CAPITAL STRUCTURE AND PROFITABILITY OF MANUFACTURING FIRMS IN NIGERIA: 2006-2022
BY

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ABSTRACT

This study examined the effect of capital structure on the profitability of manufacturing firms in Nigeria for a period of 17 years (2006-2022). The specific objectives of the study include: to investigate the effect of total equity capital on the profitability of manufacturing firms in Nigeria and also to examine the effect of total debt capital on the profitability of manufacturing firms in Nigeria. Data of three randomly selected manufacturing firms listed on the Nigeria Stock Exchange were sourced from the firms' published financial reports for the period under study and were analyzed using Panel Least Square Regression technique. The model's coefficient of determination has a value of 91% with adjusted R^2 value of 86% indicating that 91% of changes in profitability are jointly influenced by the explanatory variables. The outcome of Panel Least Square Regression indicates that both equity financing and debt financing were positively signed at 5% level of significance; the coefficients suggested that the independent variables have increasing and significant effect on profitability of manufacturing firms in Nigeria. Based on these findings, it is therefore recommended that managers of manufacturing firms should increase their capital base through issuance of shares to the public or to existing shareholders and obtain more debt instruments that ensure capital adequacy. In taking such financial decisions, caution should be taken in order to maintain optimal capital structure.

Keywords*: capital structure, equity capital, debt capital, manufacturing firms, profitability*

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Introduction

Profit maximization is one of the crucial and motivating factors to be considered in sitting up any business firm because it is important to the firm's going concern. The existence and survival of any business firm depends maximally on its profits. Profit has different meanings to various groups of people. It could be seen as gain made after subtraction of all expenses incurred in generating the profit. Profitability expresses the rate of expertise of a firm in employing assets to earn gains for the company and also for esteem investors (Agha, 2015). Profitability is described as a ratio among gains and different kinds of gains used as assets. The cardinal focus of budgetary examination is to show firm's ability to generate profit. Hifza (2011) opines that profitability and productivity of companies are significant factors used to determine performance.

A major component used to determine a firm's profitability among other factors is its capital structure. Given that, the success and survival of any firm can be examined through its profitability, financial managers do employ the essential rules and policies that are concerned with finance in order to attain an optimal capital structure in their various organizations so as to increase their profitability (Muhammed, Gugon & A. Ayuba 2022). Decisions on the composition of different sources of funds that organizations can utilize to run their business operations and investments involve what is termed capital structure. Capital structure deals with financing sources that are available to business organizations to fund their business activities. These sources include: equity finance, retained earnings, bonds, bank loans, account payable, line of credit, and interest bearing debts like debenture and among others. Rahman, Darker and Uddin (2019) defined capital structure as the combination in which organization's management chooses to combine equity, debt or both in the organization's operations in order to maximize shareholders' wealth.

In a field of finance, there have been series of discussions on how a firm should choose its capital structure and how such a decision affects the firm's profitability (Uford, 2017). The combination of both internal and external financial sources will determine if the firm would succeed or not (Okpoku & Asante 2022). Furthermore, Omukaga (2017) added that lack of capital structure decisions to fund a firm's business activities can lead to

liquidation, financial crisis or bankruptcy. Given the rate of competition and changes in technology in the Nigerian manufacturing industry, it is important that businesses in this sector adopt an ideal capital structure which will guarantee its survival and existence. Rosario and Chavali (2019) opined that in taking capital structure decisions, a trade-off between risk and return is equally being taken, and it is necessary to find the equilibrium between the two, that is, risk and return. The balancing of the two (risk and return) in capital structure is described as optimal capital structure. This is one of the most important tasks of a company's management in financing (Rosario & Chavali 2019).

Optimal capital structure signifies the point in which debt and equity ratios are at equilibrium which would cause a company to maximize profits and minimize cost of capital (Dang, Bui, & Nguyen, 2019). Similarly, James (2023) explained that optimal capital structure represents the proportions of capital that maximizes a firm's total value, comprising of debts and equity funds. Ariyo (2023) added that basic and complex capital structure exists, ranging from simple equity and bonds. As such, judicious use of the available (limited) capital resources is important for optimal business operations and maximum returns.

Dawood, Moustafa, and El-Hennawi (2011) expressed that companies can raise funds from either equity or debt or both equity and debt sources to develop their businesses, however, these sources of funds have their implications. The choice of financing between equity and debt, bearing in mind the shareholders' wealth maximization objective, has its advantages and disadvantages when made (Dang, Biu and Nguyen, 2019). Consequently, if the proportion of debt in a company's capital is too high, the firm's financial ability would be affected, while an excessive employment of equity would weaken proprietorship premium and it might pave way for the outsiders to have control over the organization. However, Anarfo and Appiahene (2017) observed that if a firm adopts the debts financing option in funding its operations, it shows the effort of the management in improving future earnings of the firm in order to maximise shareholders' wealth.

