Effect of Financial Leverage on Financially Sustainability in Nigerian Industrial Goods Firms

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Abstract
The study determined the extent financial leverage affected operating cashflow margin in Nigerian industrial goods firms, using total debt to equity ratio and long-term debt to asset ratio as the independent variables. Ex post facto was used as the research design. Data were extracted from the annual accounts of the sampled firms. Panel regression analysis was employed to test the hypotheses. The study shows that Total debt to equity ratio has negative significant effect on operating cashflow margin of listed industrial goods firms in Nigeria at 5% level of significance. Meanwhile, the study revealed that long-term debt to asset ratio has a positive significant effect on operating cashflow margin of listed industrial goods firms in Nigeria at 5% level of significance. Based on the results, this study recommended among others that Financial Advisers needs to assess the firm's debt-to-equity ratio regular to prevent excessive gearing as well as recommend optimal capital structure verges.

Keywords: *Total debt to equity ratio, Long-term debt to asset ratio and Operating cashflow margin*

Introduction

Financial leverage plays both multifaceted and impactful role in a firm's capital structure decision-making process. Financial leverage denotes to the use of debt to finance the firm's operations and investment opportunities, with the expectation that the return on the investment financed by debt will exceed the cost of that debt (Aderemi, 2024). In simple terms, it is the proportion of a firm's capital that comes from borrowing as opposed to equity financing. Financial leverage allows firms to increase their potential return on equity by using borrowed funds to amplify the effects of earnings (Alaaraj, *et al* 2024). However, this also comes with a downside risk: excessive leverage can lead to higher financial costs, increased vulnerability during economic downturns, and even financial distress or bankruptcy if not carefully managed. The main concepts surrounding financial leverage include the cost of debt, the debt-to-equity ratio, and the firm's risk profile. The decision to use leverage is typically guided by the trade-off theory, which posits that firms seek to balance the tax benefits of debt with the potential costs of financial distress. Another theory, the pecking order theory, suggests that firms prefer to use internal financing first and will resort to external debt only when internal funds are insufficient. In Nigeria, where the financial landscape is characterized by high interest rates, inflation, and regulatory challenges, these concepts are of particular significance for firms that rely heavily on capital to fund their operations, expansion, and innovation (Adeyemi, *et al* 2024).

Financial sustainability refers to the ability of a firm to achieve long-term financial stability,

growth, and profitability while simultaneously contributing positively to the economy and society (Agu & Amedu, 2018). In the context of financial leverage, financial sustainability can be measured through various financial metrics that indicate a firm's ability to generate sufficient cash flow, maintain liquidity, and minimize risk. One of the key indicators used to assess a firm's economic sustainability is the operating cash flow margin, which measures the percentage of operating cash flows relative to total sales revenue (Elahi, *et al* 2021). This ratio is critical because it shows how effectively a firm generates cash from its core operations, which is a direct reflection of its long-term viability and sustainability (Oranefo & Egbunike, 2023). Adequate cash flow margin is also considered an important proxy for a firm's financial sustainability disclosure as it highlights whether a firm can generate enough cash from its operations to meet its financial obligations, pay off debt, and reinvest in the business (Akpan & Uwakmfonabasi, 2021). In a country like Nigeria, where access to credit is often constrained and the economy is subject to volatility, firms with strong operating cash flows are more likely to be resilient in the face of economic shocks.

Consequently, excessive debt in the capital structure can strain operating cash flows, reduce profitability, and limit the firm's ability to reinvest in growth opportunities or service debt obligations. High debt also increases the firm's exposure to financial distress, particularly in volatile economic conditions, further undermining long-term sustainability. As industrial goods firms struggle with their leverage decisions, many are unable to fully realize the benefits of debt financing, such as tax shields or access to capital, and may face difficulties in maintaining liquidity. Ultimately, the inability to balance financial leverage may result in reduced competitiveness, lower investor confidence, and even long-term financial instability for these firms (Bappah, *et al* 2024).

