NEXUS BETWEEN FIRM SIZE AND CAPITAL STRUCTURE OF INDUSTRIAL COMPANIES IN NIGERIA

[1]ATAYI Abraham Vincent, [2]CHINSHAKA Ayuba Sitdang, [3] *EVINEMI Elijah Adeiza*,
[4]*ABDULLAHI Aishatu*

[1,2]Department of Economics, Plateau State University Bokkos, Nigeria.
[3]Department of Accounting, University of Nigeria Nsukka, Nigeria.
[4]Department of Statistics, Central Bank of Nigeria, Nigeria.

ABSTRACT

This study aims to analyze the effect of firm size on capital structure of listed industrial companies in Nigeria. The factors tested in this study are firm size on capital structure through debt-to-equity and debt-to-asset ratios. This research makes use of non-experimental research design to analyze data of 7 industrial companies listed on the Nigerian Exchange Group (NGX) over the periods in 2007-2022. The study made use of purposive sampling technique and analysis was carried out using the simple linear regression model. Findings of the study proves that firm size negatively affects the debt-to-asset ratio of industries and have no significant effect on debt-to-equity of industrial companies. The study shows that a change in firm size leads to a 41.2% decrease in the debt-to-asset ratio of listed industrial companies. The study recommends that in order to reverse the negative effect of firm size on debt-to-asset ratio, industrial companies should strive to attain sound asset base by embracing innovation as a way of increasing the efficiency of the total assets. This is critical in reducing the negative impact arising from the cost of debt.

KEYWORDS: Firm Size, Capital Structure, Debt-to-equity, Debt-to-asset.

1. INTRODUCTION

It's time for managers to analyze the factors that affect using debt and the extent to which they have an impact on firms because Nigeria is one of the developing nations with great potential and it has an emerging market with a lot of potential investment opportunities. One of the qualities of a corporation that can either positively or negatively impact its performance is its size (Amahalu et al., 2019). Total market share of any given firm is used to calculate the size of the firm. In the examination for the fact of diversification, the size of the company is primarily taken into account. A firm is a for-profit commercial entity, such as a corporation, limited liability company (LLC), or partnership, that offers professional services and bears the responsibility for the volume of operations produced by a firm because this is directly related to its human capital. The extent of a commercial enterprise's organization and operations is referred to as its "size of business" (Okudo & Ndubuisi, 2021). Realizing a company's "size" and how it influences the company and profitability of commercial enterprises is one of the most crucial entrepreneurial decisions in business organization (Amahalu, Nweze, & Obi, 2017). There are businesses in every industry, ranging in size. These businesses of various sizes have distinct manufacturing costs. The ideal size of a business unit, or the firm with the lowest average cost of production per unit, is an issue for economists (Sindhuja, 2021). According to the philosophy of the firm, businesses exist to maximize profits. Additionally, it has been suggested that a firm's size influences its capital structure. Smaller businesses, on the other hand, may find it relatively more expensive to resolve information asymmetries with lenders, resulting in lower debt ratios (Castanias, 1983). Larger businesses, on the other hand, are more diversified and, as a result, have lower variance of earnings, making them able to tolerate high debt ratios. Lenders to larger firms are more likely to get repaid than lenders to smaller firms, reducing the agency costs associated with debt.

Capital is one of the key components for a business to prosper. Financial managers in industrial businesses in Nigeria must consider a company's capital structure when making financing decisions in order to make sensible investment decisions. The majority of a company's capital structure is made up of debt and equity. The major responsibility of the financial management is to increase the value of the firm and, more specifically, to maximize shareholder wealth by reducing the cost of capital. In order to increase shareholder wealth, financial managers must investigate the appropriate capital structure to fund. When selecting a capital structure for a business, it is

important to consider a number of factors in order to maximize the company's value and profitability. The net cost or value of a particular company is impacted by the capital structure decisions made by businesses. Debt and equity are combined by businesses that finance their assets. A wise decision will increase the wealth of the shareholders, while a poor one will damage the company's net reputation (Liu, Wujun, & Chen, 2021). Profitability, scale, expansion, tangibility, non-debt tax shield, volatility, and liquidity are just a few of the variables that might affect a company's capital structure. The business will decide what number is ideal. This study therefore empirically examines the effect of firm size on the capital structure of listed industrial companies in Nigeria. The rest of the study is organized as follows; Section 2 reviews both theoretical and empirical literature related to the study. Section 3 presents the methodology of the study. Section 4 presents the findings of the study, and Section 5 provides relevant conclusions from the study and recommendations.

