

Impact of Combined Leverage on Capital Employed Of Selected Listed Manufacturing Firms in Nigeria

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Abstract: *The issue of how a company is financed has been of concern to finance managers for a long-time. The objective of this study is to investigate impact of combined leverage on capital employed of selected listed manufacturing firms in Nigeria from 2008 to 2014.*

Ex-post facto research design was used for this study. The secondary data were obtained from the Factbook published by the Nigerian Stock Exchange (NSE) and financial statements of selected companies. Results from the study revealed that degree of combined leverage exhibited significant and positive relationship with total capital employed. The study concluded that application of leverage enhanced corporate performance of Nigeria manufacturing firms.

Keywords: *Capital employed, degree of combined leverage, degree of financial leverage and degree of operating leverage.*

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I. Introduction

Leverage is not merely the extent of debt within the capital structure of a firm. Leverage consists of both financial leverage and operating leverage otherwise known as combined leverage (Mohohlo and Halif, 2018).

Pandey (2010) defined financial leverage as the use of the fixed-charges sources of funds, such as debt and preference capital along with the owners' equity in the capital structure of a firm. Financial leverage employed by a firm is intended to earn more return on the fixed-charge funds than their costs.

Financial leverage is a financial technique that uses borrowed funds or preferred stock (items not involving fixed financial costs) to improve the return on an equity investment. As long as a higher rate of return can be earned on assets than is paid for the capital used to acquire the assets, the rate of return to owners can be increased. Financial leverage is concerned with the relationship between the firm's earnings before interest and taxes (EBIT) and the earnings available to common stockholders or the owners. Financial leverage is often referred to as "trading on the equity".

Olowe (2017) defined operating leverage as the extent of the use of fixed cost in the operation of the firm. A firm with a high degree of operating leverage also has a higher break-even point since it must make sufficient contribution to cover fixed cost before there can be any profit. Olowe went further to state that operating leverage has implication for the financial manager by stating that a highly operating leverage firm will have its profits increasing at a high rate with a small increase in sales. On the other hand, for a highly operating levered firm, a small drop in sales may wipe out profits and losses reported. Mohohlo and Halif (2018) stated that operating leverage has not received much attention within the context of capital structure theory.

Operating and financial leverage can be combined to show the total leverage effect for a given change in sales on earnings available to ordinary shareholders (that is earnings per share). Combined leverage combines the effect of business and financial risk (Olowe, 2017).

Operating and financial leverage together cause wide fluctuation in earnings per share (EPS) for a given change sales and operating costs. (Saleem, Rahman and Sultana, 2004). The operating leverage affects EBITs and financial leverage affects EPS, ROE and ROI. The management has to manage a right combination of operating and financial leverage. A company whose sales fluctuate widely and erratically should avoid use of high leverage because it will be exposed to a very high degree of risk (Saleem, Rahman & Sultana, 2004).

Return on capital employed measures the operating profit of the tangible investment (capital) that company management uses to generate that profit.

Return on capital employed (ROCE) is understood to centre on the relationship between income produced by an activity and the monetary investment in that activity (Cram, 1995). Return on capital employed is extensively used as a performance measure in the profit-seeking sector and successfully measures how well

management is able to employ a firm's assets to generate returns (Das, 2017). ROCE uses operating income in the numerator and capital employed in the denominator. It represents financial resources necessary for the company to continue functioning and engage in its primary task of revenue generation and it is an indication of management's ability to effectively allocate capital. A firm's competitive advantage stems from its basic business function and ROCE determines how well a company invests in its core operation. A high ROCE is an indication of both well-managed and profitable enterprise. It is from the discussion above that this study investigates impact of combined leverage on total capital employed of selected listed manufacturing firms in Nigeria from 2008 to 2014.

II. Literature Review

This section presents a brief review of literatures relating to the study

2.1 Conceptual Framework

2.1.1 Degree of Operating Leverage (DOL)

Degree of operating leverage (DOL) is defined as the percentage change in the earnings before interest and taxes relative to a given percentage change in sales.

$$\text{DOL} = \frac{\% \text{ change in EBIT}}{\% \text{ change in sales}}$$

$$\text{DOL} = \frac{\Delta \text{EBIT}/\text{EBIT}}{\Delta \text{sales}/\text{sales}} \quad \text{Equation 1}$$

