EFFECT OF FINANCIAL LEVERAGE ON FINANCIAL PERFORMANCE OF LISTED INDUSTRIAL FIRMS IN NIGERIA.

Ibrahim Ahmed[1], Gimba John Toro[2], Ezekiel Dauda Daschen[3],

and Osama Caleb Kehinde[4]

[1]Department of Business Administration, Nasarawa State University, Keffi, Nigeria.

[2]Department of Business Administration, Veritas University, Abuja, Nigeria.

[3]Department of Banking & Finance, Nasarawa State University, Keffi, Nigeria.

[4]Department of Banking & Finance, Veriats University, Abuja, Nigeria.

ABSTRACT: *The research explores how the use of financial leverage impacts the financial performance of listed industrial companies in Nigeria from 2018-2022. To assess financial leverage, it utilised the total debt-to-asset ratio and interest coverage ratio as proxies, while gross profit margin was used as a measure of financial performance. The data was analysed using panel data, which included information from the individual financial statements of the listed industrial companies. The dataset consisted of thirteen (13) industrial companies listed on the Nigerian Stock Exchange Group (NGX). The research utilised a panel regression model to determine the main relationship between financial leverage and gross profit margin. The result shows that the total debt-to-asset ratio had a positive significant effect on the gross profit margin of listed industrial firms in Nigeria. Interest coverage ratio had a negative significant effect on the gross profit margin of listed industrial firms in Nigeria. The management of the industrial firms should employ more sustainable debt financing to critical areas of the firm's investment for asset expansion, in order to gross profit and financial performance of the firm. The study also recommends that industrial firms in Nigeria should consider debt with a lower percentage of interest coverage. This will minimise its capital cost, reduce the risk of default on loan payments and help the financial managers improve the financial performance of the firm.*

KEYWORDS: Financial leverage, Total Debt Asset, Interest Coverage ratio, Gross profit margin, Listed Industrial Firms.

INTRODUCTION

In the capital build-up of an entity, it's common for businesses to secure capital through various methods, depending on their level of risk. The ideal approach aims to find a middle ground between potential risks and expected returns. Companies require capital for both starting up and growing their production of goods and services. Given a company's capital budgeting choices, it must determine how to finance its capital projects, as financial decisions stem from investment choices. The use of debt by a company offers a glimpse into its leverage level. The ideal ratio of equity to debt for a company is a matter of balance. Consequently, information from listed industrial companies on the Nigerian Exchange Limited, NGX, shows that the cost of borrowing skyrocketed by 411.2% to N330.972 billion in the first quarter of 2023 compared to N64.745 billion in the same period of 2022.

Financial performance gauges a company's ability to leverage its core assets to produce income. Gross profit serves as an essential indicator for businesses, helping to assess their historical and present standing. Therefore, analysing gross profit aims to address a wide array of critical inquiries, such as if the company possesses adequate funds to fulfil its financial commitments, and if the sales volume is high enough to support investments through financial leverage (Ibrahim & Isiaka, 2020).

Managing the firm involves crucial decisions about financial leverage, as increasing the firm's value is a key task for the management. A growing company typically requires capital, which can be obtained through a combination of debt and equity financing. The financial manager's role is to determine the best mix of funding that enhances shareholder value. While financial leverage impacts a firm's profit potential, it also introduces risk. Without effective management of financial resources, firms may struggle to cover costs and achieve cost minimisation and peak performance goals. Financial leverage reflects the extent to which a firm depends on debt, requiring firms to carefully consider their capital structure to anticipate capital expenses (Mainoma & Aruwa, 2021).

The connection between financial leverage and the financial performance of industrial companies illustrates how utilising debt to fund operations results in incurring interest expenses, which can impact profitability. Therefore, if industrial firms take on excessive debt, they may struggle to meet their interest obligations, potentially leading to default and bankruptcy. Conversely, if industrial companies use minimal debt, they may miss out on growth opportunities and fail to make necessary investments to maintain competitiveness. Consequently, a higher interest coverage ratio indicates that a company is capable of paying its interest expense multiple times while a lower ratio denotes a heightened risk of defaulting on loan payments (Olowe, 2018). Lenders, creditors, and investors use the interest coverage ratio to assess the risk of providing funds to a company. It serves as a critical tool for evaluating a company's financial well-being and its capacity to fulfil its debt commitments. (Ismawati, 2018).