The profitability of any company is affected by the composition of its capital structure. Moreover, every business organization aims at maximising

the value and wealth of their shareholders. Therefore, business firms should strive to maintain an ideal capital structure that could maximize profit and minimize the cost of capital (Dahiru, Dogarawa & Haruna, 2016).

In Nigeria, inappropriate capital structure has stagnated most companies as they have not figured out their optimum capital structure. Thus, several studies on capital structure and financial performance of firms have been conducted but the financial problems of corporate entities persist, therefore making this study on the effect of capital structure on profitability of manufacturing firms in Nigeria necessary.

Thus, the specific objectives of the study include:

1 To examine the effect of total equity capital on the profitability of manufacturing firms in Nigeria.
2 To investigate the effect of total debt capital on the profitability of manufacturing firms in Nigeria.

With regards to the research objectives stated above, this study seeks to provide answers to the following research questions:

i. To what extent does total equity capital effect on the profitability of manufacturing firms in Nigeria?
ii. What effect does total debt capital have on the profitability of manufacturing firms in Nigeria?

The following hypotheses stated in their null form will be tested in the course of this study:

H_{01}: Equity financing has no significant effect on the profitability of manufacturing firms in Nigeria.

H_{02}: Debt financing has no significant effect on the profitability of manufacturing firms in Nigeria.

The findings of this study are expected to be of importance to the stakeholders of manufacturing sector and other sectors of the economy. It would also be of great benefit to investors and financial analysts as it will provide some economic indices upon which financial decisions regarding investments can be made. Researchers and students also stand to gain from the findings of this research work to enhance their knowledge on capital structure of companies.

The study focused on manufacturing firms that are listed on the Nigeria Stock Exchange between the periods (2006-2022). The study focused on three manufacturing firms in Nigeria which include: Nestle Nigeria Plc,

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Cadbury Nigeria Plc and Nigerian Breweries Plc. These three manufacturing firms were selected because of their perceived suitability in explaining the effect of capital structure on the profitability of manufacturing firms in Nigeria.

Literature Review
Conceptual Review
Capital structure refers to the combination of equity and/or debt employed in funding the overall activities of a business organisation. It is seen as the proportion of debt and equity that constitute the total capital of a company. Salawo (2009) described capital structure as the mixture of different securities used by a company in funding its profitable venture. It is described as capital mix or financing mix. The capital structure of any firm relates to the arrangement of different financial resources used to fund business operations and capital expenditure. A firm needs money to finance its daily activities as well as its long-term project and investments (Dahiru and Dogarawa 2016). A firm can source for capital through stock issuance, that is, equity capital or bonds or debentures (debt capital). A firm may choose to fund its business solely with either equity (100% equity) or debt (100% debt), though such is rare (Charles & Uford, 2023; Etuk, Anyadighibe, James, & Ukpe, (2022).

Equity capital is the capital raised from external source (shareholders) by the company through the issuance of equity shares to the public to finance its investment activities. Shareholders are part owners of the company and are given dividends at the end of accounting period (usually a year) from the profit made by the company. Equity (owners') capital consists of two different types as follows:
   (a) **Contributed Capital:** Contributed capital is the amount of money that the founders of the company invested at the time of establishing the company or received from shareholders as a price for part (fractional) ownership of the company.
   (b) **Retained Earnings:** Retained earnings refers to the accumulated net income of a company after paying direct and indirect costs, income taxes and dividends to shareholders.
Debt capital refers to borrowed capital from external sources that a firm uses to finance its investment activities and it is usually associated with a long period of repayment.

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The debt repayment process is based on the terms and conditions of the borrowed funds, usually with regular repayment schedule including the principal and interest. There are various forms of debt capital including:

(a) Long - Term Bond: This is a long-term debt instrument considered very safe as it has an extended repayment period, and only interest needs to be repaid at intervals while the principal needs to be repaid at maturity.

(b) Short Term Commercial Paper: This is a type of short term debt instrument that is used by companies to raise capital for a short period of time.

(c) Debenture: This is a long-term debt instrument that is not secured by collateral issued by both corporations and governments. Since debenture is unsecured by collateral, it therefore relies on the creditworthiness and reputation of the issuer. As such, the interest rate is quite high on debentures compared to bonds.

(d) Term Loan: This is the fund acquired by the firms at a floating or fixed rate of interest. It is an appropriate source of fund for the companies which have a good and strong financial position.

Optimal capital structure is referred to as the perfect mix of debt and equity financing that helps in maximizing the value of a company in the market while at the same time minimizes its cost of capital (Nwankwo, 2021). Capital structure varies across industries. For a company that is involved in mining or petroleum and oil extraction, a high debt ratio is not suitable, but some industries like insurance or banking have a high amount of debt as part of their capital structure.

Theoretical Framework

In providing a theoretical framework for this study, the Trade-off Theory was used as an anchor. Notwithstanding, Modigliani and Miller Theory; Pecking Order Theory and Agency Theory were discussed.

