

# Financial Leverage and Financial Performance of Nigerian Manufacturing Firms

Norhani Aripin<sup>#1</sup>, Ogirima Abdulmumuni<sup>\*2</sup>

<sup>#</sup>*Tunku Puteri Intan Safinaz School of Accountancy (TISSA-UUM), Universiti Utara Malaysia, 06010 UUM Sintok, Kedah, Malaysia*

<sup>\*</sup>*Kogi State University, Anyigba, Kogi State, Nigeria*

<sup>1</sup>norhani@uum.edu.my

<sup>2</sup>ogirimaabdulm@yahoo.com

**Abstract**— This paper examined the association between financial leverage and financial performance of Nigerian manufacturing firms. Performance is the ability of management to control firms' resources to gain competitive advantage. Among the internal organisational factors that affect firms' profitability is financial leverage which is the firms' capital structure framework. From agency theory perspective, it is hypothesised that profitability increases with debt financing to a certain optimal level of debts. A five-year data covering a period between 2011 to 2015, sourced from the financial statements of 66 Nigerian manufacturing firms were collected. This study found that financial leverage is positively and significantly associated with the financial performance of Nigerian manufacturing firms, measured as return on equity (ROE). Further, the firms with moderate level of debt ratio are found positively associated with ROE. In contrast, all equity-financed firms and those firms with excessive debts financing are negatively associated with ROE. A positive association is also found between firm size and revenue growth rate with ROE. Nigerian manufacturing firms are recommended to apply agency theory of optimal debts financing to address their financial constraint and poor performance issues.

**Keywords**— *performance, financial performance, financial leverage, agency theory, Nigerian manufacturing firms*

## 1. Introduction

### 1.1 Background

The fastest channel through which sustainable economic growth and development are attained is arguably through technological innovation, enterprise development and industrial capacity [1]. The unimpressive nature of Nigerian manufacturing sector since her independence has called for the concern of many Nigerian scholars with the hope of providing solutions for the challenges facing the sector. The role of the manufacturing sector in job provision, foreign exchange earnings and in international trade cannot be overemphasised [2]. Nigerian manufacturing sector performed with satisfactory growth potential between periods of 1970 to 1980. The recorded growth and profitability declined significantly a moment from this period [3]. The contribution of this sector is approximately 10% to Nigerian Gross Domestic Product before the oil boom in 1970's. However, since this period the sector has been ailing due to over-reliance on oil in part of the government and mismanagement by the management team in charge of the firm's stewardship [4]. Many corporate organisations in Nigeria liquidated due to poor management. The higher production cost and non-value added costs contributed to the low profitability of

Nigerian manufacturing firms [5].

Financial leverage (gearing) is financing business with equity funds and debts [6]. The level of debts that maximises firms' profitability depends on the management expertise on financing decision. This is because the ultimate goal of management is taking responsible for developing strategic tool that will match internal organisational strength and weaknesses with external opportunity and threat [7].

Performance measurement is the quantitative means of assessing the firms' management ability to achieve result with little resources and the achievement of the planned strategic goal of an organisation [8]. Further, Kaplan and Norton [9] revealed the four performance measurement perspectives termed "balance scorecard" to include financial perspective, internal business perspective, customers' perspective and innovation and learning perspective. A financial performance which serves as an avenue to satisfy investors is the organisational earnings, profits, share price appreciation and revenue growth [10]. However economic and organisational factors influence the firms' financial performance, but the organisational specific factors have much influence [11].

Further, among these organisational specific factors are liquidity management, operational activities, financial leverage, management competence or capability, asset structure, and corporate governance, as suggested by [12] and [13]. In line with this, the paper reviewed the related articles on firms' financial performance in relation to financial leverage to see the nature of their association. This will help in examining the relationship between financial leverage and financial performance of Nigerian manufacturing firms.

### 1.2 Research Problem

The problem of this study is related to the weakness in the financial performance of Nigerian manufacturing firms which is accompanied by financial constraints over years. Past studies suggested loan financing as a way of ameliorating the firms' financial constraints. The suggestion was not empirically backed to reveal the effects of loan financing on firms' profitability. Debt financing increases firms' profitability to a certain level of indebtedness called optimal capital structure theoretically. However, studies revealed that the association of financial leverage on firms' financial performance could either be positive or otherwise depend on the kind of industry, firms, and the specific country factors in which the firm

located. However, loan financing will increase the gearing ratio of the firms which is as well has an agency cost element.

