

## LIQUIDITY, PROFITABILITY, ASSET STRUCTURE AND DEBT-EQUITY MIX OF LISTED NON-FINANCIAL COMPANIES IN NIGERIAN

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### Abstract

*This paper sought to empirically analyse the influence of liquidity, profitability and asset structure on debt-equity mix of non-financial listed companies in Nigerian. The authors used deductive and quantitative approach, focusing on population of 123 quoted companies in Nigeria that are non-financial between 2006- 2020, from which only 58 firms that satisfied selection rules set were chosen as sample for this study. A generalized method of moments techniques was employed. The findings revealed that lagged value of long-term debt to Asset is positive and significant, liquidity, return on equity and non-current assets are positive and significantly related to long term debt to asset. Return on asset and tangibility are negative and significantly related to long term debt to asset. When long term debts to equity was taken to represent debt equity mix, findings showed that lagged value of long-term debt to equity is negative and significant, return on equity is negative and significant, liquidity, return on asset, tangibility and non-current assets were positive and significant. This paper recommended that Nigerian companies should consider many proxies for both dependent and independent variables and select the most appropriate variable that will minimize cost of capital and maximize the firms value in their financing decisions.*

**Keywords:** Asset-structure, debt-equity-mix, liquidity, profitability, non-financial firms.

### 1.0 Introduction

Debt equity mix is the combination of long-term debt and equity, which are used by companies to fund their investments and grow their businesses. It is made up of shares (both equity and preference), debentures, bonds, long-term loans, retained earnings from operations, and loans from individuals and institutions. It is a combination of different types of long-term sources of funds. A robust debt-equity mix is very important for the company as it helps to maximize the shareholder's capital while minimizing the cost of capital for the company. Permanent financing is a big part of figuring out how much a company is worth, and finance managers must make very important decisions about the right mix of financing. Most businesses have a goal for their capital, even though the mix of debt and equity may change over time.

The groundbreaking article of Modigliani and Miller (1958) disclosed the irrelevance of debt-equity mix to firm's value and cost of capital. Strong assumptions such as, perfect capital market, no transaction cost, no taxation, no bankruptcy cost, no information asymmetry, and no friction in the capital market were made. Modigliani and Miller (1958) argued that the source of the money used to make investments has no effect on the market value of the firm, because, in a perfect capital market, investors can borrow and

lend money at the same rate of interest to counteract the financial decisions made on the choice of finance. In the same way, the weighted average cost of capital will not change no matter how much equity and debt a company has, because the effect of a decrease in the cost of debt will be canceled out by an increase in the cost of equity. Modigliani and Miler (1963) posited that in the event of corporate taxes, interest payments on debts are tax-deductible expenses, which implies that as debt increased, the market value of the firms' increased due to the debt tax shield. The optimal capital structure is obtained when there is a minimal cost of capital and an increase in the value of the firm.

An assessment of company's profit in relation to its expenses is Profitability. Excess of revenue generated from production of goods and services over its attributable expenses is profit. Profitability is the ability of the firm to produce income more than expenses incurred in generating such income (Owolabi., Obiakor., & Okwu, 2011). Profit is the outcome of successful deployment of the firm's scarce financial resources to its operating activities. Profit making is the essence of setting up any business venture and it's a crucial indicator of success in any organization. A vital goal of setting up a company is to achieve profit, maximize the profits as well as firms value. In enhancing the firm's value, management needs to set and implement the right strategy needed to attain this (Prasetyorini, 2010). The ability of the firm to generate high profit enhances the firm's value and serves as a vital tool for assessing the efficiency and effectiveness of management in running the affairs of the company (Andriani, 2017). Good performance will be reflected in the ability of management to generate maximum profit for the company (Hery, 2016). High profit firms use their internal equity to finance their operations and are most likely use less debt nor issue external equity to run the affairs of the company. The capability of firms to settle its short- and long-term obligations as at when due is Liquidity. The measuring tool for liquidity is the amount of current assets possessed by the firm, which can be converted to cash easily without losing its value.

The availability of Cash for immediate usage makes it the most liquid asset, it can be used for instant settlement of all obligations. Chasanah and Satrio, (2017), opined that companies having adequate liquidity need not borrow loan nor issue new shares, other than using retained earnings to finance its operations. This implies that high liquidity reduces debt level. Timely Stock disposal in security market without negative influence on its price signifies the liquidity content of such stock.

The wealth of the firm, having future benefits, such as fixed Assets, intangible assets, current assets, and other assets are known as Asset Structure Kesuma, (2009). Asset structure represents assets owned by a firm with future benefits, firms having many assets invariably possess collateral that can be pledged as

security for obtaining loans., hence they made use of debts in financing their operations Firms having many assets can use such assets maximally in production, and have high profits therefrom (Karima & Khafid, 2015). Asset structure means the ratio of different assets in a firm's total assets, that is, the ratio of fixed investment, securities- investment, and liquidity investment. Asset structure is measured as the proportion of property, plant and equipment, other assets, and current assets to Total Assets.

