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FINANCIAL LEVERAGE AND INTERNAL GROWTH RATE OF LISTED INDUSTRIAL GOODS FIRMS IN NIGERIA

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ABSTRACT

The study examined the effect of financial leverage on the internal growth rate of listed industrial goods firms in Nigeria. The specific objective was to ascertain the effect of debt asset ratio, debt equity ratio, debt to earnings before interest, taxes, depreciation, and amortisation (EBITDA) ratio and interest coverage ratio on internal growth rate. Ex-post facto research design was adopted. The population comprised thirteen listed industrial goods firms in Nigeria, from which a purposive sample size of nine was selected. Secondary data were sourced from the annual reports of the firms (2013-2023). The hypotheses were tested using panel estimated generalised least square. The findings revealed that: Debt Asset Ratio has a positive and significant effect on internal growth rate of listed industrial goods firms in Nigeria (β = 0.8677, p = 0.0012); Debt Equity Ratio has a negative and significant effect on internal growth rate (β = -1.7390, p = 0.0000); Debt to EBITDA Ratio has a positive and significant effect on internal growth rate (β = 0.2397, p = 0.0000); Interest Coverage Ratio has a positive but insignificant effect on internal growth rate of listed industrial goods firms in Nigeria (β = 0.0004, p = 0.8113). The study concluded that financial leverage exerts both positive and negative influences on the internal growth rate of listed industrial goods firms in Nigeria, emphasizing the need for strategic debt management to balance growth potential with financial stability. It therefore recommends that management teams of Nigerian industrial goods firms are advised to strategically use debt financing to fund expansion and capital investment, ensuring that the firm is making optimal use of its assets by supporting growth initiatives, such as new product development or market expansion, without jeopardizing the firm's long-term sustainability.

Key words: *Debt to Assets Ratio, Debt to EBITDA, Debt to Equity Ratio, Financial Leverage, Interest Coverage Ratio, Internal Growth Rate.*

INTRODUCTION

In today's dynamic and competitive business environment, the strategic management of financial resources is central to growth and survival of firms. One of the key financial decisions firms make is how to structure their capital, whether to rely on internal funds such

as retained earnings and equity or to rely on external sources like debt. Financial leverage, which refers to the use of debt in a firm's capital structure (Ofulue, Ezeagba, Amahalu & Obi, 2022), has significant implications on firm performance, value creation and ultimately growth. When used effectively, leverage can enhance shareholder's returns, but when mismanaged, it can lead to financial distress or even bankruptcy (Anaike, Chigbo & Nworie, 2025; Ikwuo, Nwite, Nworie & Nworie, 2025). On the other hand, firm internal growth refers to the increase in a company's capacity, revenue, or profitability driven by its existing resources and operations, without relying on external financing or acquisitions (Indeed, 2022). In recent times, every business environment across the globe has got more competitive than it used to be years ago. This is understandable as consumer tastes, technology and the market trend keep on changing. Particularly, the Nigerian business environment faces a wide range of challenges that require firms to explore different strategies for growth and sustainability. Among these strategies, financial leverage is one of the most significant factors influencing the growth potential of firms (Hamouri, Al-Rdaydeh & Ghazalat, 2018). Olulu-Briggs (2024) submitted that the leverage level of a firm refers to the use of debt financing to fund operations or expand business activities, with the goal of enhancing the return on equity for shareholders. As businesses grow in size and complexity, leveraging financial resources through both debt and equity has become essential for the expansion and diversification of firms, especially in the industrial goods sector. In today's business environment, effective financial leverage plays a critical role in the decision-making process of corporate managers. Financial leverage allows companies to use borrowed funds to finance their activities without necessarily diluting ownership or equity (Chizuru & Ogoke, 2024). This is particularly important in an environment like Nigeria's, where access to capital is limited and businesses often struggle to raise enough equity from shareholders.

The concept of financial leverage, while widely recognized, involves a combination of different financial elements, including debt financing, interest rates, and equity financing (Ofulue, Ezeagba, Amahalu & Obi, 2022). Financial leverage essentially refers to the ability of a company to use borrowed funds to increase its returns on equity. Of note, the Nigerian industrial goods sector is capital intensive and often requires significant financing to sustain and expand operations. Hence, without leveraging financial tools such as loans and bonds, many firms would find it difficult to fund their growth initiatives or remain competitive (Ofulue, Ezeagba, Amahalu & Obi, 2022). The basic principle behind financial leverage is that a company can increase its profitability by using debt to fund operations, especially when the cost of borrowing is lower than the return on investment generated by the borrowed funds

(Ukwueze & Ajibo, 2024). However, leveraging also comes with its risks, as excessive reliance on debt can lead to financial distress or bankruptcy, particularly if the business is unable to meet its debt obligations.

