

FINANCIAL MIX AND BOTTOM LINE PROFIT OF QUOTED INDUSTRIAL GOODS COMPANIES IN NIGERIA

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Abstract: This study examined the nexus between financial mix and bottom line profit of quoted industrial goods companies in Nigeria. Financial mix was measured with long term debt ratio, short term debt ratio and debt-to-equity ratio while return on capital employed was used as a proxy for bottom line profit. Three hypotheses were formulated and statistically tested at 5 per cent level of significance. Eleven (11) quoted industrial goods firms constituted the sample size of this study between 2008 and 2020. *Ex-Post facto* research design was adopted while secondary data were extracted from the annual reports and accounts of the sampled firms and were analysed using E-Views 10 statistical software. The study employed inferential statistics using Pearson correlation, Panel Unit Root Test, Granger Causality Test and Johansen Fishers Panel Co-integration. Findings from the empirical analysis showed that long term debt ratio and short term debt ratio have a significant positive relationship with return on capital employed, while, a significant negative relationship exists between debt-to-equity ratio and return on capital employed at 5% significant level respectively. It was recommended inter alia that Bankers and debt providers should help industrial goods firms by charging lower cost of debt. The lower cost of debt financing helps to bring down the required rate of return on the capital project being financed, thus, improving its profit margins.

Keywords: Long Term Debt Ratio, Short Term Debt Ratio, Debt-To-Equity Ratio, Return on Capital Employed

Background to the Study

Financial decision is a major factor every business enterprise must consider at startup and during operations. This decision will however affect the profitability, survival and sustainability of such business entity. At startup of every business enterprise, after generating the business idea, it is expedient that the owners of the business consider the various factors of production that will be relevant to the successful execution of the business idea. In the process of doing this, the owners will need to answer the question: "How do we finance the project at hand?" In an attempt to find an answer to this question, all the available sources of finance is then explored and this is reflected in the business plan or the feasibility report prepared (Robert, 2012). Finance is a very important issue every business organization must put into consideration at the start-up or expansion of a business venture. Knowing that the estimated start-up capital is a different issue, while the finance mix is another one, if not properly handled could affect the business survival and profitability (Ndulue, Okoye & Amahalu, 2021). Financial mix decisions are crucial for the financial wellbeing of the firm. Financial distress, liquidation and bankruptcy are the ultimate consequences lying ahead if any major misjudgment occurred following any financing decision of the firm's activity. One of the strategies a firm should look into is to lower the weighted cost of capital. This will increase net economic return, which eventually increases the firm's value. Hence, maximizing the firm's value is the focal point for every financing decision made by the management of the company. The management of the firm operating in the very uncertain world has a tough task ahead in achieving the best financial mix. However, the key to choosing an appropriate and acceptable level of financial leverage is still debatable by the top management of a firm (Omabu, Okoye & Amahalu, 2021).

Determining an optimal financial mix is a very hot issue in the literature of accounting and finance. When an investor decides to invest in the stock of any company, the strength of the statement of financial position helps him in making decision and financial mix is one of the significant evaluators which determine the strength of the balance sheet. Basically, the financial mix of any company describes the long-term capital of the company that is the mixture of debt and equity. So it is crucial for the company to have such a mixture that will help in maximizing the company's stock price. The effect of financial mix on bottom line profit in Nigeria has been a bone of

contention amongst authors. Some researchers have argued for (Mbonu & Amahalu, 2021a; Efeeloo & Nwokeji 2021) and some against equal mix of finance, that is, equal mix of equity and debt finance (Thorsell & Cornelius, 2019; Nangih, 2020), while some have attributed the mix to some factors, which are seen as determinants of finance mix (Eriki. & Omorokunwa, 2014; Omaliko & Okpala, 2020). Based on the forgoing, there is need to examine the relationship between financial mix and bottom line profit of quoted industrial goods companies in Nigeria.

Objectives of the Study

The broad objective of this study is to examine the relationship between financial mix and bottom line profit of quoted industrial goods companies in Nigeria.

The specific objectives are to;

1. Determine the relationship that exists between long term debt ratio and return on capital employed of quoted industrial goods companies in Nigeria.
2. Evaluate the relationship that exists between short term debt ratio and return on capital employed of quoted industrial goods companies in Nigeria.
3. Assess the relationship between debt-to-equity ratio and return on capital employed of quoted industrial goods companies in Nigeria.