## **2.0 Review of Literature**

### **2.1 Conceptual Review**

#### **2.1.1 An Optimal debt-equity mix**

An Optimal debt-equity mix is the mix of debt and equity financing that minimizes the weighted average cost of capital and enhances the value of the firm. The effort of finance manager in setting suitable targets and continuous adjustments of the targets for equity and debt mix is to achieve optimal capital structure. In other to maximize the intrinsic value of the firm, the weighted average cost of capital must be reduced to the lowest level. When this point is reached, the optimum debt-equity mix is achieved. Optimum debt-equity mix as defined by Parmasivan and Subramanian, (2009) is the debt-equity mix level that assures the maximization of the shareholders' wealth as well as enhancing the value of the firm at the lowest weighted average cost of capital.

#### **2.1.2. Liquidity and debt-equity mix**

An organization's liquidity denotes the capability of the organization to meet its short-term debts and other obligations. According to Kimondo, Irungu, and Obanda (2016), an optimal level of liquidity is essential for promoting profitability and enhancing the welfare of shareholders and the value of the organization. Sound financial management enables the firm to plan, organize and apportion funds to easily meet their financial commitments as at when due and build a good financial credibility image (Akenga, 2017). Liquidity is the degree to which an asset can be bought or sold in the market without affecting its price. Ideally, the more liquid the firm is, the less leveraged it is. A company that has high liquidity means that it can pay the short-term debt, so it tends to reduce total debt.

#### **2.1.3 Profitability and debt-equity mix**

A profit is the difference between the revenue that a company has received from its outputs and the opportunity costs of its inputs. It equals to total revenue minus total costs, including, both explicit and implicit costs. The higher the profitability, the higher is the amount of internal fund from the retained earnings, decreasing the proportion of debt in the debt-equity mix. Pecking order theory predicts that there should be a negative relationship between profitability and leverage, since the order have preference for internally generated form of finance over external funds. Profitability is related to availability of internal funds and may therefore be related to less leverage with respect to pecking order theory, Fama & French (2002) as well as Lious et al., (2016) found that profitability is negatively and statistically significant with debt issues on the balance sheet.

#### **2.1.4 Asset Structure and Capital Structure**

Tangible asset is an asset that has physical substance, it refers to the proportion of fixed assets in a firm's total assets, firms acquire fixed assets for their production activities as they grow older, the magnitude of these fixed assets can be considered by its creditors as a guarantee that will allow them to recover their funds in case of financial distress experienced by the borrower (Erika, 2019). More tangible assets also alleviate conflicts between debt holders and shareholders, while creditors also have renewed guarantee of repayment, since tangible assets serves as collateral against inability to repay (Jensen & Meckling, 1976). Trade-off theory predicts and supports a positive relationship between tangibility and leverage. In the same vein, managers of highly geared firms are cautious of the danger involve in their inability to pay fixed interest to debt holders who are closely monitoring their activities, such managers are not able to consume perquisites of office in excess, (Grossman & Hart, 1982). Pecking order theory on the other hand predicts an inverse relationship between capital structure and asset tangibility. This may be due to low information asymmetry in respect of tangible assets, making cost of equity issuance lesser. Leverage ratios should therefore be lower for firms with higher tangible assets (Frank & Goyal, 2009)

## **2.2 Theoretical Framework**

This study is based on two theories below.

### **2.2.1 Pecking order Theory (Asymmetric information model)**

The pecking order theory, which was first proposed by Donaldson in 1961 and later improved by Myers and Majluf in 1984, explains how managers choose to finance their investment opportunities, it posits that managers prefer to pay for their investments first with money from inside the company, like retained earnings, and then with money from outside the company, like debt or equity.

This preference comes from the idea of information asymmetry, which says that managers know more and better information about the company than people outside of it. This creates an imbalance in transaction power, which makes managers prefer to do business with themselves. External stakeholders want higher returns to make up for this, so internal financing is the cheapest and most convenient way to get money.

When they need outside funding, managers prefer debt over equity because debt costs less than equity. Debt holders want a lower return than shareholders, who want a higher return because they have less of a right to assets if the company goes bankrupt. When a company issues debt, it shows that they are confident in the investment and may mean that the stock is undervalued.

In contrast, the issuance of equity sends a negative signal, indicating an overvalued stock, and managers are hesitant to issue equity if they believe the market has underpriced it. This is because underpricing may lead to new investors capturing more than the net present value of the project, resulting in a net loss to existing shareholders.