The effectiveness of management and its ability to generate earnings for the firm are clearly indicated by firm performance, which is crucial for the business to yield returns. However, currently, the firm's productivity is largely focused on financial assets, leading to a significant number of companies closing down in Nigeria (NGX, 2023). Additionally, industrial goods companies are facing challenges in generating cash from their business activities, impacting their overall performance. Consequently, these companies have increased their total

borrowings to meet their working capital requirements. According to NGX (2023), Dangote Cement Plc, BUA Cement Plc, and Lafarge Africa, Nigeria's largest industrial firms, collectively recorded a 29 percent increase in total borrowings to NN868.76 billion in 2022 from NN671.72 billion in 2021. The cost of these borrowings also rose by 22 percent to N84.39 billion in 2022 from N69.12 billion, with Dangote Cement contributing the majority of the interest expense reported by the sector. Specifically, Dangote Cement's interest on loans and borrowings increased by 31.61 percent to N75.24 billion in 2022 from N57.17 billion in 2021, while Lafarge Africa and BUA Cement saw decreases in interest expense by 51.61 percent and 3.3 percent, respectively.

In the second half of 2022, industrial firms experienced a 4.1 percent decrease in capacity utilisation, as reported by NGX in 2023. The review indicated that year-over-year capacity utilisation in industrial firms dropped to 54.9 percent from the 59 percent recorded in the same period of 2021. Additionally, the review noted a quarter-on-quarter capacity utilisation decline of 3.0 percentage points compared to the 57.9 percent recorded in the first half of the year. The average capacity utilisation for 2022 was 56.4 percent, up from the 55.9 percent average in 2021. Masturah et al (2022) put forth the argument supporting the use of debt and viewed debt finance as beneficial in improving firms' performance, provided it is obtained at a favourable rate and the proceeds are used effectively. These developments, in conjunction with the absence of a universal theory, have prompted the necessity for further research to investigate the impact of capital composition on firm performance, which serves as the motivation for this research study.

Subsequently, the practical gap facing the growth and expansion of industries in Nigeria is the problem of a high credit rate of over 30%. In Nigeria, many industrialists are hesitant to collaborate with other investors in order to raise sufficient funds to operate their businesses, resulting in a lack of capital that hampers company performance. Moreover, the stringent loan requirements and high interest rates imposed by most lending institutions along with government apathy, deter industrialists from borrowing, thus impeding industrial development in the country (Ali et al, 2022). Therefore, the study intends to investigate the effect of financial leverage on the financial performance of listed industrial firms in Nigeria from 2018-2022.

In line with the main objective of the study, the following hypotheses were tested:

H_{01}: The total debt-asset ratio has no significant effect on the financial performance of listed industrial firms in Nigeria.

H_{02}: Interest coverage ratio has no significant effect on the financial performance of listed industrial firms in Nigeria.

LITERATURE REVIEW

Concepts of Financial Leverage

Financial leverage entails utilising fixed-charge sources of funds, like debt and preference capital, in addition to owner's equity in the capital structure (Pandey, 2010). It denotes the extent to which a company utilises fixed-income securities, such as debt and equity. As per Rajput et al. (2020), financial leverage is a double-edged sword, offering the potential to increase shareholders' earnings while also posing the risk of loss. The extent of debt utilised reflects the level of leverage in a firm. For a firm adept at directing its funds towards profitable investments, it helps create opportunities for expansion and meeting shareholders' expectations, including achieving the firm's wealth maximisation objectives. High leverage signifies that debts exceed equity, resulting in increased financial costs. Elevated finance costs negatively impact earnings per share. High financial leverage equates to high-interest payments, leading to decreased earnings per share. (Ali et al, 2022).

However, this study adopted the definition of Rajput et al (2020), which states that financial leverage measures the number of total funds provided by creditors in relation to the total assets of the firm. Financial leverage is a proportion of an organisation's debt financed by using borrowed money from the externalities.

Total Debt Asset Ratio

The debt ratio assesses a company's level of leverage by comparing its total debt to its total assets. It is calculated by dividing the total debt by the total assets and is presented as a decimal or percentage. The formula for the debt ratio calculation is Total Debt Asset Ratio = Total Debt / Total Assets.

