The Relationship between Corporate Performance and Financial Structure: An Empirical Study of Construction and Real Estate Firms in Nigeria

Echekoba Felix Nwaolisa[1] and Ananwude Amalachukwu Chijindu[1*]

[1]*Department of Banking and Finance, Nnamdi Azikiwe University, Anambra State, PMB 5025, Awka, Nigeria.*

Authors' contributions

This research was carried out in collaboration between both authors. Author EFN was responsible for study conceptualization and sourcing of relevant literature. He also wrote the first draft of the manuscript and critically reviewed it thereafter. Author AAC sourced the data, performed the analysis and interpreted the results. Both authors read and approved the final version of the manuscript.

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ABSTRACT

This paper evaluates the relationship between corporate performance and financial structure as well as the effect of financial structure on corporate performance of construction and real estate firms in Nigeria. The data were collected from Nigerian Stock Exchange factbook for the period of twenty one years from 1993 to 2013. The unit root test was conducted on the variables and was found to be stationary at the second difference. The Johansen Co-integration was applied to assess the relationship while the pooled OLS was used to determine the effect of financial structure on corporate performance. Two models were developed with two dependent variables: return on assets and return on equity representing firm corporate performance and five independent variables: total debt to equity ratio, total debt to total assets ratio and short term debt to total equity ratio reflecting financial structure; growth opportunity and taxation as control variables. The Johansen Co-integration analysis shows the presence of a long run relationship between corporate performance and financial structure. When return on assets was used as a measure of corporate

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*Corresponding author: E-mail: amalision4ltd@yahoo.com;

performance of firms, only debt to equity ratio and growth opportunity exhibited a positive relationship while total debt to total assets ratio, short term debt to total equity ratio and taxation indicated a negative relationship. On the other hand, when return on equity was applied as corporate performance proxy, all the financial structure variables and taxation signalled a negative relationship while growth opportunity showed a positive relationship. Therefore, the findings disclosed that firm's corporate performance and financial structure are correlated and financial structure negatively affect firm corporate performance. This supports the pecking order theory and consistent with previous studies that financial structure and corporate performance are negatively related. Based on the findings, we may conclude that the optimal financial structure does not play a significant role in the construction and real estate firms listed in Nigerian Stock Exchange. This paper will assist financial managers in making healthier decisions and scholars can develop new idea for further research on the nexus between financial structure and corporate performance of firms.

1. INTRODUCTION

Construction and Real estate development is a multifaceted business, encompassing activities that range from the construction, renovation and re-lease of existing infrastructural facility/buildings to the purchase of raw land (acquisition by government for infrastructural development) and the sale of improved land or parcels to others. Developers are the coordinators of the activities, converting ideas on paper into real property/facility. Accounting and auditing firm [1] reported that the Nigerian real estate sector is growing at a rate of 8.7 percent, which is faster than the average GDP growth rate of 7.4 percent. In the report titled, "Real Estate: Building the future of Africa", PricewaterhouseCoopers also projected the country's real estate investment to rise by about 49 percent, from $9.16 billion currently to $13.65 billion in 2016. PricewaterhouseCoopers also noted that residential real estate market is driven by the growing population in Nigeria, as well as the increasing rural-urban migration, strong economic growth and a growing middle class. It added that commercial real estate market is driven by an influx of institutional, foreign and private business into the country as well as the growth of locally established businesses and multi-national oil companies across the cities of Lagos, Abuja and Port Harcourt.

In the tumultuous economic scenery as currently witnessed in Nigeria, coupled with the decline in federal government revenue as a result of fall in crude oil price in the international market, the nation is faced with progressively byzantine task. The need for infrastructural enhancement through good road/rail network, stable electricity,

affordable housing for the increasingly growing population, etc. regulatory reforms by the government and its various agencies, desire for stable economic growth, firms financial and liquidity risk, corporate governance, risk management and corporate/organizational matters arising from mergers and acquisition cannot be over emphasized. Choosing the right construction/real estate firms: the one with the industry profundity, acquaintance and acumen to help the government and corporate bodies tackle their imperative exigencies and actualize prospect ahead can be precarious to goals attainment. To this effect, a sound financial structure is a necessity for the actualization of these aspirations of government and corporate bodies as well.

Financial structure of firms summarizes how they finance their assets with their resources [2]. Firms' assets can differ along diverse lines as they are related to their operating activity (inventories or fixed assets), to their liquidity needs (cash and deposits), or represent financial assets connected to their transactions (trade receivables) or owned as a form of investment (shares). In general, firms finance only a part of their assets with equity (capital and retained earnings), while other resources such as financial debt (bank loans, other loans and bonds) and other liabilities (for example trade payables) represent an important part of their liabilities [2].

The two major sources of finance available to firms are internal financing via equity and external financing via debt and these signify the financial structure. The quality of a firm balance sheet is determined through debt to equity ratio.

[2] also noted that apart from summarising a firm balance sheet, financial structure also affects their economic results: leverage could have a positive impact when the rate of return from operating activity is higher than the cost of debt, but this effect could reverse during an economic downturn as operating profitability decreases and the cost of debt goes up due to an increased riskiness of firms.

Corporate performance is measuring the results of a firm's policies and operations in monetary terms. These results are reflected in the firm's return on assets, return on equity, profit after tax, earnings per share, dividend per share, net assets per share, value added, etc. Getting on top of financial measures of a firm performance is an important part of running a growing business, especially in the current economic condition. Many business fails because of poor financial management or planning stemming from firm's management and financial managers. Corporate performance via profitability is one of the most important area of focused by shareholders as well as debt holders if the firm is using debt for operation.

