

Capital Structure and Financial Performance of Quoted Manufacturing Firms in Nigeria

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ABSTRACT: *There is a divide of view on the relationship between capital structure and corporate financial performance. This study explored the effects of capital structure on financial performance of quoted manufacturing firms in Nigeria. The study used panel least square multiple regression to examine secondary data gathered from the 14 sampled organizations' financial statements from 2011 to 2020. The null hypothesis that there is no statistically significant link between total-debt-to-total-equity and return on assets of manufacturing entities in Nigeria was accepted. The study rejected the second hypothesis relating to long-term-debt -to-total-assets. The study recommended that management of manufacturing corporations that are active on the stock market should strive to increase their long-term-debt-to-total-assets so as to improve their business operations and by extension, their financial performance. The study established that there is a beneficial link between capital structure and financial performance of manufacturing companies.*

KEYWORDS: financial performance; capital structure; return on assets; manufacturing firms

INTRODUCTION

The nature and breadth of the link between capital structure and financial performance of business entities has piqued interest in the finance literature. The choice of how a company's multiple sources of finances are combined to finance its operations and capital projects is known as capital structure. Long-term loan funding, also known as debt financing, as well as preferred stock and ordinary stock, also known as equity financing, are examples of these sources. One of the most

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significant objectives of financial managers is to maximize shareholder's wealth by determining the optimal mix of financial resources for a company and maximization of the company's worth by deciding where to invest those resources.

A very significant aspect that could really influence the performance of an organization is the structure of its capital. Due to the existence of bankruptcy expenses, there is a declination of returns which occurs with the continuous application of leverage so as to enjoy tax deduction and interest benefits. In a resultant effect, there exist an optimum capital structure beyond which the associated bankruptcy cost increases are greater than the marginal tax sheltering advantages that comes with increasingly substituting equity for debt. By applying and sustaining an optimal structure of capital, organizations are motivated to ensure performance maximization and finance cost minimization.

Adeoye and Olojede (2019) and Ajayi and Obisesan (2020) are some of the existing capital structure studies that has utilized many proxies to examine capital structure of organizations. Total debt to total assets/total equity, short term/long term debt to total assets/equity are examples of ratios that are frequently applied in existing literatures. The level of debt used by a firm to finance its assets and some capital expenditures which can aid the performance of the firm are shown by the total debt to total assets. Consequently, an increase in the capital structure, especially the leverage components is expected to improve efficiency and performance.

Managers who can detect the amount of leverages as components of a firm's capital structure are rewarded by lowering the firm's cost of borrowing and thereby maximizing the firm's profitability (Ariekpar, 2020). The percentage of total funds made available by outsiders in relativity to the total assets of a firm is measured and shown by the total debt to total assets ratio. The extent to which the debt of a firm is paid by the overall assets is demonstrated by this ratio, thereby defining the amount to which borrowed funds is being utilized by the company or investors. In a generalized perspective, investors would want a low ratio for every loan, especially since a lower loan ratio suggest a larger buffer against the losses incurred by creditors in the event of liquidation. Several businesses, with the projection of an increased performance, uses debt or leverage to finance their business operations. Therefore, a company's leverage may increase due to the ability to invest in business operations without equity increment.

Usage of debt as a component of the structure of a company's capital has an impact on its financial performance in both positive and negative ways. Organizations that employ the least portion of debt in their structure of capital possesses significant firm value, that are reflected in improved sales, improved and efficient production lower rate of taxes. Subsequently, organizations that engages in inadequate debt application in the structure of their capital are typically inflicted with several forms of financial maladies such as high tax payments, higher level of payables, cash flow showing massive deficits, with corporate dissolution in some instances (Owolabi & Inyang, 2012).

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However, gathering the information relating to capital structure of a firm is dependent on the robustness of the accounting information system. According to Enyi et al. (2019), financial performance is a vital strategic initiative that can ensure sustainability of an organisation or dwindle the fortune of a business organisation hence there should be a robust accounting information system that will track all required indicators for success including indicators on capital structure.