Financial leverage affects the internal growth rate of a company, which is the rate at which a business can grow using its own resources (Dzafic & Polić, 2021), primarily its retained earnings. The internal growth rate (IGR) represents the maximum growth a company can achieve without resorting to external financing (Dzafic & Polić, 2021). Financial leverage, when used properly, can influence a company's internal growth rate by increasing the return on investment and allowing the company to reinvest the profits into further expansion. However, the impact of financial leverage on internal growth is complex, as it also depends on the firm's ability to manage the risks associated with debt. For example, a company that has excessive debt might face challenges in maintaining its growth rate because the higher interest costs can reduce available resources for reinvestment (Aderemi, 2024). On the other hand, a company with optimal financial leverage may be able to reinvest more into its business, leading to higher growth. Moreover, the use of financial leverage is closely tied to the firm's capital structure, which refers to the mix of debt and equity used to finance the company's operations (Aghaebe & Oranefo, 2024).

A critical problem confronting companies, especially those in the industrial goods sector is the difficulty in striking an optimal balance between debt and equity to support sustainable growth. Although financial leverage, which denotes using borrowed funds to finance operations and expansion, is a widely used strategy, it presents significant risks when not properly managed (Moridu, 2024); Yen & Thanh, 2024). While the appropriate use of leverage can increase profitability, fund innovation, and enhance a firm's competitive edge, excessive reliance on debt can result in financial distress, reduced investor confidence, and potential insolvency. Many firms struggle to determine the precise level of leverage that maximizes returns without compromising financial stability. This persistent challenge highlights the need for strategic financial management frameworks that can guide firms in using leverage to drive growth while minimizing associated risks (Ajao & Azukaego, 2024). Also, many firms in the sector face challenges in managing financial leverage effectively due to external factors such as high inflation, volatile exchange rates, and an unstable power supply. These challenges create an environment where firms are often forced to take on excessive debt to meet their operational and expansion needs. Despite the potential for leveraging, many industrial goods companies in Nigeria struggle with an imbalance in their

capital structure, either relying too heavily on debt or equity (Ofulue, Ezeagba, Amahalu & Obi, 2022). Sub-optimal financial leverage undermines firm's ability to realize the full benefits of debt financing and hampers their internal growth rate, as the burden of debt servicing reduces available resources for reinvestment.

Additionally, the failure to effectively manage financial leverage in the industrial goods sector has far-reaching consequences for firms' long term growth prospects. Excessive reliance on debt can lead to financial distress, high interest expenses, and ultimately, a reduction in profitability. Similarly, firms that are overly dependent on equity may dilute their ownership base and reduce their return on equity. These issues can limit a firm's ability to reinvest in its operations, hinder innovation, and reduce its competitive advantage, ultimately impeding the company's internal growth rate. Finally, poor financial leverage management can lead to a decline in investor confidence and a decrease in market value, which adversely affects the sustainability of these firms in the highly competitive Nigerian business environment.

Objectives

The main objective of the study is to examine the effect of financial leverage on the internal growth rate of listed industrial goods firms in Nigeria. The specific objectives are to:

1. examine the effect of debt asset ratio on internal growth rate of listed industrial goods firms in Nigeria.
2. ascertain the effect of debt equity ratio on internal growth rate of listed industrial goods firms in Nigeria.
3. determine the effect of debt to earning before interest, tax, depreciation and amortization (EBITDA) Ratio on internal growth rate of listed industrial goods firms in Nigeria.
4. examine the effect of interest coverage ratio on internal growth rate of listed industrial goods firms in Nigeria.

LITERATURE REVIEW

Financial Leverage

Financial leverage refers to the use of borrowed funds to finance assets with the aim of increasing potential returns on investment (Odhiambo, Murori & Aringo, 2025). Ofulue, Ezeagba, Amahalu, and Obi (2022) conceptualized financial leverage as the extent to which a company relies on debt in its capital structure to achieve business objectives, such as expansion or operational efficiency. The concept stems from the principle that while equity capital is limited and often costly, borrowing allows firms to acquire resources without

diluting ownership (Omabu, Okoye & Amahalu, 2021). In essence, financial leverage measures the degree to which a company's operations are funded through debt rather than equity (Dam & Phan, 2025). This reliance on debt financing introduces a fixed financial obligation in the form of interest payments, which must be met regardless of the company's profitability. Consequently, firms with high financial leverage face heightened risks during economic downturns or periods of poor performance, as their ability to meet these obligations can be jeopardized (Chizuru & Ogoke, 2024). On the other hand, during periods of growth, high leverage can significantly amplify profits and shareholder returns. Financial leverage is often expressed through various ratios, such as the debt-to-equity ratio or the debt-to-asset ratio (Imeokparia, Adesanmi & Fadipe, 2021). These ratios provide a quantitative assessment of leverage, offering stakeholders hint into a firm's financial structure and risk profile (Odhiambo, Murori & Aringo, 2025).

Debt Asset Ratio

The debt asset ratio is a financial metric that assesses the proportion of a company's assets that are financed through debt (Imeokparia, Adesanmi & Fadipe, 2021). It is calculated by dividing total liabilities by total assets, providing a snapshot of the firm's financial leverage and solvency (Ndubuisi, Juliet & Onyema, 2018). This ratio helps stakeholders understand the extent to which a company relies on borrowed funds to acquire and maintain its asset base. A higher debt asset ratio indicates a greater reliance on debt, while a lower ratio suggests that assets are primarily funded through equity or retained earnings. This ratio is pivotal in evaluating a firm's financial stability and risk exposure.