This paper is broken down into sections with introduction as section one. Section two comprises review of related literature (concept of financial structure and corporate performance, theoretical framework and empirical studies) and statement of the problem. Methodology takes care of section three, section four for results and discussion while section five features conclusion.

2. REVIEW OF RELATED LITERATURE

2.1 Concept of Financial Structure and Corporate Performance

One of the difficult task face by financial managers nowadays is the decision on financial structure. The proportion of equity and debt in the financial structure of a firm is critical to its performance. Financial structure is the framework of various types of financing a firm employs to acquire and support necessary resources for its operations. Normally, it comprises of equity capital (shareholder's investment), long term debt (loan capital) and short term liabilities (overdrafts, trade credits, etc.) as represented in the right side of the balance sheet. Capital structure when compared with financial structure does not include short term liabilities. Equity capital is the risk capital staked by owners through purchase of a firm

common stock. Short term liabilities are liabilities arising from normal business operations and recurring expenses that is expected to be settled within one year. Long term debts are debts due in one year or more. A firm long term debt are ranked on the balance sheet in the order they will be repaid if the firm goes into liquidation. A firm must record the market value of its long term debt on the balance sheet, which is the amount necessary to off the debt as of the date of the balance sheet. According to [3], financial structure, preferred stock and common equity are mostly used by firms to raise needed fund and financial structure policy seeks a trade-off between risk and expected return. Theoretically, modern financial techniques would allow top financial managers to accurately calculate optimal trade-off between equity and debt of each firm, however, in practice, several studies have found that most firms do not have an optimal financial structure [3].

Corporate performance is the analysis of a firm relative to its goals and objectives. In a corporate business organization, there are majorly three parameters analysed: financial performance, market performance and shareholder's value performance. However, in some cases, performance production capacity may be analysed. Corporate performance consist of a wide range of dimensions, but liquidity (quick ratio, current ratio and cash ratio), profitability (return on assets, return on equity, net profit margin, gross profit margin, etc.) and growth (sales growth, market share growth and change in net income) are commonly chosen parameters [4]. Corporate performance analysis is a subset of business analysis or business intelligence that is concern with the performance of a firm, which has been traditionally measured in terms of financial performance. Nevertheless, in recent years, the concept of corporate performance has become broader. Like the concept of business sustainability, corporate performance is now considered to involve not only financial considerations but also other factors such as corporate social responsibility and reputation, innovations, employee morale and productivity. Consequently, corporate performance is no longer measured on key performance indicators like revenue, return on investment, overhead and operational cost. Corporate performance management has expanded beyond forecasting, budgeting and planning and performance results are often shared publicly rather than only with financial stakeholders and investors, as was the case in the past. Non-financial areas monitored

for corporate performance management and reporting include strategic planning, process efficiencies, brand equity, risk management and human resource management.

2.2 Theoretical Framework

Modigliani and Miller [5] demonstrated that financial structure decisions do not depend on the firm's value. This theory is based on several assumptions: the absence of information asymmetry, where, for example, does not have any taxes, facing a perfectly competitive market, there is no more transaction costs, no contracts no problem, personal and corporate risk. Empirical works on financial structure and corporate performance posits different results depending on the proxy reflecting financial structure and corporate performance. Majority of the empirical findings supports the pecking order theory that financial structure negatively affects firm's corporate performance. However, some scholars have found the existence of a positive relationship between firm's financial structure and performance. In the argument regarding financial structure and corporate performance, pecking order theory and trade-off theory are the dominant theories discussed by scholars. The axioms of these theories and empirical findings buttressing their propositions are presented.

2.3 Modigliani-miller Proposition on Financial Structure

Modigliani and Miller [5], in their original proposition advocated that the relationship between financial structure and the cost of capital is explained by the net operating income approach. They make a formidable attack on the traditional position by offering behavioural justification for having the cost of capital remain constant throughout all degrees of leverage. The theory assumed a perfect capital market where there is no problem of asymmetric information: there are no transaction costs; no bankruptcy cost and the securities are infinitely divisible. Managers act in the interest of shareholders and the firms can be grouped into equivalent risk classes on the basis of their business risk; and they assumed that there is no tax. In their first proposition, they considered the value of the firm to be independent of its financial structure. This proposition was more or less similar to that of the net operating income approach. They viewed the value of a firm as a function of expected operating income divided by the discount rate appropriate to its risk class, and proved that the

average cost of capital within a given class is independent of the degree of leverage. The second proposition held that financial leverage increases to expected earnings per share while the share price remains constant. This is because the change in the expected earnings is offset by a corresponding change in the return required by the shareholders. Their third proposition made an attempt to develop the theory of investment, wherein they concluded that an investment financed by common stock is advantageous to the current stockholders if and only if its yield exceeds the capitalization rate. When a corporate income tax, under which interest is a deductible expense, is considered, gain can accrue to stockholders from having debt in the financial structure, even when capital markets are perfect.

2.4 Trade-off Theory

The term trade-off theory is used by different authors to describe a family of related theories. Management running a firm evaluates the various costs and benefits of alternative leverage plans and strives to bring a trade-off between them. Often it is assumed that an interior solution is obtained so that marginal costs and marginal benefits are balanced. Thus, trade-off theory, implies that firm's financial structure decision involves a trade-off between the tax benefits of debt financing and the costs of financial distress. When firms adjust their financial structure, they tend to move toward a target debt ratio that is consistent with theories based on trade-offs between the costs and benefits of debt. [6] empirical work, explicitly account for the fact that firms may face impediments to movements toward their target ratio, and that the target ratio may change over time as the firm's profitability and stock price change.