Research Hypotheses

In line with objectives of this study, the following null hypotheses were tested:

Ho₁: There is no significant relationship between long term debt ratio and return on capital employed of quoted industrial goods companies in Nigeria

Ho₂: There is no significant relationship between short term debt ratio and return on capital employed of quoted industrial goods companies in Nigeria

Ho₃: There is no significant relationship between debt-to-equity ratio and return on capital employed of quoted industrial goods companies in Nigeria

Conceptual Review

Financial Mix

Financial mix is a term used in the corporate world to define a mix of equity to debt in a firm. In other words, this term is used to describe the formula that defines how much capital is being raised by debt and how much is being raised by equity (Young, 2019). Financial structure refers to the mix of debt and equity that a company uses to finance its operations. This composition directly affects the risk and value of the associated business (Amahalu & Obi, 2020a). The goal of any firm is to continuously increase the value. Any plans that are made, financial or otherwise, will be done with this goal in mind. Financial managers want to bring more wealth to the shareholders to keep them happy with the way the business is going.

Long Term Debt Ratio

Long-term debt generally refers to a company's loans and other liabilities that will not become due within one year of the statement of financial position date. (The amount that will be due within one year is reported on the balance sheet as a current liability) (Mbonu & Amahalu, 2021b). Long-term debt is financing that usually requires an extended payback period of more than one year, and often up to 20 to 30 years. Long-term financing is usually used to purchase major assets such as buildings and equipment, and the assets often serve as collateral on the loan. Despite some risks, long-term debt is a common source of financing for businesses (Omabu, Okoye & Amahalu, 2021). Long Term Debt (LTD) is any amount of outstanding debt a company holds that has a maturity of 12 months or longer. It is classified as a non-current liability on the company's statement of financial position. The time to maturity for LTD can range anywhere from 12 months to 30+ years and the types of debt can include bonds, mortgages, bank loans, debentures.

$$\text{Long Term Debt Ratio} = \frac{\text{Long Term Debt}}{\text{Total Assets}}$$

Short Term Debt

Short term debt, also called current liabilities, is a firm's financial obligations that are expected to be paid off within a year. It is listed under the current liabilities portion of the total liabilities section of a company's statement of financial position. Short-term debt is the amount of a loan that is payable to the lender within one year. In the statement of financial position, this amount is classified as a short-term liability. All other debts with longer repayment periods are classified as long-term debt (non-current liabilities) on the statement of financial position (Okegbe, Eneh & Amahalu, 2019). The balance in the short-term debt account is a major consideration when evaluating the liquidity of a business. If the proportion of this debt to the amount of liquid assets is too high, an analyst might conclude that the firm is facing a liquidity crisis and so will downgrade its credit rating. Short-term debt is generally considered any amount you must pay back within 12 months. When taking on short-term debt, it's a good idea to set a payment schedule that ensures you track your payments and finish them on time. Including cash flow statements in your financial reporting helps you pay your short-term debt on time and avoid the loss of credit or access to goods, supplies, services and materials (Grimsley, 2019). Examples of short term debt include Accounts payable, short term notes payable, short term bank loans, Commercial paper (Gilleland, 2019).

$$\text{Short Term Debt Ratio} = \frac{\text{Short Term Debt}}{\text{Total Assets}}$$

Debt-to-Equity Ratio

The debt-to-equity (D/E) ratio is calculated by dividing a company's total liabilities by its shareholder equity. These numbers are available on the balance sheet of a company's financial statements. Debt-to-equity ratio is used to evaluate a company's financial leverage. It is a measure of the degree to which a company is financing its operations through debt versus wholly-owned funds. More specifically, it reflects the ability of shareholder equity to cover all outstanding debts in the event of a business downturn (Kenton, & Hayes, 2019). The debt-to-equity ratio shows the proportions of equity and debt a company is using to finance its assets and it signals the extent to which shareholder's equity can fulfill obligations to creditors, in the event a business declines (Amahalu, Egolum, Nweze & Obi, 2018). A low debt-to-equity ratio indicates a lower amount of financing by debt via lenders, versus funding through equity via shareholders. A lower debt to equity ratio usually implies a more financially stable business. A higher ratio indicates that the company is getting more of its financing by borrowing money, which subjects the company to potential risk if debt levels are too high. The more a company's operations rely on borrowed money, the greater the risk of bankruptcy, if the business hits hard times. This is because minimum payments on loans must still be paid-, even if a company has not profited enough to meet its obligations. For a highly leveraged company, sustained earnings declines could lead to financial distress or bankruptcy. A debt to equity ratio of 1 would mean that investors and creditors have an equal stake in the business assets.