Due to the strategically important role that the Nigeria's manufacturing sector plays in the growth of the nation's economy, it is therefore pivotal for key players such as the management, investors and shareholders to understand the influence of the structure of capital on the performance of manufacturing corporations. This has become apparent as the decision to build the capital structure with equity or debt can change the eventual outcome at any time, especially since it affects the returns and losses of shareholders, and by extension the market value of shares. With this disclosure, investigating the association between capital structure and financial performance of quoted manufacturing enterprises in Nigeria has become a matter of utmost paramount.

Statement of the Problem

The topic of capital structure and financial performance of enterprises has been a source of contention for some time. This issue is further focused down to determining which of the variables under discussion has the greatest influence in predicting and determining the capital structure of manufacturing enterprises. It is difficult to determine a company's appropriate capital structure. A company must issue a wide range of securities in an infinite number of combinations in order to find specific combinations that maximize its overall worth, i.e. optimal capital structure. The value of a corporation is maximized when it has a capital structure considered optimal which eventually resulted in a low weighted-average cost of capital. Capital structure decisions that is not optimal, according to Rahul (1997), may result in a loss in the value of strategic assets. Therefore, it is critical for companies to manage its financial policies if it is to profit from its specialized resources. Many scholars (Abdul, 2012; Keusar, 2014) have been interested in the nature, scope and extent of influence of capital structure on corporate financial performance. However, the research, which are mostly from other countries, have yielded contradictory results.

In line with the traditional theory of capital structure, a company is expected to have a capital structure considered optimal in terms of the debt-equity financing mix. This optimal mix minimizes the overall cost of financing or the Weighted Average Cost of Capital (WACC), thus maximizing the value of the company. According to the traditional theory, this ideal or optimal mix of financing is arrived at the point when marginal cost of equity and the marginal cost of debt are the same. This theory is based on the notion that cost of equity or debt financing are influenced by the gearing level. The irrelevance opposition theory which argues that the gearing level has no effect on the on value of a company was a proposition by the two scholars, Merton Miller and Franco Modigliani, in their work ""The Cost of Capital, Corporation Finance, and Theory of Investment." However, the theory was challenged for failing to account for real-world

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considerations where companies are liable to income tax and distress payments and other determinants of company's value which include assets size and profit.

As a result of the contradictory nature of the above school of thoughts on capital structure, this study attempts an investigation into the relationship that exist between the capital structure of a firm and its financial performance. Hence this study seeks to answer the major question posed by both capital structure philosophies on whether the mix of capital have any effect whatsoever on the success and financial performance of the manufacturing industry?

Objectives of the Study

This study aims to examine the relationship between capital structure and the financial performance of quoted manufacturing companies quoted on the Nigerian Exchange. The study specifically aimed to:

- i. Assess the relationship between the total-debt-to-total-equity ratio and the financial performance of Nigerian quoted manufacturing firms;
- ii. Evaluate the relationship between long-term-debt-to-total-assets ratio and financial performance of Nigerian quoted manufacturing firms.

Statement of Research Hypotheses

The following null hypotheses were formulated for the purpose of this study:

H₀₁: There is no statistically significant relationship between total-debt-to-total-equity ratio and financial performance of quoted manufacturing firms in Nigeria.

H₀₂: There is no statistically significant relationship between long-term-debt-to-total-assets ratio and financial performance of quoted manufacturing firms in Nigeria.

LITERATURE REVIEW

Theoretical Review

Modigliani and Miller (MM) Capital Structure Theory

Most capital structure arguments begin with Modigliani and Miller's theory of 1958 and their statements about irrelevancy of capital structure as a determinant of companies WACC and value. The groundbreaking study contains various capital structure hypotheses that are still contested today. According to MM, the following proposals can be formed in a perfectly efficient market, where there is no tax payment, no transaction costs, no bankruptcy fees, no agency costs, and where there is no information asymmetry.

The first proposition of the MM theory states that the market value of a firm does not depend on the financing methods.

Value of a levered firm = value of an unlevered firm

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This means that notwithstanding the amount of equity or debt firms have in their capital structure, the value remains the same for firms of equal size. The value of a corporation is the same whether it is levered or not. Arbitrage opportunities emerge if the cash flows of two identical enterprises with differing capital structures are not identical.