2.5 Static Trade-off Theory

In a static trade-off framework the firm is viewed as setting a target debt to value ratio and gradually moving towards it [7]. The theory says that every firm has an optimal debt–equity ratio that maximizes its value. The theory affirms that firms have optimal financial structure, which they determine by trading off the costs against the benefits of the use of debt and equity. The benefits from debt tax shield are thus adjusted against cost of financial distress. Agency cost, informational asymmetry and transaction cost are some of the other costs to be mitigated. The theory predicts that an optimal target financial

debt ratio exists, which maximizes the value of the firm. The optimal point can be attained when the marginal value of the benefits associated with debt issues exactly offsets the increase in the present value of the costs associated with issuing more debt.

2.6 Dynamic Trade-off Theory

Implementing the role of time is very significant in identifying the optimal financial structure. In a dynamic model, the correct financing decision typically depends on the financing margin that the firm anticipates in the next period. Some firms expect to pay out funds in the next period, while others expect to raise funds. [8] took the drastic step of assuming away uncertainty. The first dynamic models to consider the tax savings versus bankruptcy cost trade-off are [9,10]. Their models took into consideration: uncertainty, taxes, and bankruptcy costs, but no transaction costs. These firms maintain high levels of debt to take advantage of the tax savings and to adjust to shocks without any cost as there is no transaction cost. [11] analysed a model quite similar to that of [12,13]. Again, if firms optimally finance only periodically because of transaction costs, then the debt ratios of most firms will deviate from the optimum most of the time. In the model, the firm's leverage responds less to short-run equity fluctuations and more to long-run value changes.

2.7 The Pecking Order Theory

Myers [7] suggests that management followed a preference ordering when it comes to financing. His work suggests that the costs of issuing risky debt or equity overwhelm the forces that determine optimal leverage in the trade-off model, the result is the pecking order. He also argued that the trade-off theory fails to predict the wide degree of cross-sectional and time variation of observed debt ratios. The pecking order theory is mainly a behavioural explanation of why certain firms finance the way they do. It is consistent with some rationale arguments, such as asymmetric information and signalling, as well as with flotation costs. Moreover, it is consistent with the observation that the most profitable companies within an industry tend to have the least amount of leverage. This Pecking Order Theory suits large firms with high profitability and which has enough internal funds in the form of retained earnings and depreciation. These firms follow a stringent dividend policy and a target dividend pay-out ratio. Thus, this theory states that highly profitable firms prefer internal funds

and when external funds are required the firm will borrow, rather than issuing equity. The pecking order theory predicts that high-growth firms, typically with large financing needs, will end up with high debt ratios because of a manager's reluctance to issue equity. [14] pecking order theory is an attempt to describe firms' decision hierarchy of financing preferences. In this order firms tend to exhaust their internal funds first, use safe debt second and riskier external equity as a last resort. [15] suggest that having equity in both ends of the pecking order is one explanation for this, which is due to the existence of both internal and external equity. Every firm's cumulative need for external finance is therefore shown by its debt ratio.

2.8 Agency Cost Theory

Jensen and Meckling [16] put forward the concept of agency costs. There is an agency relationship between the shareholders and creditors of firms that have substantial amounts of debt. In such firms shareholders have little incentive to limit losses in the event of a bankruptcy. Agency theory recognizes that the interests of managers and shareholders may conflict and that, left on their own, managers may make major financial policy decisions, such as the choice of a financial structure, that are suboptimal from the shareholders' standpoint. The theory also suggests, however, that compensation contracts, managerial equity investment, and monitoring by the board of directors and major shareholders can reduce conflicts of interest between managers and shareholders. It is also suggested that financial structure models that ignore agency costs are incomplete. Debt financing is another crucial factor that limits the free cash flow available to managers and thereby helps to control this agency problem [16].

2.9 Empirical Studies

The study of [17] on Swedish listed real estate firms during the period 1995-2004 from the perspective of conventional financial structure theory says that the pecking order theory seems to dominate the trade-off theory in order to explain the choice of capital. The fundamental of the pecking order theory is that manager's financial structure decisions are influenced by the market perceptions of managers' superior information. The trade-off theory provides evidence for manager's trade-off between costs and benefits of debt.

Feng and Guo [18] applied factor analysis to analyse the relationship between financial structure and financial performance of real estate listed firms in Shanghai Stock Exchange from 2010 to 2012. The empirical findings suggests that financial structure of real estate listed firms is negatively related to its financial performance.

Ramezanalivaloujerdi et al. [19] studied the corporate financial structure of listed construction firms in Malaysia from 2005 to 2009. The analysis revealed that profitability of the firm, growth opportunity and firm size had a significant relationship with leverage. On the other hand, non-tax debt shield had a significant relationship with leverage in the year 2006 and there was no relationship between tangibility of assets and leverage of construction firms.

Youssef and El-Ghonamie [20] evaluated the factors that affect the financial structure of the Egyptian firms for building materials and construction sector and to analyse financial structures and whether optimal financial structure exists or not. This exploration was performed using panel data procedures for a sample of 18 firms listed on the Egyptian Stock Exchange during the period from 2003 through 2012. The results depicted that profitability is negatively related to debt ratios; whereas firm tangibility is positively linked to the debt ratios. Size, Non-debt taxes shields, liquidity and growth opportunities do not appear to be significantly related to the debt ratios.