### 1.3 Research Question

The research question is as derived from the research problem statements. This research is conducted to answer the question as presented below:

Does financial leverage associate with financial performance of Nigerian manufacturing firms?

### 1.4 Research Objective

The firm's mode of financing is vital to its survival and as well affects its profitability to which Nigerian manufacturing firms may not be exceptional. The objective of this study is to examine the association between financial leverage and the financial performance of Nigerian manufacturing firms.

## 2. Literature Review

### 2.1 Firm performance

Performance is the organisational ability to gain competitive advantage through proper coordination of human and material resource toward achieving the set goals and objectives of the organisation [14]. The process of quantifying the achievement of the organisation over time toward assessing its effectiveness and efficiency is performance measurement. On this note, performance measurement could be viewed as a metric for evaluating organisation action quantitatively [8]. Hence, to determine the extent to which the stakeholders' needs as mandated by the stakeholders' theory are met necessitate the need for performance measurement [15].

The four perspectives of assessing organisational performance as demonstrated by Kaplan and Norton [16] are financial perspective, customers' perspective, internal business perspective, and innovation and learning perspective. These are termed "balanced scorecard". In line with these, financial performance helps in assessing the ultimate health and survival of firms, and all business stakeholders are primarily concerned with the firms' financial performance [17]. In addition, three main roles played by the financial measure of organisational performance are that it serves as a tool for financial management, as a major objective of the business establishment, and as a mechanism for controlling and motivation [18].

The management of the organisational internal affairs has a serious impact on its financial performance among which is financing decision [11]. The performance measures come with outcomes and the drivers as established by Kaplan and Norton [9]. The outcome of financial performance of firms could be assessed through return on assets, return on investment and return on equity. Therefore, these returns are influenced by operational activities, management competency, liquidity management, financial leverage, or capability, asset structure, corporate governance and market structure.

Their nature and degree of influence on financial performance are demonstrated by Pandya and Rao [12] and Mubin, Iqbal and Hussain [19] among other scholars. Therefore, financial leverage influences firms' performance and addressing the financial constraint of the Nigerian manufacturing firms, it may be vital review the financial decisions in relations to firms' profitability.

### 2.2 Financial leverage and financial performance

The financing of a business with the combination of owner's equity and debts is financial leverage. Financial leverage or capital structure could be viewed as the financial framework of an organisation [6]. The financing decision of every business organisation is influenced by specific geographical or country factors [20]. The choice of firms' financial leverage is depending on the various theories of corporate finance. Modigliani and Miller [21] studied that debt financing is beneficial to firms because debts interests are tax deductible. This increase firms' profit after tax. However, Rose, Westerfield and Jaffe [22] revealed that firms' value could decrease with a higher level of debt financing through an increase in financial distress.

Further, many studies revealed that financial leverage is associated with financial performance. The relationship between financial leverage and financial performance could either be a positive relationship or a negative relationship depending on the firms or the influencing factors in the country in which the firms are located, asserted by [23], [24], [25] and [26]. The studies by Abor [24] and Babatunde, Nwidobie and Adesina [27] revealed that financial leverage is positively associated with financial performance. While Chiang, Chan and Hui [23] and Mule and Mukras [28] studied a positive relationship between financial leverage and financial performance.

### 2.3 Theoretical Review

Agency theory focuses on shareholders' wealth maximisation, and this will be enhanced by an appropriate corporate governance structure in place [29]. An agency relationship is a contractual relationship between the principal and his agent whereby the agent involves in decision making on behalf of the principal, as suggested by [30] and [29]. Agency theory suggests that firms' profitability increases with debts to a certain level which determined the optimal level of capital structure. Agency theory suggests debts financing to reconcile the potential conflict of interest between the managers and the shareholders. This enhances goal congruence toward the objective of profit maximisation [29]. This implies that debt financing increases firms' financial performance. In line with the position of the agency theory, it could be concluded theoretically that the financing constraint facing Nigerian manufacturing firms could be solved via debt financing and this will improve the firms' financial performance.