2. LITERATURE REVIEW

2.1 Theoretical Framework

Firm Growth Theory

Penrose developed the Firm Growth Theory (Volpe & Biferali, 2008). A theory of business growth is essentially an investigation of how firms' productive opportunities are evolving. According to Penrose, this productive opportunity consists of all the productive opportunities that its "entrepreneurs" perceive and can seize. According to Penrose's (Volpe & Biferali, 2008) fundamentally dynamic view of firms, a learning-by-doing-generated internal momentum drives firm growth. Managers gradually increase their output as they get used to their tasks. Initial difficulties with executive processes stemming from their relative unfamiliarity quickly turn into routines. Therefore, when managers gain experience, their administrative activities need less focus and effort. Managerial resources are consequently continuously released. The extra managerial ability can then be employed to concentrate on chances for growth that provide value, particularly the development of new managers. Strong incentives exist for businesses to expand because, despite the fact that staff members' knowledge tends to improve naturally as they gain experience, it might be difficult to fully utilize this priceless firm-specific knowledge. New managerial resources must be successfully integrated into the organization over time, but once they have, these new hires will be able to carry out managerial duties and teach new managers. A company will develop in this fashion in order to extract value from its underutilized resources, which in turn will produce new resources.

Myers and Majluf (1984) offer a different explanation for the pecking order based on an asymmetric information paradigm. It is assumed that the management is more knowledgeable than potential investors about the firm's value. Only insiders are aware of a company's or its investment projects' quality. Therefore, if outsiders are requested to fund these initiatives, they must pay a premium. When compared to debt, there is more information asymmetry with relation to equity. Financial intermediaries have access to information that outside investors do not and can monitor the company. Outsiders typically aren't able to monitor businesses; therefore, they demand a significantly bigger premium on equity financing than debt because they don't know what the businesses' growth prospects are. Asymmetric information raises the cost of borrowing, whereas tax benefits have the opposite impact and lower the cost of borrowing in comparison to equity issues (Myers, 1984). Due to different expenses connected with fresh stock offerings, equity finance is thought to be the most expensive method of funding. Underwriting discounts, registration fees, taxes, and marketing and administrative costs are some of these costs. Additionally, businesses often release "safe" securities first, i.e. debt rather than equity. According to Shyam- Sunder and Myers (1999), the term "safe" here suggests that the phrases are not impacted by managers' inside knowledge. Debt cannot be regarded as a 'safe' security as there are costs of financial distress associated with it, but it is still considered 'safer' than equity.

2.2 Empirical review

Larger companies with fewer issues with asymmetrical information should often have more stock than debt and lower leverage (Chakroborty, 2010). In comparison to smaller businesses, larger ones have lower information costs and can raise equity capital more readily. As a result, firm size and target leverage may be negatively correlated in the presence of asymmetric knowledge. According to the capital structure pecking order theory, it is predicted that leverage will be adversely correlated with business size. Contrarily, the trade-off argument contends that because large enterprises are less likely to experience financial difficulty and agency costs, they are more likely to be able to borrow money than small ones (Dang, 2013). The implication is that target leverage is positively impacted by business size. Firm size and leverage are found to be positively correlated in some studies (Gropp and Heider, 2010; Baltacci and Ayaydin, 2014; Joeveer, 2013; Dang, 2013), whereas they are found to be adversely correlated in others (Chakraborty, 2010). Firm Size and leverage should be correlated positively for the trade-off theory to hold true and negatively for the pecking order.

Small businesses typically do not have as easy of access to the capital markets as large companies have. As a firm-specific component, the business size plays a crucial role in determining the capital structure. Small businesses are different from large businesses in that they often rely on banks and have fewer diverse financing sources. They receive fewer debt tax benefits than large, listed corporations since they are less likely to tax planning (Ali et al. 2022). Furthermore, according to Allen et al. (2006), while large corporations mostly rely on long-term debt for financing, small businesses largely depend on short-term debt. Due to large enterprises' greater diversification and hence lower risk, Frank and Goyal (2009) discover a positive link between firm size and leverage. This finding is consistent with the trade-off theory. Hanousek and Shamshur (2011) examine a conflict between leverage and business size. (Gill et al., 2009) looked into the factors that affect capital structure in the US services sector. The study's findings showed no conclusive link between business size and leverage. (Wanrapee, 2011) looked into the factors affecting 81 randomly chosen Thai enterprises' capital structures. The findings showed a strong positive correlation between size and debt ratio, demonstrating that big businesses issue a lot of debt. Leverage, a measure of capital structure, has a negative connection with firm size, according to research by Akinyomi and Olagunju (2013) that looked at the factors affecting capital structure in Nigeria.