Bao and Gong [21] using prospect theory, developed a theoretical framework to examine the relationship between leverage and Real Estate Investment Trust (REIT) returns by introducing the concept of reference point. They postulated that firms' financial structure decisions are affected by a target leverage ratio (i.e., the reference point) as well as the observed leverage ratio. Firm-specific and time-varying target leverage determines a firm's leverage position, which when combined with market conditions will put firms in either loss or gain domains, where firms behave differently. In general, the effect of leverage on returns is positive in the gain domain and negative in the loss domain. Two hypotheses are derived and tested by using United States Real Estate Investment Trust (REIT) data from 1993–2013. The empirical evidence shows strong support for the theoretical model.

Gohar et al. [22] studied the impact of financial structure on firms' financial performance in Construction and Material (Cement) Sector of Karachi Stock Exchange. The data were collected from the annual reports and accounts of eight listed firms for the period of six years from 2009 to 2014. The balanced panel regression and correlation were used for analysis. The five models were regressed with five dependent and four independent variables. All models are significant but the results explained that the financial structure is not related with firms' financial performance. Also financial performance of the sector is not influenced by the control variable (size of the firm) and concluded that the optimal financial structure may not have such importance in Construction and Material (Cement) Sector of Karachi Stock Exchange.

Cook [23] analysed data for the top ten listed real-estate firms in South Africa to examine the relationships that exist between internal liquidity, financial structure and firm profitability. Results indicates that the level of internal liquidity has explanatory power on the level of debt used by the listed real-estate firm. Interestingly, results also shows that the market's perception of a listed real-estate firm is independent of its financial structure and its cash on hand. It is further implied that firms in South Africa with property as the majority asset, are under geared as a result.

Purnomosidi et al. [24] assessed the influences of company size, financial structure, good corporate governance, inflation, interest rate, and exchange rate of financial performance and value of property firm's Indonesian stock exchange. .The results of path analysis showed that the size is just a sales that significantly affect financial performance through return on assets, return on equity, and net profit margin. Financial structure, debt equity ratio significantly affect financial performance through return on assets and return on equity, while the debt to assets ratio impact on net profit margin.

Kurzrock et al. [25] tested whether adjustments in the financing structure of residential property firms in Germany can be explained by one or both of the dominating principles of corporate financial structuring: the pecking order theory and the trade-off theory. In general, they found support for pecking order considerations in financial structuring decisions of German residential property firms. The strongest effects were observed for housing cooperatives. This was the only category of firms in which they

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observed financial structure targeting behaviour as explained by the trade-off theory of capital choice.

Kumar and Himani [26] determined the financial structure of selected construction firms in India between the periods 2009 to 2013. Emphasis has been laid to show the impact of financial structure on the financial performance of Indian construction companies listed in the Bombay Stock Exchange. Multiple Regression and correlation were used to analyse the data. The variables used for the study were debt equity ratio, long term debt and debt asset ratio as the independent variable and gross profit margin, net profit margin, return on capital employed, return on assets and return on equity as the dependent variables. The result revealed that there is a positive relationship between the financial structure and financial performance of the selected firms.

Muthukumaran [27] ascertained the impact that the financial structure of a firm has on its stock price performance. Regression analysis was applied at a sample consisting of listed Indian construction firms over the period 2007-2011, both at the full sample level and at four leverage deciles. Leverage can be used as strategic investment instrument. From the results of five factor model, it is clear that leverage has significant informational content that causes stock price variability.

Khan [28] looked into the relationship of financial structure decision with the performance of the firms in developing market economies like Pakistan. Pooled Ordinary Least Square regression was applied to 36 engineering sector firms in Pakistani market listed on the Karachi Stock Exchange (KSE) during the period 2003-2009. The result showed that financial leverage measured by short term debt to total assets and total debt to total assets have significant negative relationship with the firm performance measured by return on assets, Gross Profit Margin and Tobin's Q. The relationship between financial leverage and firm performance measured by the return on equity is negative but insignificant.

San and Heng [29] investigated the relationship of financial structure and corporate performance of firm before and during crisis (2007). The study focused on construction firms which were listed in Main Board of Bursa Malaysia from 2005 to 2008. All the 49 construction firms were divided into big, medium and small sizes, based on the

paid-up capital. The result shows that there is relationship between financial structure and corporate performance For big firms, return on capital with debt to equity market value and earnings per share with long-term debt to capital have a positive relationship whereas earnings per share with debt to capital is negatively related. In the interim, only operating margin with long-term debt to common equity has positive relationship in medium firms and earnings per share with debt to capital has a negative relationship in small firms.

Sahudin et al. [30] examined whether firm's size, growth opportunity, and firm's reputation affect the debt level (leverage) of the construction firms in Malaysia. The study used data from 10 selected Malaysia's construction firms for the period 2001 to 2008. Using the panel data technique, the estimation result shows that size of construction firms has a strong significant positive relationship to the firm's leverage. The result also suggest that firm's leverage is positively affected by firm's reputation. On the other hand, growth opportunity has inverse relationship with leverage, indicating that high leverage would retard the growth of firms.

Baharuddin et al. [31] assessed the debt and equity structure for the construction firms listed in the Bursa Malaysia market during a seven-year period from 2001 to 2007. A sample data was derived from financial statements of 42 firms with a number of observations totalling 294. The dependent variable used was debt ratio and expressed by total debt divided by total assets while the independent variables are profitability, size, growth and assets tangibility. Using panel data method, the result shows that profitability of construction firms is significant and negatively related to debt ratio while size, growth and assets tangibility are positively significant in relations to total debt. The result of the study suggests that construction firms depend heavily on debt financing compared to equity financing for expansion and growth. The findings also indicate that profit is reduced when the firms are using more debt.

