



Sustainable Financing and Financial Performance of Manufacturing Firms in Enugu State, Nigeria

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Abstract

Research Objective: This study examined the effect of sustainable financing on the financial performance of manufacturing firms in Enugu State, Nigeria, focusing on long-term debt to total assets and short-term debt to total assets as independent variables, and return on asset and profit margin as dependent variables.

Methodology: An ex-post facto research design was adopted, utilizing secondary data obtained from the audited annual accounts and reports of manufacturing firms in Enugu State. The data were analyzed using simple linear regression.

Findings: The results revealed that long-term debt to total assets has a significant positive effect on return on asset ($p = 0.008 < 0.05$), while short-term debt to total assets has a significant positive effect on profit margin ($p = 0.0175 < 0.05$) of manufacturing firms in Enugu State, Nigeria.

Conclusion: Sustainable financing has a significant positive effect on the financial performance of manufacturing firms in Enugu State, Nigeria.

Recommendations: It is recommended that policymakers create incentives for manufacturing firms to access long-term sustainable financing options, which could include tax breaks, subsidies, or low-interest loans for investments in green technologies and sustainable practices.

Key words: *Sustainable Financing, Financial Performance, Manufacturing Firms, Long-term Debt, Short-term Debt.*

1.0 INTRODUCTION

In recent years, sustainability has garnered significant attention across various sectors of the global economy. This heightened focus stems from the recognition that businesses play a crucial role in addressing environmental, social, and governance (ESG) challenges. A key component of sustainability is sustainable financing, which involves allocating financial resources to support activities that promote long-term economic, social, and environmental well-being (Al Muhairi & Nobanee, 2019). In the context of manufacturing firms in Enugu



State, Nigeria, sustainable financing is essential for their financial performance and overall success. Sustainable finance, defined as the consideration of ESG factors in investment decisions, leads to increased long-term investments in sustainable economic activities and projects (European Commission; Lagoarde-Segot, 2019). This movement is driven globally by regulators, institutional investors, and asset managers. Sustainability, however, remains a complex and evolving topic. The World Bank Group's long-term finance unit has been pivotal in promoting sustainable finance worldwide through data provision, analytical work, instrument design, and technical assistance to support the 'greening' of financial systems (Buallay, 2019).

Enugu State, located in southeastern Nigeria, boasts a vibrant manufacturing sector that significantly contributes to the state's economic growth and employment. However, the region faces sustainability challenges such as resource depletion, waste management, and social inequality. To address these issues, manufacturing firms must adopt sustainable practices and secure adequate financing to support their initiatives (Al Muhairi & Nobanee, 2019). The relationship between sustainable financing and financial performance has gained traction in academic and business circles. Sustainable financing can enhance financial performance by reducing costs, improving operational efficiency, attracting investors, and boosting brand reputation. Conversely, insufficient financing for sustainable initiatives may impede firms' long-term profitability, leading to reputational damage and increased risk exposure (Rahman et al., 2020). Understanding the dynamics between sustainable financing and financial performance in Enugu State's manufacturing sector is crucial for policymakers, investors, and managers aiming to drive sustainable development in the region.

1.1.1 Statement of the Problem

The relationship between sustainable financing and financial performance has garnered significant attention in recent years, particularly within the manufacturing sector. Sustainable financing, which encompasses financial strategies and investments that promote environmental, social, and governance (ESG) criteria, is increasingly seen as a critical driver for long-term business success and resilience. Despite this growing interest, there is a lack of empirical evidence regarding its impact on the financial performance of manufacturing firms, especially within specific regional contexts such as Enugu State, Nigeria.

Manufacturing firms in Enugu State face unique economic, social, and environmental challenges that influence their operational and financial outcomes. These firms must navigate issues such as fluctuating energy costs, environmental regulations, and social responsibility expectations from local communities and stakeholders. Sustainable financing could potentially mitigate some of these challenges by providing access to capital that supports eco-friendly technologies, efficient resource utilization, and socially responsible practices. However, the extent to which sustainable financing directly influences financial performance,



measured through indicators such as profitability, return on assets, and market share, remains underexplored in this context.