According to Abdullah and Tursoy (2019), a debt ratio exceeding 1 indicates that a significant portion of the company's assets are financed by debt, signifying more liabilities than assets. A high ratio suggests that the company may face default risk on its loans if interest rates suddenly increase. Conversely, a ratio below 1 implies that a larger part of the company's assets is financed by equity. Usually, a lower debt ratio is preferable, although the ideal ratio may differ by industry. The debt ratio is a critical metric used by analysts and finance professionals to evaluate a company's financial well-being. It offers insights into the proportion of a company's financing obtained from debt in comparison to its assets (Kargar & Bluementhal, 2014).

This study adopted the definition of total debt-assets ratio as a measure of a company's financial leverage. The total debt assets debt ratio is calculated by dividing total debt by total assets and is expressed as a decimal or percentage. A higher ratio signifies that a company has more liabilities than assets, indicating a higher risk of loan default if interest rates suddenly rise.

Interest Coverage Ratio

The ICR, or interest coverage ratio, is a financial metric that assesses a company's capacity to meet interest payments on its debts (Bui, 2017). Lenders, creditors, and investors commonly use the ICR to evaluate the risk of lending funds to a company. It is also referred to as the "times interest earned" ratio. The interest coverage ratio (ICR) measures a company's ability to fulfil interest payments from its internal cash flows, which is calculated as the ratio of earnings before interest and taxes to interest expenses. Several studies have highlighted the ICR's

significance as an indicator of financial distress for informing government policy decisions (Das et al., 2022).

According to Ji (2019), alternate versions of the formula may incorporate EBITDA or EBIAT instead of EBIT for computing the ratio. In the interest coverage ratio, the coverage denotes the period for which interest payments can be sustained with the company's current earnings. Essentially, it reflects the frequency at which the company can meet its obligations with its earnings. A higher interest coverage ratio indicates that a company can cover its interest expense multiple times, whereas a lower ratio signifies a greater risk of defaulting on loan payments. Generally, a higher coverage ratio is preferable, although the optimal ratio may differ by industry (Liu et al., 2022).

This study uses the definition of the interest coverage ratio, also known as the times interest earned (TIE) ratio, to evaluate a company's capability to fulfil the interest on its outstanding debt. It is calculated by dividing a company's earnings before interest and taxes (EBIT) by its interest expense over a specified period (Ali et al., 2022). The formula for computing the interest coverage ratio is: Interest Coverage Ratio = EBIT / Interest Expense

Financial Performance

The success of a bank in generating profits can be determined by certain variables that measure its financial performance. The company's achievements are reflected in its financial statements, which indicate the state of the company during a specific period, known as the company's financial performance (Almajali et al, 2012). Ameur and Mhiri (2013) defined performance measurement as a method to ensure the most efficient and effective use of available resources, aiming to provide the maximum return on the capital employed in the business. It serves as a general gauge of a firm's overall financial health over a specific period and allows for comparisons between similar firms within the same industry or across different sectors.

In this study, the financial performance of a firm can be interpreted as indicating prospects, growth, and the potential for good development. Financial performance information is crucial for assessing potential changes in economic resources that may be controlled in the future and predicting the production capacity of existing resources.

Gross Profit Margin

According to Rizqa et al (20123), the gross profit margin (GPM) represents the relationship between the company's gross profit and its sales during the same period. The GPM is heavily influenced by sales prices, and higher profitability indicates better performance. If the cost of goods sold rises, the GPM will decline, and conversely. The GPM ratio demonstrates the gross profit earned per unit of sale, or when subtracted from 100%, it reveals the amount remaining to cover operating costs and net profit. Analysing the GPM ratio data across multiple periods can offer insights into the trend of the obtained margin and can be compared with the standard ratio to determine if the company's margins are high or low (Indrayati, 2020).