2.10 Statement of the Problem

If the debt components is higher than the equity components of a firm's financial structure, the higher the risk borne by the common equity holders due to fear of bankruptcy. Bankruptcy is associated with the fluctuation in earnings to shareholders and this ultimately sharps the

financial structure. Generally, the higher the level of leverage in a financial structure, the greater the instability in firm's net income and consequently, the bigger the financial risk connected with equity shareholdings and subsequently the firm's corporate performance. Besides financial structure, [32] noted that size, risk, tangibility and non-debt tax shield are the important and significant determinants of firm's corporate performance. The ability of a firm to effectively utilize its assets can to a high extent influence the corporate performance of the firm [33].

The [34] statistical bulletin reveals that between the periods 1960-1980 the construction and real estate sector got ₦4,991.20 million as loans and advances from deposit money banks in Nigeria. From 1981-2007, it increased by more than 700 percent to ₦39,179.3 million. In a time frame of three years (2008-2010) the construction and real estate sector obtained ₦1,185,071.53 million as advances from commercial banks while ₦4,744,150.0 million was dispatched in just four years (2011-2014). From the data made available by the Central Bank of Nigeria on sectorial distribution of commercial loans and advances, it is clear that the construction and real estate sector have continued to receive increasingly debts from money deposit banks in Nigeria since independence in 1960. Relying on the assertion by [1] that Nigeria real estate sector is growing at a rate of 8.7 percent, which is faster than the average GDP growth rate of 7.4 percent as well as the projection that the country's real estate investment will rise by about 49 percent, from 9.16 billion US dollars currently to 13.65 billion US dollars in 2016. In an effort to empirically determine why there is an outrageous growth rate in real estate sector compared to Nigeria gross domestic product, this study was conducted.

There are previous research testing if traditional financial structure theories such as the pecking order theory and trade-off theory are able to empirically explain the constituents of financial structure. Researches on financial structure have been conducted across several sectors allowing for sectorial effects to influence their dataset. However, in this study, our attention was on construction and real estate firms in Nigeria which we are of the view that it will exclude the appearance of sectorial effects and provides the opportunity of obtaining a robust result. The construction and real estate provides an interesting area of research since it is unique in

the matter of having high asset backing. This is due to its great deal of collateral which can be used to support high levels of debt.

In view of the assertion by [1] that Nigeria real estate sector is growing at a rate of 8.7 percent, which is faster than the average GDP growth rate of 7.4 percent, the objective of this study is to explore the relationship between financial structure and corporate performance of Nigeria construction and real estate firms as well as the effect of financial structure on their corporate performance. Consequently, the directional hypothesis is that there is no significant relationship between corporate performance of Nigeria construction and real estate firms and financial structure.

3. RESEARCH METHODOLOGY

This paper adopted a test of causation to evaluate the effect of financial structure on corporate performance of construction and real estate firms in Nigeria. To realize this purpose, out of the nine (9) firms listed on the Construction/Real Estate sector of Nigeria Stock Exchange, seven (7) firms were randomly selected for the period of twenty one (21) years from 1993 to 2013. This represents 77.78% of the total firms listed on the construction and real estate sector of the exchange floor as at 19th December, 2015. Annual/yearly financial data of each firm were collected from the factbook of Nigeria Stock Exchange as submitted by the firms in compliance with the rule and regulation of listing on the floor of Nigeria Stock Exchange (NSE). The average/mean value of Return on Assets (ROA), return on Equity (ROE), Total Debt to Total Equity (TDTE), Total Debt to Total Assets (TDTA), Short Term Debt to Total Equity (STDTE), Growth Opportunity (GRTOP) and Taxation (TAX) of the seven (7) selected construction and real estate firms were used in determining the relationship between financial structure and corporate performance. On the other hand, the balanced panel/pooled OLS techniques was employed to assess the effect of financial structure on corporate performance of selected oil and gas firms. The choice of balanced/pool OLS was based on different sub-sample of financial data of firms and needed to control time based effect. As at 31st July, 2015, there were only nine (9) listed firms on Construction/Real sector of Nigerian Stock Exchange (NSE). Seven (7) of the firms were selected due to availability of data within the period covered by the study while the two (2)

other firms were dropped due to insufficient data. The selected firms are Arbico Plc, Costain (W.A) Plc, G. Cappa Plc, Julius Berger Nigeria Plc, Roads Nigeria Plc, Smart Products Nigeria Plc and UACN Property Development Company Plc.

3.1 Research Design

This paper is elucidatory in nature and the hypotheses stated were tested. This paper is based on statistical modelling and ordinary least square estimations were employed. The paper applied various econometric tools like unit root test, Johansen co-integration and pooled ordinary least square in analysing the secondary data obtained from Nigeria Stock Exchange factbook of various issues as relevant (1993 to 2013).