3. METHODOLOGY

3.1 Model Specification

Based on the theoretical literature and earlier empirical studies on the determinants of capital structure, we specify our model to capture firm size as one of the determinants of capital structure. Thus, the study adapted the model specified by Jaworski and Czerwonka (2021) which was modified for the purpose of establishing the relationship between the dependent variables and the independent variable. Succinctly, the econometric form of our model is expressed as:

$$DETE_{it} = \beta_0 + \beta_1 FSIZ_{it} + \mu_{it1} \qquad (1)$$
$$DETA_{it} = \delta_0 + \delta_1 FSIZ_{it} + \mu_{it2} \qquad (2)$$

Where:

$DETE$ = Debt to Equity (Proxy for capital structure measured by total liabilities/total equity)
$DETA$ = Debt to Asset (Proxy for capital structure measured by total liabilities/total asset)
$FSIZ$ = Firm Size (measured by the natural log of total asset)
β_0, δ_0 = Constants
β_1, δ_1 = Slope Coefficients
μ = Stochastic disturbance
i = i^{th} firm
t = time period

3.2 Research Design

Quantitative research was used in this study to gather data, analyze that data, and present findings. Generalization is made possible and the time and effort required to describe the outcome is reduced when data gathering is done scientifically (Eyisi, 2016). We utilized the firm-level strategy for this analysis. Additionally, we used a firm-level strategy based on a non-experimental, expo-facto research design. The research is longitudinal and spans fifteen (15) years. That is, from 2006 to 2020 employing listed industrial goods firms on the floor of the Nigerian Exchange Group.

3.3 Sample Size and Sampling Technique

The listed industrial enterprises in Nigeria made up the study population for this study. All of Nigeria's listed industrial products enterprises make up the study's population. We had 15 industrial goods companies listed on the Nigerian Exchange Group (NGX) floor as of December 2021. Because companies were included in the sample based on specific selection criteria, a purposeful sampling strategy was used for this study. These standards were based on industrial companies listed on the Nigerian Exchange Group market between 2006 and 2021, excluding newly listed companies and delisted corporations.

3.4 Method and Sources of Data Collection

This study employed the use of secondary data for sampled industrial goods listed companies sourced from Nigerian Exchange Group Fact Books and related companies' annual financial reports and footnotes for the periods covered in the study as compiled by Machame RATIOS®.

4. RESULT AND FINDINGS

Table 1 shows the total number of observations of 172. From the table, the average of firm size (FSIZ) for of listed industrial companies is 16 with minimum of 12 and maximum firm size of 22. The standard deviation of 2.5 indicates that small spread around the average value. Also, the average debt to equity (DETE) ratio of -18.16

indicates that listed industrial companies are less risky with minimum of -3123 and maximum of 30. The standard deviation of 239 show a wide spread variation around the average value. In addition, the average debt to asset (DETA) ratio of 0.61 indicates that listed industrial companies have more asset than debt with a minimum and maximum of 0.036 and 2.23 respectively. The standard deviation of 0.61 shows small spread around the average value.

Table 1: Summary Statistics

Variable		Mean	Std. Dev.	Min	Max	Observations
FSIZ	Overall	15.51163	2.504939	12	22	N = 172
	Between		2.799548	12.4375	20.83333	n = 13
	Within		0.543861	14.26163	16.67829	T-bar = 13.2308
DETE	Overall	-18.1573	238.969	-3123.06	30.00447	N = 172
	Between		59.7304	-213.161	10.11603	n = 13
	Within		230.6049	-2928.05	218.5268	T-bar = 13.2308
DETA	Overall	0.607218	0.292509	0.035548	2.229656	N = 172
	Between		0.183402	0.384309	1.054594	n = 13
	Within		0.224218	-0.088	2.182523	T-bar = 13.2308

Source: Computed by the Author (STATA, 16)

Based on normality of residuals, the insignificant values of the test results suggest the acceptance of null hypothesis and indicate that the residual is normally distributed as the probability is greater than 5%, which implies it follows a normal distribution.

Table 2: Skeweness-Kurtosis test of Normality

Variable	Pr (Skewness)	Pr (Kurtosis)	adj chi2(2)	Prob>chi2
residuals	0.2076	3.1181	8.62	0.0534

Source: Computed by the Author (STATA, 16)

The result of the correlation reveals that FSIZ has positive correlation with DETE and a negative correlation with DETA. More so, the highest correlation coefficient of 0.0829 between FSIZ and DETE. Conclusively, there is the absence of multicollinearity in the model.