1) **Trade off Theory**

Trade off theory was developed by Miller in 1977 and it is based on the concept that a firm would consider how much of debt finance and equity finance to be used, taking its benefits and costs into consideration. It is based on a trade-off between tax savings and distress costs of debts. The theory states that target debt-equity ratio is approached at the point where the tax advantage of debt is offset by the costs of prevailing market imperfections. As opined by Muritala (2012), the theory is premised on the

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fact that a company will select how much debt finance and equity finance will be needed by balancing the costs and benefits.

2) Modigliani and Miller Theory

The first theory on capital structure was propounded by Modigliani and Miller in 1958. The theory known as "capital structure irrelevance" is based on the concept that the relationship between cost of capital and capital structure is irrelevant, that is, the increase in debt has no effect on cost of capital. Their theory was based on assumptions such as perfect capital market, no taxes, no transaction costs, and homogeneous expectations.

3) Pecking Order

This theory was developed by Stewart Myers and Nicolas Majluf in 1984. The theory was based on the concept that firms prioritize sources of financing their investment. According to the theorists, there is asymmetric information between managers and investors. Thus, investors would want higher returns to compensate for the risk they are taking and the less information at their disposal. Therefore the conclusion drawn based on asymmetric information is that firms have a hierarchy of financing preferences; firms initially rely on internal funds, or turn to debt and later issue equity to cover for the remaining capital if there is need for it.

4) Agency Theory

This theory is based on the relationship between the principal (the shareholders) and the agent (the managers). The agency relationship happens when the principal hire the agent to act and perform certain services on its behalf. The principal is the owner of the company and expects maximum returns on their investment. The agency relationship leads to conflicts of interest and priorities where the agent tends to pursue his own interest instead of the interest of the principal. Thus, in order to ensure that the agent maximizes the wealth of the principal, the principal must undertake some agency cost to monitor the activities of the agent or to compensate him.

This research work is anchored on Trade off theory, although three other relevant theories have been explained. The trade-off theory is a cost-benefit analysis theory. It is used in this research work because firms analyze the cost they will pay for obtaining capital and the benefits they will reap from

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such engagement. Of course, if the benefits weigh higher than the cost, the firms will source for such capital and the reverse would be the case.

Empirical Review

Some studies have been carried out to examine the effect of capital structure on profitability of manufacturing firms in Nigeria and other countries. Such studies reviewed as follows:

Banabo & Aganaba (2024) investigated the link between capital structure and financial performance of listed brewery corporations in Nigeria with the moderating factor of firm size. The study made use of secondary data sourced from annual financial reports of the companies under study. Correlational research design was adopted. Capital Structure (predictor) variables were equity financing and debt financing. While financial performance was measured with return on assets and return on investment. The study found that capital structure has a positive but not significant relationship with financial performance of listed brewery companies in Nigeria. Also, firm's size has a positive, but weak and not significant moderating effect on the relationship between capital structure and financial performance of listed brewery companies in Nigeria. Based on the findings, the study concluded that equity financing has a positive, but very weak and not significant relationship with return on assets and return on investment. The study therefore recommended among other things that, there should be a review of the capital structure of the firms so as to ascertain the optimal capital structure that can be used to enhance financial performance. Also, the equity position of the firm should be reviewed also as this could have a way of increasing their performance in terms of return on investment if adequately utilized. Lastly, the firm size in terms of its total assets base should be considered by the management of listed manufacturing firms so that the appropriate kind of capital structure for the companies can be adopted.

Omiete (2024) investigated how financial leverage, firm's size and profitability affect the value of quoted insurance companies in Nigeria covering the period 2010-2022. Secondary time-series data were sourced from annual reports of 20 quoted insurance companies. The unit root, Pendroni cointegration, and generalized method of moment techniques were employed. The unit root test revealed that all the variables are integrated at first difference leading to application of the Pendroni cointegration which

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confirmed the absence of long-run form among the variables. The GMM test indicates that long-run debt and firm size are largely positive to Tobin's Q ratio, but this was not significant. The study concluded that financial leverage and firm size are the two determinants of firm value. Based on the findings, the study suggests for the continual usage of long-term debt ratio and an increase in firm's size of quoted insurance companies to accommodate more insurance businesses and at the same time boost the level of their confidence among potential and actual investors. Again, insurance companies are advised to engage in share buyback when analyzed to be undervalued to remain more competitive in their industry and create added value for their shareholders. Finally, the Central Bank of Nigeria should revert to a bi-monthly review of interest rate charges by lending institutions in Nigeria to help monitor and improve their performance on the utilization of borrowed funds.