The second proposition of the MM theory states that the firm's expected return on equity rises proportionately to the amount of leverage. This statement indicates that a company's capital structure has no effect on its cost of capital. This happens because as a company's debt-to-equity ratio rises, so does its cost of equity. It is also vital to remember that the risk of equity is anticipated to increase in proportion to the leverage ratio. Taxes are not considered in the Modigliani and Miller (1958) paper's arguments. Taxes, on the other hand, are commonly thought to have an implicit influence on a firm's leverage. For example, interest on debt is tax-deductible, indicating that having debt in your capital structure decision has advantages.

MM revised their propositions in 1963 to account for taxes. The addition of tax suggests that having debt has tax advantages in the form of a tax shield. A tax shield benefits a business by allowing it to save money on taxes on interest payments. Unlevered enterprises are taxed on their gross earnings, but leveraged firms benefit from tax deductions that are taxed after interest expenses. Because interest expenses are tax deductible, leveraged enterprises pay less tax.

Criticism

The statements are extremely sound in principle. The primary problem with these propositions is that they are predicated on a "perfect market," which is predicated on a number of assumptions. Many of the assumptions are unrealistic even with taxes present while some, like no transaction costs, no bankruptcy fees, no agency costs and equality of borrowing rates for different companies were discovered to be false in the real world. Because these MM assumptions do not hold true in practice, determination of capital structure can affect business valuation (Amraoui et al. 2018).

Pecking Order Theory

The pecking order theory, unlike the tradeoff theory, is a dynamic capital structure theory. According to Myers and Majluf's (1984) view, managers are hesitant to source additional finance through issuance of equity when the value of their company's shares are perceived to have been undervalued. The issuing of equity would be interpreted by investors as a sign that the firm's stock is overvalued. When fresh shares are issued, the share price will fall and as a result of the market reaction, a company may decide not to issue stock.

The knowledge imbalance between managers and the market causes this market reaction. Managers have access to more information about a company's true value and are required to respond in certain ways when it comes to funding. When a company's stock is undervalued, a manager is unlikely to issue equity; yet, when the stock is overvalued, they may be more willing

to do so. The market's reaction to a company's capital structure decision is based on their expectations for how the managers will behave.

According to the notion, a company's funding decisions would be organized in a hierarchy. First, if possible, the company will use internal funding, such as retained earnings. If a company is aware of future investment requirements, it may decide to adjust its dividend policy. Then there's debt financing. Normal bonds are favoured over convertible bonds in this scenario. Third, and only if no other choices are available, equity financing. In the most extreme instances, a company may even forego projects with a positive net present value in order to secure external funding. The basic concept of the pecking order hypothesis is that there is an information asymmetry between enterprises and the market, which causes equity financing to be the last alternative. (Ishaya & Abduljeleel, 2014).

Previous studies like D'Mello and Ferris (2000) and Asquith and Mullins (1986) has validated the theory's prediction that the announcement of stock issuance diminishes value of a firm. Only debt will be issued in equilibrium, according to Myers (2001). Even if they believe their stock is undervalued, management will issue debt rather than equity. Only when debt is expensive would there be an issuance of equity. Costly debt can arise when a company is already heavily leveraged, and investors anticipate the expenses of financial hardship. As a result, there is a pecking order hierarchy.

The theory of pecking order seems to explain the reason for company's preference for external sourcing of finance through debt capital. Another explanation is that companies that are adjudged profitable are averse to borrowing because of the availability of internal source of financing why companies that are less lucrative may have to borrow, thus resulting in debt accumulation (Myers, 2001).

Conceptual Review of Capital Structure

Total Debt to Total Equity

The ratio of total debt-to-total equity measures the percentage of funds from creditors to funds made available by the shareholders. A smaller ratio of this indicator is preferred by creditors because this equates a higher amount of financing given by stockholders which also lead to a higher margin of protection in the occurrence of decline in the value of an asset or outright losses. Kurfi (2003) states that it is a measure of how much financing comes from the lenders or creditors against how much of the financing comes from the shareholders of the company. Magpayo (2011) also noted that a significant portion of the organization's cash flow would be reduced due to the repayment of the principal and interest.