The following equation is also used for calculating DOL:

$$\text{DOL} = \frac{Q(S-V)}{Q(S-V)-F} \quad \text{Equation 2}$$

Where Q is the units of output, S is the unit selling price, V is the unit variable cost and F is the total fixed costs. Equation above can also be written as follows:

$$\text{DOL} = \frac{\text{Contribution}}{\text{EBIT}} \quad \text{Equation 3}$$

Since contribution = EBIT + fixed cost

Equation 3 can be expressed as follows:

$$\text{DOL} = \frac{\text{EBIT} + \text{Fixed cost}}{\text{EBIT}} = 1 + \frac{F}{\text{EBIT}} \quad \text{Equation 4}$$

2.1.2 Degree of Financial Leverage

The degree of financial leverage (DFL) is defined as the percentage change in earnings per share (EPS) due to an given parentage change in EBIT:

$$\text{DFL} = \frac{\% \text{ change in EPS}}{\% \text{ change in EBIT}}$$

$$\text{DFL} = \frac{\Delta \text{EPS}/\text{EPS}}{\Delta \text{EBIT}/\text{EBIT}} \quad \text{Equation 5}$$

$$\text{DFL} = \frac{\text{EBIT}}{\text{EBIT}-\text{INT}} = \frac{\text{EBIT}}{\text{PBT}} = 1 + \frac{\text{INT}}{\text{PBT}} \quad \text{Equation 6}$$

EBIT = Q (P-V)-F (and EBIT-INT=PBT)

Thus equation (6) above also be written as follows:

$$\text{DFL} = \frac{Q(S-V)-F}{Q(S-V)-F-\text{INT}} \quad \text{Equation 7}$$

The numerator of equation (6) or (7) is earnings before interest and taxes and the denominator is profit before taxes.

2.1.3 Combined Leverage

Operating and financial leverages together cause wide fluctuation in EPS for a given change in sale.

Degree of Combined Leverage (DCL) is given by the following equation

$$\begin{aligned} \text{DCL} &= \frac{\% \text{ change in EBIT}}{\% \text{ change in sales}} \times \frac{\% \text{ change in EPS}}{\% \text{ change in EBIT}} \\ &= \frac{\% \text{ change in EPS}}{\% \text{ change in sales}} \end{aligned} \quad \text{Equation 8}$$

Another way of expressing the degree of combined leverage is as follows:

$$\begin{aligned} \text{DCL} &= \frac{Q(S-V)}{Q(S-V)-F} \times \frac{Q(S-V)-F}{Q(S-V)-F-\text{INT}} \\ &= \frac{Q(S-V)}{Q(S-V)-F-\text{INT}} \end{aligned} \quad \text{Equation 9}$$

Since $Q(S-V)$ is contribution and $Q(S-V)-F-\text{INT}$ is the profit after interest but before taxes, equation (9) can also be written as follows:

$$\begin{aligned} \text{DCL} &= \frac{\text{Contribution}}{\text{Profit before taxes}} \\ &= \frac{\text{EBIT}-\text{Fixed costs}}{\text{PBT}} \\ &= \frac{\text{PBT}+\text{INT}+\text{F}}{\text{PBT}} = 1 + \frac{\text{INT}+\text{F}}{\text{PBT}} \end{aligned} \quad \text{Equation 10}$$

2.2 Empirical Review

Mseddi and Abid (2004), employed the panel data methodology to compute the degree of operating leverage and the degree of financial leverage for firms in USA for a period of five years and explored the association between the risky nature of the firms and the relative value. The study identified a positive effect on company value of both operating and financial leverage meaning that with the surge in the various degrees of leverage of the firms in USA, the value of the company also increases which is obvious because of the benefit debt as a capital. The researchers also proved that the excess return is a positive and increasing function of operating leverage, degree of financial leverage and systematic risk for sample firms that show a positive correlation of sales changes with market portfolio returns.

Zubairi (2010), investigated how profitability of firms in the automobile sector of Pakistan, is influenced by working capital management and capital structure of firms. The paper used current ratio as representative of the result of working capital management policy and financial leverage as the benchmark for capital structure. Supplementary analysis was also undertaken to assess the impact of operating leverage and firm size on profitability but their study did not factor in the effect of some macroeconomic variable: even though the used pooled data analysis; to indicate whether profitability of automobile firms is related to selected indicators in accordance with the generally accepted finance theory there is insufficient evidence using the panel data methodology from the perspective of financial institutions.

Abbadi and Abu-Rub (2012) examined the effect of capital structure on the performance of Palestinian financial institutions. Using the multiple linear regression models, they utilized the data of 8 banks listed on the Palestine Securities Exchange. They found that a positive relationship exists between leverage and market efficiency.

