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**EFFECT OF CAPITAL STRUCTURE ON PROFITABILITY OF LISTED CONSTRUCTION FIRMS IN NIGERIA**

**UDOCHUKWU GODFREY OGBONNA**

Department of Management Sciences, Rhema University Nigeria  
kellyogbo2004@yahoo.com

**JOHN CHIKA ONWUCHEKWA**

Department of Accounting, Federal University, Otuoke  
Bayelsa State, Nigeria  
Chikajohn29@yahoo.com

**EJEM CHUKWU AGWU**

Department of Banking and Finance, Abia State University, Uturu  
ecjah71@yahoo.com

And

**PREYE OMBU**

Department of Accounting, Federal University, Otuoke  
Bayelsa State, Nigeria  
ombupreye@yahoo.com

***Abstract***

*This study lent its voice with regards to the unending controversy on the relevance of Capital Structure and firms value. The data of the study represented profitability variable (Earnings per Share) and Capital structure variables (Debt Ratio, Equity Ratio, and Leverage Ratio) of three construction firms listed on the Nigerian Exchange Group Plc (NGX) for period of ten years (2011 to 2020). This study employed all the variants of panel data analysis techniques, where the result of the fixed effect found that all the variables of capital structure impact significantly on the profitability of the three selected construction firms within the scope of this study. The results corroborate the propositions of net income theory which support that firms should borrow as much as possible to minimize the cost of capital and maximize the value of the firm, hence affirms the relevance of capital structure in determining the firm's value. The result of the Likelihood test favoured the fixed effect that unobserved variables are important explanatory variable of firms' profitability. Considering the finding. The researchers recommend that firms should go for issuance of debentures and other loans to enhance flexibility of financial plans.*

*Keywords: Earning Per Share, Debt/Equity ratio, Net Income theory, Panel Data*

**Introduction**

The effect of capital structure on profitability is a topic of great concern in the financial world. Every firm has the primary objective of profit maximization, and the capital structure of the firm is one of the significant factors on its profitability. Capital structure can be described as the combination of debt and equity capital, which makes up the total assets of companies (San and Heng, 2011). It represents the mix of a company's debt and equity, and

how the companies finance their numerous operations using various forms of funds. Capital structure can therefore be defined as the form or mix of capital used to finance a firm. It could either be a mix of equity, preference shares, debentures and retained earnings or otherwise. Company management has the responsibility of establishing the optimal capital structure whose cost of capital is minimized while the value of the firm is maximized. Although all firms have a goal to achieve optimal capital structure, their judgement on the importance of the mix of various forms of capital differs significantly.

Equity and debt can be found on the firm's statement of financial position and the proportion is considered when analysing firms' capital structure. A firm's proportion of its debt and equity capital provides detailed information on how risky their borrowing status is. In most cases, a firm that is heavily financed by debt capital poses more risks on investors than a firm that is majorly equity financed. However, the risk from a highly leveraged firm may be the primary source of its growth. Kochhar (1997) is of the view that poor capital structure decisions may lead to a potential fall in the value of a firm. The capability of management in making financial decisions is significant if the firm is to make profit on its operations. The decision on the appropriate mix of capital will aid the firm effectively and efficiently in its operations; therefore, it is important for firms in Nigeria to know the debt-equity mix that forms its optimal capital structure.

Long-term debt to total assets is one of the factors that influence the performance of a firm, and it measures the impact of long-term debts on the capital structure of a firm. Kurfi (2013) argues that a firm that have a higher long-term debt to total assets ratio would have little resources to take care of other objectives and vice versa. Financial performance is the measure of how well a firm can use its assets from its primary operations to generate revenue. Capital structure is significantly influenced by financial performance as it provides a valuable tool to the numerous users in evaluating the firm's past and current financial performance and position to determine the value of the firm.

