

# Moderating Effect of Ownership Concentration on the Relationship between Financial Leverage and Tax Burden on Financial Sustainability of Listed Manufacturing Firms in Nigeria

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## ABSTRACT

The performance of the Nigerian manufacturing sector has been unimpressive with an average annual growth of 3.4% in 2021 and 1.38% in 2022, aggravating the sector's poor contribution to GDP to an average of 10% for over two decades which is far below the global standard. It is on this backdrop that this study examines the moderating effect of ownership concentration on the relationship between financial leverage and tax burden on financial sustainability of listed manufacturing firms in Nigeria. The study's population consists of fifty-five (55) listed manufacturing firms from where forty four (44) firms were selected using purposive sampling technique for the period of thirteen (13) years (2012 to 2024). The research adopted the ex-post facto research design with longitudinal panel, and secondary data were collected from the firms' annual accounts for the period under review. Using Eviews 12 econometric statistical package for the analysis, the results revealed that the moderating effect of ownership concentration on the relationship between debt-to-asset ratio and return on equity of listed manufacturing firms in Nigeria is negative and statistically insignificant. Also found was that the relationship between effective tax rate and return on equity of listed manufacturing firms in Nigeria is positive and statistically insignificant when it is moderated by ownership concentration. The study concluded that debt-to-asset ratio and effective tax rate has insignificant relationship with financial sustainability when it is moderated by ownership concentration of Nigerian listed manufacturing firms. The study recommends that listed manufacturing firms in Nigeria should use more internal funds to back their activities since debts reduces financial sustainability and also ensure that they give priority to effective tax rate as tax planning strategy.

**Keywords:** Financial Sustainability, Financial leverage, Tax Burden, Ownership Concentration, Manufacturing Sector

## INTRODUCTION

Financial sustainability otherwise called economic sustainability on a global scale, is rapidly gaining momentum due to its direct link to organizational survival and its signaling effects (Al-Sartawi & Sanad, 2019; Alshareef, 2024). Financial sustainability minimizes the potential agency conflicts between shareholders and managers and also serves as a vehicle of signaling governance quality of firms to the public with a view to attracting more investors (Alshareef, 2024). In other words, leveraging on financial sustainability can lower refinancing and insolvency risks in an imperfect capital market with financing constraints and insolvency costs, resulting in risk-adjusted surplus returns (Gleißner *et al.*, 2022). In addition, risk-averse investors can use financial sustainability as a vital control parameter to determine shareholders' value when making investment decisions. Despite the fact that rating agencies are now evaluating firms extensively on the basis of their impact on society and the environment which underpins the importance of other dimensions of sustainability like social and environmental, the financial dimension is the most desirable of all as it makes the organizations financially strong and helps to avoid situations leading towards bankruptcy or shut down (Ahmed and Tirmizi, 2020; Al-Duais *et al.*, 2021).

Developed from the profit perspective, financial sustainability refers to the ability of an organization to meet all of its costs with its revenue, and to produce a profit to fund its expansion (Ayayi & Sene, 2010) cited in Adebawojo (2023). Besides, financial sustainability is often seen to have an inverse relationship with financial

risk and distress, and the factors that favour it often indirectly act as drivers of its opposite (Gardini & Grossi, 2018). Moreover, financial sustainability caters for the going concern principle of accounting and value maximization for stakeholders, and many studies have equated it with profitability in current and future periods (Okoye *et al.*, 2017; Umobong, 2015). This goes to justify that profitability plays a crucial role in the going concern of any firm since its continuous survival depends to a large extent on its periodic profitability (Umobong, 2015). As key profitability surrogate, return on equity (ROE) is a major determinant of financial sustainability since investors often view ROE as a barometer of a company's financial health and management effectiveness thus implying that when a company reports a negative ROE, it can trigger a sell-off in its stock, leading to a decline in market value and subsequently lead to financial distress. Also, previous studies showed that firm age used as a control variable in this study which shows the length of time during which a firm has existed in business, can influence financial sustainability significantly as a result of the interaction of ownership concentration with other variables.

Financial leverage is a fundamental factor that influences the profitability and survival of business organizations, including the manufacturing firms, since it relates to the borrowing of debt to expand a company's asset base. As firms grow, meeting the financial obligation from equity may be a challenge to many managers hence resort to debt financing to invest or acquire materials that the firm do not have. Overtime, reliance on financial leverage has been identified to boost firm growth and make it possible for managers to expand in a short period of time (Habrosh, 2017). However, excessive reliance on debt financing can increase the risk of financial distress and insolvency, particularly in the event of an economic downturn or a sharp rise in interest rates as servicing the loan becomes more challenging (Ritho *et al.*, 2023). As higher debt may attract higher interest rate and affects financial performance while providing a tax benefit, low debt may also be a sign of tight operating margins which can impede firms' ability to borrow (Purushothaman *et al.*, 2022). Besides, poor management of debt has been reported as the most recorded reason of companies collapsing; this is because when financial institutions give out credit and managers fail to repay, they can use legal procedures to take ownership or put firm under administrator whom will help them recover their cash. To the owners of the firm, they lose control and profits through dividends (Dao & Nguyen, 2020).