Empirical Review

Total Debt to Asset Ratio and Financial Performance

In their study, Khan and Siddiqui (2023) investigated the impact of financial leverage and liquidity on the performance of companies operating in Pakistan's cement, textile, sugar, and pharmaceutical sectors. Data from the official websites of 50 companies across these industries for the previous decade (2011-2020) was compiled for analysis. Additionally, data from the World Bank was utilised. The generalised method of moments (GMM) was employed for data analysis, revealing that in the cement industry, financial leverage negatively affects company performance while it has a positive impact in the textile, sugar, and pharmaceutical sectors. Supply chain finance (SCF) has a detrimental effect on firm performance in the cement industry, but a positive impact on the textile, sugar, and pharmaceutical sectors. Liquidity (LIQ) has a positive impact on firm performance across all sectors. The study's key insight is the significant role played by supply chain finance in enhancing firm performance. The research concludes that increased debt levels and inefficient use of debt have a negative impact on firm performance. The findings suggest that financial leverage enhances company performance as long as debt levels do not exceed equity. Despite these significant findings, the study lacks additional empirical reviews to identify research gaps.

In 2023, Rizqa and colleagues explored the association between leverage and firm value and investigated whether firm performance, specifically return on equity and earnings per share, plays a mediating role in this relationship. They used a quantitative approach and the partial least squares-structural equation modelling (PLS-SEM) tool to analyse data from 687 companies listed on the Indonesia Stock Exchange (IDX) in 2021. The researchers employed purposive sampling to select the sample. The results revealed that leverage does not directly impact firm value, but the mediating role of return on equity is significant. Conversely, earnings per share was found not to mediate the relationship between leverage and firm value, even though it was used as a measure of financial performance, along with gross profit margin.

Abideen (2023) explored the link between financial leverage, firm liquidity, and firm size on company performance in China. The research used a quantitative approach and collected secondary data from 2010 to 2022 from firms listed on the China Stock Exchange using the wind database. The study employed a fixed effect model to test the hypotheses. The results showed that firm liquidity and firm size significantly affect company performance in China. Additionally, the study suggested that financial leverage also plays a significant role in influencing firm performance. The findings highlight the importance for corporate managers, policymakers, and investors to take into account factors such as financial liquidity and firm size when making decisions related to firm performance, particularly in an emerging stock market.

Ali et al (2022) examined the relationship between leverage and firm performance. The study utilised accounting-based measures, specifically return on assets (ROA) and return on equity (ROE), as dependent variables, while leverage, ownership proxies, and other control variables were the independent variables. The research included managerial ownership, institutional ownership, and family-owned ownership as ownership proxies, and the size of the firm and net income of the selected firms as control variables. The study used panel data analysis on data from 70 firms listed on the Pakistan Stock Exchange from 2010 to 2016. The findings revealed a negative but statistically significant relationship of leverage on firm performance with both

ROA and ROE. The study underscored the distinctiveness of their results, given the unique cultural and corporate governance context of Pakistan's rising economy compared to research conducted in developed countries. However, the authors did not provide further details on the research design.

Masturah et al. (2022) in their study investigated how financial leverage affected the performance of Shariah-listed Consumer Products & Services firms in Malaysia from 2014 to 2018. They used Tobin's Q and return on assets as measures of firm performance, while debt-asset ratio, debt-equity ratio, and tangibility served as indicators of financial leverage. The study employed different regression models, including the balanced panel regression, pooled regression model, fixed-effect model, and random effect model. The findings highlighted Tobin's Q as the most effective model for assessing the impact of financial leverage on Shariah firm performance. The results revealed a significant and negative impact of financial leverage indicators on the performance of Shariah firms, consistent with the pecking order theory's assumption that internal financing is preferred over external financing.

Interest Coverage Ratio and Financial Performance

Noghondari et al (2022) explored how a company's interest coverage ratio impacts the predictive accuracy of credit derivatives pricing models. They gathered data from the Bloomberg Terminal over eight years from 2008 to 2015. The study included 125 North American and European companies as the statistical sample, recognised as reference entities for Credit Default Swaps (CDS) during that time. Four Artificial Neural Network (ANN) algorithms - ANFIS, NNARX, AdaBoost, and SVM - were used to analyse the data. The results suggested that adding the interest coverage ratio (ICR) improved the predictive accuracy of the pricing models under examination. However, the study did not establish the superiority of the intensity model over the structural model in predicting CDS contract prices.

Kurnia (2022) focused on the individual and combined effects of interest coverage ratio, basic earning power, and earnings per share on the stock price of PT Indofood Sukses Makmur Tbk. The study emphasised the importance of careful investment decision-making given the multiple factors influencing stock prices, including interest coverage ratio, basic earning power, and earnings per share. The research employed a quantitative method and utilised secondary data from the company's annual reports published between 2011 and 2020 on the official website. The findings indicated that the interest coverage ratio had a very weak partial relationship, basic earning power had a weak partial relationship, and earnings per share had a moderate partial relationship with the stock price. Additionally, when considered simultaneously, interest coverage ratio, basic earning power, and earnings per share had a strong relationship but no significant effect on stock price.