H_{01} Debt asset ratio has no significant effect on internal growth rate of listed industrial goods firms in Nigeria.

Debt Equity Ratio

The debt equity ratio is a financial metric that measures the relationship between a company's total liabilities and its shareholders' equity (Imeokparia, Adesanmi & Fadipe, 2021). It is calculated by dividing total debt by total equity, offering a clear representation of the firm's financial leverage. This ratio serves as a critical indicator of the balance between borrowed funds and the owners' investment, reflecting the company's capital structure and financial strategy (Danso, Lartey, Gyimah & Adu-Ameyaw, 2021). A high debt equity ratio indicates that a company relies heavily on borrowed funds, which may suggest greater financial risk. Companies with high ratios are more exposed to fluctuations in interest rates, economic

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downturns, and changes in market conditions. Conversely, a low ratio implies a conservative approach to financing, with a heavier reliance on equity capital. While this reduces financial risk, it may also limit the firm's ability to capitalize on growth opportunities that require substantial funding (Moridu, 2024). The debt equity ratio is widely used by investors, creditors, and financial analysts to assess a firm's risk profile and financial health (Okpunor, Echekoba & Adigwe, 2023).

H_{02} Debt equity ratio has no significant effect on internal growth rate of listed industrial goods firms in Nigeria.

Debt to EBITDA Ratio

The Debt to Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA) ratio is a financial metric that measures a company's ability to repay its debt obligations using its earnings before non-cash expenses and interest payments (Vestr, 2025). This ratio is calculated by dividing total debt by EBITDA (CFI Team, 2025), offering a clear picture of how many years it would take for a company to pay off its debt if it devoted all of its EBITDA to repayment. As a measure of leverage, it serves as an indicator of a company's financial health, its capacity to handle debt, and its operational efficiency. This ratio is especially significant for stakeholders, such as investors and creditors, as it provides a straightforward means of assessing the sustainability of a company's debt levels in relation to its core profitability. High Debt to EBITDA ratios may signal potential financial strain, suggesting that a company might face difficulties in meeting its debt obligations during periods of reduced profitability. Conversely, a low ratio often indicates manageable debt levels and strong financial stability, which can be a positive signal for long-term viability (Vestr, 2025).

H_{03} Debt to EBITDA Ratio does not significantly affect internal growth rate of listed industrial goods firms in Nigeria.

Interest Coverage Ratio

The Interest Coverage Ratio is a financial metric that measures a company's ability to meet its interest payment obligations using its operating earnings (Imeokparia, Adesanmi & Fadipe, 2021). It is calculated by dividing earnings before interest and taxes (EBIT) by the total interest expenses for a given period (Aderemi, Sadiq & Fadilat, 2024). This ratio offers hints into a company's short-term financial health, particularly its capacity to service debt without compromising operational sustainability. A high Interest Coverage Ratio indicates that a company generates sufficient earnings to cover its interest payments comfortably, reflecting

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strong financial stability. Companies with higher ratios are typically considered less risky by creditors and investors, as they are less likely to face financial distress due to an inability to meet debt-related obligations. Conversely, a low ratio suggests potential vulnerability, as the company may struggle to generate enough earnings to cover interest payments, particularly during periods of economic downturn or declining revenues.

H_{04} Interest coverage ratio has no significant effect on internal growth rate of listed industrial goods firms in Nigeria.

Firm Internal Growth

Firm Internal Growth refers to the increase in a company's capacity, revenue, or profitability driven by its existing resources and operations, without relying on external financing or acquisitions (Indeed, 2022). This concept emphasizes the expansion of a company's market share, production capabilities, or product offerings through organic means, such as reinvesting profits, improving operational efficiency, or innovating new products and services (Tella, Olaleye, Olorunsola, Babatunde & Akanbi, 2023).

Internal growth is a measure of a company's ability to sustain its development using internally generated funds (Gibb, 2021). This self-reliance highlights the firm's operational strength and management efficiency, as it avoids the risks and costs associated with external borrowing or equity dilution. Companies focused on internal growth often prioritize sustainable practices, investing in areas like research and development, employee training, and process optimization to enhance their long-term competitive advantage. The concept of internal growth underscores the importance of reinvestment in business operations (Dzafic & Polić, 2021). For example, firms may allocate retained earnings to expand production facilities, upgrade technology, or develop new products to meet evolving customer needs. This reinvestment cycle allows companies to grow incrementally while maintaining financial independence and minimizing debt exposure. Over time, sustained internal growth builds a solid foundation for profitability and market resilience (Indeed, 2022).