3.2 Regression Model

The subsection of this paper is an attempt to empirically apply the theoretical framework of financial structure on Nigeria listed construction and real estate firms. This paper adopted the model of [26] but with slight modification. The authors expressed firm corporate performance as a function of debt to equity ratio, long term to debt ratio and debt to total asset ratio. Consequently, two models were developed. Return on assets and return on equity are the dependent variables representing firm corporate performance while total debt to equity ratio, total debt to total assets ratio and short term debt to total assets ratio are proxies for financial structure. The regression models were transformed in logarithm terms are stated as follows:

Model 1

$$LogROA_t = a_0 + a_1 LogTDTE_t + a_2 LogTDTA_t \\ + a_3 LogSTDTE_t + a_4 LogGRTOP_t \\ + a_5 LogTAX_t + U_t \quad (3.1)$$

Model 2

$$LogROE_t = a_0 + a_1 LogTDTE_t + a_2 LogTDTA_t \\ + a_3 LogSTDTE_t + a_4 LogGRTOP_t \\ + a_5 LogTAX_t + U_t \quad (3.2)$$

Where: ROA = Return on Assets, ROE = Return on Equity, $TDTE$ = Total Debt to Total Equity Ratio, $TDTA$ = Total Debt to Total Assets Ratio, $STDTE$ = Short Term Debt to Total Equity Ratio, $GRTOP$ = Growth Opportunity represented by firm turnover, TAX = Taxation by firms to government, a_0 is regression constant, a_1-a_5 depict parameters of the independent variables, and U_t is a random unobserved component that reflects unobserved shocks affecting the performance of firms.

The variables were logged for the purpose of easy interpretation. The advantage of logging the variables is the enhancement of achieving a good level of stationarity at the earliest level of integration. In models were variables are logged, the coefficients are easy to interpret as the problem of different units have been solved and the interpretation becomes easy in elasticity terms.

4. RESULTS AND DISCUSSION

4.1 Unit Root Test

The result of the unit root test conducted at level, first and second difference are presented in Tables 4.1a, 4.1b and 4.1c. The stationarity test conducted on level and first difference reflected that the variable are not stationary. However, in the second difference, all the variables were stationary. Thus, all the variables are of integrated of order 2 allowing for co-integration test to be perform on them.

Table 4.1a. Augmented dickey-fuller test result at level form: Intercept

Variables	Augmented dickey-fuller test statistic	Test critical value at 1%	Test critical value at 5%	Remark
ROA	-3.440585	-3.808546	-3.020686	Not stationary
ROE	-3.649677	-3.808546	-3.020686	Not stationary
TDTE	-0.781964	-3.808546	-3.020686	Not stationary
TDTA	-3.324270	-3.808546	-3.020686	Not stationary
STDTE	-6.200275	-3.808546	-3.020686	Stationary
GRTOP	1.526148	-3.808546	-3.020686	Stationary
TAX	1.762010	-3.920350	-3.065585	Stationary

Source: Computer analysis using E-views 8.0

Table 4.1b. Augmented dickey-fuller test result at first difference: Intercept

Variables	Augmented dickey-fuller test statistic	Test critical value at 1%	Test critical value at 5%	Remark
ROA	-6.082754	-3.831511	-3.029970	Stationary
ROE	-5.271162	-3.857386	-3.040391	Not stationary
TDTE	-1.933692	-3.831511	-3.029970	Not stationary
TDTA	-6.196517	-3.831511	-3.029970	Stationary
STDTE	-10.48713	-3.831511	-3.029970	Stationary
GRTOP	-3.273054	-3.831511	-3.029970	Not stationary
TAX	-6.473875	-3.831511	-3.029970	Stationary

Source: Computer analysis using E-views 8.0

Table 4.1c. Augmented Dickey-Fuller test result at second difference: Intercept

Variables	Augmented dickey-fuller test statistic	Test critical value at 1%	Test critical value at 5%	Remark
ROA	-5.819364	-3.886751	-3.052169	Stationary
ROE	-6.723003	-3.886751	-3.052169	Stationary
TDTE	-4.258645	-3.857386	-3.040391	Stationary
TDTA	-10.05746	-3.857386	-3.040391	Stationary
STDTE	-4.013218	-4.004425	-3.098896	Stationary
GRTOP	-6.713605	-3.857386	-3.040391	Stationary
TAX	-5.294739	-4.004425	-3.098896	Stationary

Source: Computer analysis using E-views 8.0

4.2 VAR Lag Order Selection Criteria

To ensure the reliability of long run relationship, the level of time lag was confirmed. Under the Vector Auto Regression model, the optimal level of time lag was gotten with the aid of standard tests Akaike information criterion (AIC) and Schwarz information criterion (SC). If the values of tests Akaike information criterion (AIC) and Schwarz information criterion (SC) are small, the better the terseness and veracity of the model. The number of lag was two (2) as automatically selected the E-Views 8.0 software and the result summarized in Tables 4.2a and 4.2b.

Table 4.2a. VAR lag order selection criteria where ROA is dependent variable

Lag	LogL	LR	FPE	AIC	SC	HQ
0	23.35167	NA*	0.009638*	-1.826492*	-1.528248*	-1.776017*
1	23.35247	0.001009	0.010858	-1.721313	-1.373362	-1.662426
2	23.44472	0.106810	0.012182	-1.625760	-1.228101	-1.558460

Source: Computer analysis using E-views 8.0
* Indicates lag order selected by the criterion, LR: sequential modified LR test statistic (each test at 5% level),
FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion and HQ: Hannan-Quinn information criterion

Table 4.2b. VAR lag order selection criteria where ROE is dependent variable

Lag	LogL	LR	FPE	AIC	SC	HQ
0	3.835146	NA	0.075197	0.227879	0.526123	0.278354
1	4.501406	0.841591	0.078983	0.263010	0.610961	0.321897
2	9.081032	5.302725*	0.055253*	-0.113793*	0.283866*	-0.046493*

Source: Computer analysis using E-views 8.0
* Indicates lag order selected by the criterion, LR: sequential modified LR test statistic (each test at 5% level),
FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion and HQ: Hannan-Quinn information criterion

4.3 Johansen Co-integration Test of Relationship

Having established from the Augmented Dickey-Fuller tests that the variables are stationary at their second difference in order of two i.e. 1(2), the co-integration test was carried out using the [35] frameworks in order to assess the presence or absence of relationship between financial structure and corporate performance.