Furthermore, much of the existing studies limited to data that predates 2021. This study sought to fill this time period gap hence, ascertained data spanning 2012 to 2024. The study therefore assessed the extent financial leverage affects operating cashflow margin in Nigerian industrial goods firms. Specifically, this study determines the effect total debt to equity ratio and long-term debt to asset ratio on the operating cashflow margin of industrial goods firms in Nigeria.

Conceptual Review

Kajal and Bansal (2024) reported that firm financial leverage is a measure of how much a firm relies on borrowed capital (debt) as opposed to equity financing. By borrowing money, a company can invest in projects or assets that may yield returns greater than the cost of debt, thereby increasing shareholder value. Financial leverage is typically expressed as a ratio of debt to equity or as the debt-to-assets ratio (Suardi & Noor, 2015). While leverage can enhance returns in a favorable economic environment, it also introduces additional risk. High financial leverage means a company is more exposed to interest rate fluctuations and may struggle to meet its debt obligations during periods of financial difficulty or lower-than-expected revenues. Mohamed (2024) and Adeyemi, *et al* (2024) found that the degree of financial leverage a company uses can significantly affect its profitability and volatility. If the returns on investments funded by debt exceed the cost of borrowing, leverage can lead to higher returns for equity holders. Conversely, if the returns are lower than the cost of debt, the company may face financial distress or reduced profitability. Thus, the use of financial leverage is a balancing act—while it can magnify profits; it also increases the potential for losses, making it a key strategic decision for management (Moronya, 2024). The optimal level of financial leverage varies across firms and industries, depending on factors such as business risk, market conditions, and the

firm's ability to generate stable cash flows to service debt obligations.

Total Debt to Equity Ratio

The third key independent variable is the total debt to equity ratio, which combines both short-term and long-term debt relative to the firm's equity. This ratio offers a comprehensive view of a firm's overall debt structure and its reliance on external borrowing to finance its operations (Oktrima & Sutrisno, 2023). The total debt to equity ratio could affect the operating cash flow margin by increasing the firm's overall debt servicing obligations. A higher total debt load could put significant pressure on cash flow, particularly if the firm is unable to generate sufficient revenue or control costs effectively. However, if the firm uses debt judiciously to fund growth or capital expenditures that lead to higher sales, this ratio might have a positive impact on the operating cash flow margin.

The total debt to equity ratio's effect on operating cash flow margin is more contentious, with evidence supporting both negative and positive correlations. In Nigeria, Nworie and Mba (2022) concluded that leverage had a significant negative effect on return on assets, which may reflect a similar trend in cash flow margins, indicating that high total debt to equity ratios could hinder liquidity. This negative relationship was also echoed by Oranefo and Egbunike (2023), who found a negative effect of capital gearing on operating cash flows. However, Aderemi (2024) suggested that total debt might have a more complex, potentially positive influence depending on the firm's overall financial health, suggesting that while total debt can pose risks, it could also facilitate cash flows under favorable conditions.

Long-term Debt to Asset Ratio

The long-term debt to asset ratio represents the proportion of a firm's assets financed by long-term debt. This ratio is similar to the long-term debt to equity ratio, but instead of measuring debt in relation to equity, it compares debt to total assets (Aderemi, 2024). A high long-term debt to asset ratio may indicate that a firm is using debt to fund substantial portions of its capital investment or long-term projects. While this can lead to long-term growth and profitability, it can also affect the operating cash flow margin if the firm needs to service large interest payments on its long-term debt. As the framework suggests, the long-term debt to asset ratio could have both direct and indirect effects on the firm's liquidity, depending on how effectively it manages its debt and generates cash from operations.

Similarly, the long-term debt to asset ratio's effect on operating cash flow margin appears to follow a mixed trend. Meteke, *et al* (2022) found that long-term debt positively impacted return on assets, which could be extrapolated to improved cash flow margins in some cases, while long-term debt was also linked to negative effects on financial performance in other contexts, as seen in studies by Bappah et al. (2024). This suggests that long-term debt's effect on cash flows may depend on its scale and the company's ability to service it effectively.