As already discussed, the debt-to-equity index shows the percentage of monies or funds that are contributed by either/both the creditors and investors. A higher rate of this indicator suggests that

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creditors mostly in form of bank loans are employed more frequently than investments from shareholders. Because these variables are recorded in the statement of financial position, the debt-to-equity indicator is treated as a balance sheet item. Due to the industrial difference in the use of debt financing, different sector set its own threshold debt-to-equity ratio.

Creditors and investors consider firms that has a greater debt-to-equity ratio to be riskier than those that have a lower ratio. Unlike equity, debt capital needs to be refunded to the creditors as and when due. Financing through debt may be cheaper than financing through equity because of the guarantee rate of interest payment.

Long Term Debt to Total Assets

The long-term-debt-to-total assets ratio indicates the importance of long-term debt in the capital structure of a firm (long-term financing). The long-term-debt-to-total-assets ratio assesses a company's ability to service its debt. Because this ratio is computed on annual basis, a reduction in the ratio suggests that the firm is doing well portraying the use of debt for commercial purposes less frequently (Kurfi, 2003). The more long-term debt a firm has, it becomes crucial that the firm should generate increasing revenue with sustainable cash flow. Hence, it is important that there is a need for every firm to review its debt component of its capital structure (Akinsulire 2014).

Long-term debt-to-total-assets is a ratio that can easily use to measure capital structure of a firm. Long-term debt are borrowings that is subject to be repaid in over three-year period and these are not classified as part of current liabilities in the statement of financial position. According to Akinyomi (2016), basic trading obligations are excluded but long-term leases and mortgages are included. A higher long-term debt-to-total-assets ratio is an indication of a business with a higher risk as the business may be in difficulty meeting its obligations in terms of principal and interest due. Likely investors or creditors are therefore cautious in availing credit to a firm that is heavily in debt.

Concepts of Firm Financial Performance

Firm's performance is of great concern to shareholders, investors and the general public. The returns on their investment are what they care about as they can benefit from a successful firm. Employees can also have a boost to their income which in turn motivates them to render a premium service delivery to customers.

Companies that perform well can post a higher profit that can creates future goodwill for them, creating jobs and enhance the wealth of all stakeholders. The capacity of a company to achieve its goals with limited resources is referred to as the company's performance. A company's performance, according to Babalola (2018), is defined as its capacity to meet its set goals while using the limited resources available in its operations. In the words of Alawwad (2013), performance is the outcome of appraisal of a company or strategy on the extent which the set goals are met. Financial performance is a deductive indicator of the capacity of a company to earn

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income from the deployed assets in the operation of the business. Financial performance, according to Van Horn (2005), is a measure of the ability of a firm to use its available assets to generate income. According to Pandey (1999), this phrase is used to describe a “general measure of a company's overall financial health”. Organizational theory and strategic management inform research on a company's financial performance. The term financial performance refers to the performance of a firm that has the legal status of a corporation. Because of its multifaceted meaning, financial performance as a concept is a contentious topic in corporate finance, therefore, assessment of firm's performance requires a clarity and special consideration.

One of the strategic roles of management is to measure the financial performance of a firm in order to meet the expectations of all stakeholders in the business. The performance appraisal of a company entails a periodic and systematic evaluation of its activities in order to establish whether or not the company's goals have been met. The evaluation of a company's performance necessitates the use of particular criteria, which might be internal or external. Internal principles refer to a company's capacity to fulfill its stated goals, whilst external principles refer to a company's ability to compare itself to its industry competitors to ensure establishment of a successful business strategy that will give the company a competitive advantage in the market (Ariekpar, 2020).

Total Debt to Total Equity and Firm Financial Performance

In Saudi Arabia, Alawwad (2013) looked at the impact of capital structure on firm performance. It was established that a negative association exists between total debt and total equity, as well as return on assets. In Kenya, Maina and Ishmail (2014) looked at the impact of capital structure on financial performance. Population of the study comprises of all enterprises listed on the Nairobi Securities Exchange, and it was carried-out using a census technique from 2002 to 2011. Results revealed that that the relationship between total debt to total equity and financial success was negatively correlated. Lawal et al. (2014) looked at the impact of capital structure on manufacturing company performance in Nigeria from 2003 to 2012. We used descriptive and regression techniques. Mathanika et al. (2015) evaluated the impact of capital structure on a firm's value in Sri Lankan listed manufacturing enterprises. Secondary data sources from 15 manufacturing companies were used. Multiple regression analysis and correlation were performed. The study concluded that there is a substantial relationship between financial performance and the ratio of total debt to total equity.