### **2.2.2 Trade-off Theory**

The trade-off theory posits that firms strive to achieve an optimal balance between the benefits of the tax shield from debt financing and the costs associated with financial distress, bankruptcy, and agency conflicts. The theory dates to Kraus and Litzenberger (1973) and is often regarded as a competing theory to the pecking order theory. The optimal debt-equity mix is reached when the present value of the tax shield is equal to the present value of the financial distress costs, and firms seek to adjust their levels of debt and equity to achieve this balance. The deduction of interest payments on debts from taxes encourages firms to borrow more up to the point where the present value of the debt tax shield is offset by the value loss due to financial distress costs and bankruptcy. In addition to the tax benefits, debt financing also has a disciplinary role by reducing free cash flow and encouraging firms to make more disciplined investment decisions (Gansuwan & Onel, 2012). The trade-off theory shows how important it is to find a balance between the different benefits and costs of debt financing to find the best capital structure.

### **2.3 Empirical Review**

Empirical studies revealed mixed findings of the association among liquidity, profitability, asset structure and debt-equity mix. Among such empirical findings are the following:

Odukwu et al., (2022). examined the impact of liquidity and profitability on profits growth of Nigerian Pharmaceutical firms in Nigeria, using six quoted pharmaceutical companies in Nigerian. The results

revealed that the current and quick ratios for liquidity had a significant relationship with the profitability ratio proxies by net profit margin and asset returns. Sutardjo & Afriyani, (2019). investigated the impact of liquidity and firm size on profitability and corporate value in the Indonesian financial firms. The paper focused on forty listed firms on Indonesia stock exchange, using structural equation modeling and Analysis moment structure. The results revealed that liquidity and profitability are positive and significantly related, but liquidity is negative and insignificantly related to firm value; profitability and firm value are positive and significantly related.

Kuria and Omboi, (2015) examined relationship between profitability and liquidity of banking and investment companies quoted on Securities Exchange in Kenya's Nairobi from 2009 to 2013, using inferential analysis and correlation techniques. Results revealed that debt to capital and debt to equity ratios had negative and significant relationship with asset returns, however there is no such link with long term debt. The debt-to-equity ratio of another model revealed a significant relationship with returns on equity, while the debt to capital ratio and ROE has a significant and negative relationship.

Cicilia and Fachrurrozie, (2021). examined the impact of profitability, liquidity, and Asset structure on capital structure with moderating variable being firm size, focusing on all real estate and property companies quoted on the Indonesian Stock Exchange from 2014 to 2016. Findings revealed that liquidity, profitability, and asset structure had negative and significant relationship with capital structure, firm size successfully moderate significantly the impact of liquidity on the capital structure but could not moderate the impact of asset structure and profitability on capital structure.

Akinyomi and Olagunju (2013), examined the determinants of capital structure in Nigeria for 24 randomly selected manufacturing firms quoted in Nigeria for a 10-years 2003-2012, culminating into a firm-year observation of 240. Panel data estimation technique was employed for data analysis, the findings indicate firm size was inverse and significantly related with long term debt to assets, debt tax shield was inverse and insignificantly related, profitability and firm growth opportunities have positive and insignificant relationship, while assets tangibility has positive and significant relationship with long term debt to assets.

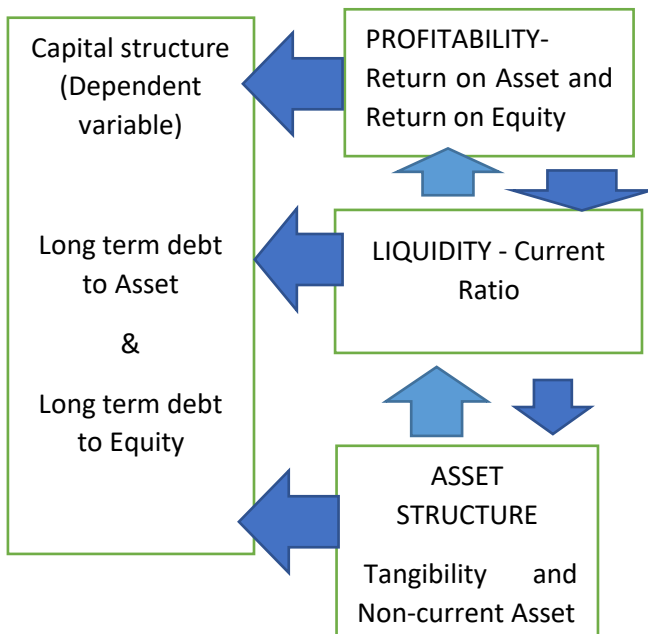
In India, Atif (2021) examined 'a study on the determinants of capital structure: evidence from India' using short term debt to total assets; long term debt to total assets and total debts to total assets as dependent variables (capital structure), the results indicates that Indian firms explore short term form of finance, while profitability, firm size, liquidity, tax rates and business risks were found to affect and have strong relationship with capital structure of Indian firms. In Spain, Liou, Cecilio, and Felix (2016) examined the determinants of capital structure of 77 non-financial Spanish firms listed on Madrid stock exchange from 2001 to 2014, the study tested tangibility, size, volatility, profitability, Non-debt tax shield, growth opportunities and industry effective factors, it was found out that leverage have positive and

significant relationship with size, Non-debt tax shield and industry effects have negative and significant relationship with profitability, growth opportunity and volatility. It was also observed that during the financial crises of 2008, the cost of financial distress was high.