$$\text{Debt/Equity} = \frac{\text{Total Liabilities}}{\text{Total Shareholders' Equity}}$$

Bottom Line Profit

Bottom line is often used and refers to the profitability of a business after all expenses are deducted from revenues. Bottom line profit is net profit after all the costs of the business have been accounted for. The remainder is either a positive or negative figure (Tuovila, 2019). The bottom line refers to a company's net earnings, net profit/net income, or earnings per share (EPS). The reference to bottom line describes the relative location of the net income figure on a company's income statement. Bottom line is commonly used in reference to any actions that may increase or decrease net earnings or a company's overall profit. A company that is growing its earnings or reducing its costs is said to be improving its bottom line. Most companies aim to improve their bottom lines through two simultaneous methods: increasing revenues (i.e., generate top line growth) and improving efficiency (or cutting costs) (Egolum, Amahalu, & Obi, 2019). From company's income statement, the bottom line is usually labeled "net income", although it is also referred to as net profit or net earnings. Net income

is the amount remaining after all costs and taxes are subtracted from the gross sales a business generates during a year or other accounting period.

Return on Capital Employed (ROCE)

Capital employed is the total amount of equity invested in a business. Capital employed refers to the amount of capital investment a business uses to operate and provides an indication of how a company is investing its money (Adam, 2021). Return on capital employed (ROCE) is a financial ratio that can be used to assess a company's profitability and capital efficiency. This ratio can help to understand how well a company is generating profits from its capital as it is put to use. Return on Capital Employed (ROCE), a profitability ratio, measures how efficiently a company is using its capital to generate profits. The return on capital employed metric is considered one of the best profitability ratios and is commonly used by investors to determine whether a company is suitable to invest in or not (Amahalu & Obi, 2020b).

$$\text{ROCE} = \frac{\text{Earnings before interest and tax (EBIT)}}{\text{Total Assets} - \text{Current Liabilities}}$$

Financial Mix and Bottom Line Profit

Manufacturing businesses are considered important in both developed and developing countries. They produce goods and services which help to increase economic growth and contribute significantly to employment creation, although they play this crucial role in economic growth and employment. Their operations are often crippled by lack of adequate financing from financial institutions. The operations of manufacturing businesses require capital which can be raised in different ways (Chen, Liang & Yu, 2018). One way of raising this capital is through long-term debt finance from financial institutions (Alam & Parinduri, 2017). Debt finance is raised by borrowing from financial institutions. Studies have been carried out focusing on the effect of long term debt on performance of firms. The results from these studies are inconsistent. Yazdanfar and Ohman (2015) found a negative relationship between long term debt on performance while Ezechukwu and Amahalu (2020); Nassar (2016) documented a positive relationship long term debt on performance.

Theoretical Review

Pecking Order Theory

Pecking order theory is a theory related to capital structure. It was initially suggested by Donaldson in 1961. In 1984, Stewart Myers and Nicolas Majluf modified the theory and made it popular. According to this theory, managers follow a hierarchy to choose sources of finance. The hierarchy gives first preference to internal financing. If internal financing is not enough, then managers would have to shift to external sources. They will issue debt to generate funds. After a point when it is no longer practical to issue more debt, equity is issued as a last option. The pecking order theory begins from the asymmetry of information in the organization. Asymmetric information is an unequal distribution of information. The managers generally have more information about company's performance, prospects and risks than outside creditors or investors. Higher the asymmetry of information, higher the risk in the company. Also, it is not possible for the investors to know everything about a company. So, there will always be some amount of information asymmetry in every company (Amahalu, Okoye, Nweze & Okika, 2017).

Empirical Review

Efeeloo and Nwokeji (2021) assessed the effect of asset mix on financial performance of selected consumer goods firms in Nigeria. The specific objectives of the study were to determine the effects of tangible non-current assets, current and intangible assets structures and returns on asset. Ex post facto research design was adopted and data obtained from the annual reports of the companies for a seven-year period from 2013 to 2019. Multiple regression analytical technique was employed in analyzing the data. The findings of the study revealed that the independent variables employed in the study explained about 13.7% of the variations in returns on asset. Specifically, both current and intangible assets have positive and significant effect with ROA at 5% level of significance. Noncurrent asset has positive but insignificant effect on ROA. Thus, the assets composition of a firm plays a critical role in

the financial performance of that firm, although it explains only about 14% of the performance of the firm.