Ozondu and Egbunike (2024) investigated the effect of capital structure on financial performance of listed deposit money banks in Nigeria. The study adopted ex post-facto research design. The data for the study was sourced from the published financial reports of the concerned banks. Pearson correlation and multiple regression analyses were used for data analysis with the help of Stata 13 software. The result showed that there is the existence of a positive and significant effect of debt capital on net profit of listed deposit money banks on the Nigerian Stock Exchange. The study concluded that statistically, there is positive and significant effect of capital structure on financial performance of listed deposit money banks in Nigeria. The study therefore recommended that management of deposit money banks in Nigeria should endeavor to finance their business activities with equity and debts as encouraged by pecking order theory and agency theory. Lastly, the management of deposit money banks in Nigeria should consider industry benchmarks and best practices in capital structure management in order to continue operating productive business activities.

Yisau, Oke, and Odukoya (2024) examined the factors that influence capital structure decisions in Nigerian consumer goods publicly traded companies by accounting for economic growth effect. The study utilized secondary data sourced from the firms' annual reports of 15 of the mentioned companies, spanning ten years from 2011-2020. The association between the leverage ratio and the six explanatory variables in the model was

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examined using the Panel Least Square Regression approach. The findings revealed that while non-debt tax shield is not statistically significant, asset tangibility, firm size and economic growth all positively and significantly affects leverage. Furthermore, profitability and firm growth are negative and have a serious effect on leverage. Based on the findings of the study, capital structure of listed consumer products companies in Nigeria is significantly affected by factors like firm's size, firm's growth, profitability, tangibility and economic growth. The study then recommended that financial managers of listed firms in Nigeria should engage effective measures to spur up these relevant variables in order to have an optimum financing mix for their firms.

Isiaka (2023) evaluated the impact of capital structure on firm's value in Nigeria's food and beverages sector. A quantitative research approach was employed concentrating on the association between financial ratios (debt to equity, return on assets, current ratio, asset growth and firm size) and stock prices as a proxy for firm value. Panel data was gathered from financial statements of the 16 publicly quoted food and beverages companies in the Nigeria Stock Exchange from 2017-2021 and the data was analyzed using statistical software. The descriptive statistics showed features of the variables, revealing variation in stock prices, return on assets, current ratio, asset growth, firm size and debt to equity ratio. Regression analysis using the random effects model exhibits the significance of the firm size on stock prices. Also, other variables such as current ratio, return on asset, and debt to equity and asset growth are statistically significant. The study concluded that firm size has a negative and significant impact on stock prices, revealing that larger firms tend to have lower stock prices.

Akintola, Tomori and Audu (2023) explored the effect of capital structure on financial performance of quoted manufacturing firms in Nigeria. The study made use of panel least square multiple regression to analyze the secondary data sourced from financial statements of 14 sampled organizations from 2011-2020. The result of the analyses revealed that there is no statistically significant relationship between total debt to total equity and return on asset of manufacturing firms in Nigeria. The study also showed no long-run relationship between debt to total asset and return on assets. The study therefore suggests that management of manufacturing firms that are active on the stock exchange market should make attempt to

increase their long-term debt to total asset in order to boost their business activities and by extension, their financial performance.

Ariyo and Aminat (2023) assessed how capital structure affects the profitability of listed Nigerian manufacturing companies. The study employed secondary data sourced from the annual financial reports of the concerned companies. The study made use of both descriptive and inferential statistics and the data was analyzed using a multiple regression method. The results of the study indicated a noticeably inverse relationship between total debt and profitability; that is, the higher the debt, the lesser the profitability of the company. The study there recommended that to boost the profitability of manufacturing enterprises, a suitable (optimal) mix of capital structure should be employed.

Ifeanyi and Ukaegbu (2023) examined the effect of capital structure on financial performance of listed industrial goods manufacturing firms in Nigeria. The secondary data used were sourced from the annual financial reports and accounts of the firms under study from 2013 to 2022. The study adopted ex-post-facto research design. The data were analyzed using descriptive statistics, unit root test, and diagnosis test and panel least square regression analysis with the aid of E-view 12. The study results revealed that there is a significant effect of equity capital, debt capital and retained earnings on the financial performance of manufacturing firms in Nigeria. The study therefore recommended that listed industrial goods manufacturing firms in Nigeria should make use of more debt capital because it increases their financial performance in terms of earnings per share and also the shareholders wealth would be increased.

Nwafor, Yusuf and Shuaibu (2022) examined the effect of capital structure on profitability of listed Pharmaceutical companies in Nigeria. Ex-post facto research design was used and secondary data gathered from annual financial report of four listed pharmaceutical companies in Nigeria were used for the analysis. Descriptive statistics, correlation analysis and pooled ordinary least square regression analysis were employed. The results showed that total debt ratio (TDR) was found to be negatively related to profitability of pharmaceutical companies in Nigeria; while Debt equity ratio (DER) was positively related to profitability of pharmaceutical companies in Nigeria. The study therefore recommended that pharmaceutical companies in Nigeria should make use of less proportion of debt because high level of debt decreases their profitability. Rather, the

firms should depend largely on their internal source of finance because it cheaper and more reliable source of financing a business.