## 2.4 Gaps in the Literature

Previous work done on capital structure mostly focused on developed nations, few work done in developing nations focused on other areas of capital structure research. This area of research have been neglected by previous researchers, this constitutes a gap that this work seeks to fill, In addition, most of the previous work used short term debt to assets, long term debt to assets and total debts to assets as proxies for debt-equity mix, few work focused on long term debt to equity, and since debt-equity mix is a mix of debt and equity, this constitutes another gap that has to be filled. This work used both long term debt to asset and long-term debt to equity as proxies for debt-equity mix in filling this gap.

## 2.5 Conceptual Model



## 3.0 Research Methodology

### 3.1 Research Design

The research design adopted in this study is deductive and quantitative approach, which is easy to explain based on data analysis results as well as easy to conclude. It is in line with the literature (Anjum et al., 2017; Hussain et al., 2017 & Maqsood et al., 2021). Characteristics of the data used for the study qualified it for a dynamic panel study. The longitudinal nature, that is fifteen-year time from year 2006 to

year 2020 and the cross-sectional attributes, that is fifty-eight firms, substantiate the usage of dynamic panel technique.

### **3.2 Population of the Study**

This comprises 123 non-financial quoted companies in Nigeria for the year 2006 to year 2020.

#### **3.2.1 The Sample Size**

The sample size was determined using judgemental/ purposive / inclusion and exclusion approach. Companies that have continuous data for fifteen years from year 2006 to year 2020 only were included, while newly listed companies not having adequate data for 15 years and repeated names of some firms were excluded, only 58 firms that had all the relevant data for all the research variables due to continuous existence for fifteen years, constitute the sample for the study.

#### **3.2.2 Sampling Technique**

Non-probability sampling/ randomization technique was adopted, this technique does not give equal and non-zero chances to all the individuals in the population to be selected in the sample. The above sample size approach is an example, where the sample is selected as per the judgement of the researcher based on certain criteria. Like this is convenience sampling, where samples are done as per the convenience of the researcher.

### **3.3 Data Collection Method**

The study followed the scientific procedures for data collection, which is in line with past literature (Aqeel et al., 2022; Li et al., 2022; Yao et al., 2022). Secondary data (historical data) were collected in respect of dependent and independent variables from sampled companies' annual financial statements for the fifteen-year period covering the year 2006 to the year 2020. Secondary data usage provides systematic, empirical and unambiguous answers to research questions, since such data were independently provided by statutory auditors in audited financial statements. These reports are reliable, verifiable, and less prone to research manipulation. Examination of the data captured for the variables of interest from the audited financial statements of the sampled companies provides a basis for subjecting the hypotheses to robust and verifiable empirical tests. Data for this study were obtained from the audited financial statements of each of the sampled companies as compiled by MachameRatios@database from official sources such as the Nigerian Exchange Group and Central Bank of Nigeria Statistical Bulletins for the year 2006 to the year 2020.



**3.4 Data Estimation Method**

**3.4.1 GMM Analysis:**

This study investigates liquidity, profitability, asset’s structure, and debt equity mix of listed non-financial companies in Nigeria using Generalized Methods of Moments (GMM). This was used because, biases may exist in panel regression analysis, which could lead to inconsistent coefficient estimates across different techniques. Therefore, the System GMM estimation technique was used to estimate the dynamic panel model and correct for any possible biases. Previous research has identified IV estimator and 2SLS methods as effective tools for addressing endogeneity issues in panel regression analysis. However, these methods have a weakness in that they rely on "external" instruments, which are often weak and fail to meet the conditions of a good instrument. Specifically, it is difficult to find an instrument that is both correlated with the explanatory variable and uncorrelated with the error term, making it challenging to satisfy the exogeneity and relevance properties of a good instrument. GMM estimation techniques are more efficient than IV and 2SLS in the presence of heteroscedasticity. Therefore, the GMM technique was used to address endogeneity issues in this analysis and ensure the robustness of the results.

**3.4.2 Multicollinearity Test:**

This is a concept that indicates correlation among many independent variables in a model. Perfect collinearity exists in two variables, if their coefficient of correlation is +/- 1.0. The existence of multicollinearity among independent variables renders the statistical inferences less reliable. The variance inflation Factor (VIF) is recommended for examining the existence or otherwise of multicollinearity. If the result of this VIF is above 10, then there is a challenge (Velnampy, 2011).

**3.5 Model Specification**

This study aimed at measuring the impact of liquidity, profitability and Asset Structure on debt-equity mix of quoted non-financial companies in Nigeria. To attain this aim, the models hereunder are specified.

Model one

$$LTDA_{it} = \beta_0 + \beta_1LTDA_{it}(-1) + \beta_2CUTR_{it} + \beta_3ROET_{it} + \beta_4ROA_{it} + \beta_5TANG_{it} + \beta_6NCAR_{it} + \varepsilon_{it}.....1$$

Where: LTDA = Long term debt to Asset.