Rajput et al. (2020) conducted a study that explored how leverage affects profitability in the Indian cement industry. The study analysed a sample of 14 cement companies listed on the National Stock Exchange of India from 2008 to 2017. The researchers used regression analysis to examine the impact of leverage on profitability and found a positive correlation. They discovered that an increase in leverage leads to higher profitability for cement companies in India. Additionally, the study revealed that factors such as firm size, liquidity, and sales growth have a favourable influence on profitability, while interest coverage and inventory turnover have an adverse effect. In conclusion, the study suggested that cement companies in India could

utilise leverage to enhance profitability, but they must prudently manage their debt levels to avoid financial difficulties.

Theoretical Framework

Modigliani-Miller Theory

Franco Modigliani and Merton Miller proposed the theory that financial leverage increases a firm's value and reduces the weighted average cost of capital (WACC) if tax information is available. In 1958, these financial researchers introduced the Modigliani and Miller theory, which significantly impacted capital structure. They introduced the Proposition I Theorem, demonstrating that, under specific assumptions, a firm's value is unaffected by debt. They later developed Proposition II, which relaxed the initial assumptions and took corporate taxes into account. In 1977, Miller elaborated on the two propositions and created a model that incorporated personal taxes.

The researchers stated in Proposition I, also referred to as net operating income, that a firm's capital structure does not affect its value. They argued that, since the firm's value is independent of its leverage and there are no corporate taxes, using debt does not confer any advantage. In a perfect market with no corporate taxes, no transaction costs, and uniform investor expectations, capital structure has no bearing on firm value. The cost of equity rises as gearing increases, while the cost of debt remains constant, underscoring the irrelevance of capital structure decisions on firm value (Kuo et al, 2018).

Modigliani and Miller posited that in the absence of certain assumptions, investors will engage in an arbitrage process where they exploit market imperfections by selling overvalued firm shares and buying undervalued firm shares to make arbitrage gains. They argued that the capital structure has no impact on firm value by demonstrating the arbitrage process between two identical companies. Through the arbitrage process, overvalued shares' prices will decrease while undervalued shares' prices will rise, bringing the market to equilibrium. Modigliani and Miller noted that firms with the same cost of capital, except for their leverage, should have equal market values. However, subsequent studies have shown that these assumptions do not hold, leading to a reevaluation of the impact of capital structure on firm value and performance.

Watson and Head criticized the Modigliani and Miller theory, highlighting several flaws in the assumptions. They contested the assumption that individuals and companies can borrow at the same rate due to the higher risk and cost of borrowing for individuals. They also argued that the absence of transaction costs is not realistic, as borrowing costs exist and affect arbitrage gains by eliminating risk-free profit. Additionally, they pointed out that investors have diverse expectations and that a perfect market does not exist. Subsequently, they introduced Proposition II, the net income approach, which relaxed the unrealistic assumptions of Proposition I and acknowledged the existence of corporate taxes and the associated tax shield benefit with debt capital. They concluded that as companies take on more debt, they can shield more of their profits from corporate taxes and asserted that the value of a leveraged firm will always exceed that of an unleveraged firm by an amount equal to the interest on the tax shield.

METHODOLOGY

The study utilised an expo-facto research design. The study encompassed all thirteen (13) industrial firms listed on the Nigerian Exchange Group (NGX) – namely Austinlaz, Berger Paints, Beta Glass, BUA Cement, CAP PLC, Cutix PLC, Dangote Cement, Greif Nigeria Plc, Lafarge Africa PLC, Meyer PLC, Notore Chemical PLC, Tripple Gee and Company PLC, and Premier Paints PLC. However, due to inconsistent and unbalanced panel data, four (4) companies were excluded using a convenience sampling technique. Therefore, the sample size for this study comprised all thirteen (13) industrial firms.