Another determinant of financial sustainability of firms is tax burden. Tax burden is the collective financial responsibility imposed on individuals and corporate entities by the government through various levies and duties (Adebimpe & Gundu, 2024). A higher tax burden can negatively impact financial sustainability by reducing disposable income for individuals and businesses, potentially leading to decreased investment and economic growth. However, tax revenue is also crucial source of funding for public services and infrastructure, which can contribute to long-term sustainability (Nwaorgu *et al.*, 2020). Therefore, finding an optimal tax burden is essential for balancing. Further, ownership concentration can substantially moderate financial leverage and tax burden and influence financial sustainability of manufacturing firms in two opposing ways; ownership concentration could reduce or exacerbate agency issues. On one hand, concentrated ownership might induce managers to keep their interests with stockholders, thereby alleviating agency problems (alignment effect). On the contrary, agency conflicts increase because concentrated ownership gives enormous power (entrenchment effects) which can harm minority shareholders, and eventually impede financial sustainability (Irom *et al.* 2023).

Nevertheless, despite the acknowledgment that manufacturing plays a significant part in Nigerian economy, many companies in the sector still struggle with long term financial sustainability issues. Precisely, the financial sustainability of the Nigerian manufacturing sector has been hampered by persistent poor profitability for over a decade. This situation may be influenced by ineffective ownership concentration interaction with financial leverage and Tax burden. As a consequence, the sector has witnessed much liquidation and declined average annual contribution of 10% to Nigeria's GDP, falling far short of globally competitive levels in almost 2 decades (KPMG, 2023). Previous studies focused on the direct relationship using objective measures such as operational efficiency, cash management techniques, corporate tax, inventory management, cost management, and managerial financial practices (Ukwueze & Ugwuodo, 2024; Adebawojo, 2023; Nwaorgu *et al.*, 2020; Imhanzenobe, 2020; Okeke *et al.*, 2020; Osazefua, 2019). While some of these studies needs to be updated to reflect current economic realities, there has also been limited studies exploring the indirect relationship of how financial leverage and tax burden impacts financial sustainability of manufacturing firms in Nigeria when it is

moderated by ownership concentration. Hence, this study intends to fill the existing gap in knowledge. The under-listed hypotheses all stated in null form are germane to this study.

**H<sub>01</sub>:** Debt to assets ratio has no significant effect on return on equity when it is moderated by ownership concentration of listed manufacturing firms in Nigeria.

**H<sub>02</sub>:** Effective tax rate has no significant effect on return on equity when it is moderated by ownership concentration of listed manufacturing firms in Nigeria.

## LITERATURE REVIEW

### Conceptual Framework

#### Financial Leverage

|              |
|--------------|
| Total Debts  |
| Total Equity |

Financial leverage is defined as the proportion of capital that a business acquires through borrowing from sources external to it (Gitari & Mohamed, 2021). Financial leverage is borrowing debt to expand a company's asset base. As firms grow, meeting the financial obligation from equity may be a challenge to many managers hence resort to debt financing to invest or acquire materials that the firm do not have. Accounting principles offers a number of benefits to firm using debt through relaxed taxation which gives firms' managers an opportunity to lower operations cost as they seek better returns from investments. Financial leverage can signal whether the firm can meet its financial obligations or not. Low debt which may be a sign of tight operating margins can impede firms including manufacturing, the ability to borrow, while higher debt attracts higher interest rate and affects financial performance but provides a tax benefit (Purushothaman *et al*, 2022). Financial leverage has been identified to boost firm growth and makes it possible for managers to expand in a short period of time (Habrosh, 2017). However, excessive reliance on debt financing can increase the risk of financial distress and insolvency, particularly in the event of an economic downturn or a sharp rise in interest rates as servicing the loan becomes more challenging (Ritho *et al*, 2023). The financial leverage formula is a valuable indicator of a company's borrowing capacity as a ratio of total debt to total assets mathematically computed thus:

#### Tax Burden

Generally, tax burden refers to the proportion of total amount of income of individuals and firms paid as tax to the government at a specified period of time (Adebimpe & Gundu, 2024). The tax burden in Nigeria represents the collective financial responsibility imposed on individuals and corporate entities by the government through various levies and duties. The nation's tax landscape encompasses a mix of direct and indirect taxes, each contributing to the overall fiscal demands placed on citizens and businesses (Lelly *et al*, 2022). Personal income tax, corporate income tax, value-added tax (VAT), and other levies collectively constitute the spectrum of taxes individuals and corporations must fulfill. The tax burden is influenced by regulatory changes, such as those introduced through Finance Acts, shaping tax rates, deductions, and incentives. For individual taxpayers, the burden manifests in the form of direct deductions from income, while corporate entities face the challenge of aligning with changing corporate tax regulations. Despite efforts to strike a balance between revenue generation and economic stimulation, challenges persist in optimizing the tax burden's equitable distribution (Uket, *et al*, 2020). Issues such as tax evasion, inadequate infrastructure, and bureaucratic complexities pose obstacles to seamless implementation. Navigating this intricate landscape necessitates a comprehensive understanding of the evolving tax policies and their ramifications, ensuring a sustainable approach to meeting fiscal responsibilities and fostering economic growth in Nigeria. The effective tax rate (ETR) is a metric utilised to evaluate the precise percentage of an individual's or entity's income that is remitted in taxes, considering different deductions, exemptions, and credits. The ETR is mathematically computed thus:

Corporate Tax Paid

Profit Before Tax

## Financial Sustainability

A firm's financial sustainability is defined as the potential to provide continuity of activities and to create value for owners in the long term, using optimal combination of investment and sources of financing (Zabolotnyy & Wasilewski, 2019). Developed from the profit perspective, financial sustainability otherwise called economic sustainability refers to the ability of an organization to meet all of its costs with its revenue, and to produce a profit to fund its expansion (Ayayi & Sene, 2010) cited in Adebawojo (2023). Likewise, Myšková and Hájek (2017) described financial sustainability as the ability of entities to make profit, optimize their value of invested capital, and offset their long- and short-term obligations at the same time. In addition, financial sustainability involves the distribution of financial resources with a view of promoting the sustainable development of corporate organisations in the long term (Koleda & Oganisjana, 2015). To this end, financial sustainability which is rapidly gaining momentum due to its direct link to organizational survival, emphasizes on long-term value creation, generation of stable profit, and growth acceleration to meet the different needs of firms' (Dang *et al.*, 2022; Wu *et al.*, 2024). The concept of financial sustainability focuses on the synergy between the growth strategies and financial policies of companies, and the absence of this synergy may deteriorate firms' financial conditions, resulting in unsustainable financial performance (Shakil *et al.*, 2024; Gómez-Bezares *et al.* 2017). This study proxied financial sustainability of listed manufacturing firms in Nigeria by return on equity.

## Return on Equity

Return on equity ratio is a profitability ratio that measures a company's ability to generate profits from shareholder investments in the company. Return on equity can also be described as the rate of return that is achieved by a company for each currency unit that further becomes the company's capital (Nurhikmawaty & Widiyanti, 2020). The Return on equity ratio shows the efficient use of own capital, and if this ratio is higher, the better because the company's position will be stronger, and vice versa (Tang, 2016). Profitability affects stock returns, and return on equity is a measure of a company's ability to generate profits using their own capital (Berggrun *et al.*, 2020). According to Corporate Finance Institute (2015) cited in Asiedu *et al.* (2020), return of equity is said to be the quotient of a company's annual return (net income) and the value of its total shareholders' equity, expressed as a percentage. The result shows the total return on shareholders' fund and reflects the firm's ability to turn shareholders' investment into profit. Simply put, ROE shows net profit made per naira of shareholders' equity. Return on equity may give understanding about how a company's management is using equity financing to expand its business. Investors may interpret a negative ROE as a sign that the company is struggling to generate profits and may face ongoing financial difficulties. This perception can be particularly damaging for publicly traded companies like manufacturing firms, where stock price volatility can erode investor confidence and make it more challenging to attract new capital. Return on Equity is computed as:

Profit After Tax

Equity

## Ownership Concentration

Ownership concentration is a form of ownership structure which deals with the degree of ownership in a company where a shareholder has a large proportion of shares in companies (Zhang *et al.*, 2016) cited in Iron *et al.* (2023). It also means absolute concentration of ownership, where only one shareholder has the absolute power to control the company and usually keeps 50% ownership. Ownership concentration is also referred to as block holding. Nigeria's Securities and Exchange Commission (SEC) in its documents relating to the corporate governance code defines block holdings as those shareholders who have more than 5% equity stake

in a company (Abdulfatah *et al.*, 2021). Ownership concentration is a vital internal corporate governance component where principals can scrutinize and oversee the operations of the company to safeguard their investment (Madhani, 2016). Ownership concentration could reduce or exacerbate agency issues. Because concentrated ownership confers great authority (entrenchment effects), agency conflicts are on the rise. Agency conflicts increase because concentrated ownership gives big power (entrenchment effects) which harm minority shareholders. On the contrary, concentrated ownership might induce managers to keep their interests with stockholders, thereby alleviating agency problems (alignment effect) (Morck *et al.*, 1988; Rosenstein & Wyatt, 1997) cited in Irom *et al.* (2023). In this study, ownership concentration will be computed as: equity ownership of 5% and above.

### Firm Age

Firm age is a picture of the length of time a company is founded and runs its business, it indicates competitive capacity and performance of company (Indriyani & Yuliandhari, 2020). Firm Age is a proxy for experience and it can also be described as the number of years of incorporation or of listing of the firm on the stock exchange. An older firm should be able to withstand better a severe economic shock to the system than a new firm. The age of the company may also be a point of attraction for employees who see older firm as safe and steady, and a place to build careers on a long-term basis (Lehn *et al.*, 2003) cited in Gambo *et al.* (2019). However, firm value may decline with age, potentially due to decreased profitability, reduced agility and innovation, reduced investment opportunities, or increased complexity and bureaucracy, rigidity and inertia (Muzayin & Trisnawati, 2022). Therefore, firm age is used as a control variable in this study, and it is computed thus: Current Year – Incorporation Year

### Empirical Review

Sani (2025) examined the effect of capital structure on financial sustainability of micro, small and medium-scale enterprises (MSMEs) in Northeastern Nigeria. Using the fixed effects method, the research analyzed panel data of 174 MSMEs across the six (6) states from 2018-2023. Further evidence was provided using the random effect technique. The finding revealed that short-term debt has negative and significant influence on financial sustainability, while long-term debt exerts positive and insignificant effect on financial sustainability. The study concluded that the effect of short term and long term debt on the financial sustainability of MSMEs in Northeastern Nigeria is not statistically significant. The also author recommended that that MSMEs should prioritise securing long-term borrowing to enhance their performance and attain financial sustainability, and the policymakers and regulators should provide long-term financing opportunities to MSMEs for consistent growth. The study was without a moderating variable and also focused only on MSMEs in Northeastern Nigeria. The current study will introduce ownership concentration as moderating variable and concentrate on listed manufacturing firms across Nigeria.