Long Term Debt to Total Assets and Firm Financial Performance

Long-term debt to total assets reflects a company's long-term debt's relative size in its capital structure (long-term financing). Abdullah (2014) evaluated the extent to which capital structure impacted the performance of 74 Saudi enterprises from 2004 to 2012. The regression results established a link existed between financial performance and the ratio of long-term-debt-to-total-assets. Amara and Bilal (2014) evaluated the effect of capital structure on the performance of 33 food companies listed between 2007 and 2012 on the Karachi Stock Exchange. According to the analysis, there is no clear association between financial performance and long-term-debt-to-total-

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assets' ratio. Khalaf (2013), with a sample size of 45 listed manufacturing firms in Jordan explored the link between capital structure and company performance across industries. The yearly financial statements of the sampled enterprises were used over a five-year period of 2005 to 2009. A negative and negligible association between long-term debt to total asset and financial performance was established with the use of multiple regression analysis. Cengiz et al. (2013) looked at the impact of capital structure changes on manufacturing firm profitability in Turkey. The research used secondary data which was obtained from a variety of sources, including yearly reports and publications, in order to conduct a thorough analysis. Findings from the study showed a negative correlation between financial performance and long-term debt and total assets.

Review of empirical literature

Akinyomi (2016) examined three manufacturing enterprises chosen at random from the food and beverage sectors for a five-year period (2007-2015). The study was based on the pecking order and static trade-off theories and used the correlation analysis method. It was discovered that short-term-debt-to-total-debt, debt-to common equity, debt-to-capital and firm age are all significantly and positively related to return on equity and return on asset, but long-term debt to capital is only significantly and relatively related to return on asset and return on equity. Using both return on asset and return on equity, it was further evaluated to see if a substantial relationship exists between capital structure and financial success.

Appah et al. (2013) used 32 firms listed on the Nigerian Exchange Group for a seven-year timeframe (2005-2015). They used a panel analysis to find that long-term debt, short-term debt, and total debt all have a significant and negative relationship with performance when measured using the return on equity and return on assets. Non-tax debt and liquidity also have a negative relationship with performance, while tangibility and efficiency have a significant positive relationship.

In Turkey, Nassir (2016) examined how capital structure affects the performance of industrial enterprises. Annual financial statements, for eight-year period from 2005 to 2012, of 136 listed industrial enterprises on the Istanbul Stock Exchange were analysed. The study used multivariate regression analysis to determine if any causal association exists between companies' financial performances and capital structure. The results revealed that there exist a negative and statistically significant relationship between companies' performances and capital structure.

Within the pecking order concept, Lawal et al. (2014) employed regression to ascertain the effect of capital structure on company performance. Findings from this study revealed that there exist a negative association between firm performance and the level of debt-to-equity ratio.

In a study conducted in Netherlands by Schulz (2017), the effect of capital structure on financial performance of small and medium-sized businesses was examined with a timeframe of eight years between 2008 and 2015. The study used panel regression method and findings showed

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that there exists a substantially negative association between capital structure and financial performance proxied by return on assets.

Arikekpar (2020) looked at the capital structure and financial performance of manufacturing firms in Nigeria. The research was conducted across a five-year timeframe of 2014 to 2018. The model utilized was a fixed effect regression. Organizations' performance was proxied by return on equity, return on assets and earnings per share while equity and debt ratios were used to proxy capital structure. According to the result, capital structure has a favorable significant impact on the financial performance of chosen Nigerian companies.

METHODOLOGY

Research Design

The research design adopted for this study is the quantitative ex-post facto design, The adopted research design, according to Shoma (2011), can assist researchers to analyse figures and statistics, interrogate theories and establish assumptions relating to a concept.

The study used the descriptive and correlational approach to explain the relationships that exist between the study variables. Secondary data were obtained from the financial statements of sampled manufacturing companies in alignment with the researcher's concepts and were analyzed and used in testing hypotheses.