The study involved secondary data collection methods. Panel data was extracted from the annual reports of the listed industrial firms in Nigeria from 2018 to 2022. Total debt assets ratio and interest coverage ratio were used as proxies for financial leverage, while gross profit margin served as a proxy for financial performance. The study utilised multiple regression analysis to identify, explain, and estimate the key relationship between leverage (independent variable) and the financial performance of listed industrial firms in Nigeria.

The panel data was analysed using E-views version 13. Descriptive statistics, correlation matrix, normality test, and regression analysis were conducted, followed by post-estimation analysis including the Heteroskedasticity test and Hausman test. The specific model provided below for the Hausman test describes a convenient version for regression applications regarding testing whether specific transformations of the original regressors have zero coefficients.

The Model Specification:

The model adopted for this study is given as:

$$GPM_{it} = a_0 + \alpha_1 TDA_{it} + \alpha_2 ICR_{it} + e_{it} \ldots\ldots..(1)$$

Where;

GPM_{it} = Gross profit margin (depend variable)

TDA_{it} = Total debt to asset ratio

ICR_{it} = Interest coverage ratio

a_0 = Constant,

e_{it} = Error term

α_s = coefficients of the independent variables.

Decision Rules

The decision rule to test the hypothesis of the study is as follows: If the p-value of the t-coefficient is less than 5% (0.05), the null hypothesis is rejected, otherwise accepted.

Table 1: Variables Measurement

Variables	Description	Source
Gross profit margin	Measures as Revenue minus the cost of goods sold/ Revenue	Abideen (2023)
Total Debt Asset Ratio	Measures as Total Debt / Total Assets	Purwanti and Siregar (2019).
Interest coverage ratio	Measures dividing a company's earnings before interest and taxes (EBIT) by interest expense	Ali et al (2022)

RESULTS AND DISCUSSIONS

Tables 2: Descriptive Statistics

	GPM	TDA	ICR
Mean	1.342561	1.7364382	1.1201922
Median	1.4214607	1.7478000	1.16546987
Maximum	1.8539681	2.348246	1.7449068
Minimum	0.26554	0.5502283	0.12752592
Std. Dev.	0.394609	0.2913877	0.4253043
Skewness	-0.95155	-1.694785	-0.4997726
Kurtosis	3.2860	9.366986	2.356768
Jarque-Bera	10.03063	140.90838	3.82643572
Probability	0.006635	2.5242576	0.14760465
Sum	87.26650	112.8684	72.812499
Sum Sq. Dev.	9.9658720	5.434038	11.576560
Observations	65	65	65

Source: *E-Views 13, 2024*

Table 2 revealed the data used in the study with GPM, TDA and ICR having a mean value of 1.342561, 1.7364382 and 1.1201922 respectively. The deviation from the mean (standard deviation) was 0.394609, 0.2913877 and 0.4253043 respectively. In like manner, the Jacque-Bera values of GPM, TDA and ICR are 10.03063, 140.90838 and 3.82643572 respectively confirming that the data was normally distributed.

Table 3: Correlation Matrix

	GPM	TDA_	ICR
GPM	1	-0.21678	-0.244248
TDA	-0.2167	1	-0.07028
ICR	-0.24424	-0.07028	1

Source: *E-Views 13, 2024*

In Table 3, the relationship between financial leverage and the financial performance of listed industrial firms in Nigeria is presented. GPM showed a correlation of -0.21 with TDA, indicating a low correlation due to the negative value. Similarly, GPM exhibited a correlation of -0.24 with ICR, also indicating a low correlation due to the negative value. The correlation between TDA and GPM was -0.21, indicating a low correlation due to the negative value. The correlation between TDA and ICR was -0.07, signifying a low correlation due to the negative value. Additionally, ICR showed a correlation of -0.24 with GPM and -0.07 with TDA, both indicating low correlations due to the negative values.

Table 4: Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	3.166022	2	0.2054

Source: *E-Views 13, 2024*

The result of the Hausman test in Table 4 indicates that the fixed effect regression model is the most appropriate model to analyse the data of the study. With a probability of 0.2054, the random effect was rejected. Therefore, the fixed effect estimator was used to run the regression.