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Conceptual Framework

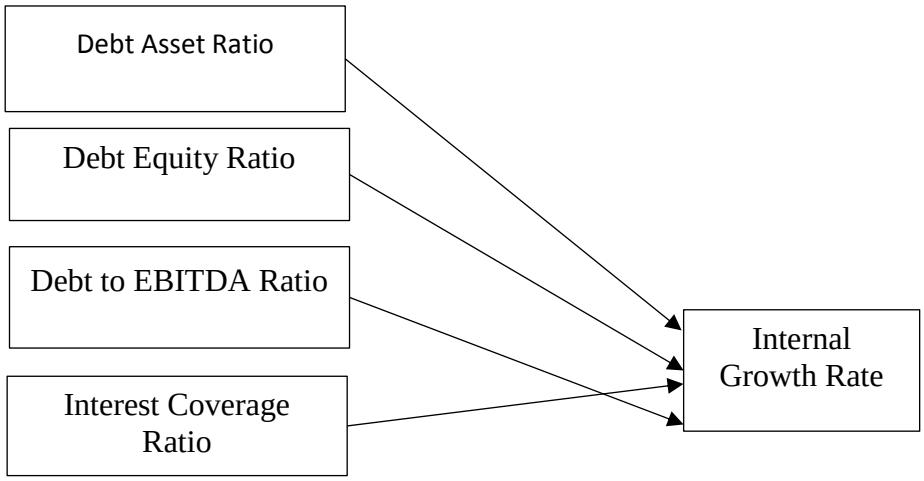

Figure 2.1 Conceptual Framework

Source: Author (2024)

Theoretical Review

Pecking Order Theory

The Pecking Order Theory was developed by Stewart C. Myers and Nicolas Majluf in 1984 (Maimako & Moses, 2011). Their work built on earlier ideas related to information asymmetry in capital markets (Ezenwafor, Okegbe & Nwoye, 2021) and how it affects financing decisions. They proposed this theory in a bid to explain why firms might prefer one source of financing over another. The theory gained ground because it addressed observed behavior that could not be explained by traditional capital structure theories, such as why firms often avoid issuing new equity even when it seems financially viable to do so. The main argument of the Pecking Order Theory is that firms follow a hierarchy when choosing how to finance their activities. Internal funds such as retained earnings are preferred because they do not involve any external scrutiny or ownership dilution (Mbugua, 2010). When internal resources are insufficient, firms next turn to debt, and only as a last resort will they issue new equity. The theory assumes that managers have better information about the firm's true value and prospects than outside investors (Maimako & Moses, 2011). Because issuing new equity can signal that a firm is overvalued, managers avoid it to prevent negative market reactions. This behavior influences the structure of a firm's balance sheet and ultimately its financial strategy.

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In the context of this study, the Pecking Order Theory is particularly relevant because it helps to explain how financial leverage, especially debt-based measures, impacts a firm's internal growth rate. Industrial goods firms in Nigeria may rely heavily on internally generated funds due to market conditions or high costs of external financing. When such funds are not enough, debt becomes the next option. However, the level and structure of that debt, whether measured by debt-to-assets, debt-to-equity, or interest coverage, can influence how much the firm reinvests in its operations. A high dependence on debt may either facilitate growth through capital infusion or constrain it if servicing the debt becomes burdensome. Thus, the theory supports the study's investigation into how financial leverage variables affect internal growth outcomes.

Trade-Off Theory

The Trade-Off Theory originated from the work of Franco Modigliani and Merton Miller in 1963 when they extended their earlier work on capital structure by incorporating the effects of corporate taxes (Al-Kahtani & Al-Eraij, 2018). Their initial theorem of 1958 proposed that in a world without taxes, bankruptcy costs, and asymmetric information, a firm's capital structure would not influence its value (Yilmaz, 2020). However, in their 1963 revision, they introduced the concept of tax shields arising from debt financing, thus laying the groundwork for the Trade-Off Theory. Over the years, scholars such as Kraus and Litzenberger (1973) further developed the theory by formalizing the trade-off between the tax advantages of debt and the costs associated with financial distress. The main postulation of the Trade-Off Theory is that firms strive to achieve an optimal capital structure by balancing the benefits and costs of debt financing (Odhiambo, Murori & Aringo, 2025). On the benefit side, debt provides a tax shield as interest payments are tax-deductible, which reduces the firm's taxable income and enhances profitability. However, excessive reliance on debt increases the likelihood of financial distress, which entails both direct costs, such as legal fees during bankruptcy, and indirect costs, such as reputational damage and operational disruptions. The theory suggests that a firm's value is maximized at the point where the marginal benefits of additional debt equal its marginal costs (Ramadan, 2015). Therefore, firms consider their risk profile, growth opportunities, and operating environment when determining their leverage levels.

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Empirical Review

Taibu (2024) explored the relationship between leverage and the financial performance of non-financial firms listed on the Nigerian Stock Exchange (NSE). The study used secondary data from the annual reports and accounts of these firms for the period 2011 to 2022. Regression analysis revealed that changes in leverage positively affected return on equity and enhanced shareholder wealth. Additionally, the study found an insignificantly positive relationship between financial leverage (measured by the debt-equity ratio) and return on capital employed. It recommended that the government create a more favorable business environment, such as increasing tax relief, to help Nigerian companies retain earnings and improve internal investment.

Chizuru and Ogoke (2024) examined the effect of financial leverage on the financial performance of quoted commercial banks in Nigeria from 2014 to 2023. A sample of 13 banks was analyzed using fixed effect models. The study found that short-term debt and total debt negatively impacted return on equity (ROE), while long-term debt, debt equity ratio, and interest earned ratio positively influenced return on assets (ROA). The study concluded that financial leverage significantly affects bank performance by improving managerial efficiency, with a recommendation for an optimal debt-equity mix to enhance financial performance and competitiveness.