Adebimpe and Gundu (2024) assessed tax reforms and tax burden of listed consumer goods companies in Nigeria. The study adopted longitudinal panel research design. The data obtained for the period, 2013 to 2022 were analysed using the panel data regression approach with the assistance of statistical tools of E-view 10. The findings indicated that direct tax paid exerts insignificant effect on effective tax rate of consumer goods firms in Nigeria while indirect tax paid has a negative and significant effect on effective tax rate of consumer goods firms in Nigeria. The study concluded that tax reforms influences the tax burden of listed consumer goods companies in Nigeria. The authors recommended that consumer goods firms should consider engaging with policymakers and tax authorities to advocate for favorable indirect tax policies. However, the authors adopted tax burden as a dependent variable and also did not use a moderating variable in the study.

Malik and Munir (2024) examined the moderating effect of ownership concentration on the relationship between corporate tax avoidance and firm performance of developing economies. Specifically, the study aimed at evaluating the moderating effect of ownership concentration on effective tax rate and return on equity. The data for the study were gathered from the banks in Pakistan, India, Bangladesh, and Sri Lanka from 2010 to 2021. Employing panel regression analysis technique, the study found that there is a positive and significant effect on the relationship between effective tax rate and return on equity when it is moderated by ownership concentration. The study concluded that tax avoidance enhances firm performance when it is moderated by

ownership concentration. The study recommended that to fully tap the benefits of tax avoidance, firms should enhance their internal controls and management competencies. The study which may not be relevant to Nigeria was also based on many developing economies.

Bawuah (2024) evaluated the moderating role of corporate governance mechanism on capital structure and firm performance of listed non-financial firms in Sub-Saharan Africa. The main objective of the study was to examine the moderating effect of corporate governance (board independence, board size, board gender diversity, board meetings, board ownership and institutional ownership) on capital structure (long-term leverage, short-term leverage and total leverage) and firm performance (return on assets, return on equity and Tobin's Q). Data for a sample of 100 companies were obtained from seven Sub-Saharan African Countries for the period, 2010 to 2020. Using the two-step system generalized methods of moments estimator for the analysis, the results showed that corporate governance mechanisms play a positive and significant moderating effect between capital structure and firm performance. The study recommended that the regulatory bodies and firms should commit to ensuring quality corporate governance practices to achieve higher firm performance. However, the study which was not restricted to manufacturing sector in Nigeria, was also not focused on Nigerian economy.

Rahma *et al.* (2023) examined the moderating effects of institutional ownership on the relationship between capital structure and firm performance. Specifically, the study focused on examining the moderating effect of institutional ownership on capital debt to equity ratio and return on equity. The study employed quantitative methods with secondary data and the population was the financial sector companies, from which a sample of 57 was selected. Data was obtained from the annual report for 2017–2021 registered at Indonesian Stock Exchange (IDX). Applying descriptive statistical analysis and multiple linear regression analysis to test the data, the results revealed that the relationship between debt to equity ratio and return on equity is negative and statistically insignificant when it is moderated with institutional ownership. The study concluded that capital structure strengthens the effect of institutional ownership as a moderating variable. Based on the findings, the study recommended that shareholders must pay attention to the size of the percentage of shares owned by management because this can improve company performance through the company's capital structure. The study which did not use the variable of corporate tax planning, may not also be relevant to the Nigerian economic environment.

Ibrahim *et al.* (2022) studied the influence of managerial ownership and debt financing on financial performance of manufacturing firms listed on the Nigerian Stock Exchange. The panel regression model utilized secondary data for the period, 2011 to 2020. The study sampled twelve (12) listed manufacturing firms in Nigeria. The results revealed that the interaction of debt to asset ratio and managerial ownership does not significantly influence the return on equity of listed manufacturing firms in Nigeria. The study concluded that the interaction of debt financing and managerial ownership does not significantly influence the financial performance of listed manufacturing firms in Nigeria. The study recommends that listed manufacturing firms should consider their retained earnings to finance their operations instead of relying on debt finance, and directors should only own minority shareholding right in their companies since ownership of major shares cannot influence borrowing plans of the business. However, not only that the study did not use ownership concentration as a moderating variable, is also no longer recent as the period of the empirical data employed is four years older than the current study which spans from 2012 to 2024.

Tackie *et al.* (2022) examined the moderating role of corporate governance on tax planning and financial performance of insurance companies in Ghana. Specifically, the study examined the moderating effect of corporate governance on effective tax rate and return on equity of insurance companies in Ghana. The research work adopted causal design approach. The data was made up of 117 observations from 35 Ghanaian insurance firms over the 2012-2017 period. Using the dynamic generalized method of moments (GMM) framework, the results revealed that there is a positive and non-significant moderating effect on effective tax rate and return on equity of insurance companies in Ghana. The study concluded that the moderating role of corporate governance on tax planning and financial performance of insurance companies in Ghana is positive and significant. The authors recommended that managers of insurance companies intensify the corporate governance measures to help mitigate the agency conflict and associated costs between management and shareholders. However, the study was not based on the manufacturing sector.