Table 3: Correlation Matrix

VARIABLE	DETE	DETA	FSIZ
DETE	1.0000		
DETA	-0.1101	1.0000	
FSIZ	0.0829	-0.4039	1.0000

Source: Computed by the Author (STATA, 16)

Based on heteroskedasticity test results, the insignificant values of the test results suggest the acceptance of null hypothesis and indicate that the model is free from heteroskedasticity problem as the probability is greater than 5%.

Table 4: White Test for Homoskedasticity

Source	chi2	df	P
Heteroskedasticity	6.18	5	0.2895
Skewness	4.76	2	0.0928
Kurtosis	1.04	1	0.3087
Total	11.97	8	0.1526

Source: Computed by the Author (STATA, 16)

Effect of firm size on debt-to-asset of listed industrial companies in Nigeria
The within r-square of this model is 0.0049, with between r-square of 0.4017 and overall r-square of this model is 0.1632. The result of the wald chi2 (8.66) shows that the model is significant at 1% level of significance with z score of -2.94 which is negative and lies below the mean. The result of the regression result shows a negative significant relationship between firm size and debt-to-asset ratio. So that, a unit increase in firm size, leads to a 41.2% decrease in the debt-to-asset ratio of listed industrial companies given the study period. Overall, firm size has significant effect on capital structure of listed industrial companies in Nigeria.

Table 5: Effect of firm size on debt-to-asset of listed industrial companies in Nigeria

DETA	Coefficient	Standard Error	Z	P>|z|
FSIZ	-0.0411772	0.0139886	-2.94	0.003
_cons	1.253043	0.2247357	5.58	0.000
R-square	Within 0.0049			
	Between 0.4017			
	Overall 0.1632			
Wald chi^2	8.66 (0.0000)			

Source: Computed by the Author (STATA, 16)

Effect of firm size on debt-to-equity of listed industrial companies in Nigeria
The within r-square of this model is 0.0079, with between r-square of 0.1443 and overall r-square of this model is 0.0069. The result of the wald chi2 (1.18) shows that the model is insignificant at with a z score of 1.09 which is positive and lies above the mean. The result of the regression result shows a positive insignificant relationship between firm size and debt-to-equity ratio.

Table 6: Effect of firm size on debt-to-equity of listed industrial companies in Nigeria

DETE	Coefficient	Standard Error	Z	P>|z|
FSIZ	7.913075	7.291565	1.09	0.278
_cons	-140.902	114.5609	-1.23	0.219
R-square	Within 0.0079			
	Between 0.1443			
	Overall 0.0069			
Wald chi^2	1.18 (0.2778)			

Source: Computed by the Author (STATA, 16)

Firm size has negative significant impact on the capital structure of listed industrial companies in Nigeria. By implication, as firm size increases, the capital structure of listed industrial companies in Nigeria declines. (Liang et al., 2023) in their study of firm characteristics and capital structure among ASEAN economies found that size is negatively associated with leverage among Malaysian, Philippine, and Thai firms but positively associated among Indonesian firms. This corroborates with the findings of this study as firm size is seen to consistently influence capital structure. Findings by (Hejazi & Khademi, 2013) however, show a positive relationship between the companies' capital structure and firm size of companies listed in Tehran's stock exchange market. Similarly, (Suhaila & Wan Mahmood, 2008), found that there is positive significant difference between capital structure and firm size which indicates less leverage financing. Also, (Eriotis & Vasiliou, 2007) found that size appears to maintain a positive relation and further shows a differentiation in the capital structure among the firms with a debt ratio greater than 50 per cent and those with a debt ratio lower than 50 per cent. Contrary to the findings of this study where debt-to-equity has no significant effect on firm size, (Mbonu & Amahalu, 2021) in their study found that Firm Size exerts a significant positive effect on Debt-to-Equity Ratio of insurance companies in Nigeria. (Omran & Pointon, 2009) also found that size is positively related to short-term financing in heavy industries and services. Furthermore, findings by (Buvanendra et al., 2017) found that firm size is a major determinant of capital structure of listed firms in Sri Lanka and India.

5. CONCLUSION AND RECOMMENDATIONS

This study attempts to examine the effect of firm size on the Capital Structure of listed Industrial Companies in Nigeria. The study revealed that, firm size is a determinant of capital structure of listed industrial companies in Nigeria. So that, a negative impact of firm size implies that an increase in firm size on capital structure in form of debt-to asset declines. The study recommends that in order to reverse the negative effect of firm size on debt-to-asset ratio, industrial companies should strive to attain sound asset base by embracing innovation as a way of

increasing the efficiency of the total assets. This is critical in reducing the negative impact arising from the cost of debt.