### 3.0 Research methodology

#### 3.1 Research Framework

The operational efficiency and firms' policies are evaluated in monetary term through profitability which is the primary objective of the business owners. Firms' financial performance is expressed through profitability because of economist belief that the main objective of every business establishment is profit maximisation. Return on equity as one of the measures of profitability as employment as the measure of financial performance in this research. Return on equity was used as a proxy for the earnings attributable to the equity owners/holders. Return on equity was used because it is a vital goal of financial management that mainly concerned on wealth maximisation as the focal point of agency theory, as proposed by [31] and [19].

Further, financial leverage of the firms was examined through the ratio of total debt to total assets to determine the proportion of firms' assets financial by debts and the ratio of fixed interests' debt total equity to determine the proportion of fixed interest debt to firms' total equity. This will aid in determining the extent of inherent tax shield from fixed interest debt and its agency cost of firms' financial performance. The firms' sizes and sales revenue growth rate were used as the research control variables.

#### 3.2 Research Hypothesis

The financial framework of an organisation is termed financial leverage or capital structure [20]. The ratios of total debt to total asset and fixed interest debt to total equity were used as measures of financial leverage in this research. They vital to this research because they could aid in determining the optimal capital mix for the firms that could address their financial constraint issues identified by previous scholars.

A positive relationship between financial leverage and financial performance were studied by [24], [32], [33] and [10]. While on the other hand, the studies by Yoon and Jang [25], Kodongo, Mokoaleli and Maina [34], Xu and Banchuenvijit [14] and Mule and Mukras [28] revealed a negative relationship between financial leverage and financial performance.

Agency theory suggests an optimal capital mix that would enhance firms' profit maximisation [29]. This indicates that profit increase with debts to a certain level of debt financing. Agency theory proposed debt financing as a mean of resolving the potential conflict of interest between the manager and shareholders. This is to enhance profit maximisation. Additionally, the tax shield from financial expenses (i.e. debt cost) will lead to increase firms' earnings after tax [29].

In line with the theory and the empirical studies on financial leverage and financial performance, the hypothesis goes thus;

**H<sub>1</sub>:** Financial leverage is positively associated with the financial performance of Nigerian manufacturing firms.

#### 3.3 Research Model

The multiple linear regression equation employed for the purpose of this research is as presented below:

$$ROE = \alpha + \beta_1 TDTA + \beta_2 LDTE + \beta_3 FS + \beta_4 SGR + e$$

Where; ROE is return on equity,  $\alpha$  is constant coefficient,  $\beta$  is the coefficient of independent variable,  $i$  is the number of firms,  $t$  is the time period covered, TDTA is total debt to total assets, LDTE is long-term debt to total equity, FS is the firm's size, SGR is the sales revenue growth rate and  $e$  is the error term.

**Table 1.** Measurement of variables

Variables	Measurement
<b>Dependent variable</b>	
Return on Equity	$\frac{\text{Earnings after tax}}{\text{Total book value of equity}}$
<b>Independent Variables</b>	
Total debt to total assets	$\frac{\text{Total liabilities}}{\text{Total assets}}$
Long term debt to Equity	$\frac{\text{Total fixed interest debts}}{\text{Total book value of equity}}$
<b>Control Variables</b>	
Firms' size	Logarithm of total sales revenue
Sales growth rate	$\frac{\text{Sales}_1 - \text{Sales}_0}{\text{Sales}_0} \times 100\%$

#### 3.4 Research Design

The method and the master plan of procedures employed for data collection and analytical approach are research design [35]. The design for this research is longitudinal research. A quantitative approach to research was employed to examine the relationship between the dependent variable and the independent variables. Secondary data sourced from the annual reports of the firms were used. The annual reports of 66 manufacturing firms listed on the Nigerian stock exchange (NSE) between the period of years 2011 to 2015 were used in this study.

#### 3.5 Technique for Data Analysis

The analytical tools applied for this research are descriptive statistics, Pearson correlation test and multiple linear regression analysis. These were employed by Odunga, Nyangweso and Nkobe [36] and Khalifa and Shafii [37].