Population

The study population encompass the total of 71 listed manufacturing firms on the Nigerian Exchange Group as at February, 2022. This information was derived from the Nigerian Exchange Group data which listed a total of 161 firms on its platform. The combination of industrial, consumer, construction, agricultural, pharmaceutical production, conglomerate producers and oil and gas producers were considered manufacturers.

Sampling Technique

The study adopted a random sampling technique. The sampling processes were determined using Slovin's formula which provided for a desirable degree of precision (Stephanie, 2003). This formula was particularly useful when a sample size of a subset of the population was required. Stephanie (2003) recommended a confidence level of 95%. Using the Slovin's sample size formula, a sample size of 14 manufacturing firms which were drawn from the defined population were used. This is represented below:

$$n = N/(1+Ne^2)$$

Where n = sample size in number

N = Population of the study

e = Error terms

$$\text{Therefore; } n = 71 / (1+71(0.05)^2) = 71/5.0714 = 14$$

Sources and Method of Data Collection

This study used secondary data obtained from the annual financial statements of the manufacturing firms sampled for the study. Complimentary data were also obtained from the Fact Book of the Nigerian Exchange Group. To examine the relationship between the variables of this study, time series data were extracted from the financial statements of the manufacturing firms sampled for the study for ten-year period from 2011 to 2020 which are the most recent and complete audited accounts submitted to the Exchange. Panel data derived from the time series data obtained from individual firms was analysed to achieved the objective of the study.

Method of Data Analysis

Descriptive analysis was used to categorized the data collected for the study to give insight to the nature of the data set gathered in line with the proposition of Walker (2006). To evaluate the nature and extent of association that exist between the dependent variable and the independent variable, Panel Vector Error Correction Model (PVECM) was used for regression analysis. The PVECM provides specifics on the relationship between the dependent and independent variables and specific equation to evaluate the speed of adjustment to equilibrium.

Multiple correlation coefficients are used to denote the correlation between the predicted and observed values of the dependent variable which ranges between 0 and 1. Higher value of R towards 1 portrays the existence of stronger link and vice-versa.

Coefficient of determination (R^2), which is the proportion or percentage of change or variation in the dependent variable that can be explained by the independent variables. The value of R^2 ranges between 0 and 1, and it show how well the data fit the regression model i.e. a measure of goodness of fit. A low value towards 0 suggests that the model is unfit to explain the relationship between the dependent and the independent variables.

Stationarity Test

The first element of the investigation was using the Augmented Dickey-Fuller (ADF) unit root method to test for stationarity. The essence is to ensure that all the parameters are approximated using stationary time series data. As a result, the purpose of this research is to avoid the occurrence of false results.

Co-integration Test

This study used the Pedroni co-integration test to determine the extent of long-run stationary relationship among the variables of the study. Also employed as part of the co-integration test are the trace test and the Engel-value test.

Model Description and Justification

The model adopted to test the hypotheses of the study is as shown below:

$$ROA_{it} = \beta_0 + \beta_1 TDTA_{it} + \beta_2 TDTE_{it} + \beta_3 STTA_{it} + \beta_4 LTTA_{it} + \epsilon_{it}$$

The variables in the equation are defined thus:

ROA = Return on total asset

$\beta_0, \beta_1 - \beta_4$ = Estimated parameters

TDTA = The ratio of total-debt to total assets

TDTE = The ratio of total-debt-to-total-equity

STTA = The ratio of short-term-debt-to-total-assets

LTTA = The ratio of long-term-debt-to-total-assets

ε = error term representing other variables not captured in the model

it = Data for firm i at time t period

DATA PRESENTATION, RESULTS AND DISCUSSION OF FINDINGS

Table 1: Descriptive statistics

	ROA	TDTA	TDTE	STDTA	LTDTA
Mean	0.090430	0.437143	0.880594	2.504872	0.193488
Median	0.045281	0.255367	0.515806	0.290369	0.112041
Maximum	6.174312	13.92398	17.59549	11.77450	2.320664
Minimum	-0.993239	0.012927	0.009140	0.008615	0.003549
Std. Dev.	0.532019	1.176843	1.682389	17.09989	0.260029
Skewness	10.72985	10.86453	7.607679	8.155882	4.551070
Kurtosis	124.0403	124.9929	72.44498	67.84632	34.07675
Jarque-Bera Probability	88149.11 0.000000	89567.41 0.000000	29482.32 0.000000	26081.53 0.000000	6116.910 0.000000
Sum	12.66022	61.20007	123.2832	350.6820	27.08838
Sum Sq. Dev.	39.34308	192.5095	393.4303	40644.44	9.398514
Observations	140	140	140	140	140