Idolor and Omehe (2022) engaged in a study on the topic 'effect of capital structure on the financial performance of quoted deposit money banks in Nigeria'. The study employed a cross sectional time series secondary data covering the period of seven years (2015-2021) and it was sourced from the audited financial statements of ten (10) banks listed on the floor of Nigerian stock exchange. The descriptive statistics, Pearson moment correlation and multiple linear regressions were utilized. The correlation results revealed that capital structure is negatively correlated with financial performance (Return on Assets and Return on Equity) of quoted deposit money banks in Nigeria. Result from panel regression showed that debt to equity, though significant, impacted negatively on return on assets (ROA) and return on equity (ROE), asset tangibility significantly impacted return on asset but insignificantly impacted return on shareholders' equity and also Age have a significant impact on return on asset and insignificant effect on return on equity. The study concluded that capital structure exerts a negative effect on the financial performance of deposit money banks in Nigeria and it was recommended that appropriate combination of capital should be achieved for maximum shareholders' returns and increase in value of the firm.

Ezuma (2022) assessed the link between capital structure and financial performance of listed pharmaceutical companies in Nigeria. The ex post facto research design was adopted for the study with a population of ten (10) listed pharmaceutical companies in Nigeria as at 2021. The data for the study were sourced from the annual reports of the chosen listed pharmaceutical companies in Nigeria. Multiple regression analysis was used to analyze the data with the help of Stata12 statistical software. The findings showed a positive and significant relationship between equity capital and profit before tax of listed pharmaceutical companies in Nigeria. Also, the findings revealed the existence of a positive and significant relationship between equity capital and return on assets of listed pharmaceutical companies in Nigeria. The study therefore recommended among others that the management of pharmaceutical companies in Nigeria should key into financing their business operations through equity capital because it increases profitability of pharmaceutical companies in Nigeria.

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Orichom and Omeke (2021) examined the link between capital structure, credit risk management and financial performance of Micro-finance Institutions in Uganda. The study used a cross-sectional research design to investigate 64 Micro-finance Institutions in Uganda. Correlation and multiple regression analyses were employed to analyze the data. The results indicated that credit risk management significantly contributes to sound financial performance of Micro-finance Institutions in Uganda. Therefore, credit risk appraisal, credit risk monitoring and credit risk mitigation are important in achieving a sound financial performance of Micro-finance Institutions. However, the structure of debt or equity does not necessarily affect the financial performance of Micro-finance Institutions in Uganda. The study therefore recommended that Micro-finance Institutions' managers in Uganda should endeavour to inculcate risk preventive and control measures in order to reduce credit risk and achieve a positive financial performance.

Umoh, Udofia, Hanson and Ekanem (2021) investigated capital structure and the profitability of commercial banks in Nigeria utilizing co-integrated approach. The set of data used for the analysis was sourced from Central Bank of Nigeria (CBN) Statistical Bulletin. The study employed total debt and total equity as proxies for explanatory variables while net profit of the commercial banks was used as dependent variable. Data were analyzed by employing ordinary least square regression (OLS) model on a sample of 14 commercial banks in Nigeria from 2008 to 2019. The findings showed that capital structure has positively and significantly impacted the net profit of commercial banks in Nigeria within the period under study. The study therefore recommended that bank managers should not depend on debt capital as a source of funding the organization but should utilize retained earnings of the business and consider debt as the least alternative.

Mustapha, Adio, and Abdulazeez (2020) examined the link between equity and debt ratio as a common cause of capital structure imbalance. The study's population consisted of the 15 publicly quoted commercial banks. The analysis relied on secondary data sourced from audited financial reports of the 15 deposit money banks in Nigeria rated by Fitch in 2017. Data were analyzed with the Fixed Effect, Random Effect, and Panel regression models. The findings show that at 5% level of significance, debt-equity ratio (DER) had a significant negative effect on the financial health of

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commercial banks in Nigeria. Furthermore, the debt-asset ratio has a considerable negative effect on the financial health of Nigerian commercial banks. Based on the findings, the study recommended that financial managers should aim to finance their activities with retained earnings instead of relying largely on loan capital in their capital structure. Financial managers should also strive to attain an ideal level of capital structure and maintain it as much as possible.

Nelson and Peter (2019) examined the relationship between capital structure and firms' performance in the microfinance banking subsector in Nigeria from 2009 to 2018. The study employed debt to equity ratio, long term debt ratio and total debt ratio as proxies for capital structure and return on equity as a proxy for firms' performance. Descriptive statistics and regression technique were utilized for the analysis. The results indicated a negative but not significant relationship between debt-to-equity ratio and return on equity; a positive but not significant relationship between Long term debt ratio and return on equity and a positive and significant relationship between total debt ratio and return on equity. The results also revealed that F-statistic is 37.16701 with a probability of 0.026372 showing that the combined effect of the independent variables on firm's performance represented by return on equity is statistically significant. The study therefore recommended that microfinance banks in Nigeria and other African countries especially, should devise strategies that are effective to expand their debt profile in order to attain greater performance.