The lack of comprehensive studies on this topic creates a gap in understanding the tangible benefits of sustainable financing for manufacturing firms in Enugu State. This gap hampers the ability of policymakers, financial institutions, and business leaders to make informed decisions that align financial performance with sustainability goals. Therefore, it is imperative to investigate the effect of sustainable financing on the financial performance of manufacturing firms in Enugu State, Nigeria, to provide evidence-based insights that can drive strategic investments and policy formulations.

1.2 Objective of the Study

The main objective of this study is to examine the effect of Sustainable Financing and Financial Performance of Manufacturing Firms in Enugu State Nigeria. The specific objectives are;

- i. To examine the effect of long-term debt to total assets on the return to assets of a Manufacturing Firm in Enugu State Nigeria.
- ii. To determine the effect of short-term debt to total assets on the profit margin of a Manufacturing Firm in Enugu State Nigeria.

1.3 Hypotheses of the study

- i. Long-term debt to total assets has no significant positive effect on the return to assets of the Manufacturing Firm in Enugu State Nigeria.
- ii. Short-term debt to total assets has no significant positive effect on the profit margin of the Manufacturing Firm in Enugu State Nigeria.

2. REVIEW OF RELATED LITERATURE

Sustainable Financing

Sustainability was first defined in the Bruntland Report (Visser & Brundtland, 2013). The three major interrelated elements of sustainability are economic growth, environmental protection, and social justice (Jan Jaap Bouma, 2021). Over the past few decades, the concept of sustainability has grown rapidly as a global response to problems like poverty, social inequality, and climate change (Lagoarde-Segot, 2019). This resolution calls on all countries and stakeholders, including governments, the private sector, economic agents, and communities, to act and cooperate in implementing the Sustainable Development Goals (Al Muhairi & Nobanee, 2019). Thus, the current implementation of sustainability is expected to provide long-term value and meet future requirements (Kemfert & Schmalz, 2019).



Sustainable finance involves incorporating environmental, social, and governance (ESG) considerations into investment decisions in the financial sector, leading to increased longer-term investments in sustainable economic activities. This powerful movement is led by regulators, institutional investors, and asset managers globally.

Long-Term Debt-To-Total Assets Ratio

The long-term debt-to-total assets ratio measures the percentage of a corporation's assets financed with long-term debt, which includes loans or other debt obligations 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. For example, a mortgage is a long-term debt typically due over 15 to 30 years, but the payments due in the current year are considered the current portion of long-term debt and should be listed separately on the balance sheet.

The long-term debt-to-total assets ratio, a leverage ratio, illustrates the amount of assets that would need to be liquidated to pay off long-term debts. Additionally, the debt-to-equity ratio assesses how much a company owns versus how much it owes, evaluating a company's overall debt in relation to the capital initially contributed by the owners and the profits retained over time.

Short-Term Debt

The short-term debt-to-total assets ratio is a leverage ratio that shows what percentage of a company's total assets are financed by short-term debt with a one-year or shorter maturity period. This ratio helps determine the amount of assets that must be sold to satisfy immediate obligations. According to Meyers and Majluf (1984), businesses using short-term debt are likely to have greater growth prospects in their investment opportunities. Utilizing short-term indebtedness expands the pool of available external capital and encourages improved business financial performance (Seid, 2017).

Financial Performance

Various management researchers have proposed definitions of financial performance influenced by their perspectives, whether financial or operational. Financial performance is viewed as the outcome of an enterprise's capital mobilization, use, and management (Dinh & Pham, 2020). It consists of instruments used to assess a company's total financial standing over time, which can be compared between enterprises in the same industry or between aggregated industries or sectors (Okonkwo et al., 2017). Financial performance can be gauged using accounting techniques like Return on Assets (ROA), Return on Equity (ROE), and economic models such as Maris coefficient and Tobin's Q (Dinh & Pham, 2020).

In this study, Return on Assets (ROA) is used to gauge the financial performance of oil and gas businesses. ROA measures a company's profitability relative to its total assets by dividing



the net income by the total value of the assets. A high ROA indicates the company is particularly effective at converting its assets into revenue.

Return on Assets

Return on Assets (ROA) measures how well a company is utilizing its assets in terms of profitability. Unlike other metrics, ROA considers a company's debt. It is calculated by dividing the net income of a company by its total assets, showing the effectiveness of a company in converting the money invested into net income.