Model two

$$LTDE_{it} = \beta_0 + \beta_1LTDE_{it}(-1) + \beta_2CUTR_{it} + \beta_3ROET_{it} + \beta_4ROA_{it} + \beta_5TANG_{it} + \beta_6NCAR_{it} + \varepsilon_{it}.....2$$

Where: LTDE = Long term debt to Equity.

### 3.6 Measurement of Variables and a priori expectations

#### 3.6.1 Dependent Variables

3.6.1.1 Loan term debts to Assets ratio is a measurement representing part of a firm's assets financed with long-term debt, such as loans lasting more than one year. This ratio provides a general measure of the long-term financial position of a company, including its ability to meet its financial obligations for outstanding loans.  $LTDA = \frac{\text{Long Term Debt}}{\text{Total Assets}}$

Decrease in this ratio implies that the firm is becoming less dependent on debt to grow its business. A ratio result of less than 0.5 is considered good. It is a coverage or solvency ratio used to calculate the amount of a company's leverage. Prior studies that used long term debt to asset to represent debt-equity mix among many others include (Akinyomi & Olagunju, 2013; Arsov & Naumoski, 2016 & Cevheroghu-Acar, 2018).

3.6.1.2 Long term debt to Equity ratio shows how much of a business assets are financed by long term financial obligations, such as loans.

$$LTDE = \frac{\text{Long term debt}}{\text{Shareholders' Equity}}$$

Shareholders' equity is the total assets minus total liabilities. It is riskier if it has a high ratio. A good debt to equity ratio is anything lower than 1.0. A ratio of 2.0 or higher is usually considered risky. If it is negative, it means the company has more liabilities than assets and that will be too risky.

#### 3.6.2 The Explanatory Variables

This consists of liquidity, profitability, and asset structure.

**3.6.2.1 Liquidity:** This is represented by current ratio, calculated as current Asset divided by current liability. It is the working capital available to meet short term obligations as they fall due. It refers to the efficiency with which an asset can be converted into cash without affecting its market price or cash itself. The trade-off theory's viewpoint is that companies with high liquidity should take up more debts in order to benefit from tax shield deriving from interest payment on debt and therefore have positive relationship with capital structure., Pecking order theory's preference for internal financing views that companies with high liquidity should reduce their leverage and make use of internal funding for their investment and therefore have negative relationship with capital structure.

**3.6.2.2 Profitability:** This is represented by both return on assets and return on equity. Return on asset is calculated as net income divided by total assets, while return on equity is calculated as net income divided by shareholders' equity. There is no consistent theoretical prediction on the effects of profitability on debt-equity mix. The Tradeoff theory predicts positive relationship on the premise that more profitable companies should use more debt to shield more income from taxes. Pecking order theory views that more profitable companies have lower need for external financing and should therefore have lower leverage.

**3.6.2.3 Asset Tangibility** is calculated as fixed asset divided by total asset, it shows the proportion of fixed assets in the total assets of the company, it is assumed that tangible assets can be used as collateral. Higher tangibility therefore lowers the risk of a creditor and increase the value of the assets in the case of bankruptcy. The more tangible the assets of the firm are, the greater its ability to issue secured debt and the less information is revealed about the future profits of the company. Several empirical studies support this position, such as Rajan and Zingales, (1995) as well as Titman and Wessels, (1988);

**3.6.2.4 Non-current Assets** are calculated as original purchase cost of long-term investment less depreciation. They are assets and properties owned by a business that are not easily converted to cash within a year. They may also be called long term assets, for long term use and are expected to generate income. They include bonds, shares, and other long-term investments as well as intangible assets such as copyrights and patents, they are always capitalized as balance sheet items and depreciated over their useful life. Pecking order theory predicts a negative relationship with debt-equity mix.

## 4.0 Results and Discussion of Findings

### 4.1 Descriptive Analysis

In this section, the descriptive statistics for both the explanatory and dependent variables of interest were examined. Each variable is examined based on the mean, median, maximum, minimum, and standard deviation.

Table 1 below displays the descriptive statistics for the variables that are used in this study. A critical examination of the descriptive statistics for the dependent and independent variables reveals several issues.

**Table 1: Descriptive statistics**

VARIABLES	MEAN	MEDIAN	MAXIMUM	MINIMUM	Std. Dev
LTDA	18.5426	12.8107	192.2804	-333.6500	25.1073
LTDE	-70.5832	27.5625	54397.6700	-148399	5665.8770
CUTR	1.4453	1.1784	38.6978	0.0239	1.8748
ROET	111.2980	11.1959	69701.1400	-2087.7000	2509.0370
ROA	3.6829	3.5754	176.2669	-71.3574	13.4393
TANG	40.4176	39.1863	114.9298	0.0790	23.4468
NCAR	48.8943	50.3239	95.7825	-66.8201	24.5190

**Source: Author (2023)**

Long term debt to asset (LTDA), revealed that the mean value of the sampled companies was 18.5426, this value is low, it can be stated that non-financial quoted firms in Nigeria do not use much long term debt in their respective debt-equity choice, most non-financial firms made use of short term loans and overdraft, which are rolled over many times, rather than employing long term loan. The median value was 12.8107, lower than the mean, the maximum value was 192.2804 while the minimum value was -333.6500, and the standard deviation was 25.1073. In the case of long term debt to equity (LTDE), the mean value of the sampled companies was -70.5832 while its median value was 27.5625, this explains the wide variation in the standard deviation of 5665.8770 from the mean. The maximum value was 54397.6700 while the minimum value was -148399.