Aderemi, Sadiq, and Fadilat (2024) studied the effect of leverage on the financial performance of quoted consumer goods firms in Nigeria, using data from 11 firms listed on the Nigeria Exchange Group (NGX) between 2015 and 2022. The study utilized Long Term Debt Ratio (LTDR), Short Term Debt Ratio (STDR), and Interest Coverage Ratio (INCOV) as measures of leverage, and Return on Equity (ROE) as a performance indicator. The analysis, which included descriptive statistics, correlation, and panel regression with the Hausman test, found that LTDR had a positive and significant effect on financial performance, while STDR and INCOV showed positive but insignificant effects. The study concluded that leverage has a significant impact on the financial performance of quoted consumer goods firms in Nigeria.

Moridu (2024) investigated the effect of financial leverage, measured by the Debt to Asset Ratio (DAR) and Debt to Equity Ratio (DER), on return on assets (ROA) in food and beverage sector companies listed on the Indonesia Stock Exchange (BEI) during 2017-2021. Data from 14 firms selected using purposive sampling were analyzed using multiple linear regression. The findings showed that the DAR ratio did not significantly affect ROA, whereas the DER ratio had a significant positive impact on ROA.

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Dibua and Ikilidih (2023) examined the effect of debt financing on shareholder wealth in quoted manufacturing firms in Nigeria, focusing on the debt-to-capital ratio and earnings per share. The study adopted an ex-post facto research design and analyzed data from the sampled firms over an eleven-year period, from 2010 to 2020. Descriptive statistics, correlation analysis, and panel least squares regression were applied. The analysis revealed an inverse relationship between the debt-to-capital ratio and earnings per share. The study concluded that debt financing significantly affects shareholder wealth creation and recommended that firm managers exercise caution when considering financing options, preferring internal sources like owners' capital, retained profit, and asset sales.

Adibeli and Amahalu (2023) investigated the effect of debt financing on shareholder wealth creation in quoted manufacturing firms in Nigeria, covering a period of ten years from 2012 to 2021. The study specifically examined the effects of debt ratio on earnings per share, short-term debt ratio on return on equity, and long-term debt ratio on cash value added. The data were sourced from the annual reports of 21 sampled manufacturing firms, with an ex-post facto research design employed. Descriptive statistics and inferential statistics, including Pearson correlation and panel least squares regression, were used to analyze the data. The results indicated significant positive relationships between debt ratio and earnings per share, short-term debt ratio and return on equity, and long-term debt ratio and cash value added. The study concluded that debt financing significantly influences shareholder wealth creation and recommended that firms leverage debt to improve their financial outcomes.

MATERIALS AND METHOD

This study adopts an *ex-post facto* research design due to its appropriateness in investigating the effects of financial leverage on the internal growth rate of listed industrial goods firms in Nigeria. The *ex-post facto* design is particularly suitable for research where data is collected retrospectively to explore causal relationships (Rohwer, 2022). Since the study evaluates how historical financial leverage practices (such as debt-to-equity ratio, debt-to-asset ratio, debt-to-EBITDA ratio, and interest coverage ratio) influence the internal growth rate of listed industrial goods firms, the ex-post facto approach enables the use of existing financial data to uncover patterns and relationships over a defined period The population of this study consists of all industrial goods firms listed on the Nigserian Exchange Group (NGX) as of December 31st, 2023. According to the NGX Daily Stock Listing, there are 13 firms actively listed in the industrial goods sector. These firms, representing a diverse cross-section of Nigeria's

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manufacturing industry, form the population from which the sample is drawn. A purposive sampling method is employed to select a sample of nine (9) firms from the thirteen (13) firms in the industrial goods sector. Purposive sampling is used because it allows the researcher to focus on firms that meet specific criteria, ensuring that the sample firms are suitable for the study's objectives. This study utilized secondary data obtained from the audited financial statements of the selected firms. The period under consideration spans from 2013 to 2023. Secondary data is an efficient and reliable data source for this type of research because it is sourced from documents that have already been verified and audited, ensuring accuracy and credibility

This study adapts the linear regression model of Okpunor, Echekoba, and Adigwe (2023) by modifying the dependent variable to internal growth rate, enabling an examination of the impact of financial leverage on the internal growth rate of selected industrial goods firms.

$IGRit = \beta0 + \beta1(DAR)it + \beta2(DER)it + \beta3(DEER)it + \beta4(ICR)it + \epsilon it$ …… Eqn 1.

$IGRit = \beta0 + \beta1(DAR)it + \epsilon it$ …… Eqn 2.

$IGRit = \beta0 + \beta1(DER)it + \epsilon it$ …… Eqn 3.

$IGRit = \beta0 + \beta1(DEER)it + \epsilon it$ …… Eqn 4.

$IGRit = \beta0 + \beta1(ICR)it + \epsilon it$ …… Eqn 5.