Profit Margin

Profit margin measures the degree to which a company or a particular business activity makes money. Expressed as a percentage, it represents the portion of a company's sales revenue that it keeps as a profit after subtracting all costs. Profitability, a measure of financial performance, is defined as the ability of a firm to make profits from all its activities, including operating, investing, and financing activities (Owolabi & Obida, 2012). Maximizing shareholders' wealth, reflected in consistent dividend payments and the appreciation of the firm's market share, indicates profitability (Arikekpar, 2020).

Theoretical Framework

The agency cost theory, developed by Jensen and Meckling (1976), addresses the dispute between shareholders and managers (agency cost of equity) or shareholders and creditors (agency cost of debt), suggesting that a company might not maximize its worth due to these conflicts. Choosing the optimal capital structure helps eliminate agency conflicts and costs by incentivizing managers to act in the shareholders' best interests, potentially increasing the company's worth. Despite criticisms that it neglects other stakeholders, this study uses the agency cost theory to link manufacturing firms' capital structure and financial performance.

Empirical Review

Dahiru and Dogarawa (2016) studied the effect of capital structure on the financial performance of listed manufacturing businesses in Nigeria. Using generalized least square multiple regression to evaluate panel data from 31 sampled companies (2009–2014), they found that overall debt and long-term debt negatively impact financial performance, while short-term debt has a positive influence.

Rahman et al. (2020) examined the impact of financial leverage on the profitability of listed textile firms in Bangladesh, using pooled ordinary least squares for analysis. They found a significant negative relationship between leverage and profitability.

Lawal et al. (2014) studied the impact of capital structure on the performance of manufacturing companies in Nigeria, using panel data analysis on ten companies (2002–2012). They discovered that total debt, age, and debt-to-equity ratio negatively correlate with firm performance.



Whetman (2018) examined the impact of sustainability reporting on firm's profitability, focusing on 95 publicly traded firms from various sectors (2015–2016). The study revealed a positive and significant effect of sustainability reporting on return on equity, return on assets, and profit margin in the subsequent year, especially for firms with low institutional ownership.

Laskar (2018) conducted a similar study on the impact of corporate sustainability reporting on firm's performance in Asia, using 111 non-financial firms from Japan, South Korea, Indonesia, and India. The study found a significant positive association between sustainability reporting and firm performance, with a more pronounced impact in developed countries.

Buallay (2019) compared sustainability reporting and firm performance in the banking and manufacturing sectors of 80 economies. The findings showed a positive effect on operational, financial, and market performance in manufacturing firms, but a negative impact in the banking sector.

3. METHODOLOGY

An *ex-post facto* research design was adopted for the study. The choice of the *ex-post facto* design is because the research relied on already recorded events, and researchers do not have control over the relevant dependent and independent variables. The data for the study was derived from audited annual accounts and reports of the manufacturing firms in Enugu. The data was analyzed using simple linear regression. The dependent variable is the variable that is influenced by the independent variable. The dependent variables in this study are Return on Assets (ROA) and Profit Margin. While the independent variables used in the study are short-term debt (STDT) and loan-term debt (LTDT).

Table 1: Variable measurement

Variable Type	Variable Name	Measurement
Independent variable	Short term debt	$\frac{\text{Short term debt}}{\text{Total assets}}$
	Long term debt	$\frac{\text{Net Profit before tax}}{\text{Total assets}}$
Dependent variable	Return on assets	$\frac{\text{Net Profit before tax}}{\text{Total assets}}$
	Profit margin	$\frac{\text{Net Profit before tax}}{\text{Total sales}}$

Sampling Method

Purposive sampling is the sampling technique the researcher employed, meaning the sampling was done according to the guidelines established by the researcher, and the population to be utilized as the study sample was a corporation that met the set criteria. A total of 10 manufacturing firms meeting the following criteria make up the study's sample, which includes firms listed on the Nigerian Exchange group between 2012 and 2022: firstly, the



research sample used is a manufacturing firm listed on the Nigeria Stock Exchange in For the 2012-2022 period, the two researchers took Manufacturing firms that did not experience delisting during 2012-2022, and To conduct the aforementioned research, the researchers selected manufacturing firms that had complete financial records and complied with the requirements and needs of variable data.

Regression Methods.