For Liquidity (CURR), the mean value of the sampled companies was 1.4453 while its median value was 1.1784. The maximum value was 38.6978 while the minimum was 0.0239 and the standard deviation was 1.8749. The variation is not that far from the mean, however the range between the maximum for some firms of 38.6978 and the very low minimum of 0.0239 for others is not good enough. For Profitability (ROET) return on equity, the mean value of the sampled companies was 111.2980 while its median value was 11.1959. The maximum value was 69701.1400 while the minimum was -2087.7000 and the standard deviation was 2509.0370. The wide difference between the mean of return on equity of 111.2980 and mean of return on assets of only 3.6829, implies that most of the firms engaged equity in financing their operations rather than debt. It also implies that every Naira invested in equity generates ₦111.2980 returns compared to same Naira invested in assets that generates only ₦3.6829 in earnings. Tangibility had a mean of 40.4176, median of 39.1863, maximum value of 114.9298 and a very low minimum value of 0.0790, the maximum value depicts big firms that have grown to acquire fixed assets that can be used as collateral for loan and reduces asymmetry information, as creditors are confident of recouping their money, in case of any eventuality, the minimum of 0.0790 depicts struggling firms that does not have much assets, the standard deviation is as much as 23.4468 from the mean.

#### 4.2 Variance Inflated Factor and Value of Tolerance

VIF was used to test the presence of multi-collinearity. Field, (2009), as well as Hair et al., (1995), posit that this can be examined by applying VIF and tolerance level. If the VIF was more than or equal to 10 and tolerance was lower than 0.10, then presence of multi-collinearity is confirmed in the model. VIF for this study ranges between 1.01 and 2.79 and the tolerance ranges between 0.359036 and 0.986597, while the mean value of the VIF was 1.42, which is less than 10 and the tolerance greater than 0.10, thereby indicating the absence of multi-collinearity.

Table 2: VARIANCE INFLATED FACTOR AND VALUE OF TOLERANCE

VARIABLE	VIF	1/VIF
CUTR	1.13	0.884176
ROET	1.02	0.984209
ROA	1.38	0.722482
TANG	2.79	0.359036
NCAR	2.77	0.361531
MEAN VIF	1.42	

Source: Author (2022)

### 4.3 Econometric Analysis

#### MODEL 1:

$$LTDA_{it} = \beta_0 + \beta_1 LTDA_{it}(-1) + \beta_2 CUTR_{it} + \beta_3 ROET_{it} + \beta_4 ROA_{it} + \beta_5 TANG_{it} + \beta_6 NCAR_{it} + \varepsilon_{it}$$

#### GMM Result

Dependent Variable: LTDA				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LTDA(-1)	0.287	0.021	13.668	0.000
CUTR	4.994	0.425	11.748	0.000
ROET	0.000	0.000	10.904	0.000
ROA	-0.268	0.054	-4.921	0.000
TANG	-0.061	0.030	-2.015	0.044
NCAR	0.486	0.039	12.515	0.000
Effects Specification				
Mean dependent var	0.269	S.D. dependent var	24.083	
S.E. of regression	26.285	Sum squared residual	500209.800	
J-statistic	42.476	Instrument rank	58.000	
Prob(J-statistic)	0.621			

Source: Author's Computation Using EViews

LTDA(-1): This variable captures the effect of the lagged value of LTDA on the current level of long-term debt. The positive and significant coefficient suggests that the level of long-term debt in the previous

period has a strong influence on the current level of long-term debt. This could indicate that firms with a history of high long-term debt are more likely to continue to use long-term debt as a financing source.

CUTR: Current ratio measures a firm's ability to meet its short-term obligations with its current assets. The positive and significant coefficient implies that firms with higher current ratios tend to have higher levels of long-term debt. This suggests that firms use long-term debt to finance their short-term liquidity needs. This also implies that an increase in the ratio of working capital (Liquidity) of non-financial listed companies in Nigeria increases the debt-equity mix of such companies and the positive impact is also significant. This corroborates the trade-off theory. Empirical studies have also found a positive relationship between current ratio and long-term debt. This result agrees with prior empirical results which show that liquidity is a major driver of debt-equity mix. (Atif, 2021; Cevheroglu-Acar, 2018; Utami & Inanga, 2012).

Most specifically, the results did not tally with previous findings of various researchers that report that liquidity has no significant influence on debt-equity mix. (Abdullahi & Alifiah, 2020; Khaled & An-Nisha, 2021; Masooma, 2016).