### **Conceptual Clarifications**

#### **Capital Structure**

Capital structure is the balance between equity and debt adopted by firms in running their operations to finance their assets and aid future growth (Zhu, 2014). It is the debt/equity mix which the firm uses in financing its operations. Velnampy & Niresh (2012) defined capital structure as how firms make its financing decisions by choosing among the various sources of funds such as retained earnings, debt, equity, or a combination of either. The capital structure of a firm is generally divided into two components, debt, and equity finance. Debt finance is finance generated through borrowing from external sources such as banks, or from the issue of bonds, all of which attracts a fixed return. This type of financing arises when a firm raises money for working capital of capital payments by selling corporate bonds, trade bills or notes to individuals and/or investors (Ubesie, 2016).

It refers to the use of external funds such as preference shares and debentures in financing the operations of the firm. Debt may be short term (repayable over a period less than or equal to one year) or long term (repayable over periods greater than one year). While equity finance is the risk bearing finance of a firm which is provided by the owners of the business. It is the sum of funds owned by owners of the firm and it includes ordinary share capital, share premium and retained earnings. Capital structure is measured in ratios such as debt ratio, equity ratio, leverage ratio and capitalization ratio, amongst others. Debt ratio measures the percentage of funds generated through borrowing from external

sources, which attracts a fixed return. It is the ratio measured as long-term debts to total assets (Abdullah, 2013).

Debt ratio is given as: 
$$\frac{\text{Long-term Debts}}{\text{Total Assets}}$$

Whereas Equity ratio measures the percentage of funds provided by the owners of the business (Praise & Esther, 2020).

It is given as: 
$$\frac{\text{Net Asset}}{\text{Total Assets}}$$

Leverage ratios measure the relationship between the total funds supplied by external creditors and the funds generated by the owners of the company. It measures the extent to which borrowed funds are utilized for the operations of the business (Okeke, Ezejiofor&Okoye, 2021).

The ratio is given as: 
$$\frac{\text{Long-term Debts}}{\text{Net Assets}}$$

Capitalization ratio measures the proportion of debt that a firm uses in its capital structure. It is used to analyze the long-term solvency of the firm.

The ratio is given as: 
$$\frac{\text{Long-term Debts}}{\text{Long-term Debts} + \text{Net Assets}}$$

Capital structure decisions are significant because they affect shareholders risks and returns (Mwangi et al, 2014). Financial managers of firm should decide on the optimal capital structure which is the appropriate combination of debt/equity as well as all other sources of finance, such as retained earnings amongst others, that maximizes the overall value of the firm by minimizing the cost of capital. These different sources of

### Profitability

Profitability is the ability of a firm to make profit from its operating, financing, and investing activities. Every business has the primary goal of profit maximization from its operations (Kamau et al, 2018). For a firm to make profit, it must be able to generate more revenue than expenses from its operations. In evaluating the profitability of firms, ratios have been used as a benchmark for analysis. The profitability ratios include gross profit margin, return on equity, earnings per share, Tobin Q's, and price earnings ratio, amongst others.

Gross profit margin measures the efficiency of management in producing a unit of product.

It is given as: 
$$\frac{\text{Gross Profit}}{\text{Revenue}}$$

Return on equity is the ratio which measures the profit generated on the funds provided by the owners of the business (Omaliko et al, 2020).

It is given as: 
$$\frac{\text{Net Profit}}{\text{Net Assets}}$$

Earnings per share are the proportion of the firm's profit allocated to each share. It measures the amount that each outstanding ordinary share of a company is worth (Seetharaman & Raj, 2011).

It is given as: 
$$\frac{\text{Net Profit}}{\text{Number of Ordinary Shares Outstanding}}$$

Tobin Q's ratio expresses the relationship between the market value of the firm's net assets and the book value.

It is given as: 
$$\frac{\text{Net Assets Market Value}}{\text{Net Assets Book Value}}$$

### Theoretical Framework

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Following the pioneer work of Modigliani and Miller (1958, 1968) on capital structure which states that value of a firm only depends on its capitalized operating cash flow and not the division of the firm's finding between the providers of its capital, meaning capital structure is irrelevant to firm performance, some other theories such as pecking order theory, trade-off theory, agency cost theory and market timing theory have emerged. This study considers the following theories below

**The pecking order theory**

The pecking order theory which was postulated by Myers and Majluf (1984). Pecking order theory explains the relationship between profitability and leverage. It states that firms have a particular preference of sources of funds when financing their operations, which are retained earnings, debt, and equity, respectively. This theory shows that profitability affects debt negatively. Firms making low profit seem to make more use of debt in financing their operations and firms that have a lower level of debt in their capital structure may be since they are making more profits. It advocates that companies should use the cheapest form of finance to run their operations.