Dachomo *et al.* (2022) evaluated the moderating effect of managerial ownership on capital structure and financial performance of listed conglomerate firms in Nigeria. The specific objective of the thesis was to examine the moderating effect of managerial ownership on capital structure (long-term debt and short-term debt) and return on assets of listed conglomerate firms in Nigeria for the period, 2004 to 2018. Secondary data was obtained from a population of six firms through their annual reports and accounts. The study adopted generalized least square fixed effect multiple regression technique in analyzing the data. The findings revealed that short-term debt have negative and significant impact on return on assets, while long-term debt and managerial ownership of the study shows insignificant impact on return on assets. The authors concluded that there is an insignificant effect of capital structure on financial performance when it is moderated with managerial ownership of listed conglomerate firms in Nigeria. On this basis, the study recommended that firms should reduce the percentage of debt in their capital structure and focused more attention on equity financing or debt with a cheaper cost attached to it. The study adopted only capital structure to measure corporate financial management practices, had its empirical data covered up to year 2018 only, and also did not focus on manufacturing firms and use ownership concentration to measure ownership structure.

## Theoretical Framework

### Agency Theory

As propounded by Jensen and Meckling (1976), the agency theory essentially describes the relationship between two parties: owner as a principal and management as an agent. The theory states that the separation of ownership from control of the modern-day business has turned the relationship between the owners (shareholders) and controllers (managers) to that of an agent and a principal. As such the managers are supposed to treat this fiduciary link with ultimate sense of transparency and accountability. However, in practice, the existence of information asymmetry that gives the managers a privilege information may lead to the breach of the agency arrangement as the managers are tempted to use their positions for self enhancement, hence the agency problem. Similarly, Fama and Jensen (1983) advocate that agency problems that arise from the separation of ownership and control could be reduced if the residual claimants (shareholders) and the decision agents (managers) in a firm are the same.

### Stakeholder Theory

Freeman (1984) developed the stakeholders' theory which is hinged on the significance of taking into account the interests of various stakeholders in organizational decision-making. It posits that organizations have obligations not only to their shareholders but also to a diverse array of stakeholders. A stakeholder is a person or a party that is affected by the attainment of the objectives of the organization. The stakeholder theory goes beyond the relationship that exists between managers and shareholders, which has been the major setback of agency theory. This study is anchored on stakeholder's theory because when there is synergy in the business relationships among the various stakeholders and the firm, such synergy is expected to enhance the firm's performance and improves its financial sustainability.

## METHODOLOGY

This study adopts ex-post facto research design with a longitudinal panel. The positivism approach, which is the research paradigm, informs the design. The design is considered appropriate for the study because data for the study are already available and cannot be manipulated by the researcher. The study's population consists of 55 listed manufacturing firms and purposive sampling of 44 of the listed firms was used. Data were sourced from the audited annual reports and accounts of these firms, which spanned between 2012 and 2024. STATA 13 version was used in analyzing the data. The model of Lambe *et al.* (2022) was adapted thus:  $ROA_{it} = \beta_0 + \beta_1 INVD_{it} + \beta_2 WCTA_{it} + \beta_3 FSIZ_{it} + \epsilon_{it}$

### The Modified Models for the study are:

#### Model I: Without moderating variable

$$ROE_{it} = \beta_0 + \beta_1 DAR_{it} + \beta_6 ETR_{it} + \beta_7 FAGE_{it} + \epsilon_{it} \dots \dots \dots \text{equation (i)}$$

## Model II: With Moderating Variable

$$ROE_{it} = \beta_0 + \beta_1 DAR_{it} * OC + \beta_6 ETR_{it} * OC + \beta_7 FAGE_{it} * OC + \epsilon_{it} \dots \dots \dots \text{equation (ii)}$$

Where,

ROE: Return on Equity

DAR: Debt-to-Assets Ratio

ETR: Effective Tax Rate

OWC: Ownership Concentration (Moderating Variable)

FAGE: Firm Age

$\beta$ : Interception of the equations.

$\epsilon$ : The error term.

## Apriori Expectation

The study expects ownership concentration proxied by blockholdings to have a positive and significant moderating role on the effect of debt-to-equity ratio and effective tax rate on financial sustainability proxied by return on equity of manufacturing firms in Nigeria. The expression is mathematically stated thus:  $B_1, B_2, \beta_3 > 0$  The variables that are used in the analysis are shown in the table below.

Table 1: Measurement of Variables

| VARIABLE | VARIABLE TYPE    | MEASUREMENT                                                 | SOURCE                       |
|----------|------------------|-------------------------------------------------------------|------------------------------|
| ROE      | Dependent        | <u>Profit After Tax</u>                                     | Rahma et al. (2023)          |
|          |                  | Equity                                                      | Tackle et al. (2022)         |
| DAR      | Independent      | <u>Total Debt</u>                                           | Bamgboye (2024)              |
|          |                  | Total Assets                                                | Ibrahim <i>et al.</i> (2022) |
| ETR      | Independent      | <u>Tax Paid</u>                                             | Malik & Munir et al.(2019)   |
|          |                  | Profit Before Tax                                           | Wang et al. (2021)           |
| OWC      | Moderating       | <u>Number of shares held by 5% &amp; Above Shareholders</u> | Irom et al. (2023)           |
|          |                  | Total Number of Shares Outstanding                          | Zulfikar et al. (2020)       |
| FAG      | Control Variable | Current Year - Incorporation Year                           | Ado et al. (2021)            |
|          |                  |                                                             | Gao and Huang (2018)         |

Source: Researcher's Compilation (2025)

## RESULTS AND DISCUSION

### Descriptive Statistics

Descriptive statistics is employed to have a glimpse of the past behaviour of a dataset using parameters such as; mean, minimum, maximum values as well as their corresponding standard deviations to explain the variables of interest. Table 4 shows the descriptive statistic results.