The research methodologies that are consistent with the research's title can be explained systematically using the below equation (1 & 2) for both objectives 1 and 2 respectively:

$$ROA = \beta_0 + \beta_1(LTDT) + \mu_t \quad (1)$$

$$PM = \beta_0 + \beta_1(STDT) + \mu_t \quad (2)$$

Description of terms

ROA = Return on assets.

PM = Profit margin.

LTDT = Loan term debt to the total asset.

STDT = Short-term debt to total asset.

μ_t = Error term.

Presentation of Results

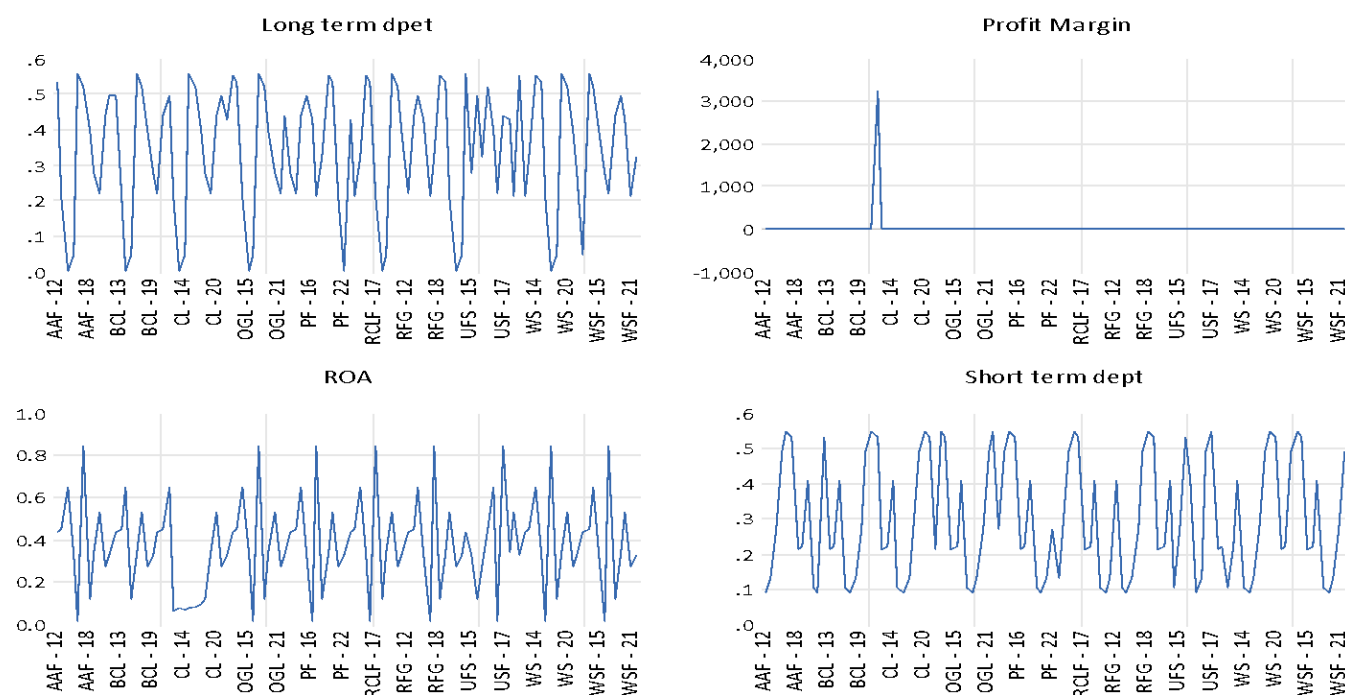


FIG 4.1: Multiple line plot of long-term debt, profit margin, Return on assets, and short-term debt.

Results of Descriptive Statistical Analysis.