Where:

IGR = Internal Growth Rate

DER = Debt to Equity Ratio

DAR = Debt to Asset Ratio

DEER = Debt to EBITDA Ratio

ICR = Interest Coverage Ratio

$\beta0$ = Constant

$\beta1,\beta2,\beta3,\beta4$ = Regression coefficients for each independent variable

ϵit = Error term

i = Firm (i = 1 to 8)

t = Year (2013 to 2023)

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RESULT AND DISCUSSIONS

Descriptive statistics

Table 1: Descriptive statistics

	IGR	DER	DAR	DEER	ICR
Mean	3.757208	0.957854	0.412239	0.547092	51.42245
Median	3.778768	0.648483	0.393382	2.043377	5.601078
Maximum	36.76539	5.241450	0.839781	13.17285	2439.709
Minimum	-35.88791	0.033328	0.032253	-153.6252	-49.24573
Std. Dev.	8.225619	0.959978	0.185396	16.40563	272.5260
Skewness	-0.402043	2.571573	0.019214	-8.585084	7.654012
Kurtosis	9.497286	10.40208	3.031449	80.59021	63.96075
Jarque-Bera	176.8028	335.1266	0.010171	26049.60	16296.01
Probability	0.000000	0.000000	0.994927	0.000000	0.000000
Sum	371.9636	94.82759	40.81166	54.16210	5090.823
Sum Sq. Dev.	6630.760	90.31260	3.368409	26376.17	7278499.
Observations	99	99	99	99	99

Source: EVIEWS 10 Output (2025)

The descriptive statistics for the variables of listed industrial goods firms in Nigeria from 2013 to 2023 are as follows. Internal Growth Rate (IGR) has a mean of 3.76%, indicating moderate internal growth, with a range from -35.89% to 36.77% and considerable variation (SD = 8.23%). The Debt to Equity Ratio (DER) averages 0.96, meaning debt is almost equal to equity, with a range of 0.03 to 5.24 and high variation (SD = 0.96). The Debt to Asset Ratio (DAR) shows that on average, 41% of assets are financed by debt, ranging from 0.03 to 0.84 with moderate variation (SD = 0.19). Debt to EBITDA Ratio (DEER) averages 0.55 with a wide range from -153.63 to 13.17 and high variation (SD = 16.41). Interest Coverage Ratio (ICR) averages 51.42, indicating a strong ability to cover interest payments, with a range from -49.25 to 2439.71 and substantial variation (SD = 272.53). Most of these variables exhibit non-normal distributions except for the Debt to Asset Ratio (DAR), which is approximately normal.

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Correlational Analysis

Table 2 Correlational Analysis

Date: 01/28/25 Time: 22:12

Sample: 2013 2023

Included observations: 99

Correlation Probability	IGR	DER	DAR	DEER	ICR
IGR	1.000000				
DER	-0.190911	1.000000			
	0.0584	-----			
DAR	0.011521	0.855709	1.000000		
	0.9099	0.0000	-----		
DEER	0.458859	-0.091103	-0.054767	1.000000	
	0.0000	0.3698	0.5903	-----	
ICR	-0.002682	0.083200	0.157584	0.029781	1.000000
	0.9790	0.4129	0.1193	0.7698	-----

Source: EVIEWS 10 Output (2025)

The Pearson correlation analysis in Table 2 reveals relationships between various debt ratios and the internal growth rate (IGR) of firms. The debt to equity ratio (DER) has a statistically insignificant negative correlation with IGR (coef = -0.1909, p-value = 0.0584). The debt to asset ratio (DAR) shows a very weak and insignificant positive correlation with IGR (coef = 0.0115, p-value = 0.9099). In contrast, the debt to EBITDA ratio (DEER) has a statistically significant moderate positive correlation with IGR (coef = 0.4589, p-value = 0.0000), suggesting that higher DEER is associated with higher IGR. The interest coverage ratio (ICR) has an extremely weak and insignificant negative correlation with IGR (coef = -0.0027, p-value = 0.9790).

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Test of Multicollinearity

The Variance Inflation Factor (VIF) test is used to check for multicollinearity among the independent variables in the model. High multicollinearity can lead to unreliable coefficient estimates and difficulties in interpreting the relationship between independent and dependent variables.

Table 3 Test of Multicollinearity

Variance Inflation Factors
Sample: 1 99
Included observations: 99

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
DER	1.965515	7.619522	3.798857
DAR	53.38664	23.07026	3.848449
DEER	0.001792	1.012497	1.011361
ICR	6.66E-06	1.074316	1.037018
C	4.343692	9.202856	NA

Source: EVIEWS 10 Output (2025)

In Table 3, the VIF values for Debt to Equity Ratio (DER) (3.80) and Debt to Asset Ratio (DAR) (3.85) suggest moderate multicollinearity, as values above 10 are often considered problematic. However, both values are below this threshold, indicating that the relationship between these variables is not highly problematic. The VIFs for Debt to EBITDA Ratio (DEER) (1.01) and Interest Coverage Ratio (ICR) (1.04) are close to 1, suggesting no significant multicollinearity with these variables.

Test of Cross-sectional Independence

The Test of Cross-sectional Independence examines whether the residuals from the regression model are correlated across cross-sectional units. The Pesaran CD test is used for this purpose, and the null hypothesis is that there is no cross-sectional dependence, meaning that the residuals are not correlated across the units in the dataset.