Companies prefer internal sources of finance to external sources of finance due to asymmetric information. This theory is relevant to this study because construction firms operate in a financial environment that fits the pecking order. If the construction company must use external financing, preference share capital should be used to maintain an appropriate debt to equity ratio.

**Net Income Theory**

This suggests that firms should borrow as much as possible to take full advantage of the cost of debt. The assumption is that the cost of debt and equity remain constant as borrowing is increased. On this basis, it would be best to borrow as much as possible to minimize the overall cost and maximize the market value of the firm. This theory lent that increase market value of firm results to decrease in the overall cost of capital of a firm. A firm can choose a degree of capital structure in which debt is more than equity share capital. It will be helpful to increase the market value of firm and decrease the value of overall cost of capital.

Debt is cheap source of finance because its interest is deductible from net profit before taxes. After deduction of interest firm must pay less tax and thus, it will decrease the weighted average cost of capital (WACC) (overall cost). This shows that, in the net income view, capital structure is relevant in determining the firm's value (Broyles, 2003; Ejem et al, 2020). High debt content mixture of equity-debt mix ratio is also called "Financial Leverage" therefore, increasing of financial leverage will be helpful to for maximizing the firm's value.

**Review of Empirical Literature**

Abdi and Bayu (2021) carried out a study on the impact of capital structure on Ethiopian construction companies' profitability: evidence from large tax pay organizations. The criterion for companies to be included in the study required companies to have a ten-year audited financial statement particularly balances sheet and profit and loss statements covering a period from 2009 to 2018 inclusive. The results of the study showed that return on equity and short-term debt ratio have a statistically significant positive effect on the profitability of construction companies in Ethiopia.

Orji et al, (2021) examined the effect of debt financing on performance of firms in Nigeria. A total of 26 firms formed the sample size with 208 observations and data spanning

from 2013-2020. Data for the study were obtained from the NSE Fact book and annual reports and accounts of the firms. The dependent variables used in the study were long-term debt financing (LTDF), short term debt financing (STDF) and preferred stock financing (PSF); while firms' performance on the other hand, was measured using return on equity (ROE) which is the independent variable. The findings of the study showed that debt financing has a

significant and positive effect on firms' performance in Nigeria at 5% significant level. They concluded that debt financing has improved firms' performance over the years.

Hajisaaid (2020) also investigated the effect of capital structure on profitability of eight companies working in the basic material sector in Saudi Arabia for the period of 2009 to 2018. The dependent variable is the return on equity (ROE). In contrast, independent variables were short-term debt to total assets ratio (SDA), long-term debt to total assets ratio (LDA), and total debt to total assets ratio (DA). The results documented a negative relationship between short-term debt to total assets ratio (SDA) and profitability and this complemented studies like Hamid et al (2015), and others.

Obisesan and Ajayi (2020) investigated the impact of capital structure on firm performance in Nigeria in the period of 2013 and 2017. The data (secondary data) were obtained from various sources which included annual reviews from various companies and Central Bank of Nigeria Statistical Bulletin (various issues). The variables used were ROI, leverage, inflation, and GDP. The results provided strong evidence in support of the traditional theory of capital structure which asserts that leverage is a significant determinant of firms' performance. A significant negative relationship was established between leverage and performance. Elom and Uguru (2019) examined the effect of capital structure on profitability of selected quoted agricultural companies in Nigeria.

The secondary quantitative panel data on the research variables were obtained from the published annual reports/financial statements of the quoted agricultural companies at the Nigerian Stock Exchange (NSE) using their websites for the data covering a period of 12 years (2006 to 2017). Return on assets (ROA), debt ratio (DBTR), equity ratio (EQR), debt to equity ratio (D/EQR), capitalization ratio (CAPR) and company's assets tangibility (TANG) were used as independent variables. The study found that debt and debt-to-equity ratios exert negative and significant influence on profitability of quoted agricultural companies in Nigeria, while equity and capitalization ratios have a positive and significant effect on profitability of quoted agricultural companies in Nigeria.