REFERENCES

1. Akinyomi, O. J., & Olagunju, A. (2013). Determinants of capital structure in Nigeria.
2. Ali, S., Rangone, A., & Farooq, M. (2022). Corporate taxation and firm-specific determinants of capital structure: Evidence from the UK and US multinational firms. *Journal of Risk and Financial Management*, *15*(2), 55.
3. Amahalu, N.N., & Ezechukwu, B.O. (2017). Effect of cash holding on financial performance of selected quoted insurance firms in Nigeria. Journal of Marketing Management and Consumer Behavior, 2 (1), 90-112.
4. Amahalu, N.N., & Obi, J.C. (2020). Effect of financial statement quality on investment decisions of quoted deposit money banks in Nigeria. International Journal of Management Studies and Social Science Research, 2(4), 99-109.
5. Baltacı, N., & Ayaydın, H. (2014). Firm, country and macroeconomic determinants of capital structure: Evidence from Turkish banking sector.
6. Buvanendra, S., Sridharan, P., & Thiyagarajan, S. (2017). Firm characteristics, corporate governance and capital structure adjustments: A comparative study of listed firms in Sri Lanka and India. *IIMB management review*, *29*(4), 245-258.
7. Chakraborty, I. (2010). Capital structure in an emerging stock market: The case of India. *Research in international business and finance*, *24*(3), 295-314.
8. Dang, H. N., Vu, V. T. T., Ngo, X. T., & Hoang, H. T. V. (2019). Study the impact of growth, firm size, capital structure, and profitability on enterprise value: Evidence of enterprises in Vietnam. *Journal of Corporate Accounting & Finance*, *30*(1), 144-160.
9. Eyisi, D. (2016). The usefulness of qualitative and quantitative approaches and methods in researching problem-solving ability in science education curriculum. *Journal of education and practice*, *7*(15), 91-100.
10. Frank, M. Z., & Goyal, V. K. (2009). Capital structure decisions: which factors are reliably important?. *Financial management*, *38*(1), 1-37.
11. Gill, A., Biger, N., Pai, C., & Bhutani, S. (2009). The determinants of capital structure in the service industry: evidence from United States. *The Open Business Journal*, *2*(1).
12. Gropp, R., & Heider, F. (2010). The determinants of bank capital structure. *Review of finance*, *14*(4), 587-622.
13. Hanousek, J., Shamshur, A., & Tresl, J. (2019). Firm efficiency, foreign ownership and CEO gender in corrupt environments. *Journal of Corporate Finance*, *59*, 344-360.
14. Hejazi, R., & Khademi, S. (2013). The effect of economic factors and firm characteristics on the capital structure of listed companies in Tehran stock exchange (TSE). *Financial Accounting Research*, *5*(2), 1-16.
15. Jaworski, J., & Czerwonka, L. (2021). Determinants of enterprises' capital structure in energy industry: Evidence from European Union. *Energies*, *14*(7), 1871.
16. Jõeveer, K. (2013). What do we know about the capital structure of small firms?. *Small Business Economics*, *41*, 479-501.
17. Liang, S., Xin, F., Yu, J., & Zhao, G. (2023). Local government turnover and capital structure: evidence from China. *Asian Review of Accounting*, *31*(1), 131-152.
18. Liu, G., Wujun, L., & Chen, Y. (2021). Capital structure adjustment speed over the business cycle. Finance Research Letters 39.
19. Okudo, A.G., & Ndubuisi, A.N. (2021). Corporate governance and carbon disclosure practices of quoted manufacturing firms in Nigeria. International Journal of Contemporary Research and Review, 12 (07), 20409
20. Sindhuja, S. (2021). The size of a firm: definition, measures and concepts. https://www.businessmanagementideas.com/enterprises/the-size-of-a-firm-definition-measures-and-concepts/9054. Accessed 25/7/2021
21. Suhaila, M. K., & Wan Mahmood, W. M. (2008). Capital structure and firm characteristics: Some evidence from Malaysian companies.
22. Volpe, L., & Biferali, D. (2008). Edith Tilton Penrose, The Theory of the Growth of the Firm: John Wiley & Sons, New York, 1959.
23. Wanrapee, B. (2011). Capital structure determinants of Thai listed companies. In *The clute institute international academic conferences* (pp. 1-8).