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Table 4 Test of Cross-sectional Independence

Residual Cross-Section Dependence Test
Null hypothesis: No cross-section dependence (correlation) in residuals

Equation: Untitled
Periods included: 11
Cross-sections included: 9
Total panel observations: 99
Note: non-zero cross-section means detected in data
Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Pesaran CD	0.056583		0.9549

Source: EVIEWS 10 Output (2025)

From Table 4, the p-value of 0.9549 suggests that we fail to reject the null hypothesis. This indicates that there is no significant cross-sectional dependence in the residuals, implying that the errors are independent across firms, which is desirable for ensuring valid regression results. Therefore, the model is not significantly affected by cross-sectional dependence.

Test of Hypotheses

Hypothesis One

H_{01} Debt asset ratio has no significant effect on internal growth rate of listed industrial goods firms in Nigeria.

H_{i1} Debt asset ratio has significant effect on internal growth rate of listed industrial goods firms in Nigeria.

Table 5 Hypothesis 1

Dependent Variable: IGR
Method: Panel EGLS (Cross-section weights)
Sample: 2013 2023
Periods included: 11
Cross-sections included: 98
Total panel (unbalanced) observations: 99
Linear estimation after one-step weighting matrix
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DAR	0.867709	0.259013	3.350061	0.0012
C	3.460218	0.072861	47.49097	0.0000
	Weighted Statistics			
R-squared	0.031501	Mean dependent var		46.62507
Adjusted R-squared	0.021517	S.D. dependent var		273.5650

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S.E. of regression	8.173405	Sum squared resid	6480.042
F-statistic	3.155031	Durbin-Watson stat	2.151532
Prob(F-statistic)	0.001200		

Source: EVIEWS 10 Output (2025)

From Table 5, the Debt to Asset Ratio (DAR) has a positive and statistically significant effect on the internal growth rate of listed industrial goods firms in Nigeria ($\beta = 0.8677$, $p = 0.0012$). This indicates that as firms increase their proportion of debt relative to total assets, they tend to experience enhanced internal growth. For every one-unit increase in DAR, the internal growth rate increases by approximately 0.87 units. This suggests that managed debt against assets can provide needed capital for growth opportunities, where borrowing costs are offset by returns from productive investments. Empirical studies like Baba et al. (2023), Okpunor et al. (2023), Adibeli & Amahalu (2023), and Ndubuisi et al. (2018) support this positive relationship in Nigerian contexts, though outcomes may vary by industry and financial systems as seen in Moridu (2024).

Hypothesis Two

H_{02} Debt equity ratio has no significant effect on internal growth rate of listed industrial goods firms in Nigeria.

H_{i2} Debt equity ratio has significant effect on internal growth rate of listed industrial goods firms in Nigeria.

Table 6 Hypothesis 2

Dependent Variable: IGR
Method: Panel EGLS (Cross-section weights)
Date: 06/01/25 Time: 11:42
Sample: 2013 2023
Periods included: 11
Cross-sections included: 98
Total panel (unbalanced) observations: 99
Linear estimation after one-step weighting matrix
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DER	-1.739043	0.045938	-37.85636	0.0000
C	5.457221	0.093622	58.28974	0.0000

Weighted Statistics			
R-squared	0.820535	Mean dependent var	22.01238
Adjusted R-squared	0.818684	S.D. dependent var	44.63115
S.E. of regression	8.037583	Sum squared resid	6266.465
F-statistic	443.4941	Durbin-Watson stat	2.108380
Prob(F-statistic)	0.000000		

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Source: EVIEWS 10 Output (2025)

The Debt to Equity Ratio (DER), in Table 6, has a negative and statistically significant effect on the internal growth rate of firms (β = -1.7390, p = 0.0000). An increase in DER, indicating heavier reliance on debt relative to equity, leads to a reduction in internal growth rates. A one-unit increase in DER results in a decrease of approximately 1.74 units in internal growth rate. This negative effect may be due to financial strain from high leverage, increased interest obligations, reduced retained earnings, and potential signals of financial distress. Studies like Dam and Phan (2025), Ofulue et al. (2022), Chizuru and Ogoke (2024), and John (2021) support this negative relationship. However, some studies like Moridu (2024) and Omabu, Okoye, & Amahalu (2021) found positive effects of DER in specific contexts, suggesting DER's impact may vary by industry or context.

Hypothesis Three

H_{03} Debt to EBITDA Ratio does not significantly affect internal growth rate of listed industrial goods firms in Nigeria.

H_{i3} Debt to EBITDA Ratio significantly affects internal growth rate of listed industrial goods firms in Nigeria.