ROET: Return on equity measures a firm's profitability in relation to its equity. The positive and significant coefficient suggests that profitable firms tend to have higher levels of long-term debt. This could indicate that long-term debt is used to finance profitable investments. Empirical studies have found mixed results regarding the relationship between profitability and long-term debt. For example, a study by Ashraf et al. (2022) found a positive relationship between profitability and long-term debt in Pakistani firms, while a study by Wang et al. (2018) found no significant relationship between profitability and long-term debt in Chinese firms.

ROA: Return on assets measures a firm's profitability in relation to its total assets. The negative and significant coefficient suggests that firms with higher return on asset tend to have lower levels of long-term debt. This could indicate that firms with higher profitability have less need for external financing in line with pecking order theory. TANG: Asset tangibility measures the proportion of a firm's assets that are fixed or tangible. The negative and significant coefficient implies that firms with higher asset tangibility tend to have lower levels of long-term debt. This could indicate that firms with more tangible assets have less need for external financing as they can use their fixed assets as collateral for loans. Empirical studies have also found a negative relationship between asset tangibility and long-term debt. For example, a study by Wang et al. (2021) found that asset tangibility is negatively related to the level of long-term debt in Chinese firms.

NCAR: Non-current assets measure a firm's investment in long-term assets such as property, plant, and equipment. The positive and significant coefficient suggests that firms with higher non-current assets tend to have higher levels of long-term debt. This could indicate that firms use long-term debt to finance their investments in fixed assets.

**Are Ilano-Bond Serial Correlation Test**

Test order	m-Statistic	Prob.
AR(1)	-1.066	0.287
AR(2)	-0.041	0.967

**Source: Author's Computations Using E view**

Based on these results, there is no significant evidence of first-order serial correlation (AR (1)) in the data, since the p-value associated with the AR(1) test statistic is larger than the usual significance level of 0.05. However, there is also no significant evidence of second-order serial correlation (AR (2)) in the data, as the p-value associated with the AR(2) test statistic is also larger than 0.05. Therefore, it can be concluded that there is no evidence of serial correlation in the panel data at either the first- or second order.

**MODEL 2:**

$$LTDE_{it} = \beta_0 + \beta_1 LTDE_{it}(-1) + \beta_2 CUTR_{it} + \beta_3 ROET_{it} + \beta_4 ROA_{it} + \beta_5 TANG_{it} + \beta_6 NCAR_{it} + \varepsilon_{it} \text{-----}2$$

Dependent Variable: LTDE				
Method: Panel Generalized Method of Moments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LTDE(-1)	-0.013	0.000	-1569.760	0.000
CUTR	224.744	1.365	164.633	0.000
ROET	-2.034	0.001	-2545.772	0.000
ROA	6.407	0.148	43.210	0.000
TANG	10.928	0.085	128.815	0.000
NCAR	23.599	0.093	253.141	0.000
Effects Specification				
Mean dependent var	-10.948	S.D. dependent var	8326.472	
S.E. of regression	3517.892	Sum squared resid	8960000000.000	
J-statistic	43.689	Instrument rank	61.000	
Prob(J-statistic)	0.688			

**Source: Author's Computations Using E-view**

LTDE (-1): This variable represents the lagged value of the dependent variable, LTDE. The negative coefficient suggests that a higher value of the LTDE ratio in the previous period is associated with a lower LTDE ratio in the current period. This finding implies that companies may adjust their long-term debt levels to maintain a desirable debt-to-equity ratio over time. This finding is consistent with prior research

by Li et al. (2022), who found that firms actively manage their debt levels to maintain target leverage ratios.

CUTR: The current ratio measures a company's ability to meet its short-term financial obligations. The positive coefficient suggests that higher current ratios are associated with higher LTDE ratios. This finding implies that companies with stronger liquidity positions may be more likely to rely on long-term debt to finance their operations. This result is supported by previous research, including the study by Al-Malkawi et al. (2021), who argued that companies with better liquidity are better able to service their debt obligations.

ROET: The return on equity, measures a company's profitability, that is, net income to shareholders equity. The negative coefficient suggests that higher profitability is associated with lower LTDE ratios. This finding implies that companies with higher profitability may be able to finance their operations with internally generated funds and may be less reliant on long-term debt. This result is consistent with previous research, including the study by Al-Malkawi et al. (2021). ROA: The return on assets measures a company's profitability, that is, net income to total assets. The positive coefficient suggests that higher profitability from total assets is associated with higher LTDE ratios. This finding supports the previous finding that higher profitability generally increases the need for long-term debt financing in line with trade-off theory. TANG: Asset tangibility measures the proportion of a company's assets that are fixed / tangible (e.g., property, plant, and equipment). The positive coefficient suggests that higher asset tangibility is associated with higher LTDE ratios. This finding implies that companies with more tangible assets may be more likely to rely on long-term debt financing, as these assets can serve as collateral for debt holders. This result is consistent with previous research, including the study by Al-Malkawi et al. (2021), Chen et al., (2021), Khaled & An-nisha, (2021) Choi, (2014) among others.