In the Johansen co-integration test, the existence of a co-integration vector is signified by a trace test value not exceeding the critical value of 5% level of significance. Such a result means that the co-integration tests are statistically significant at the level of 5% for determining a long-run relationship between the variables. On the other hand, if the trace-test results appear to be below the critical value, this points to a long-run equilibrium relationship between the variables. The results obtained for the co-integration estimations for trace statistic and maximum eigenvalue as summarised in Tables 4.3a, 4.3b, 4.4a and 4.4b.

The result of the co-integration test in Tables 4.3a and 4.3b shows the presence of co-integration vectors. The trace statistic and the maximum eigenvalue indicate five (5) co-integrating vector equations at the 5% level of significance. The results of the trace statistic and the maximum eigenvalue have provided enough evidence to reject the null hypothesis of no co-integration between the variables at 5% level of significance. This implies that there are long-run relationships between corporate performance surrogated by ROA and financial structure and this is statistically significant at 5% level of significance.

The result of the co-integration test in Tables 4.4a and 4.4b indicates the presence of co-integration vectors. The trace statistic and the maximum eigenvalue depicts three (3) co-integrating vector equations at the 5% level of significance. The results of the trace statistic and the maximum eigenvalue have provided enough evidence to reject the null hypothesis of no co-integration between the variables at 5% level of significance.

Relationship between corporate performance and financial structure where ROA is the dependent variable.

Table 4.3a. Unrestricted co-integration rank test (trace)

Hypothesized number of CE(s)	Eigen value	Trace statistic	0.05 critical value	Prob.**
None *	0.999093	271.2915	95.75366	0.0000
At most 1 *	0.957780	138.1932	69.81889	0.0000
At most 2 *	0.844418	78.06069	47.85613	0.0000
At most 3 *	0.752593	42.70956	29.79707	0.0010
At most 4 *	0.548112	16.17185	15.49471	0.0395
At most 5	0.055245	1.079764	3.841466	0.2987

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 4.3b. Unrestricted co-integration rank test (maximum Eigen value)

Hypothesized number of CE(s)	Eigen value	Maximum eigen statistic	0.05 critical value	Prob.**
None *	0.999093	133.0983	40.07757	0.0000
At most 1 *	0.957780	60.13247	33.87687	0.0000
At most 2 *	0.844418	35.35112	27.58434	0.0041
At most 3 *	0.752593	26.53771	21.13162	0.0079
At most 4 *	0.548112	15.09209	14.26460	0.0369
At most 5	0.055245	1.079764	3.841466	0.2987

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Relationship between corporate performance and financial structure where ROE is the dependent variable.

Table 4.4a. Unrestricted co-Integration rank test (trace)

Hypothesized number of CE(s)	Eigen value	Trace statistic	0.05 critical value	Prob.**
None *	0.995102	216.8150	95.75366	0.0000
At most 1 *	0.945649	115.7561	69.81889	0.0000
At most 2 *	0.817180	60.42241	47.85613	0.0022
At most 3	0.629082	28.13663	29.79707	0.0767
At most 4	0.315683	9.292931	15.49471	0.3390
At most 5	0.103958	2.085593	3.841466	0.1487

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 4.4b. Unrestricted co-integration rank test (maximum eigen value)

Hypothesized number of CE(s)	Eigen value	Maximum eigen statistic	0.05 critical value	Prob.**
None *	0.995102	101.0589	40.07757	0.0000
At most 1 *	0.945649	55.33367	33.87687	0.0000
At most 2 *	0.817180	32.28578	27.58434	0.0115
At most 3	0.629082	18.84370	21.13162	0.1015
At most 4	0.315683	7.207338	14.26460	0.4649
At most 5	0.103958	2.085593	3.841466	0.1487

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

In essence, there is a long run relationship between corporate performance reflected by ROE and financial structure and it is statistically significant at 5% level of significance.

The Johansen Co-integration test indicated that there is long run relationship between corporate performance and financial structure and it is statistically significant at 5% level of significance. In light of this, we conclude that there is a significant relationship between corporate performance and financial structure. Thus, the null hypothesis that there is no significant relationship between corporate performance of Nigeria construction and real estate firms and financial structure is rejected.

4.4 Establishing the Effect of Financial Structure on Corporate Performance

Due to the longitudinal nature of the data, the pooled OLS was estimated on the bases that there were different sub-sample each year and the outcome is summarized in Tables 4.5a and 4.5b.

The result in Table 4.5a unveiled that total debt to equity ratio is statistically significant at 1% level of significance while total debt to total assets ratio, short term debt to total equity ratio, growth opportunity and taxation are not significant at either 1% or 5% level of significance. The coefficient of the constant 268.7229 implies that holding financial structure variables (total debt to equity ratio, total debt to total assets ratio and short term debt to total equity ratio) and control variables (growth opportunity and taxation) return on assets will increase by 268.72. Total debt to equity ratio and growth opportunity have positive relationship with return on assets while total debt to total assets ratio, short term debt to total equity ratio and taxation exhibit negative relationship.