Okpara and Ifurueze (2020) examined the effect of financing mix on corporate profitability of selected firms in the brewery and beverage industry in Nigeria. Four specific objectives were achieved by the study, four research questions guided the study and four hypotheses were formulated. The study used ex-post factor research design. Ten (10) firms were selected from the Nigeria Stock Exchange (NSE). The data used were secondary data and were drawn from 2008 to 2018. The secondary data collected were analysed using descriptive statistics, correlation and regression analysis. The data used in this study were sourced from the firm's annual report and Nigerian Stock Exchange fact book. This study applied ex post facto research design. The data collected were analysed using Ordinary Least Square Method. The results show that only total debt to total asset and total debt to equity has significant impact on corporate profitability of selected firms in the brewery and beverage industry in Nigeria. Equity to total asset and Long-term debt to total asset has insignificant impact on corporate profitability of selected firms in the brewery and beverage industry in Nigeria.

Nangih (2020) examined the influence of capital intensity on the performance of listed oil and gas firms in Nigeria. The study used property, plant and equipment, intangible non-current assets, non-current prepayments as well as investment property as the dimensions of the independent variable while employing the profit margin as a measure of the dependent variable. Data was generated from nine (9) listed oil and gas companies for five years (2014 to 2018). The result of the random effect regression model used for testing the hypotheses showed that the predictor variables all had significant positive effects on the profit margin except intangible non-current assets. The study concluded that oil and gas companies with higher capital intensity were likely to be more profitable than those with low intensity.

Methodology

Research Design

In order to establish a meaningful relationship between financial mix and bottom line profit, this study was treated as *ex-post facto* research since it relied on historical data

Population of the Study

The population of this study consisted of all the seventeen (17) quoted industrial goods companies in Nigeria firms in Nigeria as at 31st December, 2020. They include: African Paints (Nigeria) Plc; Austin Laz & Company plc; Berger Paints Nigeria Plc; Chemical and Allied Products Plc; Cement Company of Northern Nigeria; DN Meyer Plc; IPWA Plc; Paints and Coatings Manufacturers Nigeria Plc; Portland Paints and Products Nigeria Plc; Premier Paints Plc; Lafarge Africa Plc; Cutix Plc; Beta Glass Plc; Avon Crown caps and Containers (Nig) Plc; Greif Nigeria Plc; West African Glass Industry Plc; Nigerian Ropes Plc.

Sample Size and Sampling Technique

The sample size of this study consisted of eleven (11) quoted industrial goods firms that were purposively selected based on continuous and active trading of firms on the floor of the Nigerian Exchange Group (NGX) during the period 1st January 2008 to 31 December 2020. They are: Berger Paints Nigeria Plc; Chemical and Allied Products Plc; DN Meyer Plc; IPWA Plc; Paints and Coatings Manufacturers Nigeria Plc; Portland Paints and Products Nigeria Plc; Lafarge Africa Plc; Cutix plc; Beta Glass plc; Avon Crown caps and Containers (Nig) Plc; Nigerian Ropes Plc.

Sources of Data

This study made use of secondary data precisely. The data were sourced from publications of the Nigerian stock exchange (NSE), fact books and the annual report and accounts of the sampled industrial goods companies from 2008 to 2020.

Research Variables

This study contains two sets of variables; the dependent variable (bottom line profit) and independent variables (financial mix)

Table 1 Operationalisation of Variables

Variables (code)	Operational Definitions
Dependent Variable (Bottom Line Profit)	
Driver:	
Return on Capital Employed (ROCE)	$\frac{\text{Earnings before interest and tax (EBIT)}}{\text{Total Assets} - \text{Current Liabilities}}$
Independent Variable (Financial Mix)	
Proxies:	
Long Term Debt Ratio (LTDR)	$\frac{\text{Long Term Debt}}{\text{Total Assets}}$
Short Term Debt Ratio (STDR)	$\frac{\text{Short Term Debt}}{\text{Total Assets}}$
Debt Equity Ratio (DER)	$\frac{\text{Total Liabilities}}{\text{Total Equity}}$