Descriptive statistics enables an in-depth analysis and understanding of data attributes. Among the descriptive statistics employed in this research are mean, minimum, maximum and standard deviations. Correlation test on the other helps in assessing the nature and the strength of the relationship between two variables. It was used also to evaluate the possibility of multicollinearity among the independent variables. Finally, multiple linear regression was used to estimate the research equation through which the research hypothesis was tested.

## 4.0 Research Finding and Analysis

### 4.1 Descriptive Analysis

The descriptive analysis is to describe the attribute of the research data as used in the research work. The data was collected from the annual reports of 66 manufacturing firms listed in Nigerian Stock Exchange (NSE) for five years' period covering years 2011 to 2015. The research descriptive statistics as presented in Table 2 reveal the variables mean, maximum value, minimum value and the standard deviation.

**Table 2.** Descriptive Statistics

Var.	ROE	TDTA	LDTE	FS	SGR
Mean	0.036642	0.776778	0.566714	22.52096	7.985390
Max	7.084939	15.97722	66.23905	27.64078	275.4186
Min	-6.90732	0.073447	0.000000	0.000000	-66.76329
SD	0.717620	1.590665	3.708487	3.458611	33.60709

Table 2 shows that the firms' average return on equity for the period is 0.036642 (3.67%). This average return on equity of the firms can be termed as low or poor collective performance of the firm because is far below the ideal return on equity of 10% as agreed upon by some scholars. The standard deviation of the firms' earnings is 0.717620 (71.8%). The minimum and the maximum return on equity are -6.90732 (-690.7%) and 7.084939 (708.5%) for the period. From these statistics, the disparity in the firms' earning is accounted for by the higher S.D and the wider gap between the minimum and the maximum value of their returns on equity.

The ratio of total debt to total assets indicates an average ratio of 0.776778 (77.7%). This shows that 77.7 of firms' assets are financed by total debts on average. The minimum debt assets ratio is 0.073447 while the maximum total debt to total assets ratio is 15.97722 with the standard deviation of 1.590665. The mean ratio of fixed interest debt to total equity of the firms is 0.566714 (56.7%) with the standard deviation of 3.708487. The minimum and the maximum ratio of fixed interest debt to equity are 0 and 66.23905 for the period. Additionally, the average size of the firms is 22.52096 with the standard deviation of 3.458611. The minimum size is 0 which reveal a nil revenue by a firm in a given year while the maximum size is 27.64078. Finally, the sales revenue growth rate of the firms is 7.98% on average with the standard deviation of 33.6%. The minimum and the maximum revenue growth rates are -66.76% and 275.4% respectively. These statistics reveal that there are discrepancies on firms earning potential, capital structure, and size and revenue generation for the study period.

### 4.2 Correlation Analysis

Correlation analysis helps in explaining the strength and the direction of the linear relationship between two or more variables [38]. A correlation of 0 signifies the absence of a relationship between variables while a correlation of +1 and -1 indicate absolute positive relationship and negative relationship respectively

between variables [39]. In addition, Cohen [40] suggested a correlation between the range of  $\pm 0.01$  and  $\pm 0.29$  as a small relationship,  $\pm 0.30$  and  $\pm 0.49$  as moderate relationship while a correlation range of  $\pm 0.50$  and above signifies a strong relationship between variables. Though, the strength of the correlation between variables is determined by its significance notwithstanding whether is a small, moderate or strong correlation.

The Pearson correlation matrix as presented in Table 3, indicates that the ratio of total debt to total assets (TDTA) is related with ROE as a coefficient of -0.043 which falls in the small relationship categories. The ratio of fixed interest debt to total equity is 0.409 correlated with ROE. This indicates a moderate relationship between LDTE and ROE. Further, the firms' size (FS) is correlated with ROE at a coefficient of 0.099. This reveals a small relationship between them. Finally, the sales revenue growth rate (SGR) is associated with ROE at a coefficient of 0.101, which is also an indication of a small relationship.