Table 2: Descriptive Statistics Results

|              | ROE       | DAR       | ETR       | OWC       | FAG      |
|--------------|-----------|-----------|-----------|-----------|----------|
| Mean         | 6.212307  | 0.857433  | 0.247524  | 62.10048  | 48.31818 |
| Median       | 7.748234  | 0.561792  | 0.266194  | 65.88905  | 50.00000 |
| Maximum      | 739.0232  | 19.55710  | 23.83270  | 96.41349  | 102.0000 |
| Minimum      | -2533.779 | -1.766921 | -11.85959 | 12.15649  | 8.000000 |
| Std. Dev.    | 134.6221  | 1.989543  | 1.318664  | 19.00178  | 19.74008 |
| Skewness     | -11.88367 | 7.141098  | 9.072078  | -0.443341 | 0.133097 |
| Kurtosis     | 228.5187  | 56.03396  | 198.9163  | 2.413000  | 2.619464 |
| Jarque-Bera  | 1225595.  | 71895.22  | 922645.6  | 26.95007  | 5.140045 |
| Probability  | 0.000000  | 0.000000  | 0.000000  | 0.000001  | 0.076534 |
| Sum          | 3553.440  | 490.4519  | 141.5835  | 35521.48  | 27638.00 |
| Sum Sq. Dev. | 10348289  | 2260.178  | 992.8976  | 206169.6  | 222502.1 |
| Observations | 572       | 572       | 572       | 572       | 572      |

Source: Eview 12 Output (2025)

As shown in table 2, the average return on equity (ROE) as a measure of financial sustainability of listed Nigerian manufacturing sector for the period of study is 6.212307. In terms of ROE, the least of the companies making losses has 2533.779 loss while the highest of the firms that made profit for the period recorded 739.0232. The high standard deviation of 134,6221 (134%) and the wide range between the highest and lowest performance signify many of the firms operated below and above the industrial average. For debt-to-asset ratio (DAR) which has an industrial average value of 0.857433 and a relatively high standard deviation of 1.989543 (198%) with a wide difference value between the maximum and minimum DAR, suggests that in the period under study many listed manufacturing firms in Nigeria operated above and below the industrial average. In addition, the average performance of effective tax rate (ETR) is 0.247524 and the lowest and highest values of -11.85959 and 23.83270 with a corresponding high standard deviation of 20.08063 (200%). This indicates a high number of the sampled firms had a wide spread from the industrial average in terms of effective tax rate.

Similarly, ownership concentration (OWC) has maximum and minimum values of 96.41349 and 12.15649 with a standard deviation of 19.00179 (190%). In relation to the average value of 62.10048, it shows a high dispersion from the mean. In terms of firm age (FAG), the oldest firm of the listed manufacturing firms in Nigeria for the period of study is 102 years while the youngest is 8 years old. The average value of 48.31818 and standard deviation of 19.74008 (197%) together with the maximum and minimum values, suggest that the sampled firms had a wide dispersion from the industrial average. Also, the skewness statistic which measures the degree and direction of asymmetry reveals that ROE and OWC are negatively skewed with the values of -11.88367 and -0.443341 while DAR ETR and FAG are positively skewed with the scores of 7.141098, 9.072078 and 0.133097 indicating that the data is distributed to both left and right direction. According to the information provided by kurtosis which measures the tail heaviness of the distribution, apart from FAG that is playtkurtic since is less than 3 with the value of 2.601446 others are leptokurtic (more than 3) indicating that the data is abnormally distributed.

### Correlation Analysis

Correlation Analysis shows the extent of variation of one variable due to change in the other, and it also shows the presence of possible multicollinearity among the independent variables. If the result is very close to one of

these values (-1 to 1), it suggests the two variables are linearly related and highly correlated with each other. The correlation analysis results are stated in table 3.

Table 3: Correlation Matrix

Covariance Analysis: Ordinary

Date: 08/20/25 Time: 15:43

Sample: 2012 2024

Included observations: 572

| Correlation<br>Probability | ROE                 | DAR_OWC             | ETR_OWC            | FAG_OWC           |
|----------------------------|---------------------|---------------------|--------------------|-------------------|
| ROE                        | 1.000000<br>-----   |                     |                    |                   |
| DAR_OWC                    | -0.011754<br>0.7791 | 1.000000<br>-----   |                    |                   |
| ETR_OWC                    | 0.012307<br>0.7690  | -0.018808<br>0.6535 | 1.000000<br>-----  |                   |
| FAG_OWC                    | 0.000539<br>0.9897  | -0.177529<br>0.0000 | 0.044068<br>0.2927 | 1.000000<br>----- |

Source: Eview 12 Output (2025)

As encapsulated in table 3, the variable of ETR\_OWC, FAG\_OWC are positively related with ROE with 0.012307, and 0.000539 values which suggest they contribute to increase in financial sustainability measured by return on equity in the period of study while DAR\_OWC with the negative values of -0.011754 indicates an adverse relationship with ROE meaning they contributed to decrease in financial sustainability(ROE) of listed manufacturing firms in Nigeria. With the values of -0.018808 and -0.177529, DAR\_OWC is negatively connected with ETR\_OWC and FAG\_OWC respectively while ETR\_OWC has positive correlation of 0.044068 with FAG\_OWC. Being that none of the relationship among the explanatory variables is close to +1 or -1, it suggests the data is free from multicollinearity.