Financial Sustainability

For a firm to be financially sustainable, it must demonstrate resilience to external shocks and market fluctuations, such as economic downturns, regulatory changes, or supply chain disruptions. This requires robust risk management strategies, diversified revenue streams, and a forward-looking approach to business strategy. Firms that achieve financial sustainability often focus on creating value that transcends immediate financial gain, seeking to build lasting relationships with customers, employees, suppliers, and communities (Nworie & Aniefuna,

2024). This could include adopting business practices that promote environmental conservation, social responsibility, and ethical governance while ensuring financial viability.

Financial sustainability also involves effectively managing resources, which includes optimizing the use of capital, labor, energy, and raw materials (Agu & Amedu, 2018). Firms with sustainable economic models invest in innovations that reduce waste, improve efficiency, and reduce the long-term environmental footprint of their operations. These companies also prioritize the well-being of their employees and local communities, recognizing that a healthy, engaged workforce and strong community ties are critical to long-term success. Moreover, a financially sustainable firm tends to have a strategic focus on diversification, whether through expanding into new markets, developing new products or services, or investing in technology to remain competitive in an ever-evolving marketplace.

This ratio is crucial because it highlights a company's ability to generate liquidity from its operations, which is essential for maintaining daily operations, paying down debt, reinvesting in the business, and rewarding shareholders. A high Operating Cashflow Margin indicates that a firm is efficient at converting sales into actual cash (Rahman, 2024), which is particularly important for sustaining operations without having to rely on external financing or credit (Elahi, *et al* 2021). Companies with strong operating cash flows are better positioned to weather financial stress, as they can meet obligations and fund growth initiatives from internal resources (Akpan & Uwakmfonabasi, 2021).

Empirical studies

Aderemi (2024) examined the effect of leverage on the financial performance of quoted consumer goods firms in Nigeria from 2015 to 2022. Descriptive statistics, correlation, Hausman Test, and panel regression analysis were employed using E-Views 10 to analyze the data. The Hausman Test was used to determine the best estimator between fixed and random effects regression. The study found that Long Term Debt Ratio had a positive and significant effect on the financial performance of quoted consumer goods firms in Nigeria. In contrast, Short Term Debt Ratio and Interest Coverage Ratio had positive but insignificant effects. Alaaraj, *et al* (2024) ascertained the effect of leverage ratio and current assets on the financial performance of Iraqi listed banks. The study utilized panel data from 2012 to 2022. Canonical correlations and weighted linear regression were used to test the hypotheses. The study showed that current assets have a significant impact on both Return on Assets (ROA) and Return on Equity (ROE). Leverage was found to have an impact on ROA but had an insignificant effect on ROE. Adeyemi, *et al* (2024) investigated the effect of financial leverage on the sustainable growth of conglomerate companies in Nigeria from 2000 to 2022. Data were extracted from annual reports and accounts of sampled firms and were analyzed with descriptive statistics, correlation, and fixed effect regression techniques. The study revealed that financial leverage has negative significant effect on sustainable growth. Akmalia (2023) ascertained the effect of leverage on firm value in manufacturing industry sector, spanning from 2016 to 2020. The research conducted hypothesis testing through multiple linear regression and moderated regression analysis (MRA) using E-Views 12. The results unveiled that, in this context, capital structure did not exert a statistically significant impact on firm value. Anozie, *et al* (2023) determined the effect of leverage on financial performance among Nigerian oil and gas companies from 2011 to 2020. The data was extracted from the annual financial reports of five Nigerian oil and gas companies. Descriptive statistics and panel regression analysis, their findings revealed that while long-term debt to total assets had a statistically significant negative impact on return on assets,