Table 5: Panel Result

Dependent Variable: GROSS_PROFIT_MARGIN
Method: Panel Least Squares
Sample: 2018 2022
Periods included: 5

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.98553563	0.20046539	9.9046348	0.0005832
TDA	0.25854038	0.10271126	2.5171567	0.0055551
ICR	-0.17321558	0.02612535	-6.6301679	0.0026847

Cross-section fixed (dummy variables)

Root MSE	9.001070	R-squared	0.784600
Mean dependent var	1.342561	Adjusted R-squared	0.719980
S.D. dependent var	0.394609	S.E. of regression	10.34144
Akaike info criterion	7.717412	Sum squared resid	5347.271
Schwarz criterion	8.248238	Log likelihood	-238.6746
Hannan-Quinn criter.	7.927167	F-statistic	12.14174
Durbin-Watson stat	1.478824	Prob(F-statistic)	0.000000

Source: *E-Views 13, 2024*

The coefficient of determination R^2 value at 0.78 shows that 78% of the change in the dependent variables is explained by the independent variables. The remaining 22% is explained by variables outside this model. The Adjusted R^2 of 71% is close to the R^2 value of 78%, meaning that the model is fit and useful for generalising within this period. The probability of the F-Statistics which is less than 0.05 indicates that the independent variables jointly explain the independent variables. Therefore, the model is fit and appropriate with a 0.000000 value.

Test of Hypotheses

H_{01}: The total debt-asset ratio has no significant effect on the financial performance of listed industrial firms in Nigeria.

The P-value of the total debt-asset ratio (TDA) is 0.0055 which is less than 0.05, this indicates that the total debt-asset ratio has a positive significant effect on the gross profit margin of listed industrial firms in Nigeria. Therefore, for every 1% increase in TDA, there is a 0.25854 increase in the financial performance of listed industrial firms in Nigeria.

H_{02}: Interest coverage ratio has no significant effect on the financial performance of listed industrial firms in Nigeria.

Conversely, the P-value of debt to interest coverage ratio (ICR) is 0.0000 which is less than 0.05, this indicates that ICR has a negative significant effect on the gross profit margin of listed industrial firms in Nigeria. Therefore, for every 1% increase in ICR, there is a -0.17321558 decrease in the financial performance of listed industrial firms in Nigeria.

Post Estimation Result

Residual Cross-Section Dependence Test

Cross-section means were removed during the computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	6.743408	65	0.9484
Pesaran scaled LM	8.051982		0.9484

Pesaran CD	4.223863	0.7381

Source: *E-view 13, 2024*

Following the residual cross-section dependence test result presented in a table, it is important to mention that the tests for Breusch-Pagan were conducted for the collated data to inspect the possibility of spurious regression among the variables (constant variance). The result recommends that there is no multicollinearity among the data, which is free from the consequences of heteroskedasticity.

DISCUSSION OF FINDINGS

Based on the findings of the research, the result of a positive significant effect of total debt-asset ratio and financial performance of listed industrial firms in Nigeria shows consistency with the works of Masturah et al (2023), Khan and Siddiqui (2023). The implication of this result the higher total debt financing indicates a higher degree of business expansion that will improve financial performance.

The result of the negative significant effect of interest coverage ratio and financial performance of listed industrial firms in Nigeria shows consistency with the works of Kurnia (2022), and Rizqa et al. (2023). A higher interest coverage ratio indicates that a company can pay its interest expense will reduce gross profit and will also reduce financial performance.

CONCLUSION AND RECOMMENDATIONS

The paper evaluates the effect of financial leverage on the financial performance of listed industrial firms in Nigeria. In agreement with prior evidence from developed countries that show significant linkage between financial leverage and financial performance. Thus, the study concluded that a unit increase in the total debt-asset ratio will have an increase in gross profit margin. The study also concluded based on the finding that the interest coverage ratio had a negative significant effect on gross profit margin, that a unit increase in interest coverage ratio will have a decrease in gross profit margin.

Drawing from our research findings, the recommendations are proffered as follows:

i.   The management of industrial firms should employ more sustainable debt financing to critical areas of the firm's investment for asset expansion, gross profit and financial performance of the firm.

ii.   The study also recommends that industrial firms in Nigeria should consider debt with a lower percentage of interest coverage, this will minimize its capital cost reduce the risk of default on loan payments and help financial managers to improve the financial performance of the firm.

REFERENCE

Abdullah, R. & Tursoy, T. (2019). Capital structure and firm performance: evidence of Germany under IFRS adoption," *Rev Manag Sci. 3(2). 1–18.*

Abideen, Z. U. (2023). Firm Performance in China: An Analysis of the Interplay between Financial Leverage, Firm Liquidity, and Firm Size. *Journal of Accounting and Finance in Emerging Economies, 9*(3), 141-150.