Adeoye and Olojede (2019) assessed the effect of capital structure on the performance of some selected banks in Nigeria. A cross sectional time series secondary data was gathered from the audited financial statement of ten (10) banks listed on the Nigeria Stock Exchange. The descriptive statistics, Pearson moment correlation and multiple linear regressions were used. The correlation results revealed that capital structure is negatively correlated with financial performance (ROA and ROE). Result from panel regression indicates that debt to equity has a significant negative effect on return on assets and return on equity; asset tangibility significantly impacted return on asset but impacted return on shareholders' equity insignificantly. Furthermore, age has a significant impact on return on asset and insignificant effect on return on equity (Okpo, Umoren, Simeon, 2024). The study therefore concluded that capital structure has a negative effect on the

financial performance of deposit money banks in Nigeria and recommended that appropriate proportion of capital should be tailored towards viable investment opportunities for maximum return of shareholders' wealth and increase in value of the firm. In addition, while finance manager is at alert to the movement in the stock market, banks should take precautionary measures for mitigating credit risk that is associated with lending and borrowing.

Dang et al. (2019) measured the relationship between capital structure and the performance of sixty-one (61) food and Beverages firms in Vietnam for periods within 2000-2017. ROA, EPS and ROE were used as proxies for firm's performance), while debt ratio, short term debt and long-term debt ratio were used as explanatory variables (Akpan, & Uwakmfonabasi, 2021). The results showed that debt ratio affects ROE and EPS but it does not affect ROA. It means that firm financed with high level of debt performs better when measured by ROE but performs poorly when measured by ROA. The study concluded that debt significantly impact food and beverages firms' performance in Vietnam. The study therefore recommended that the firms should focus large portion of their capital on debt.

Oyakhire [2019] studied the effect of capital structure on the financial performance of all listed oil and gas enterprises in Nigeria using annual financial statements between the years 2014–2018. The association between capital structure, as measured by the debt ratio, and financial performance, as measured by return on equity (ROE) and return on asset (ROA), was evaluated using the multiple regression method. The study concluded that there is a positive and significant relationship between capital structure and financial performance, and it was recommended that oil and gas companies should make use of a short-term debt management strategy to enhance their financial performance.

Ahmed et al (2018) applied random effect model to analyze ten years multivariate panel data sourced from Karachi Stock Exchange (KSE) 100 index listed securities in Pakistan. The findings of the study showed that capital structure indicates a negative relationship with the Returns on Assets which implies that listed firms when increasing the overall capital base may also put into consideration, full utilization of the additional resources.

Return on equity is impacted by the leverage ratio of debt to capital where a negative relationship is present that indicates increase in leverage may reduce the returns generated by the firm on its equity. More so, the capital structure of the business was also found as significant variables impacting Tobin's Q negatively. The finding indicates that an increase in capital structure for listed firms translates to an unbearable increment of book value of assets that the firm choose in its financial records.

Ajibola, Wisdom and Qudus (2018) investigated the effect of capital structure on financial performance of quoted manufacturing firms in Nigeria over the period of 2005-2014. Panel methodology was applied to analyze the effect of capital structure on financial performance of quoted manufacturing firms in Nigeria. The findings of the panel ordinary least square indicates that a positive statistically significant relationship exist between long term debt ratio (LTD) (0.0001), total debt ratio (TD) (0.0065) and return on equity (ROE) while a positive statistically insignificant relationship between ROE (return on equity) and STD (Short term debt ratio). There was also a negative insignificant relationship between all the proxies of capital structure (LTD, STD and TD) and ROA which makes ROE a better measure of performance. The study concluded that capital structure has a positive impact on financial performance and companies should employ more of long-term debts. Therefore, the study recommends that every firm should take good capital structure decisions in order to earn profit and carry on their business successfully.

Methodology
This research adopted *ex post facto* design. It is a time series study whose data are historical in nature and are not randomly assigned but however, helps the study to examine how capital structure (total equity and total debt) affects profitability.
The secondary data used were sourced from the Annual Financial Reports of selected manufacturing firms in Nigeria under study for the various years from 2006-2022. The variables in which data were sourced on include total equity and total debt (representing capital structure) and profit after tax. Other secondary data and financial reports were also extracted from Nigerian Stock Exchange Fact-book, and websites. The justification for the use of secondary data is based on the fact that this study is a quantitative

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research, which tries to find out the effect of capital structure on the profitability of manufacturing firms in Nigeria.

This study employed Panel Least Square (PLS) Regression Model to examine the effect of capital structure on the profitability of manufacturing firms in Nigeria.

