly statistically significant.

From the result in Table 4, earnings to total asset (ETA) showed a positive and significant effect on return on equity (coefficient = 0.13442; p-value = 0.000). This suggested that a unit increase in ETA brings about an increase of 0.134% on return on equity of consumer goods manufacturing companies in Nigeria.

From the result in Table 4, short term debt to total asset (STD) showed a positive but insignificant effect on return on equity (coefficient = 0.30763; p-value = 0.129). This suggested that a unit increase in STD brings about an increase of 0.3076% on return on equity of consumer goods manufacturing companies in Nigeria. Though not significant to influence return on equity of consumer goods manufacturing companies in Nigeria.

From the result in Table 4, debt to equity ratio (DER) showed a positive and significant effect on return on equity (coefficient = 0.0940; p-value = 0.000). This suggested that a unit increase in DER brings about an increase of 0.094% on return on equity of consumer goods manufacturing companies in Nigeria.

Decision:-

Going by the result of the regression analysis, most importantly the F- Statistic value of 236.012 (P – value = 0.001); Adjusted $R^2 = 0.8768$, there is sufficient evidences against the null hypotheses which says that Capital structure does not have any significant effect on return on equity (ROE) of selected manufacturing firms in Nigeria. Hence, the

study conclude that Capital structure has significant effect on return on equity (ROE) of selected manufacturing firms in Nigeria.

Test of Hypothesis Two

Analysing the model below, the study tests the following hypothesis:

$$ROA = \beta_0 + \beta_1 ETA_{it} + \beta_2 STD_{it} + \beta_3 DER_{it} + \mu_{it}$$

H₀₂: There is no significant effect of capital structure on Return on asset (ROA) of selected manufacturing firms in Nigeria

Table 5:- Random Effects Result for Model Two

Dependent Variable: ROA				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.638543	6.097181	1.580820	0.1172
ETA	0.249882	7.815795	0.319715	0.7499
STD	0.340621	7.280228	-0.467871	0.6409
DER	0.032656	0.133597	-2.444434	0.0163
R-squared	0.108417			
Adjusted R-squared	0.080555			
S.E. of regression	5.065714			
F-statistic	3.891215			
Prob(F-statistic)	0.011336			
Hausman Test	0.66568			
Chi.Sq. (Prob)	0.8812			

Source: Researcher's Computation using E-views 9.0 Software

The estimated fixed effects regression result is given as:

$$ROA = 9.6385 + 0.2498*ETA + 0.3406*STD + 0.0326*DER$$

The Hausman test for random effects check if the random effect model is significant otherwise fixed effect model. The results is presented in lower portion of Table 6, the insignificant value of the test results [chi= 0.66568 P-value 0.8812] indicate that Random effect model is significant and appropriate for the studies.

Model Interpretation

In Table 5, Adjusted R² = 0.08055 indicates the explanatory strength of the model. This means that the independent variables (ETA, STD, DER) explained about 8.055% variation in return on assets. These are reliable evidences that the model is weak. The F-statistics = 3.8912 and P - value =0.0113 indicated a statistically significant model at 5% level. This indicates that the earnings to total asset (ETA), short term debt to total asset (STD), and debt to equity ratio (DER) on Return on assets are jointly statistically significant.

From the result in Table 5, earnings to total asset (ETA) showed a positive but insignificant effect on return on Assets (coefficient = 0.2498; p-value = 0.7499). This suggested that a unit increase in ETA brings about an increase of 0.2498% on return on assets of consumer goods manufacturing companies in Nigeria.

From the result in Table 5, short term debt to total asset (STD) showed a positive but insignificant effect on return on assets (coefficient = 0.34062; p-value = 0.6409). This suggested that a unit increase in STD brings about an increase of 0.3406% on return on asset of consumer goods manufacturing companies in Nigeria.

From the result in Table 5, debt to equity ratio (DER) showed a positive and significant effect on return on assets (coefficient = 0.03265; p-value = 0.0163). This suggested that a unit increase in DER brings about an increase of 0.0327% on return on assets of consumer goods manufacturing companies in Nigeria.

Decision:-

Going by the result of the regression analysis, most importantly the F- Statistic value of 3.8912 (P – value = 0.0113); Adjusted R² = 0.0805, the null hypothesis is rejected and leads to the conclusion that capital structure has a significant effect on return on asset (ROA) of the selected manufacturing firms in Nigeria.