In another study carried out by Khan (2012) on 36 engineering sector firms in Pakistan, researcher was able to establish that financial leverage has an insignificant negative relationship with firm performance. He noted that firms in the engineering sector of Pakistan are mainly dependent on short-term debt.

In another research, Ogebe, Ogebe and Alewi (2013) investigated the impact of capital structure on firm performance in Nigeria for a period of 10 years. They used the fixed effect regression estimation model to confirm that a negative relationship exists between performance and leverage of the firms. They also affirmed that the traditional capital structure theory is valid.

Olokoyo (2013) examined the impact of leverage on firm's performance in Nigeria using fixed-effect estimation, random-effect estimation and a pooled regression model. The author found that all the leverage

measures have a positive and highly significant relationship with the market performance measure (Tobin's Q). The study further revealed an important fact Nigerian firms are either majorly financed by equity capital or a mix of equity capital or short-term financing. The study recommended that Nigerian firms should endeavour to match their high market performance with real activities that is potent enough to make the market performance reflect on their internal growth and accounting performance.

III. Methodology

Research design adopted in this study is *ex-post facto*. This is because the event has already taken place.

Secondary data obtained from Factbook published by Nigerian Stock Exchange and various companies audited accounts will be used for this study. The period of the study will be from 2008 to 2014. Out of the seventy (70) manufacturing companies listed on the Nigerian Stock Exchange in 2014, twenty (20) of them will be used for the study.

Method of data analysis adopted for this study is Ordinary Least Square (OLS). This method is adopted to determine impact of combined leverage on total capital employed of selected listed manufacturing firms in Nigeria. The model to capture combined leverage on total capital employed is stated below:

Functional Relationship

$$TCE = f(DCL)$$

Where:

TCE = Total capital Employed

DCL = Degree of Combined Leverage

$$TCE_{i,t} = \gamma_0 + \gamma DCL_{i,t} + \mu$$

IV. Data Analysis, Result and Discussion of Findings

Collected or generated data sets have no appreciable value until they are analyzed and interpreted and convincingly discussed. Data gathered were analyzed using regression analysis method. Regression analysis is a statistical tool for estimating relationship among variable especially when focus is on the relationship between a dependent variable and one or more independent variables. A panel regression model was used.

$$TCE = f(DCL)$$

Where:

TCE = Total capital Employed

DCL = Degree of Combined Leverage

Regression analysis was carried out with degree of combined leverage as independent variable and total capital employed as dependent variable.

$$TCE_{i,t} = \gamma_0 + \gamma DCL_{i,t} + \mu$$

From the model

$$TCE = 0.6885 L + 0.0178 DCL + \varepsilon_6$$

Table 4.1 Regression Estimate

Variable	Model			
	Coefficient	Std Error	t-Statistic	P-Value
Constant	0.6885	0.0793	8.68	0.000*
DCL	0.0178	0.0054	3.27	0.001*
Wald Test	10.70			0.001*
Hausman Test	0.03			0.865
Heteroskedasticity: Breusch-Pagan/Cook-Weisberg	1.73			0.188
Wooldridge test for autocorrelation	99.907			0.000

Source: Panel Regression Analysis Results

*significance at 5%

Diagnostics Test Result

From Table 4.1, the Hausman Test was first used to determine whether fixed or random effect is suitable for the model. The probability of this test showed 0.865 which is higher than the acceptable 5%, thus, the null hypothesis to estimate random effect was accepted. Also, random effect was estimated for the model. And, Breusch-pagan Heteroskedasticity Test showed a p-value of 0.188, implying that the null hypothesis of constant variance was accepted an indication of the absence of Heteroskedasticity. However, the probability value of Wooldridge test for autocorrelation stood at 0.025, indicating that the null hypothesis of no serial correlation should be rejected. Thus, there is presence of serial correlation. In order to accommodate the

presence of serial correlation in the model, the Feasible Generalized Least Squares (FGLS) Estimator was used. As such, the model was specified correctly.

The regression estimate of model showed that combined leverage had a positive effect on overall performance measured by the natural logarithm of earnings per share (LNEPS). This was indicated by the signs of the coefficients, that is $\beta_7 = +0.0178 > 0$. These results are consistent with a-priori expectations that combined leverage (DCL) would have a positive effect on the overall performance (LNEPS).