The summary of study data that includes the lowest, maximum, mean, and standard deviation values is referred to as a descriptive statistical analysis. Each variable's minimum and maximum values represent its respective lowest and highest values, respectively. The mean value displays each study variable's average value. The distribution of research data, which reveals whether it is homogeneous or heterogeneous and variable, can be represented by the standard deviation. The results of the descriptive statistical analysis of this research can be described as follows:

Table 2: Descriptive analysis result

	Long term Dept	Short term Dept	Profit Margin	ROA
Mean	0.342037	0.302460	0.762321	0.376773
Median	0.394000	0.246000	0.129300	0.345200
Maximum	0.557820	0.551000	0.323900	0.847300
Minimum	0.000320	0.092300	-0.41130	0.017280
Std.Dev	0.178810	0.171390	0.308716	0.219092
Skewness	-0.493117	0.254381	3.321196	0.321196
Kurtosis	2.067577	1.483058	8.009236	2.724322
Jarque-Bera	8.442821	11.73312	5.250179	2.239721
Probability	0.014678	0.002833	0.001768	0.326325
Observation	110	110	110	110

Based on the descriptive statistical analysis in Table 2 described above, it can be concluded from the interpretation results as follows: Short Term Debt, long-term term-debt, profit margin and return on assets variable obtained from the data above which has an average value (mean) of 0.302460, 342037, 0.762321 and 0.376773 respectively, with a corresponding standard deviation as 0.171390, 0.178810, 0.308716 and 0.219092.

Correlation analysis

Table 3: Correlation

	ROA	Profit Margin	Short term debt	Long term debt
ROA	1			
Profit Margin	0.11882125	1		

Short term debt	0.05219239	0.12999145	1	
Long term debt	0.06547162	0.08420972	-0.0555226	1

Table 3 is the correlation of the variables, there is significant evidence that the variables do not show signs of multicollinearity. Similarly, the result of indicates that there are positive correlations between the independent and dependent variables used in this study.

TESTING OF HYPOTHESES

At this step, tests are conducted on the hypotheses to see if they should be accepted or rejected as well as to gauge how effective the independent variable is in predicting the dependent variable. We will employ simple linear regression analysis, which is applicable to each objective test, in order to accomplish this.

Hypothesis one

H_0 : Long-term debt to total assets has no significant positive effect on the return to assets of a manufacturing firm in Enugu state, Nigeria.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.867 ^a	.423	.399	0.219632

a. Predictors: (Constant), long-term debt

Model Testing and Interpretation

The model summary above explains the percentage of the dependent variable (return on assets), that can be determined by the independent variable (long-term debt). According to this Table, the dependent variables account for 42.3% (R Square, 0.423) of the independent variable. While the remaining 58.7% can be explained by other factors outside the scope of this model.

Table 5: ANOVA table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	88.071	1	88.071	52.674	.001 ^a
	Residual	182.249	109	1.672		
	Total	4111.263	110			

a. Dependent Variable: Return on assets



b. Predictors: (Constant), Long term debt

To determine how closely the independent and dependent variables are related to one another, the study also performed an analysis of variance. The results showed that the P-value obtained (0.001) was lower than the 5% level of significance set in the SPSS software for this analysis, so this regression model is significant by the decision rule.

Table 6: Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.349335	.045363		7.700830	.000
	Long term debt	1.820221	0.117649	.0625	15.471623	.0008
a. Dependent Variable: Return on assets						

To ascertain whether the results established by ANOVA Statistics are comparable to those of the regression coefficient, a simple linear regression analysis was also carried out. The conclusion that can be drawn from this result is that the ANOVA Statistic is similar to that of the regression coefficient because the result demonstrates that the P-value obtained (i.e., 0.008) for the regression coefficient was also lower than the alpha level of significance of 5% specified in SPSS for this analysis. Thus, the Alternate Hypothesis will be accepted while the Null Hypothesis will be rejected, which means that there is a significant effect of long-term debt on the return of assets of manufacturing firms in Enugu state, Nigeria.

Hypothesis two

H₀1: Short-term debt to total assets has no significant positive effect on the profit margin of manufacturing firms in Enugu state, Nigeria.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	.238 ^a	.16898	.13328	4.07814
a. Predictors: (Constant), short-term debt				

Model Testing and Interpretation

The model summary above explains the percentage of the dependent variable (return on assets), that can be determined by the independent variable (long-term debt). According to this Table, the dependent variables account for 16.8% (R Square, 0.168) of the independent



variable. While the remaining 83.2% can be explained by other factors outside the scope of this model.