## Multicollinearity Test

Multicollinearity happens when one or more explanatory variables exert a stronger relationship among themselves, and it negates the assumptions of linear regression model. The variance inflation factor is a good parameter for detecting multicollinearity. The decision rule is that if the Centered VIF is not greater than 10, it means there is no multicollinearity, and if otherwise, it indicates the existence of severe multicollinearity in the model.

Table 3: Multicollinearity Test (VIF)

Variance Inflation Factors

Date: 08/20/25 Time: 15:45

Sample: 2012 2024

Included observations: 572

| Variable | Coefficient<br>Variance | Uncentered<br>VIF | Centered<br>VIF |
|----------|-------------------------|-------------------|-----------------|
| C        | 173.4923                | 5.448554          | NA              |
| DAR_OWC  | 5637.672                | 1.155607          | 1.032671        |
| ETR_OWC  | 0.004100                | 1.029388          | 1.002071        |
| FAG_OWC  | 1.51005                 | 5.108543          | 1.034315        |

Source: Eview 12 Output (2025)

As indicated in table 4, none of the centered VIF is close to 10; this suggests the absence of multicollinearity in the model.

### Heteroskedasticity Test

Heteroskedasticity occurs in a condition that makes the standard errors of a variable that undergoes monitoring over a given period of time, not to be constant. Heteroskedasticity violates the underlying assumptions of linear regression modeling. The decision rule is that if the probability chi2 value is not up to 5% level of significance it signifies the presence of heteroskedasticity. Otherwise, there is no heteroskedasticity problem. The heteroskedasticity test results are encapsulated in table 4

### Heteroskedasticity Test

Panel Cross-section Heteroskedasticity LR Test

Equation: EQ01

Specification: ROE C DAR\_OWC ETR\_OWC FAG\_OWC

Null hypothesis: Residuals are homoskedastic

|                  | Value    | df | Probability |
|------------------|----------|----|-------------|
| Likelihood ratio | 1759.113 | 44 | 0.0625      |

Source: Eview 12 Output (2025)

As indicated in table 6, the probability value is 0.0625. Based on the stated decision rule, the probability Chi2 of 0.0650 is more than the threshold of 0.05 level of significance. This implies that there is no conditional heteroscedasticity existence in the model, thus suggests that residuals are homoscedastic.

### Hausman Specification Test

The Hausman test was used to determine between random effect regression and fixed effect regression which is most appropriate. The null hypothesis of the test is that random effect Model is most appropriate, while the alternative hypothesis is that fixed effect model is most appropriate. The decision rule is to accept the null hypothesis if the P value is greater than 5% (0.05), otherwise accept the alternative hypothesis if the P value is less than 5% (0.05).

Table 5: Hausman Specification Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

| Test Summary         | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob.  |
|----------------------|-------------------|--------------|--------|
| Cross-section random | 3.095389          | 3            | 0.3772 |

Source: Eview 12 Output (2025)

As shown in table 7, the probability value of 0.3772 is greater than 0.05 level of significance. This means there is no sufficient reason to reject the null hypotheses which states that random effect model is more appropriate.

### Breusch-Pagan Lagrange Mulplier Test

The Breusch-Pagan Lagrange Mulplier Test is conducted to select between pooled effect regression model and random effect model. The null hypothesis ( $H_0$ ) of the test is that Pooled OLS Model is most appropriate,

while the alternative hypothesis is that Random effect model is most appropriate. The decision rule is to reject  $H_0$  if the Breusch-Pagan Cross-sectional probability value is less than 0.05. Otherwise, do not reject  $H_0$ .

Table 6: Breusch-Pagan Lagrange Mulplier Test

Lagrange Multiplier Tests for Random Effects

Null hypotheses: No effects

Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

|                      | Test Hypothesis      |                       |                       |
|----------------------|----------------------|-----------------------|-----------------------|
|                      | Cross-section        | Time                  | Both                  |
| Breusch-Pagan        | 1.138700<br>(0.0079) | 2.322598<br>(0.0075)  | 3.461299<br>(0.0028)  |
| Honda                | 1.067099<br>(0.0030) | -1.524007<br>(0.0062) | -0.323083<br>(0.0067) |
| King-Wu              | 1.067099<br>(0.0030) | -1.524007<br>(0.0062) | -0.849093<br>(0.0021) |
| Standardized Honda   | 1.385236<br>(0.0030) | -1.382599<br>(0.0166) | -5.556232<br>(1.0000) |
| Standardized King-Wu | 1.385236<br>(0.0030) | -1.382599<br>(0.0066) | -5.388105<br>(1.0000) |
| Gourieroux, et al.   | --                   | --                    | 1.138700<br>(0.2844)  |

Source: Eview 12 Output (2025)

From table 8, the Breusch-Pagan Cross-sectional probability value is 0.0059. Being that this is less than 0.05 level of significance, we reject the null hypothesis and conclude that the most suitable model is random effect model.