Table 7 Hypothesis 3

Dependent Variable: IGR
Method: Panel EGLS (Cross-section weights)
Date: 06/01/25 Time: 11:42
Sample: 2013 2023
Periods included: 11
Cross-sections included: 98
Total panel (unbalanced) observations: 99
Linear estimation after one-step weighting matrix
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DER	-1.739043	0.045938	-37.85636	0.0000
C	5.457221	0.093622	58.28974	0.0000

Weighted Statistics

R-squared	0.820535	Mean dependent var	22.01238
Adjusted R-squared	0.818684	S.D. dependent var	44.63115
S.E. of regression	8.037583	Sum squared resid	6266.465
F-statistic	443.4941	Durbin-Watson stat	2.108380
Prob(F-statistic)	0.000000		

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Source: EVIEWS 10 Output (2025)

Deducing from Table 7, the Debt to EBITDA Ratio (DEER) has a positive and statistically significant effect on the internal growth rate of firms ($\beta = 0.2397$, $p = 0.0000$). For every one-unit increase in DEER, the internal growth rate increases by about 0.24 units. This suggests that firms using debt relative to their EBITDA are likely investing in growth-yielding assets, and a high DEER can be sustainable with sufficient operating income. A higher DEER may indicate strategic debt usage for scaling, innovation, or diversification. Studies like Taibu (2024), Adibeli & Amahalu (2023), Aderemi, Sadiq, and Fadilat (2024), and Ndubuisi et al. (2018) support this positive relationship. However, excessive leverage beyond earnings capacity might lead to adverse effects as seen in Ofulue et al. (2022) and Dibua & Ikilidih (2023).

Hypothesis Four

H_{04} Interest coverage ratio has no significant effect on internal growth rate of listed industrial goods firms in Nigeria.

H_{i4} Interest coverage ratio has significant effect on internal growth rate of listed industrial goods firms in Nigeria.

Table 8 Hypothesis 4

Dependent Variable: IGR
Method: Panel EGLS (Cross-section weights)
Date: 06/01/25 Time: 11:43
Sample: 2013 2023
Periods included: 11
Cross-sections included: 98
Total panel (unbalanced) observations: 99
Linear estimation after one-step weighting matrix
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICR	0.000365	0.001527	0.239352	0.8113
C	3.771045	0.010269	367.2165	0.0000

Weighted Statistics			
R-squared	0.000209	Mean dependent var	35.54728
Adjusted R-squared	-0.010098	S.D. dependent var	175.1772
S.E. of regression	8.237078	Sum squared resid	6581.397
F-statistic	0.020305	Durbin-Watson stat	1.966100
Prob(F-statistic)	0.886985		

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Table 8 showed that the Interest Coverage Ratio (ICR) has a positive but statistically insignificant effect on internal growth rate (β = 0.0004, p = 0.8113). This suggests that changes in ICR have little influence on internal growth, possibly because firms prioritize interest payments over expansion in uncertain climates. ICR may be more of a short-term solvency indicator rather than a direct growth driver. Empirical studies show mixed results: Kumar et al. (2024) and Chizuru and Ogoke (2024) found positive effects of ICR on performance metrics, Aderemi, Sadiq, and Fadilat (2024) found an insignificant effect, and Imeokparia et al. (2021) reported a negative effect in manufacturing firms. Thus, ICR's influence on growth is likely indirect and context-dependent.

CONCLUSION AND RECOMMENDATIONS

The findings reveal the nexus between financial leverage and the internal growth rate of listed industrial goods firms in Nigeria. While leverage can serve as a catalyst for growth by providing firms with additional capital for expansion, its impact depends on how efficiently it is managed. A well-structured debt portfolio can enhance a firm's ability to generate internal funds, but an excessive reliance on certain types of leverage may introduce financial constraints that weaken reinvestment capacity. This dynamic highlights the necessity of maintaining an optimal balance between debt and equity to sustain growth without exposing firms to excessive financial risk.

Additionally, the findings suggest that the ability of firms to transform debt into growth is influenced by their operational efficiency and financial stability. When firms utilize debt productively, they can improve their earnings capacity and reinvest profits for expansion. However, if debt is poorly managed or concentrated in risk-prone areas, it can lead to reduced liquidity, higher financial costs, and ultimately limit a firm's ability to sustain internal growth. The differing effects of leverage ratios on growth indicate that firms' financial decisions must align with their revenue-generating capacity and investment strategies to maximize the benefits of leverage.

Furthermore, the results highlight the broader implications of leverage beyond just debt accumulation, emphasizing the role of financial health and risk management in sustaining growth. While leverage can facilitate expansion, firms must address the trade-offs between financing growth through debt and maintaining financial stability. In conclusion, financial leverage exerts both positive and negative influences on the internal growth rate of listed

industrial goods firms in Nigeria, emphasizing the need for strategic debt management to balance growth potential with financial stability.

Based on these findings, the study recommends that:

1. Management of listed industrial goods firms in Nigeria should consider reducing their reliance on debt financing, possibly by increasing equity capital or retaining more earnings in order to improve their financial stability and reduce the risks associated with high leverage.
2. Management teams of Nigerian industrial goods firms are advised to strategically use debt financing to fund expansion and capital investment, ensuring that the firm is making optimal use of its assets by supporting growth initiatives, such as new product development or market expansion, without jeopardizing the firm's long-term sustainability.
3. Financial managers in industrial goods firms in Nigeria should focus on improving operational efficiency to enhance EBITDA before considering increased leverage, while maintaining a conservative approach to debt expansion in order to ensure that it remains within a range where the firm can comfortably manage interest payments and still reinvest for growth.
4. Management of Nigerian industrial goods firms should aim to balance debt serviceability with growth needs by lowering the cost of debt or restructuring loans to reduce the burden on earnings, as these will allow more funds to be directed toward growth activities.

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