Source: Computed by authors using E-view 10

Descriptive Statistics

Table 1 shows the information relating to performance statistics of companies over time. The average Return on Asset (ROA), recorded is 0.09% with the maximum companies' performance of 6.17% and minimum of -0.9%. The average total-debt-to-total-asset (TDTA) shows 0.43% with maximum and minimum of 13.9% and 0.01% respectively. Average total debt to total equity (TDTE) shows 0.88% with minimum and maximum of 0.009% and 17.5% respectively. The mean of short-term-debt-to-total-asset (STDTA) shows 2.50% minimum and maximum of 0.008% and

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11.7% respectively. Average long term-debt-to-total-asset (LTDTA) revealed 0.19% with minimum and maximum values of 0.003% and 2.32% respectively.

The standard deviations indicate disparity between the data set with high values in relation to the mean values meaning that variations are rife for the data among the manufacturing companies and across time period. However, these disparities are well accounted for with the use of panel data regression in the estimation. The descriptive statistics also reveals the relationship between the Kurtosis and the Skewness of the data indicating that the variables considered are all not normally distributed. The Jarque-Bera statistic as shown in the table 1 confirm this assertion.

Table 2: Correlation result

	LNROA	LNTDTA	LNTDTE	LNLTDTA	LNSTDTA
LNROA	1.000000				
LNTDTA	0.084279	1.000000			
LNTDTE	0.179041	0.596710	1.000000		
LNLTDTA	0.238915	0.227317	0.148395	1.000000	
LNSTDTA	0.205262	0.452525	0.337193	0.240302	1.000000

Source: E-view 10 output as computed by authors

Correlation result

The essence of correlation is to determine direction of associations among variables, which can be a negative or positive association existence among the individual variables. Table 2 indicates and shows the relationship that exists between the independent variables (LNTDTA, LNTDTE, LNLDTA, and LNSDTA) and the dependent variable (LNROA) of the study data. The results indicate that there is a positive association between TDTA and ROA, as shown by the value 0.084279.

This follows that an increase in the total debt to total asset ratio should, all things being equal, increase the returns on assets of the observed manufacturing companies by 8.4%, and vice-versa. The value 0.179041 indicates a positive association between the total-debt-to-total-equity ratio and return on assets. The value of 0.238915 suggests a significant and positive association exist between LTDTA and ROA of the selected manufacturing firms in Nigeria while the value of SDTA

Publication of the European Centre for Research Training and Development-UK to ROA (0.205262) also follows a positive direction. A positive association also exists among all the study variables.

Table 3: Unit root test result

Variable	Common unit root process assumed		
	LLC test	Prob.	Stat. @
ROA	-9.96178	0.0000	I(1)
TDTA	-3.46156	0.0003	I(1)
TDTE	-2.75090	0.0030	I(1)
LTDTA	-3.68991	0.0001	I(1)
STDTA	-2.94876	0.0016	I(1)

Source: Authors' computation using E-view 10

Unit root results

Three panel unit root testing techniques were considered in determining the level of stationarity of the variables. The Levin, Lin and Chu (LLC), which is the most common unit root-based statistics, was used together with Im, Pesaran and Shin (IPS) and ADF-Fisher Chi-Square, which are individual or entity-based unit root statistics. Emphasis is laid on the LLC statistics for the purpose of this study. Table 3 shows the level of stationarity of all the study variables.

The LLC statistics indicates that all the study variables are not stationary at level I(0), however they were all stationary at first difference I(1). This point of stationarity of the variables determine the type of regression and estimation technique suitable for the data analysis.