**Table 3.** Pearson Correlation Matrix

	1	2	3	4	5
1	1.000000				
2	-0.043061	1.000000			
3	0.409246***	0.010150	1.000000		
4	0.099112*	-0.781832***	-0.057997	1.000000	
5	0.100775**	-0.031952	0.029217	0.075964	1.000000

Note: 1=ROE, 2=TDTA, 3=LDTE, 4=FS, 5=SGR

\*\*\*significant at 1% level, \*\*significant at 5% level, \*significant at 10% level

### 4.3 Diagnostic Check

#### 4.3.1 Linearity Checking

Linearity and additive assume that the dependent value is a straight-line function of individual independent variables. It also establishes that the effect of independent variables is additive on the value of the dependent variables. Hence, residual plots could help be used in assessing the linearity of data but this is considered non-scientific by many scholars. Hair, Anderson, Tatham and Black [39] and Ebrahim, Abdullah, Faudziah and Yahya [41] attached relevance to the comparison of the dependent variable' standard deviations with that of the residual over the residual plot. The data is linear if the S.D. of the dependent variable is greater than the residual S.D. This is as presented in Table 4.

**Table 4.** Test of linearity table

DV	S.D	Residual	Decision
ROE	0.71762	0.644017	Accepted

The figures from Table 4 show that the data is linear because the standard deviation of ROE is greater than the Residual Standard deviation.

#### 4.3.2 Normality Checking

The normality of the distribution was examined through the Jarque-Bera statistics and its probability value. The data has no normality problem if the p-value is greater than 0.05. Therefore, as presented in Table 5, it indicates

that the data have some normality issue because the Jarque-Bera p-value is less than 0.05. Hair, Black, Babin, Anderson and Tatham [42] suggested that normality problem of distribution of 200 observations and above could be ignored because it may not have an effect on the research outcome. In line with this, this research has a total observation of 330 which is above 200 observations as suggested by [42]. Hence the normality issue may not affect the research outcome.

**Table 5.** Test for normality

	Statistics	Probability	Decision
Jarque-Bera	45048.48	0.0000	Rejected

#### 4.3.3 Multicollinearity testing

Multicollinearity occurs when the correlation between two independent variables is up to 90% and above. The multicollinearity issue will increase the research coefficient of determination ( $R^2$ ) unnecessarily. If multicollinearity occurs, one of the variables has to be removed to address the issue. From the data presented in Table 6, the highest correlation is between FS and TDTA which is -0.78. This is below 0.9 indicating that there is no multicollinearity issue with the data.

**Table 6.** Pearson correlation matrix for multicollinearity checking

	1	2	3	4
1	1.000000			
2	0.010150	1.000000		
3	-0.781832	-0.057997	1.000000	
4	-0.031952	0.029217	0.075964	1.000000

Note: 1=TDTA, 2=LDTE, 3=FS, 4=SGR

#### 4.3.4 Test for Serial Correlation

Serial correlation is all about the independence of errors on research statistics [43]. Serial correlation is also called autocorrelation. According to Agung [44], autocorrelation occurs when errors are correlated with one another. The existence of autocorrelation in research does not affect the regression output coefficient but on the standard error of the regression. A Durbin-Watson statistic below 1 reveals a certainty for the existence of positive serial correlation and a Statistical value above 3 shows there is a negative serial correlation [45]. The Durbin-Watson statistics as used in this research is as presented in Table 7. The Durbin statistics is 1.33 which is above 1. It could be concluded that there are no serial correlation issues in this research.

**Table 7.** Serial correlation table: Durbin-Watson Statistics

DV	Durbin-Watson Stat	Decision
ROE	1.33301	Accepted

#### 4.3.5 Test for Heteroscedasticity

Homoscedasticity reveals a non-clear pattern of spread when plotted on a graph. Therefore, like autocorrelation, heteroscedasticity has no effect on the coefficient of

regression estimate but the standard error may be biased [46]. From the figures in Table 8, the probability of the ROE observed statistics is 0.0106 which is below 0.05. This is an indication of heteroscedasticity. Heteroscedasticity and serial correlation issues could be addressed by employing heteroscedasticity-robust standard error estimates, as asserted by [47] and [48]. The heteroscedasticity standard error was employed in this research