Ali, J., Tahira, Y., Amir, M., Ullah, F., Tahir, M., Shah, W., Khan, I. & Tariq, S. (2022) Leverage, Ownership Structure and Firm Performance. *Journal of Financial Risk Management*, *11*(1), 41-65. doi: 10.4236/jfrm.2022.111002.

Almajali A. Y., Alamro S.A. & Al-Soub, Y. Z. (2012). Factors Affecting the Financial Performance of Jordanian Insurance Companies Listed at Amman Stock Exchange. *Journal of Management Research, 4*(2), 266-289.

Ameur, G.B. & Mhiri, S.M., (2013). Explanatory factors of Bank performance: Evidence from Tunisia*: International Journal of Economics, Finance and Management, 2*(1),12-14.

Bui, N.T. (2017). The impact of financial leverage on firm performance: a case study of listed oil and gas companies in England. *International Journal of Economics, Commerce and Management*, 5(6), 477-485.

Das, N.C., Chowdhury, M.A.F. & Islam, M.N. (2022). The heterogeneous impact of leverage on firm performance: empirical evidence from Bangladesh. *South Asian Journal of Business Studies*, *11*(2), 235-252.

Ibrahim, U.A. & Isiaka, A.Q. (2020), Effect of financial leverage on firm value: evidence from selected firms quoted on the Nigerian stock exchange. *European Journal of Business and Management*, *12*(3), 124-134.

Ismawati, L. (2018). The Influence of Capital Structure and Dividends Policy to Firms Value Listed at Indonesian Stock Exchange. *Advances in Social Science, Education and Humanities Research*, 225, 23-44.

Ji, H. (2019). The Impact of Interest Coverage Ratio on Value Relevance of Reported Earnings: Evidence from South Korea. *Sustainability,* 11, 1-13.

Kargar, J., & Bluementhal, R. (2014). Leverage impact on working capital in small business. *TMA Journal*, *14*, 46–53.

Khan, B. F. & Siddiqui, D. A. (2023). The Effect of Financial Leverage, Supply Chain Finance and Liquidity on Firm Performance in Pakistan: A Comparative Analysis of Cement, Textile, Pharmaceutical and Sugar Sectors. *Journal of Economics, 5*(3), 1-14.

Kuo, C. H., & Lin, Y. C. (2018). The nonlinear relationship between leverage and firm performance: Evidence from Taiwanese listed firms. *Review of Pacific Basin Financial Markets and Policies*, *21*(1), 185-201.

Kurnia, M. R. (2022). The Effect of Interest Coverage Ratio, Basic Earning Power and Earning Per Share on Stock Price at PT. *Indofood Sukses Makmur Tbk. Jurnal Simki Economic*, 5 (1), 50-59.

Liu, Y., Li, L., & Wang, Y. (2022). How does leverage affect corporate performance? Empirical evidence from China's A-share listed companies. *Finance Research Letters*, 31, 74-79.

Mainoma, M.A. & Aruwa, S.A. (2021). Effect of corporate information on equity investors' decision making in listed non-financial firms in Nigeria. *International Journal of Public Administration and Management Research*, 6(6), 28-43.

Masturah, M., Keshminder, J,C., Chuah, S.C. & Khairol, A.A. (2022). The effects of financial leverage on firm performance in Shariah-listed consumer products & services firms. *Asia-Pacific Management Accounting Journal*, 17(1), 1-14.

Olowe, R. A. (2018). *Financial management*: Concepts, financial system and business finance. 4th Eds. Brierly Jones Nigeria Limited.

Pandey, I.M (2010). *Financial Management*, Tenth Edition, Vikas Publishing Home PVT Ltd, New Delhi.

Rajput, A. S., Chakraborty, S. & Kumar, P. (2020). Impact of leverage on profitability: evidence from Indian cement industry. *International Journal of Business and Globalisation*, 24(1), 91-107.

Rizqa, A., Giri, S. & Muhammad, R. (2023). Leverage on firm value: the role of financial performance mechanisms. *Jurnal Aplikasi Manajemen dan Bisnis*, 9(3), 751-762.