The predictive equation for the two independent variables which would be used in this study is:

$$Y_{it} = B0_{it} + B_1X_{1it} + B_2X_{2it} + £_{it}..(1)$$

The model was modified to suit the purpose of this research as shown in equation (2) below:

$$PROF = (TEC_{it} + TDC_{it})..(2)$$

This model was further transformed into an econometric model as seen in equation (3) below:

$$PROF_{it} = ¢+B_1TEC_{it} + B_2TDC_{it} + £_{it}..(3)$$

Where:

$¢$ = constant represents compounded figure of profitability when all other explanatory variables are held constant;

B_1-B_2 = coefficient of the explanatory variables;

$£_{it}$ = error term of manufacturing firms i at time t;

$PROF_{it}$ = compounded figure for Profitability of manufacturing firms;

TECit = Total Equity Capital of manufacturing firms;

TDCit = Total Debt Capital of manufacturing firms.

The study employed econometric approach to analyze the data and to determine the existence and degree of the effect of capital structure (Total equity value and total debt value) on the profitability of manufacturing firms in Nigeria. The data analysis was done using the Panel Least Square (PLS) Regression analysis.

Results of Data Analyses and Discussion
Results of Data Analyses and Test of Hypotheses
Raw data on Capital Structure (Total Equity Capital and Total Debt Capital) and Profitability of selected manufacturing firms in Nigeria ranging from 2006-2022, sourced from Annual Audited Financial Reports of selected manufacturing firms in Nigeria were analysed and results presented in Tables 1 and 2.

In this research work, multicollinearity test, regression analysis and residual test were conducted. The multicolinearity test was conducted to ascertain the presence or absence of colinearity between the explanatory variables as shown in table 1. The centered VIF is used in determining the presence or absence of multicolinearity; it is present when VIF value is greater than 5 and vice-versa.

Table 1: Multicolinearity Test Result

V a r i a b l e	Coefficient of varian.	Centered VIF	R e m a r k
C	0 . 1 2 5 7 7 8	1 . 4 7 8 6 4 7	N A
T E C	0 . 0 0 3 5 7 2	1 . 4 7 8 6 4 7	Absence of collinear.
T D C	0 . 0 0 2 2 8 0	N A	Absence of collinear.

Source: Output from E-Views version 10.

Table 1 above shows in summary the variables of study, their coefficient variables, centered VIFs and Remark.

The result shows VIF value for the entire variant is below the bench mark of 5-10 considered high and problematic. This therefore, shows that there is no multicolinearity between the variables.

Table 2: Panel Least Square Regression Result

Variables	Coefficient	Std. Error	t-statistics	Probability
T E C	0 . 9 2 8 0 3 1	0 . 0 8 1 8 4 2	11.33927s	0 . 0 0 0 0
T D C	0 . 1 2 3 8 2 6	0 . 0 6 0 2 7 4	2.054390	0 . 0 4 8 5
C	- 0 . 9 4 6 4 1 0	0 . 5 7 2 5 4 2	-1.652996	0 . 1 0 8 4
R^2 = 0.911483	AdjR^2 = 0.860086	D.W = 0.360341	Fast = 17.73411	Pro(f-sta) = 0.00

Source: Output from E-view version 10

Table 2 above summarizes the least square estimate of the regression. It shows the variables, their coefficients, standard errors, t-statistics and probability values. The model coefficient of determination, R^2 has a value of 91% with Adjusted R^2 value of 86%. This indicates that 91% of change in Profitability (profit after tax) are jointly influenced by the explanatory variables (Total Equity Capital and Total Debt Capital). The F-statistic value of 17.73 with a corresponding probability of 0.0000 shows that the model is fit. It shows that aggregate effect of the explanatory variables on the explained variable is statistically significant. With a Durbin-Watson

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(DW) value of 0.36, the estimated model does not have autocorrelation problem.

Table 2 equally shows that Total Equity Capital (TEC) has a coefficient of 0.928031 which implies that 1% increase in equity capital will lead to an increase in profitability of manufacturing firms in Nigeria by 92% and vice versa. Also, the results further revealed a corresponding p-value of 0.0000 which is less than 0.05, the acceptable level of significance and this suggests that the null hypothesis that states that equity financing has no significant effect on the manufacturing firms in Nigeria was rejected. The rejection of the null hypothesis implies that there is a significant effect of equity financing on the profitability of manufacturing firms in Nigeria. Furthermore, it can be seen that this significant effect of equity financing on the profitability of manufacturing firms in Nigeria is positive in nature.