Model Specification

This study adapted the model of Abdul, Abdullah and Atiqah,(2015):

$$ROA = \beta_0 + \beta_1 EQF + TDR + LTDR + \mu_{it} \quad \text{equ (i)}$$

Where:

ROA = Return on Assets

EQF = Equity Financing

TDR = Total Debt Ratio

LTDR = Long Term Debt Ratio

The following research models were formulated in line with the research hypotheses in order to empirically determine the relationship between financial mix and bottom line profit of quoted industrial goods firms in Nigeria:

$$ROCE_{it} = \beta_0 + \beta_1 LTDR_{it} + \mu_{it} \quad \text{Ho}_1$$

$$ROCE_{it} = \beta_0 + \beta_1 STDR + \mu_{it} \quad \text{Ho}_2$$

$$ROCE_{it} = \beta_0 + \beta_1 DER_{it} + \mu_{it} \quad \text{Ho}_4$$

Where:

β_0 = Constant term (intercept) of the study model

β_1 = Coefficient of the explanatory variable (Financial Mix)

$\mu_{i,t}$ = Component of unobserved error term of firm i in period t

$ROCE_{it}$ = Return on Capital Employed of firm i in period t

$LTDR_{it}$ = Long Term Debt Ratio of firm i in period t

$STDR_{it}$ = Short Term Debt Ratio of firm i in period t

DER_{it} = Debt-Equity Ratio of firm i in period t

Data Presentation and Analysis

Table 2: Differenced Result

Variables	Test Statistic	Test Critical Values			Status	Prob.
		1% level	5% level	10% level		
ROCE	-4.298334	-4.297073	-3.212696	-2.747676	1(1)	0.0100
LTDR	-5.792674	-4.200056	-3.175352	-2.728985	1(1)	0.0010
STDR	-4.413974	-4.297073	-3.212696	-2.747676	1(1)	0.0085
DER	-4.585965	-4.297073	-3.212696	-2.747676	1(1)	0.0286

Source: Researcher's computation using E-views 10.0, 2021

Interpretation

In order to ascertain the stationary state of the panel data time series variables, this study employed the panel unit root test. The Panel Augmented Dickey-Fuller test was employed and the results are shown in table 2. The results of the panel unit root test using Panel Augmented Dickey-Fuller at 1 percent level shows that all the panel time series variables are non-stationary, but became stationary only after first differencing; hence the variables have an order of integration of one.

Table 3: Pearson Correlation Matrix

	ROCE	LTDR	STDR	DER
ROCE	1.0000	-0.0554	0.5279	-0.1353
LTDR	-0.0554	1.0000	0.2489	0.3493
STDR	0.5279	0.2489	1.0000	-0.3265
DER	-0.1353	0.3493	-0.3265	1.0000

Source: E-Views 10.0 Output, 2021

Interpretation of Correlation Matrix

Table 3 indicates that there is a negative relationship between LTDR (-0.0554), DER (-0.1353) and ROCE. On the other hand, ROCE positively correlates with STDR.

Test of Hypothesis I

H₀: There is no significant relationship between long term debt ratio and return on capital employed of quoted industrial goods companies in Nigeria

H₁: There is significant relationship between long term debt ratio and return on capital employed of quoted industrial goods companies in Nigeria

Table 4: Ordinary Least Square regression analysis testing the relationship between LTDR and ROCE

Dependent Variable: DROCE

Method: Least Squares

Date: 10/14/21 Time: 13:17

Sample (adjusted): 2009 2020

Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
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C	-0.109471	0.180202	-0.607487	0.5571
DLTDR	0.471973	0.138117	3.417202	0.0066
R-squared	0.319712	Mean dependent var		-0.084167
Adjusted R-squared	0.231684	S.D. dependent var		0.629754
S.E. of regression	0.619697	Akaike info criterion		2.031841
Sum squared resid	3.840248	Schwarz criterion		2.112658
Log likelihood	-10.19104	Hannan-Quinn criter.		2.001919
F-statistic	11.67727	Durbin-Watson stat		1.695890
Prob(F-statistic)	0.006578			

Source: E-Views 10.0 Regression Output, 2021

Interpretation of Estimated Regression Coefficients

The relationship between long term debt ratio and return on capital employed of quoted industrial goods companies in Nigeria is evaluated based on the result of table 4. From table 4, LTDR with a positive co-efficient of 0.471973 has a significant relationship with ROCE as indicated by the t-statistic of 3.417202 and its associated probability value of 0.0066. The R squared which examines the extent to which the predictor (LTDR) explain the variations in the dependent variable (ROCE) shows that the R Squared figure of 0.319712 indicates that, reliance on this model will account for 31.97% of the variations in the dependent variable (ROCE), while the remaining 68.03% was accounted by other factors not included in this model. The Durbin-Watson value of 1.695890 buttressed the fact that the model does not contain auto-correlation, thereby, making the regression fit for prediction purpose. The analysis resulted in F- statistic of 11.67727 with corresponding p-value of 0.006578. This confirms that, the model is significantly reliable. That means one can rely on the model to predict ROCE with high accuracy.