NCAR: Non-current assets represent long-term investments that cannot be easily converted into cash. The positive coefficient suggests that higher non-current asset levels are associated with higher LTDE ratios. This finding implies that companies with more non-current assets may be more likely to use long-term debt financing to support these investments. This result is also consistent with previous research, including the study by Al-Malkawi et al. (2021).

**Arellano-Bond Serial Correlation Test**

Test order	m-Statistic	Prob.
AR(1)	-0.02	0.98
AR(2)	NA	NA

**Source: Author's Computations Using E view**



Based on these results, there is no significant evidence of first-order serial correlation (AR(1)) in the data, since the p-value associated with the AR(1) test statistic is larger than the usual significance level of 0.05. However, there is also no significant evidence of second-order serial correlation.

## 5.0 Discussion of Major Findings

Significant Findings: The findings that are crucial include the following: The study used panel generalized method of moments (GMM) estimation technique to investigate liquidity, profitability, asset structure and debt equity mix of listed non-financial companies in Nigeria. The study finds that the lagged value of long-term debt (LTDA) and current ratio (CUTR) have positive effects on long-term debt, suggesting that firms with a history of high long-term debt and those that use long-term debt to finance their short-term liquidity needs, are more likely to have higher long-term debt levels.

Return on equity (ROET) has a positive effect on long-term debt, indicating that profitable firms tend to use long-term debt to finance profitable investments. However, return on Asset (ROA) and asset tangibility (TANG) have negative effects on long-term debt, implying that firms with higher profitability and more tangible assets have less need for external financing. Non-current assets (NCAR) have a positive effect on long-term debt, indicating that firms use long-term debt to finance their investments in fixed assets.

The GMM results further suggest that liquidity, profitability, and asset structure are associated with a company's long-term debt-to-equity ratio (LTDE). Specifically, companies may adjust their long-term debt levels to maintain a desirable debt-to-equity ratio over time. Higher current ratios are associated with lower LTDE ratios, suggesting that companies with stronger liquidity positions may be less likely to rely on long-term debt to finance their operations. Higher profitability (return on equity) is associated with lower LTDE ratios, suggesting that companies with higher profitability may be less reliant on long-term debt. Higher profitability (return on assets) is positively related to long-term debt to equity. Asset tangibility and non-current assets are positively associated with LTDE ratios, implying that companies with more tangible and non-current assets may be more likely to rely on long-term debt financing.

## 6.0 Conclusion and Recommendations

### 6.1 Conclusions

This study has found several factors that influence a firm's debt-equity mix. The results suggest that firms tend to adjust their debt levels towards their target levels, which is consistent with the trade-off theory. The study also confirms the pecking order theory, which suggests that companies prefer to use internal financing sources before resorting to external financing sources such as debt and equity. Additionally, the study found that firms with higher liquidity and profitability tend to have lower debt levels, while those

with more tangible assets, higher non-current assets tend to have higher debt levels. It is worth noting that the study employs a robust methodology and a large sample size of firms across multiple industries. The use of generalized method of moment technique allows for the control of unobserved heterogeneity and potential endogeneity issues, increasing the reliability of the results.

Moreover, the findings are consistent with the existing literature on the determinants of debt levels, providing further evidence to support the theoretical frameworks of pecking order theory, debt conservatism, and trade-off theory. The consistency of these findings across various studies and contexts further reinforces their robustness and validity.

It is also important to note that the study highlights the importance of liquidity, profitability, and asset structure in shaping debt levels. These findings provide useful insights for firms, investors, and policymakers to better understand the factors that influence debt levels and inform their decision-making processes.

## **6.2 Recommendations**

Firms should

- 1) Consider past debt levels when setting current debt targets.
- 2) Monitor their liquidity levels to maintain a healthy balance between liquidity and debt.
- 3) Strive for profitability to reduce the debt burden.
- 4) Consider asset tangibility when making financing decisions.
- 5) Pay attention to non-current assets to achieve an optimal debt equity mix.
- 6) Consider various proxies for both dependent and independent variables and select the most suitable one that will minimize cost, maximize value, and guarantee optimum debt-equity mix for the firm in their financing decisions.

## **6.3 Contribution to Knowledge**

- 1) This study is among the few studies that investigated the impact of liquidity, profitability and asset structure on the debt-equity mix of non-financial quoted companies in Nigerian Exchange Group, and thus, has extended the evidence on debt-equity mix research using two distinct proxies for debt-equity mix.
- 2) This work examined the impact on debt-equity mix of at least two proxies for profitability and asset structure, to avoid unbalanced conclusion regarding their relationship with debt-equity mix.

Their impacts on debt-equity mix were measured on two proxies to facilitate constructive results were arrived at on possible conditions for positive, negative, significant, or insignificant impact on debt-equity mix.

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