**Table 8.** Heteroscedasticity (Breusch-Pagan-Godfrey)

DV	Obs. Stat	Probability	Decision
ROE	13.13649	0.0106	Rejected

## 4.4 Model Estimation

After the data cleansing through diagnostic testing, the ordinary least square model was employed to estimate the equation. The output of OLS from Eviews8 presented regression statistics such as independent variables coefficients and their corresponding p-values,  $R^2$ , adjusted  $R^2$ , F-statistics and its p-value as shown in Table 9. The research  $R^2$  is called coefficient of determination. The coefficient of determination explains by how much the dependent variable is predicted by the independent variables. The  $R^2$  of 0.194612 shows that the independent variables jointly explain variation in the dependent variable (ROE) by 19%. Additionally, the F-stats p-value of 0.000 reveals that the independent variables are joint significant predictors of ROE.

The outcome of the regression as presented in Table 9 shows that TDTA as is related with ROE by 0.054601 and significant at ( $p < 0.01$ ). This indicates that every 1 change in TDTA will lead to a change in ROE by 0.054601. Also, LDTE is related with ROE with a regression coefficient 0.080904 and significant at ( $p < 0.01$ ). For every 1 change in LDTE will change ROE by 0.080904. Additionally, FS is 0.044026 related with ROE and is a significant predictor of ROE at ( $p < 0.01$ ). ROE will change by 0.044026 for every 1 change in FS. Finally, SGR is associated with ROE at a regression coefficient of 0.001629 and significant at ( $p < 0.05$ ). ROE changes by 0.001629 for every 1 change in SGR.

**Table 9.** Regression

Variables	Coefficients	Probability
TDTA	0.054601	0.0000***
LDTE	0.080904	0.0000***
FS	0.044026	0.0000***
SGR	0.001629	0.0207**
R-Square ( $R^2$ )	0.194612	
Adjusted $R^2$	0.184699	
F-Statistics	19.63301	
Prob (F-stat)	0.000000	

Note: \*\*\*significant at 1% level, \*\*significant at 5% level

#### 4.5 Hypothesis testing

The hypothesis was formulated about financial leverage and financial performance of Nigerian manufacturing firms to actualise the research objective. The firms' financial leverage was measured by the ratio of total debt to total assets and the ratio of fixed interest debt to total equity while the financial performance was examined through return on equity. The ratio of total debt to total assets (TDTA) is positively associated with ROE and significant at ( $p < 0.01$ ). Additionally, the ratio of fixed interest debt to total equity is positively associated with ROE and significant at ( $p < 0.01$ ). This indicates that both TDTA and LDTE are positively and significantly associated with financial performance (measured as ROE). The research hypothesis that financial leverage is positively associated with financial performance is supported by the research findings and is therefore accepted. This is consistent with the research findings by Almazari [49] and Adedeji [50] that financial leverage is associated with financial performance positively.

#### 5.0 Conclusion

Based on the findings of this study, the following conclusions are made regarding the financial performance of manufacturing firms listed on the Nigerian stock exchange. The main objective of this study is to examine the association between financial leverage and financial performance of manufacturing firms listed on NSE. The firms' annual reports for five years covering years 2011 to 2015 were examined. The findings of this research will contribute to better understanding of the relationship between financial leverage and financial performance which could aid firms in determining their capital structure optimal level. The research findings reveal that financial performance is positively and significantly associated with financial performance. This portrays that debt financing could help improve the poor financial performance of Nigerian manufacturing firms that was observed during the study period. This research findings support the position of the agency theory that debt financing improves firms' profitability.

The firms' statistics reveal that firms with excessive debt ratio and those with too little debt ratio are associated with negative returns on equity. While firms with a moderate level of debt financing experienced a consistently positive return on equity over the study period. This is an indication that there is an optimal level of debt financing that with improve profitability. This is consistent with the dictate of agency theory that there is an optimal level of capital structure to improve firms' performance (i.e. profitability). Additionally, the size of firms (FS) is associated with ROE positively. This indicates that larger firms tend to earn more compared to smaller size firms. Finally, the larger the sales revenue growth rate, the higher the financial performance.

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