Decision

Since the p-value of the test is less than the critical significant value of 0.05 (5%), thus H_1 is accepted and H_0 rejected. This implies that there is a significant and positive relationship between long term debt ratio and return on capital employed of quoted industrial goods companies in Nigeria at 5% level of significance.

Table 5: Granger Causality Test showing the Causality between LTDR and ROCE

Pairwise Granger Causality Tests

Date: 10/14/21 Time: 13:22

Sample: 2008 2020

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DLTDR does not Granger Cause DROCE	10	13.0139	0.0419
DROCE does not Granger Cause DLTDR		1.53600	0.3020

Source: E-Views 10.0 Regression Output, 2021

Interpretation of Diagnostic Result

Table 5 shows that there is a unilateral causality between DLTDR and DROCE since the P-value (0.0419) is significant at 5% level. Moreover, at two (2) lags there is a statistically significant relationship between LTDR and ROCE indicating that the LTDR granger causes ROCE at 5% level of significance.. Consequently, the null hypothesis is rejected for the alternative which states that there is a significant relationship between long term debt ratio and return on capital employed of quoted industrial goods companies in Nigeria at 5% level of significance.

Table 6: Johansen Fishers Co-integration Test

Date: 10/14/21 Time: 13:20

Sample (adjusted): 2011 2020

Included observations: 10 after adjustments

Trend assumption: Linear deterministic trend

Series: DROCE DLTDR

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.838887	18.96520	16.49471	0.0144
At most 1 *	0.586733	6.185631	3.841466	0.0129

Trace test indicates 2 cointegration at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.838887	15.77956	14.26460	0.0184
At most 1 *	0.586733	6.185631	3.841466	0.0129

Max-eigenvalue test indicates 2 cointegration at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Researcher's computation using E-Views 10.0, 2021

Interpretation of Cointegration Test Result

From the cointegration test result presented in table 6, the decision rule is to reject the null hypothesis of no cointegration if the computed trace statistic is greater than the 5% critical value. The test result indicates the rejection of no cointegration under none. We could thus say that there exists the presence of two cointegrating equation among the variables, hence, indicating the presence of long run relationship among the variables.

Test of Hypothesis II

H₀₂: There is no significant relationship between short term debt ratio and return on capital employed of quoted industrial goods companies in Nigeria

H₂: There is significant relationship between short term debt ratio and return on capital employed of quoted

industrial goods companies in Nigeria

Table 7: Ordinary Least Square regression analysis testing the relationship between STDR and ROCE

Dependent Variable: DROCE

Method: Least Squares

Date: 10/14/21 Time: 20:46

Sample (adjusted): 2009 2020

Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.055090	0.157779	-0.349158	0.7342
DSTDR	0.930476	0.325056	2.862510	0.0154
R-squared	0.320171	Mean dependent var		-0.084167
Adjusted R-squared	0.252189	S.D. dependent var		0.629754
S.E. of regression	0.544587	Akaike info criterion		1.773432
Sum squared resid	2.965746	Schwarz criterion		1.854250
Log likelihood	-8.640595	Hannan-Quinn criter.		1.743511
F-statistic	7.709592	Durbin-Watson stat		1.735844
Prob(F-statistic)	0.015415			

Source: E-Views 10.0 Regression Output, 2021

Interpretation of Regression Coefficient Result

The following regression equation was obtained from table 7:

$$\text{DROCE} = -0.055090 + 0.930476\text{DSTDR}$$

Using the above model, it is possible to determine the relationship between DROCE and DSTDR. Holding all other factors constant, an increase in one unit of the independent variable (STDR) will cause ROCE to increase by 93%, this means that a positive relationship exists between STDR and ROCE. The slope coefficient shows that the probability value: $P(x_1=0.0154 < 0.05)$ is less than the critical P-value of 0.05. This implies that STDR has a positive and significant relationship with ROCE at 5% significant level. Results in table 7 also indicate that the R-squared for the model is 0.32, meaning that the regression model used for this study is a good predictor. The independent variables explained 32% of the variation in ROCE. Only 68% of variation in ROCE is not explained by the regression model. The Durbin-Watson value of 1.735844 indicates the absence of serial correlation in the model.