Interpretation

From Table 4.1, the size of the coefficient of the independent variable showed that a 1 unit increase in combined leverage (DCL) would lead to 1.78% increase in overall performance measured by natural logarithm of earning per shares (LNEPS) of the sampled manufacturing firms in Nigeria. Also, the overall R-square of the model showed that 58.2% variations in Earnings per share can be attributed to operating and financing leverage used in this study, while the remaining 41.8% variations in overall performance measured by Earnings per share (LNEPS) are caused by other factors not included in this model. The finding showed that the model has a somewhat strong explanatory power of the model. However, the Wald-test showed a probability value of 0.001 which indicates that the explanatory variable is statistically significant because this is less than 5%, the level of significance adopted for this study. Therefore, the model is statistically significant.

In addition to the analysis, at the degree of freedom 5%, t-statistics is 3.27 while the p-value is 0.001 which is less than 0.05. We, therefore, rejected the null hypothesis and accepted the alternate which means degree of combined leverage significantly affected total capital employed in the Nigerian manufacturing firms. Thus, the null hypothesis that combined leverage had no significant effect on overall performance (earnings per share) of manufacturing firms in Nigeria was rejected. The alternate was accepted which means that combined leverage had significant effect on overall performance (total capital employed).

V. Discussion of Findings

The objective of this study sought to determine how degree of combined leverage (DCL) affected total capital employed (TCE) in the quoted Nigerian manufacturing firm. The analysis of this study was done in three folds. The first part showed the description of the data, the second part gave the trend analysis test results of the cost of capital on the corporate performance of selected quoted Nigerian manufacturing companies for the period under review and the third part gave the empirical analysis where regression analysis estimates were shown and interpreted.

The model has level of significance of 0.05. The profitability of the test had 0.865 which was greater than 5%, thus, the null hypothesis to estimate random effect was accepted Breusch-Pagan Heteroskedasticity test showed a p-value of 0.188 implying that null hypothesis of constant variance was accepted thus indicating the absence of Heteroskedasticity. Wooldridge test for autocorrelation was 0.025. The test revealed that ($\beta = 0.0178$; $t(140) = 3.27$; $p < 0.05$) indicating that degree of combined leverage exhibited significant positive relationship with total capital employed. Our result is consistent to the findings of Chechet and Olayiwola (2014) that capital structure has positive impact on capital employed. Das (20..) stated that ROCE is extensively used as a performance measure in the profit-seeking sector and successfully measures how well management is able to employ a firm's assets to generate returns. ROCE is usually a measure of the ability and efficiency of management. Portfolio consisting of higher ROCE companies should outperform a portfolio comprising a less ROCE firms over the long-term. However, Thamila and Arulvel (2013) established a weak negative relationship between capital structure and capital employed.

V. Conclusion

The purpose of this study was to establish if a relationship exists between degree of combined leverage and total capital employed of selected listed manufacturing companies in Nigeria from 2008 to 2014. The results showed significant and positive relationship between degree of combined leverage and total capital employed.

VI. Recommendation

The management of Nigerian quoted manufacturing firms should work hard to optimize the capital structure of their firms in order to increase the value of the returns on equity, assets and investment. It is further recommended that management should ensure financial decisions made are in agreement with shareholders' wealth maximization objectives.

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Appendix

List of Nigerian firms used in the study

S/N	NAME OF FIRM	SECTOR
1	Nestle Nigeria Plc	Food/beverages and tobacco
2	Cadbury Nigeria Plc	Food/beverages and tobacco
3	7-up Bottling Company Plc	Food/beverages and tobacco
4	Honeywell Flour Mills Plc	Food/beverages and tobacco
5	Nigeria Bottling Company Plc	Food/beverages and tobacco
6	Portland Paints & Product Plc	Chemical and Paints
7	Vitafoam Nigeria Plc	Industrial and domestic product
8	BOC Gases Plc	Chemicals
9	Studio Press Nigeria Plc	Printing and Publishing
10	GSK Nigeria Plc	Healthcare
11	May & Baker Nigeria Plc	Pharmaceutical
12	Livestock Feeds Plc	Livestock/Animal specialist
13	Nigeria Wire Industry Plc	Construction
14	Lafarge Wapco Plc	Building materials
15	Nigerian Breweries Plc	Breweries
16	Presco Plc	Crop production
17	PZ Nigeria Plc	Conglomerates
18	Unilever Nigeria Plc	Conglomerates
19	Guinness Nigeria Plc	Breweries
20	Berger Paints Plc	Chemical and Paints

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