Table 7: Random effect model estimates

Dependent Variable: ROE

Method: Panel EGLS (Cross-section random effects)

Date: 08/20/25 Time: 16:02

Sample: 2012 2024

Periods included: 13

Cross-sections included: 44

Total panel (balanced) observations: 572

Swamy and Arora estimator of component variances

| Variable              | Coefficient | Std. Error         | t-Statistic | Prob.    |
|-----------------------|-------------|--------------------|-------------|----------|
| C                     | 9.186490    | 14.87412           | 0.617616    | 0.5371   |
| DAR_OWC               | -20.84928   | 84.03961           | -0.248089   | 0.8042   |
| ETR_OWC               | 0.017637    | 0.063799           | 0.276446    | 0.7823   |
| FAG_OWC               | -0.000916   | 0.004382           | -0.209106   | 0.8344   |
| Effects Specification |             |                    |             |          |
|                       |             |                    | S.D.        | Rho      |
| Cross-section random  |             |                    | 21.99781    | 0.0265   |
| Idiosyncratic random  |             |                    | 133.2786    | 0.9735   |
| Weighted Statistics   |             |                    |             |          |
| R-squared             | 0.600288    | Mean dependent var |             | 5.338513 |
| Adjusted R-squared    | 0.404991    | S.D. dependent var |             | 132.9584 |
| S.E. of regression    | 133.2898    | Sum squared resid  |             | 10091181 |
| F-statistic           | 0.054679    | Durbin-Watson stat |             | 1.296443 |
| Prob(F-statistic)     | 0.983157    |                    |             |          |
| Unweighted Statistics |             |                    |             |          |
| R-squared             | 0.000225    | Mean dependent var |             | 6.212307 |
| Sum squared resid     | 10345965    | Durbin-Watson stat |             | 1.264517 |

Source: Eviews 12 Output (2025)

The R square of 0.600288 suggests that the explanatory variables account for 60% changes in the financial sustainability while the balance of 40% is for other factors not captured in the model. For the positive intercept, it explains that holding other independent variables constant, return on equity (financial sustainability) will insignificantly improve by 7.057421.

In accordance with the hypotheses set for the study, the findings are discussed as follow.

**Ho1:** Debt to assets ratio has no significant effect on return on equity when it is moderated by ownership concentration of listed manufacturing firms in Nigeria.

As shown in the appendix, without the moderating variable, the relationship between debt-to-asset ratio and return on equity (financial sustainability) is negative and statistically insignificant with coefficient and P-value of 0.608263 and 0.8500 respectively. Similarly, with the moderating variable as shown in table 7, the interaction of debt-to-asset ratio and ownership concentration (DAR\_OWC) indicates that an increase by a unit will lead to a 20.95790 decrease in return on equity (financial sustainability) of listed Nigerian manufacturing firms. As the rise yielded a negative relationship, it also has no significant effect with 0.7803 on return on equity since its P-value is less than 5% level of significance. Therefore, there is no sufficient reason to reject the null hypothesis of the study which states that debt to asset ratio has no significant effect on return on equity when it is moderated by ownership concentration of listed manufacturing firms in Nigeria. This finding is not in tandem with the apriori expectation but agreed with the study of Rahma (2023) and Dachomo et al. (2022) that ownership concentration cannot modify significantly the relationship between debt ratio and financial sustainability of companies. In contrast, Bawwuah (2024) concluded that ownership concentration substantially impacts the relationship between debt ratio and financial sustainability of companies.

**Ho2:** Effective tax rate has no significant effect on return on equity when it is moderated by ownership concentration of listed manufacturing firms in Nigeria.

Considering the direct relationship perspective (without moderating variable) as indicated in the appendix, effective tax rate exerts positive and insignificant effect on return on equity (financial sustainability) with a beta of 1.068152 and P-value of 0.8029 respectively. In the same vein, the indirective relationship (with moderating variable) results as indicated in table 7, shows that a unit rise in the interaction of effective tax rate and ownership concentration (ETR\_OWC) yield a 0.018566 increase in return of equity (financial sustainability). Also, the increase is statistically insignificant at probability value of 0.7720 which is more than the 5% level of significance standard set. The study has no sufficient reason to reject the study's null hypothesis ( $H_0$ ) that effective tax rate has no significant effect on return on equity when it is moderated by ownership concentration of listed manufacturing firms in Nigeria. This finding is in consonance with the research effort of Tackle et al. (2022) who concluded that concentrated ownership cannot significantly modify the relationship between corporate tax planning and long term performance of companies. However, Malik and Munir (2024) concluded that the higher the ownership concentration of companies, the better management is controlled to align with the interest of the shareholders, ultimately leading to long term financial stability. This result is not in line with the apriori expectation.

## CONCLUSION AND RECOMMENDATIONS

The main objective of this study is to examine the moderating effect of ownership concentration on the relationship between debt-to-to equity ratio and effective tax rate on financial sustainability of listed manufacturing firms in Nigeria for the period, 2012 to 2023. Financial sustainability (return on equity) and ownership concentration (blockholdings) were employed as the observed and moderating variables while debt-to-asset ratio and effective tax rate were the explanatory variables used in the study. Specifically, the results reveal that the interaction of debt-to-asset ratio exerts negative and insignificant effect on financial sustainability, while the interaction of effective tax rate has positive and insignificant effect on firm value of listed industrial goods firms in Nigeria. In view of this, the study concludes that the relationship of debt-to-asset ratio and effective tax rate on financial sustainability of listed manufacturing firms in Nigeria when it is moderated by ownership concentration is statistically insignificant. Based on the findings, the study recommends that:

- i. Listed manufacturing firms in Nigeria should ensure they use more internal funds than debt to back their activities since excessive use of debt reduces financial sustainability.
- ii. The management of listed manufacturing firms in Nigeria should ensure priority is given to effective tax rate as tax planning strategy since it improves financial sustainability.

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