Decision:

Since the p-value of the test (0.015415) is less than 0.05, then there exists enough evidence to reject the null hypothesis and conclude that there is a significant and positive relationship between short term debt ratio and return on capital employed of quoted industrial goods companies in Nigeria at 5% significant level.

Table 8: Granger Causality Test showing the Causality between STDR and ROCE

Pairwise Granger Causality Tests

Date: 10/14/21 Time: 20:48

Sample: 2008 2020

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DSTDR does not Granger Cause DROCE	10	12.0533	0.0424
DROCE does not Granger Cause DSTDR		1.56020	0.2975

Source: E-Views 10.0 Regression Output, 2021

Interpretation of Diagnostic Result

Table 8 shows that there is a unidirectional causality between DSTDR and DROCE since the P-value (0.0424) is significant at 5% level. Moreover, at two (2) lags there is a statistically significant relationship between DSTDR and ROCE indicating that the DSTDR granger causes ROCE at 5% level of significance. Consequently, the null hypothesis is rejected for the alternative which states that there is a significant relationship between short term debt ratio and return on capital employed of quoted industrial goods companies in Nigeria at 5% level of significance.

Table 9: Johansen Fishers Co-integration Test

Date: 10/14/21 Time: 20:47

Sample (adjusted): 2011 2020

Included observations: 10 after adjustments

Trend assumption: Linear deterministic trend

Series: DROCE DSTDR

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.920540	21.43975	15.49471	0.0056
At most 1 *	0.373498	4.676026	3.841466	0.0306

Trace test indicates 2 cointegration at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.920540	17.72750	14.26460	0.0136
At most 1 *	0.373498	4.676026	3.841466	0.0306

Max-eigenvalue test indicates 2 cointegration at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Researcher's computation using E-Views 10.0, 2021

Interpretation of Cointegration Test Result

From the cointegration test result presented in table 9, the decision rule is to reject the null hypothesis of no cointegration if the computed trace statistic is greater than the 5% critical value. The test result indicates the rejection of no cointegration under none. We could thus say that there exists the presence of two cointegrating equation among the variables, hence, indicating the presence of long run relationship among the variables.

Test of Hypothesis III

H₀₃: There is no significant relationship between debt-to-equity ratio and return on capital employed of quoted industrial goods companies in Nigeria

H₃: There is significant relationship between debt-to-equity ratio and return on capital employed of quoted industrial goods companies in Nigeria

Table 10: Ordinary Least Square regression analysis testing the relationship between DER and ROCE

Dependent Variable: DROCE

Method: Least Squares

Date: 10/14/21 Time: 13:09

Sample (adjusted): 2009 2020

Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.078225	0.209346	-0.373664	0.7165
DDER	-2.635610	0.325843	-8.088579	0.0000
R-squared	0.290471	Mean dependent var		-0.084167
Adjusted R-squared	0.229482	S.D. dependent var		0.629754
S.E. of regression	0.660336	Akaike info criterion		2.158876
Sum squared resid	4.360436	Schwarz criterion		2.239694
Log likelihood	-10.95325	Hannan-Quinn criter.		2.128954
F-statistic	22.04714	Durbin-Watson stat		1.624896
Prob(F-statistic)	0.000000			

Source: E-Views 10.0 Regression Output, 2021

Interpretation of Regression Coefficient Result

The following regression equation was obtained from table 10:

$$\text{DROCE} = -0.078225 - 2.635610\text{DER}$$

Using the above model, it is possible to determine the relationship between DROCE and DDER. Holding all other factors constant, an increase in one unit of the independent variable (DER) will exert 264% reduction in ROCE, this means that a negative relationship exists between DER and ROCE. The slope coefficient shows that that the probability value: $P(x_1=0.0000<0.05)$ is less than the critical P-value of 0.05. This implies that DER has a

negative and significant relationship with ROCE at 5% significant level. Results in table 10 also indicate that the R-squared for the model is 0.29, meaning that the regression model used for this study is a good predictor. The independent variables explained 29% of the variation in ROCE. Only 71% of variation in ROCE is not explained by the regression model. The Durbin-Watson value of 1.624896 indicates the absence of serial correlation in the model.