Ajibola et al, (2018) also examined the impact of capital structure on financial performance of quoted manufacturing firms in Nigeria. The study obtained data to be analysed from published reports of the designated quoted manufacturing companies for each of the periods from 2005-2014. 10 companies were selected out of the 64 manufacturing firms registered on the Nigerian stock market. The variables used were short term debt ratio (STD), long term debt ratio (LTD), total debt ratio (TD), returns on equity (ROE) and returns on asset (ROA).

The findings with the use of the panel ordinary least square show that long term debt ratio (LTD), total debt ratio (TD) and return on equity (ROE) have significant and positive effect on financial performance, while ROE (return on equity) and STD (Short term debt ratio) has no significant effect on financial performance.

## **Methodology**

### **Data**

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The data of the study consists of the dependent variable (Earnings per Share (EPS)), and independent variables (Debt Ratio (DR), Equity Ratio (ER), and Leverage Ratio (LR)) of three construction firms listed on the Nigerian Exchange Group Plc (NGX) as of March 2021 for period of ten years (2011 to 2020).

**Method of Data Analysis**

Here, the researchers employed Kao Residual Cointegration test to know if long run relationship exists between the variables. The various Panel data analysis approaches (pool regression, fixed and random effects) were used to estimate the specified models. The Likelihood ratio (LR) test was used to compare the Fixed Effects and Pooled Regression. In LR test, null hypothesis favours the pooled model i.e., unobserved sectional differences are not significant, whereas rejection of the null hypothesis means that the pooled model is not valid, thus unobserved sectional differences are significant, favouring the fixed effect.

The Hausman specification test compares the random effect model with the fixed test model. The null hypothesis favours the random effects model i.e., unobserved variables are uncorrelated with the explanatory variables. A rejection of the null hypothesis favours the fixed effects model against the random effects model.

**Model Specifications**

The functional and explicit models for pool regression, fixed and random effects are:

**The Pooled Regression Model Approach**

$$EPS_{it} = \alpha_0 + \alpha_1 ER_{it} + \alpha_2 DR_{it} + \alpha_3 LR_{it} + \epsilon_{it1} \tag{1}$$

$$\log EPS_{it} = \alpha_0 + \alpha_1 \log ER_{it} + \alpha_2 \log DR_{it} + \alpha_3 LR_{it} + \epsilon_{it1} \tag{2}$$

**The Fixed Effects Approach**

$$EPS_{it} = (\alpha + Z_i) + \alpha_1 ER_{it} + \alpha_2 DR_{it} + \alpha_3 LR_{it} + \epsilon_{it2} \tag{3}$$

$$= \alpha_i + \alpha_1 ER_{it} + \alpha_2 DR_{it} + \alpha_3 LR_{it} + \epsilon_{it3} \tag{4}$$

$$\log EPS_{it} = \alpha_i + \alpha_1 \log ER_{it} + \alpha_2 \log DR_{it} + \alpha_3 LR_{it} + \epsilon_{it3} \tag{5}$$

**Random Effect**

$$EPS_{it} = \alpha_0 + \alpha_1 ER_{it} + \alpha_2 DR_{it} + \alpha_3 LR_{it} + \epsilon_{it3} + \mu_{it4} \tag{6}$$

$$\log EPS_{it} = \alpha_0 + \alpha_1 \log ER_{it} + \alpha_2 \log DR_{it} + \alpha_3 LR_{it} + \mu_{it4} \tag{7}$$

Where,  $\alpha$  = Intercept, EPS= Earnings Per Share, ER = Earnings Ratio, DR= Firms' Debt Ratio, LR = Leverage Ratio and  $\epsilon_{it}, \mu_{it}$  = Error terms.

**Analysis and Results**

**Cointegration test.**

Table 4.1 below used Kao residual based cointegration to test if cointegration relationship exists between capital structure and profitability of the firms. The result shows that the Kao Statistics is significant at 5% significant level, suggesting the existence of cointegration relationship among the variables.