Table 5: ANOVA table

Model		Sum of Squares	df	Mean Square	F	Sig.
2	Regression	133.195	1	133.195	222.262	.000 ^a
	Residual	65.321	109	.59927		
	Total	4111.263	110			
a. Dependent Variable: Profit margin						
b. Predictors: (Constant), short-term debt						

The study also conducted analysis of variance to determine the extent to which the Independent and dependent variable relates with each other, and the result showed that P-value Obtained (<0.05) was lower than the 5% level of significance specified in SPSS software for this analysis, therefore, according to the decision rule, this regression model is significant.

Table 6: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	-41.28077	59.69757		-0.691498	.4907
	Short term debt	234.2230	121.9103	201.043	1.92127 3	.0175
a. Dependent Variable: Profit margin						

To ascertain whether the results established by ANOVA Statistic are comparable to those of the regression coefficient, simple linear regression analysis was also carried out. The outcome indicates that the P-value for the regression coefficient (i.e., 0.0175) was also less than the 5% alpha level of significance set by SPSS for this analysis, indicating that the ANOVA Statistic is comparable to the regression coefficient. Thus, the Alternate Hypothesis will be accepted while the Null Hypothesis will be rejected, which means that there is a significant effect of short-term debt on the profit margin of manufacturing firms in Enugu state, Nigeria.

Summary of findings

Hypothesis One



The effect of long-term debt to total assets on the return to assets of manufacturing firms in Enugu state, Nigeria.

- **Model 1 (ROA)**

[$\beta_1=1.820$; P values = 0.008]

- **Correlation with ROA**

[0.065471]

Decision: If P-value < 0.05 Reject H_0 otherwise accept.

Hypothesis Two

The effect of short-term debt to total assets on the profit margin of manufacturing firms in Enugu state, Nigeria.

- **Model 2 (Profit Margin)**

[$\beta_1=234.2230$; P values = 0.0175]

- **Correlation with ROA**

[0.12999145]

Decision: If P-value < 0.05 Reject H_0 otherwise accept.

4.0 CONCLUSION

The study on the effect of sustainable financing on the financial performance of manufacturing firms in Enugu State, Nigeria, reveals significant insights into the critical role of financial structures in driving business success within this regional context. The findings indicate that both long-term and short-term debt financing play crucial roles in enhancing the financial performance of these firms, underscoring the importance of sustainable financial strategies.

Specifically, the analysis shows that long-term debt to total assets has a significant positive effect on the return on assets (ROA) of manufacturing firms in Enugu State. This suggests that investments in long-term debt, which often finance sustainable projects such as the adoption of green technologies and the implementation of energy-efficient practices, contribute to improved asset utilization and overall financial health. The positive impact on ROA highlights the capacity of long-term sustainable financing to enhance the firm's ability to generate returns from its assets, thereby supporting long-term business viability and growth.

Furthermore, the study finds that short-term debt to total assets has a significant positive effect on the profit margin of manufacturing firms in Enugu State. This relationship indicates that short-term financing, typically used for immediate operational needs and working capital, supports the firms' ability to maintain liquidity and manage day-to-day expenses effectively. The positive impact on profit margin underscores the importance of accessible short-term



debt in ensuring operational efficiency and profitability, which are essential for the firms' competitive positioning and market sustainability.

In conclusion, the significant positive effects of both long-term and short-term debt on financial performance metrics such as ROA and profit margin highlight the critical role of sustainable financing in the manufacturing sector of Enugu State, Nigeria. These findings emphasize the need for manufacturing firms to strategically leverage sustainable financing options to enhance their financial performance and resilience. Policymakers and financial institutions should consider promoting access to sustainable financing mechanisms that support both long-term investments and short-term operational needs. By doing so, they can facilitate the growth and sustainability of manufacturing firms, contributing to the broader economic development of Enugu State. We concluded that sustainable financing has significant positive effect on the financial performance of Manufacturing Firm in Enugu State Nigeria.

Recommendation

Based on the findings that long-term debt to total assets significantly positively affects the return on assets (ROA) and short-term debt to total assets significantly positively affects the profit margin of manufacturing firms in Enugu State, Nigeria, the following recommendations are proposed:

- i. Policymakers should create incentives for manufacturing firms to access long-term sustainable financing options. This could include tax breaks, subsidies, or low-interest loans for investments in green technologies and sustainable practices.
- ii. Manufacturing firms should aim to balance their financial structure by integrating both long-term and short-term debt strategically. This balanced approach can optimize their financial performance by enhancing both asset returns and profit margins.

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