Also, the coefficient of determination of Total Debt Capital (TDC) shows a significant positive effect on the profitability of manufacturing firms in Nigeria given that the p-value is less than the 5% critical value. The result implies that a unit percent increase in debt financing will lead to a corresponding increase in Profitability to the extent of approximately 12.4%. Therefore, based on the findings above, the study rejected the null hypothesis which states that debt financing has no significant effect on the profitability of manufacturing firms in Nigeria while the alternative hypothesis was accepted.
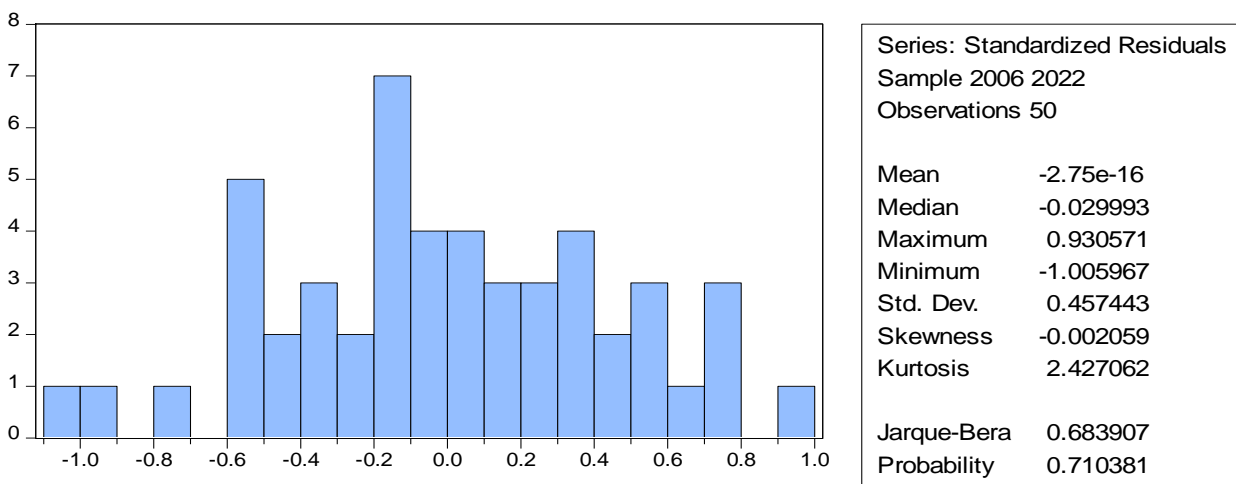

Series: Standardized Residuals	
Sample 2006 2022	
Observations 50	
Mean	-2.75e-16
Median	-0.029993
Maximum	0.930571
Minimum	-1.005967
Std. Dev.	0.457443
Skewness	-0.002059
Kurtosis	2.427062
Jarque-Bera	0.683907
Probability	0.710381

Figure1: Residual Test Results

Figure 1 above shows the values for Skewness, kurtosis and Jarque Bera statistic with its accompanying probability. The Jarque Bera value and its

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probability indicate that the residuals are normally distributed as the probability value of 0.71 is greater than 0.05.

Table 3: Summary of Hypothesis Testing

Relationship	Expected sign	Reported sign	P-value	Observation	Decision
T E C	Positive sign	Positive sign	0.0000	P-value<0.05	Reject null
T D C	Positive sign	Positive sign	0.0485	P-value<0.05	Reject null

Source: The Authors

Discussion on Findings

The result of data analyses revealed that there is a positive (0.91) and significant (0.0000) effect of Total Equity Capital (TEC) on profitability of firms in Nigeria. It implies that total equity capital positively and significantly influences profitability of manufacturing firms in Nigeria. This result agrees with the findings of Ezuma (2022) who found a positive and significant relationship between equity capital and return on assets of listed pharmaceutical companies in Nigeria. However, the finding of this study is not consistent with the findings of Dang, Bui and Nguyen (2019) who established a negative and significant effect between total equity capital and profitability of firms in Nigeria.

The data analysis found total debt capital (TDC) (one of the explanatory variables of the study); has a positive and significant effect in explaining and predicting profitability of quoted manufacturing firms in Nigeria. This result agrees with the findings of Ozondu and Egbunike (2024) who found a positive and significant effect of debt capital on net profit of listed deposit money banks on the Nigerian Stock Exchange. Ifeanyi and Ukaegbu (2023) found a significant effect of debt capital on the financial performance of manufacturing firms in Nigeria. However, the finding of this study disagrees with the result of the study of Nwafor, Yusuf and Shuaibu (2022) who found that total debt ratio (TDR) is negatively related to profitability of pharmaceutical companies in Nigeria. Similarly, Olajide and Funmi (2018) found a weak and substantial relationship between capital structure and firms performance of quoted non-financial enterprise in Nigeria.

Conclusion and Recommendations

The study concluded that total equity capital is a significant factor in explaining the profitability of manufacturing firms in Nigeria. Also, the

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study confirmed that total debt capital has a significant and positive effect on the profitability of manufacturing firms in Nigeria. This means that both total equity capital and total debt capital (measures of capital structure) have a positive contribution in explaining the profitability of manufacturing firms in Nigeria.

Based on the findings of this study, the following recommendations were made:

1) The positive effect of total equity capital on the profitability of manufacturing firms in Nigeria means the firms have been managing the shareholders' fund in a judicious manner in such that the shareholders' returns are maximized. The firms are therefore recommended to expand their equity capital through issuance of more shares to the general public or to the existing shareholders to enable them have access to more funds for business expansion.

2) Total debt capital also positively affects profitability of manufacturing firms in Nigeria. Firms are advised to obtain or source for more debt instruments to enable them raise more capital for business growth. In adhering to the two recommendations above, firms should be cautious in order to maintain an optimal capital structure.

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