both short-term debt to total assets and total debt to total equity exhibited positive yet insignificant effects. Boshnak (2023) ascertained the effect of leverage on the performance of firms listed on the Saudi Stock Exchange (Tadawul) from 2016 to 2020. The study employed a generalized method of moments (GMM) estimation to facilitate hypothesis testing. The study revealed that short-term debt, long-term debt, total debt, and debt-to-equity ratios exerted a significant negative impact on firm operational performance, as measured by return on assets. Moreover, long-term debt, total debt, and debt-to-equity ratios also exhibited a notable adverse effect on firm financial performance (return on equity) and market performance, quantified in terms of Tobin's Q. Razaq, *et al* (2023) ascertained the effect of leverage on the sustainability reporting of listed non-financial firms in Nigeria from 2011 to 2020. A panel regression model analyzed the data using the E-View 10 statistical tool. The study showed that leverage has positive and significant effects on sustainability reporting. Adekanmi (2022) determined the effect of financial leverage on the sustainability reporting of non-financial firms listed on the Nigerian Stock Exchange (NSE) from 2006 to 2020. Panel data least squares regression was used for data analysis. The study revealed that financial leverage showed positive insignificant effect on sustainability reporting. Aishwarya (2022) determined the effect of capital structure on profitability of companies listed in Indian stock exchange with respect to automobile industry from 2010-2019. The study found that there is a significant positive relationship between capital structure and firm performance. Alade and Odugbemi (2022) ascertained the effect of corporate characteristics on the implementation of the integrated reporting framework in listed oil and gas firms in Nigeria. Using a census sampling technique, the study included all 11 oil and gas firms listed on the Nigerian Stock Exchange as of December 31, 2020. Data from the period 2011 to 2020 were drawn from annual reports available on company websites. The analysis employed descriptive statistics, a serial correlation test, and panel least square regression. Findings revealed that corporate attributes had a positive and statistically significant effect on the implementation of the integrated reporting framework. Alfisah and Zulfikar (2022) examined the effects of capital structure on firm value, financial performance, and the combined influence of capital structure and financial performance on firm value. Their study focused on Food and Beverage companies listed on the Indonesia Stock Exchange (IDX) during the period from 2016 to 2020. The data analysis involved a simple multiple regression model, considering both dependent and independent variables in numerical form with size scales. The outcomes of the study indicated that capital structure had no significant impact on firm value. Musa and Ibrahim (2022) studied the effect of leverage on profitability of Information and Communication Technology (ICT) companies listed on the Nigerian Stock Exchange. Data were extracted from annual reports of the companies for the period 2012 to 2020. Data were analyzed using multiple regression analysis. The study revealed that there is no significant relationship between total debt ratio and return on assets of the ICT companies listed on the Nigerian Stock Exchange and that debt-equity-ratio has no significant relationship with return on assets. Nworie and Mba (2022) investigated the effect of firm leverage on the financial performance of listed food and beverages firms in Nigeria. Data were obtained from the annual reports of sampled companies from 2012 to 2021 reporting periods. Panel least square regression using Fixed Effect Model was employed in estimating the regression results at 5% level of significance. The study showed that firm leverage had a significant but negative effect on the return on assets of listed food and beverages firms in Nigeria.

Methodology

Research Design

Ex-post facto design was used for the study. This approach is valuable for investigating relationships between variables where the cause and effect are not manipulated but are instead inferred from existing data.

Population of the Study

The population for this study made up of the industrial goods firms listed on the Nigerian Exchange Group (NGX).

Sample Size

This study used purposive sampling technique to select nine samples of firms for the study. This technique is suitable because the sample needed to meet specific criteria, such as being listed on the NGX from 2012 and having available financial data from 2012 to 2024.

Method of Data Collection

Data were collected from the audited financial statements of the selected firms over the period 2012 to 2024. The financial statements are publicly available through the Nigerian Exchange Group (NGX) and other regulatory bodies in Nigeria.