Decision:

Since the p-value of the test (0.000000) is less than 0.05, then there exists enough evidence to reject the null hypothesis and conclude that there is a significant and negative relationship between debt-to-equity ratio and return on capital employed of quoted industrial goods companies in Nigeria at 5% significant level.

Table 11: Granger Causality Test showing the Causality between DER and ROCE

Pairwise Granger Causality Tests

Date: 10/14/21 Time: 13:12

Sample: 2008 2020

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DDER does not Granger Cause DROCE	10	15.4783	0.0127
DROCE does not Granger Cause DDER		0.16048	0.8560

Source: E-Views 10.0 Regression Output, 2021

Interpretation of Diagnostic Result

Table 11 shows that there is a unidirectional causality between DDER and DROCE since the P-value (0.0127) is significant at 5% level. Moreover, at two (2) lags there is a statistically significant relationship between DER and ROCE indicating that the DER granger causes ROCE at 5% level of significance. Consequently, the null hypothesis is rejected for the alternative which states that there is a significant relationship between debt to equity ratio and return on capital employed of quoted industrial goods companies in Nigeria at 5% level of significance.

Table 12: Johansen Fishers Co-integration Test

Date: 10/14/21 Time: 13:11

Sample (adjusted): 2011 2020

Included observations: 10 after adjustments

Trend assumption: Linear deterministic trend

Series: DROCE DDER

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.950763	23.11218	15.49471	0.0029
At most 1	0.250785	2.887288	3.841466	0.0893

Trace test indicates 1 cointegration at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.950763	21.07771	14.26460	0.0036
At most 1	0.250785	2.887288	3.841466	0.0893

Max-eigenvalue test indicates 1 cointegration at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Researcher's computation using E-Views 10.0, 2021

Interpretation of Cointegration Test Result

From the cointegration test result presented in table 12, the decision rule is to reject the null hypothesis of no cointegration if the computed trace statistic is greater than the 5% critical value. The test result indicates the rejection of no cointegration under none. We could thus say that there exists the presence of one cointegrating equation among the variables, hence, indicating the presence of long run relationship among the variables.

Findings, Conclusion and Recommendations

Findings

Based on the analysis of this study, the following findings were deduced:

- There is a significant and positive relationship between long term debt ratio and return on capital employed of quoted industrial goods companies in Nigeria at 5% level of significance.
- There is a significant and positive relationship between short term debt ratio and return on capital employed of quoted industrial goods companies in Nigeria at 5% significant level.
- There is a significant but negative relationship between debt-to-equity ratio and return on capital employed of quoted industrial goods companies in Nigeria at 5% significant level.

Conclusion

This study examined the relationship between financial mix and bottom line profit of quoted industrial goods companies in Nigeria for a period of thirteen (13) years spanning from 2008 to 2020. Panel data were sourced from the annual reports and accounts of the sampled firms. Inferential statistics using Pearson correlation analysis, Panel unit root test, Granger causality test, Johansen Fishers panel co-integration. Data analysis revealed that a significant relationship exists between financial mix and bottom line profit of quoted industrial goods companies in Nigeria. As disaggregated components, long term debt ratio and short term debt ratio have a significant positive relationship with return on capital employed, while, a significant negative relationship exists between debt-to-equity ratio and return on capital employed at 5% significant level respectively. Consequently, this analysis supports growing evidence that financial mix has a significant relationship and exerts significant influence on bottom line profit of quoted industrial goods companies in Nigeria at 5% significant level.

Recommendations

The following recommendations were made in line with the findings and conclusion of this study:

- i. There should be reduction of interest rate charges on corporate lending by banks, this can be done by waiving or lowering the transfer fees, to enable industrial goods firms invest in capital equipments and machinery, because it is difficult to make loan repayments of short-term debt financing that was used for long-term investments, in order to engender desired high corporate profitability and growth of cash value added.
- ii. Since short term debt positively affects cash value added, industrial goods firms should use more of short term debt in their capital structure to avoid paying a high cost of capital. Since, firms with more current assets are less likely to be financially constrained.
- iii. Bankers and debt providers should help industrial goods firms by charging lower cost of debt. The lower cost of debt financing helps to bring down the required rate of return on the capital project being financed, thus, improving its profit margins.

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