Discussion of the Findings:-

In estimating model one, the study tested effect of capital structure on return on equity (ROE) of the selected manufacturing firms and found that capital structure positively and significantly affects return on equity, with the coefficient of two out of the three capital structure variables (ETA and DER) both exhibiting individual significant and positive effects on the return on equity of the selected manufacturing firms. This finding implies that, although positive, the short-term debt to total assets of these manufacturing firms has not significantly improved profitability in the firms within the period under review, the firms' earnings to total asset (ETA) and debt to equity ratio (DER) significantly caused profitability to improve. The findings led to the rejection of the null hypothesis and the conclusion that capital structure has a significant effect on the return on equity (ROE) of the selected manufacturing firms in Nigeria.

This finding is consistent with the work of Hasanudin, Achsani and Sasongko (2016) who investigated the behaviour of capital structure and its impact on financial performance on Indonesian listed mining companies for the period of five years (2011-2015) using unbalanced Panel Data and found that a positive relationship exists between capital structure and financial performance. Similarly, the findings corroborate the work of Skopljak (2012) who studied the effects of capital structure on performance in the financial sector in Australia using data of Australian 15 deposit taking Institutions (ADIs) over the period 2005 – 2007 and found a robust relationship between capital structure and firm's performance. However, the findings do not corroborate the work of Nguyen (2014) who examined the validity of five (5) chosen determinants of capital structure using both primary and secondary data from seventeen (17) firms between 2008 to 2012 and employing the fixed effect and random effect panel regression model and found a negative relationship between firm's profitability, and capital structure. Furthermore, the result of same study found that the correlation of growth rate and interest coverage ratio with capital structure is insignificant. Similarly, the finding of positive non-significant effect of STD on ROE is not consistent with the work of Khalifa (2014) who empirically analysed the effect of capital structure on financial performance of thirty energy American firms for a period of nine years from 2005 – 2013 using Smart PLS (Partial Least Square) and found that short term debt significantly has a positive influence on ROE.

In estimating model two, the study tested effect of capital structure on the return on asset (ROA) of the selected manufacturing firms using the random effects panel regression model and found that the earnings to total asset (ETA) and the short-term debt to total asset (STD) both exhibited positive but non-significant effects on return on asset (ROA) while debt to equity ratio (DER) exhibited a significantly positive effect on ROA. This result implies that the capital structure of the manufacturing firms has yielded the desired effect on the profitability of the manufacturing firms. Overall, the result shows that capital structure has a significant effect on the return on assets of the firms and led to the rejection of the null hypothesis for model two and the conclusion that capital structure has a significant effect on the return on assets of the selected manufacturing firms. This finding is consistent with the work of Rahman, Sarker and Uddin (2019) who explored the impact of capital structure on the profitability of publicly traded manufacturing firms in Bangladesh using 10 manufacturing companies listed in Dhaka Stock Exchange from 2013 to 2017 and employing the fixed effect regression and found that debt to equity ratio has a significant negative impact on ROA. Similarly, the findings corroborate the work of Yegon (2014) who examined the impact of capital structure on profitability of selected banks in Kenya from 2004-2012 and found that the link between short-term debt and profitability was positive.

However, the findings do not correlate with the work of Awuah-Agyeman (2015) who assessed the impact of capital structure on profitability of manufacturing industry of selected firms in Ghana from 2005-2012 using both the fixed effects and the random effects and found that short term debt has a significant but negative relationship with profitability. Similarly, the findings are not consistent with the work of Ahmad (2017) who examined capital structure effect on performance of Malaysian consumer and industrial sectors using regression analysis and found that short term debt has a significant relationship with ROA. Additionally, the findings are negated by the work of Al-Taani (2013) who investigated the relationship between capital structure and firm performance across different industries using a sample of Jordanian manufacturing firms in Jordan from 2005-2009 using multiple regression analysis and found that the short-term debt to total assets was significant on return on assets.

Conclusion:-

This study empirically determined the effect of capital structure on the profitability of selected manufacturing companies in Nigeria. This was achieved by examining the effect of capital structure on each of return on equity

(ROE) and return on asset (ROA). The study found that capital structure has a significant effects on each of return on equity (ROE) and return on asset (ROA).

This study concluded that the capital structure is vital to the profitability of firms but with the case of the manufacturing firms, capital structure is not adequately planned and has hampered the profitability of these manufacturing firms in Nigeria.

Recommendations:-

Based on the research findings, the research recommends the following;

1. The capital structure of consumer goods manufacturing firms should be planned effectively in such a way its optimum combinations of debt and equity is achieved to improve profitability. That is, to improve earnings, manufacturing firms must make good decisions relating to their capital structure.
2. Short-term debt to total assets (STD) exhibited insignificant effects on all the profitability ratios. As such, manufacturing firms should depend less on short-term debt but rather invest adequately in long-term debts, especially since it gives the manufacturing firms more time to be able to pay back.
3. Debt to equity ratio (DER) had a significant effect on ROE and ROA. This implies that the financial leverage of the manufacturing firms is good and manufacturing firms should look to shareholder equity to finance debts.

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