Model Specification

This study modified the study of Abubakar (2020), the above model was modified thus:

$OCM_{it} = \alpha_0 + \beta_1(TDER)_{it} + \beta_2(LTDAR)_{it} + \epsilon_{it}$ ------……..i

Where:

OCFit = Operating Cash Flow Margin for firm i at time t

TDERit = Total Debt to Equity Ratio for firm i at time t

LTDARit = Long-term Debt to Asset Ratio for firm i at time t

α = Constant term

β_1,β_2, = Regression coefficients for each financial leverage proxy ratio

ϵ_{it} = Error term

i = Firm

t = Time (year)

The model assessed how each debt ratio impacts the operating cash flow margin, controlling for other variables.

Method of Data Analysis

Descriptive statistics included a measure of central tendency (mean) and measures of variability (standard deviation, range), which helped summarize the data and identify trends and patterns across the firms over time.

Panel least squares regression was used to test the hypotheses and assess the effect between financial leverage and operating cash flow margin via E-view 9.0.

Decision Rule

If the p-value is less than 0.05, the alternate hypothesis is accepted and null hypothesis rejected, however, if otherwise, the alternate hypothesis is rejected and null hypothesis accepted.

Descriptive Analysis of Data

Table 1 Descriptive Analysis

	OCF	TDER	LTDAR
Mean	0.340769	0.080769	0.056923
Median	0.070000	0.060000	0.050000
Maximum	2.060000	0.220000	0.130000
Minimum	-0.210000	0.030000	0.000000
Std. Dev.	0.594028	0.056327	0.036400
Skewness	1.802442	1.186256	0.491188
Kurtosis	5.698271	3.392179	2.216903
Jarque-Bera	98.84480	28.19025	7.694230
Probability	0.000000	0.000001	0.021341
Sum	39.87000	9.450000	6.660000
Sum Sq. Dev.	40.93283	0.368031	0.153692
Observations	117	117	117

Source: E-Views 9.0 Descriptive Output, 2025

Interpretation

Table 1 shows the descriptive statistics for the dependent variable, operating cash flow margin (OCF) and the independent variables Total debt to equity ratio (TDER), and Long-term debt to asset ratio (LTDAR). The mean serves as a tool for setting benchmark. The median re-ranks and takes the central tendency. While the maximum and minimum values help in detecting problem in a data. The standard deviation revealed the variation from the mean. It is a measure of risk, the larger the standard deviation, the higher the risk. The standard deviation is a measure that summarizes the amount by which the value within a dataset varies from the mean. It is the most robust and widely used measure of dispersion. The standard deviation in the firms various sectors for the period 2012-2024 is 0.056327 and 0.036400 for TDER and LTDAR respectively. Skewness and Kurtosis are contained in Jarque-Bera, which are positively skewed and is an indication of a rise on TDER and LTDAR respectively which is profitable or forwardness. Jarque-bera is used to test for normality; to know whether the data normally distributed. Table 1 showed that many of these variables are with probability values less than 0.05. So invariably, they are significantly normally distributed. While the probability values are significantly normally distributed because their probability values of are less than 5%.

Test of Hypotheses

Table 2: Regression analysis between

Dependent Variable: OCF
Method: Panel Least Squares
Date: 10/06/25 Time: 14:43
Sample: 2012 2024
Periods included: 13
Cross-sections included: 9
Total panel (balanced) observations: 117

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.251394	0.097590	2.576029	0.0113

TDER	-13.48488	3.404614	-3.960766	0.0001
LTDAR	20.70406	5.268463	3.929811	0.0001

R-squared	0.246244	Mean dependent var	0.340769
Adjusted R-squared	0.242845	S.D. dependent var	0.594028
S.E. of regression	0.561397	Akaike info criterion	1.708531
Sum squared resid	35.92903	Schwarz criterion	1.779356
Log likelihood	-96.94906	Hannan-Quinn criter.	1.737285
F-statistic	7.938326	Durbin-Watson stat	2.508514
Prob(F-statistic)	0.000592		

Source: E-views 9.0 Output (2025)

In table 2, a panel least square regression analysis was conducted to test the effect between Total debt to equity ratio (TDER), Long-term debt to asset ratio (LTDAR) and operating cash flow margin (OCF). Adjusted R squared is coefficient of determination which tells us the changes in the dependent variable due to variation in the independent variable. From the findings in the table 2, the value of adjusted R squared was 0.24, an indication that there was variation of 24% on OCF due to changes in TDER and LTDAR. This implies that only 24% changes in OCF could be accounted for by TDER and LTDAR. The Durbin-Watson Statistic of 2.509 suggests that the model does not contain serial correlation. The F-statistic is equal to 7.938326 and the associated F-statistic probability is equal to 0.000, so the alternative hypotheses were accepted and the null hypotheses was rejected.