Table 4: Panel Least Squares (Error Correction Model) result**Dependent variable: LNROA**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.043852	0.014814	2.960160	0.0037
D(LNTDTA)	-0.177992	0.086437	-2.059220	0.0417
D(LNTDTE)	0.106874	0.056639	1.886924	0.0016
D(LNLTDTA)	1.142766	0.517629	2.207692	0.0292
D(LNSTDTA)	-0.000281	0.001728	-0.162759	0.8710
ECM(-1)	-2.433210	0.235846	-10.31696	0.0000
R-squared	0.681314	Mean dependent var		0.045440
Adjusted R-squared	0.669286	S.D. dependent var		0.653542
S.E. of regression	0.480548	Akaike info criterion		1.419399
Sum squared resid	27.24933	Schwarz criterion		1.555864
Log likelihood	-82.00271	Hannan-Quinn criter.		1.474834
F-statistic	21.89961	Durbin-Watson stat		1.253943
Prob(F-statistic)	0.000000			

Source: Authors' Computation, 2022

Test Of Hypotheses

Hypothesis One

H₀: There is no statistically significant relationship between total-debt-to-total-equity ratio and financial performance of quoted manufacturing firms in Nigeria.

Discussion

Table 4 shows the influence of total debt to total equity ratio on the financial performance of quoted manufacturing businesses in Nigeria. According to the hypothesis, the total debt to total equity ratio has no bearing on the financial performance of quoted manufacturing businesses in Nigeria. The result demonstrates that the total debt to total equity ratio exerts a positive and statistically significant impact on the return on assets of manufacturing businesses quoted in Nigeria exchange. The TDTE shows a coefficient of 0.106874 and a probability of 0.0016. Consequently, as indicated by the p-value, the null hypothesis that states that there is no statistically significant relationship between TDTE and financial performance is rejected while the alternative hypothesis is accepted.

Hypothesis Two

H₀: There is no statistically significant relationship between long-term-debt-to-total-assets ratio and financial performance of quoted manufacturing firms in Nigeria.

Discussion

Table 4 shows the influence of the ratio of long-term debt to total assets on financial performance of manufacturing businesses listed on the Nigeria exchange. Hypothesis two states that there is no statistically significant relationship between long-term-debt-to-total-assets ratio and financial performance of quoted manufacturing firms in Nigeria. Results shown in table 4 indicates that the long-term debt to total assets ratio has a significant effect on the return on assets of manufacturing firms quoted on the Nigeria exchange. This assertion was based on the coefficient of 1.142766 and a probability value of 0.0292.

Consequently, as indicated by the p-value, the null hypothesis that states that there is no statistically significant relationship between long-term-debt-to-total-assets ratio and financial performance of quoted manufacturing firms in Nigeria is rejected while the alternative hypothesis is accepted.

CONCLUSION

The findings of this study established that the relationship between financial performance of manufacturing firms and the ratio of total debt to total equity is negative. This therefore means that the ratio of total debt to total equity does not and not a major determinant of the financial performance of manufacturing firms listed on the Nigeria exchange. This outcome was in line with the study of Lawal et al. (2014).

Furthermore, the study found out that there exists a statistically significant relationship between the ratio of long-term debt to total assets and financial performance of manufacturing firms listed on the Nigeria exchange. This therefore means that the ratio of long term debt to total assets is a key determinant of the financial success of manufacturing firms listed on the Nigeria exchange. This was in tandem with the study of Abdullah (2014) conducted on Saudi firms.

Recommendations

The study, having made the assertions about the influence of the ratio of total debt to total equity and ratio of long-term debt to total assets on financial performance made the following recommendations:

- (i) In the pursuit of improvement in the financial capacity, establishing and implementing an optimized structure of capital should be the main focus of management of listed manufacturing firms in Nigeria.
- (ii) Management of manufacturing corporations that are active on the stock market should strive to increase the ratio of their long-term debt to total assets so as to optimize their capital structure and by extension improve their financial performance. This recommendation is in accordance with the findings of this research, which established that there is a beneficial link between the two.

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(iii) There is need for the management of manufacturing corporations that participate in the stock market to occasionally monitor their ratio of total debt to total assets as a non-significant negative relationship has been established by the findings of this research in relation to the financial performance of their entity.

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