**Table 4.1 Kao residual based cointegration**

	t-Statistic	Prob.
ADF	-2.106012	0.0176

**Estimation of models**

Since relationship exists between capital structure and firm's profitability is establishes, hence it is important to estimate the variables with pool regression, fixed and random effects. Table 4.2 disclosed that only the result of the fixed effect is valid and

reliable for policy formulations since the probability of the F-statistic is significant at 5% level of confidence, hence signifies overall significance of the model specified under the fixed effect. Therefore, the result of the fixed effect revealed that all the explainable variables of the capital structure (equity, debt, and leverage ratios) impact significantly on the profitability of the construction firms under study.

Though only debt ratio exerted positive impact while equity and leverage ratio negatively relate with profitability of the construction firms. The constant is positive and significant, suggesting there are other factors that influence profitability of the construction firms apart from the variables employed in this study, Finally, the Durbin-Watson values or pool regression, fixed and random effects respectively show absence of autocorrelation in all the models.

**Table 4.2 Panel Regression Results**

Variables	Pool Regression	Fixed Effects	Random Effects
LnER	0.540717 (0.8843)	-6.510121 (0.0028)	-0.615772 (0.8696)
LnDR	-0.428931 (0.9130)	11.52845 (0.0006)	0.814407 (0.8366)
LnLR	0.613704 (0.8703)	-12.20346 (0.0004)	-0.463934 (0.9026)
Constant	0.789393 (0.3591)	12.31603 (0.0017)	0.758031 (0.3525)
F-Statistic	0.178772 (0.908884)	121.9235 (0.000176)	0.590219 (0.632229)
DW	1.788325	2.062926	2.032453

\*Probability values are inside bracket.

#### Comparing postulations of Pool Regression, Fixed Effect, and Random Effect

In table 4.3 below shows the test to know if unobserved variables have significant influence on the profitability of the construction firms in Nigeria. The result of the likelihood ratio has a probability value of the statistic significant at 5% level, suggesting the rejection of the null hypothesis that unobserved variables have no significant relationship with observed variables, hence the result favoured the fixed effect that unobserved variables are important explanatory variable for firms' profitability. The Hausman test said otherwise though not reliable.

**Table 4.3 Model Specification Test**

Specification Test	Statistics
Likelihood Ratio Test	83.012720 (0.0006)
Hausman Test	2.725974 (0.4358)

\*Probability values are inside bracket.

Since, the unobserved variables influence firms' value, the researchers reported the unobserved effects of the various firms under this study on table 4.4 below.

**Table 4.4. The unobserved firms' cross fixed effects**

	COMPANY	Effect
1	ARBICO PLC	3.328515
2	JULIUS BERGER PLC	3.834261
3	UACN PROPERTYDEVELOPMENT	-

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COMPANY PLC	10.05611
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**Conclusion and Recommendations.**

This study, effect of capital structure on the profitability of construction firms in Nigeria is in furtherance of the unending arguments pioneered by Modigliani and Miller (1958), that the firm's value is not affected by the Capital Structure; firm should have the same market value and the same weighted average cost of capital at all capital structure levels, since the value of a company should depend on the return and risks of its operation and not on the way it finances its operations. After subjecting the specified models into empirical investigation, the results found that all the variables of capital structure employed in this study impact significantly on the profitability of the three selected construction firms within the scope of this study.

The results corroborate the propositions of net income theory which supports that firms should borrow as much as possible to minimize the cost of capital and maximize the value the firm, hence affirms the relevance of capital structure in determining the firm's profitability. The result agreed with the findings of Hajisaaid (2020); Abdi & Bayu (2021); and Orji et al, (2021). Since debt ratio has positive and significant impact on the profitability of construction firms within the scope of this study, the researchers are of the opinion that firms should go for issuance of debentures and other loans to enhance flexibility of financial plan. In an enterprise, the capital structure should be such that there is both contraction as well as relaxation in plans. Debenture and loans can be refunded back as the time requires while, equity capital cannot be refunded at any point which provides rigidity to plans. Therefore, to make the capital structure possible, the firm should go for issue of debentures and other loans.

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