Hypothesis One

$H0_1$: Total debt to equity ratio has no significant effect on the operating cashflow margin of listed industrial goods firms in Nigeria.

The probability of the slope coefficients indicates that; P(= 0.000). The co-efficient value of; β_1= --13.48488, implies that total debt to equity ratio (TDER) and operating cashflow margin is negatively related to operating cashflow margin though statistically significant at 5%. Since the P-value of 0.000 is less than the critical value of 5% (0.05), then, it would be upheld that there is a significant effect between Total debt to equity ratio (TDER) and operating cashflow margin of listed industrial goods firms in Nigeria at 5% level of significance.

Hypothesis Two

$H0_2$: Long-term debt to asset ratio has no significant effect on the operating cashflow margin of listed industrial goods firms in Nigeria.

The probability of the slope coefficients indicates that; P(= 0.000). The co-efficient value of; β_1= 20.70406, showing that long-term debt to asset ratio and operating cashflow margin is positively related to operating cashflow margin though statistically significant at 5%. Since the P-value of 0.000 is less than the critical value of 5% (0.05), then, the study upheld that there is a significant effect between long-term debt to asset ratio and operating cashflow margin of listed industrial goods firms in Nigeria at 5% level of significance.

The result indicates that there is a significant effect between Total debt to equity ratio (TDER) and operating cashflow margin of listed industrial goods firms in Nigeria at 5% level of significance. This result is in contrary with Taibu (2024) who documented a positive effect on ROE, recommending that in some contexts, equity-heavy leverage may still benefit shareholders,

depending on return expectations. However, this result is in line supported by Adeyemi et al. (2024) and Bappah et al. (2024), who found that TDER negatively affects performance.
The study upheld that there is a significant effect between long-term debt to asset ratio and operating cashflow margin of listed industrial goods firms in Nigeria at 5% level of significance. This result is in contrary with Boshnak (2023) who revealed that long-term debt had negative effect on firm value. However, this result is in line with Olaniyi et al. (2022) and Sukma et al. (2022) noted a positive but varied influence of long-term debt on performance. Bui et al. (2023) found no significant effect of long-term debt on profitability in Vietnam's manufacturing sector, which aligns with this study.

Conclusion and Recommendations

The study assessed the extent financial leverage affected operating cashflow margin in Nigerian industrial goods firms, using total debt to equity ratio and long-term debt to asset ratio as the independent variables. Data were extracted from the annual accounts of the sampled firms. Panel regression analysis was employed to test the hypotheses. The study shows that Total debt to equity ratio has negative significant effect on operating cashflow margin of listed industrial goods firms in Nigeria at 5% level of significance. Meanwhile, the study revealed that long-term debt to asset ratio has a positive significant effect on operating cashflow margin of listed industrial goods firms in Nigeria at 5% level of significance. The evidence suggests that not all leverage is detrimental—some forms of debt structure may actually support sustainability by enhancing operational efficiency or freeing up internal capital for productive investment.

Recommendations

Based on the results, this study recommended as follows;

1. Financial Advisers need to evaluate the firm's debt-to-equity ratio regularly to prevent excessive gearing as well as recommend optimal capital structure thresholds.
2. Finance units need not to rely merely on long-term debt relative to asset base as a lever for improving operational cashflows. Instead, they need to combine it with asset efficiency tactics and ensure that long-term borrowings are directed towards revenue-generating assets.

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