The total debt to equity ratio coefficient of 0.221487 suggests that a percentage increase in total debt to equity ratio resulted in 0.22 increase in return on assets. This agrees with the findings of [26] and [24] debt to equity ratio has positive effect on return on assets for Indian construction and Indonesian property firms respectively. On the other hand, it disagrees with results of [22]

Table 4.5a. Result of effect of financial structure on ROA

Dependent variable: ROA
Method: Panel least squares
Sample: 1993 2013
Periods included: 21
Cross-sections included: 7

Total panel (balanced) observations: 147				
Variable	Coefficient	Std. error	t-statistic	Prob.
C	**268.7229**	197.4728	**1.360810**	0.1757
TDTE	0.221487	0.030223	7.328304	0.0000
TDTA	-0.000595	0.030915	-0.019241	0.9847
STDTE	**-0.003002**	0.025764	**-0.116500**	0.9074
GRTOP	2.25E-06	1.93E-05	-0.116623	0.9073
TAX	-1.09E-05	0.000602	0.018071	0.9856
R-squared	**0.276863**	Mean dependent var		**359.1307**
Adjusted R-squared	0.251220	S.D. dependent var		2609.331
S.E. of regression	**2257.909**	Akaike info criterion		**18.32223**
Sum squared resid	7.19E+08	Schwarz criterion		18.44428
Log likelihood	**-1340.684**	Hannan-Quinn criter.		**18.37182**
F-statistic	10.79675	Durbin-Watson stat		2.027571
Prob (F-statistic)	**0.000000**			

Source: Computed output data using E-views 8.0

Table 4.5b. Result of effect of financial structure on ROE

Dependent variable: ROE
Method: Panel least squares
Sample: 1993 2013
Periods included: 21
Cross-sections included: 7

Total panel (balanced) observations: 147				
Variable	Coefficient	Std. error	t-statistic	Prob.
C	**525.0486**	426.3930	**1.231372**	0.2202
TDTE	-0.006844	0.065260	-0.104871	0.9166
TDTA	-0.000908	0.066753	0.013599	0.9892
STDTE	**-0.005751**	0.055631	**-0.103369**	0.9178
GRTOP	9.51E-06	4.17E-05	-0.228032	0.8200
TAX	-0.000175	0.001299	0.134654	0.8931
R-squared	**0.001185**	Mean dependent var		**467.0390**
Adjusted R-squared	-0.034234	S.D. dependent var		4794.020
S.E. of regression	**4875.388**	Akaike info criterion		**19.86175**
Sum squared resid	3.35E+09	Schwarz criterion		19.98381
Log likelihood	**-1453.838**	Hannan-Quinn criter.		**19.91134**
F-statistic	0.033461	Durbin-Watson stat		2.022244
Prob(F-statistic)	**0.999412**			

Source: Computed output data using E-views 8.0

and [31] that debt to equity ratio negatively affects return on assets for construction sector of Pakistan and Malaysia respectively. Short term debt to total equity coefficient of -0.003002 entails that a percentage increase in short term debt to total equity resulted in 0.30 decline in return on assets. Total debt to total assets has a coefficient of -0.000595 indicating that a percentage surge in total debt to total assets

ratio led to 0.059 depreciation in return on assets. This is in unison with the works of [18], Khan [28,31] for construction firms in China, Pakistan and Malaysia respectively. The growth opportunity coefficient of 2.25E-06 indicates that a unit increase in turnover would increase the return on assets by a factor of 225. This shows that firms with high turnover tends to rely mostly on internal financing. Taxation has negative

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effect on performance as a unit increase in tax rate would reduce return on assets by a factor of 109.

The coefficient of the Adjusted R-squared in Table 4.1 revealed that only 25.12% of variations in return on assets were explained by total debt to equity ratio, total debt to total assets ratio, short term debt to total equity ratio, growth opportunity and taxation. Thus, 74.88% changes in return on assets of Nigeria listed construction/real estate firms were not explained by financial structure. This suggests that financial structure has not adequately influenced corporate performance of construction/real estate firms listed on Nigerian Stock Exchange.

The critical value of F-distribution at 5% level of significance at 15 degree of freedom, i.e. $F_{(6, 15)}$ is 2.79. F-statistic calculated as divulged in Table 4.5a is 10.79. This value is higher than the tabulated F-statistic of 2.79, and by implication, the model is statistically significant and has a goodness of fit. Furthermore, the probability of the F-statistic is 0.000000 which is less than 0.05 (5% level of significance). The Durbin Watson (d*) statistic is 2.0. This suggests that there is no autocorrelation between the dependent and explanatory variables.

The regression output in Table 4.5b showed that total debt to equity ratio, total debt to total assets ratio, short term debt to total equity ratio, growth opportunity and taxation are not significant at either 1% or 5% level of significance. The coefficient of the constant 525.0486 means that holding financial structure variables (total debt to equity ratio, total debt to total assets ratio and short term debt to total equity ratio) and control variables (growth opportunity and taxation) constant, return on equity will rise by 525.05. Total debt to equity ratio, total debt to total assets ratio, short term debt to total equity ratio and taxation exhibit negative relationship with return on equity while growth opportunity displays a positive relationship.

The total debt to total equity ratio coefficient of -0.006844 suggests that a percentage increase in total debt to equity ratio resulted in 0.68 decline in return on equity. This agrees with the findings of [22,31] that debt to equity ratio negatively affects return on equity for Pakistan and Malaysia construction firms respectively. Nevertheless, it does not confirm the findings of [24,26] that debt to equity ratio has positive effect on return on equity of Indian construction and

Indonesian property firms respectively. Short term debt to total equity ratio coefficient of -0.005751 depicts that a percentage increase in short term debt to total equity ratio resulted in 0.58 decline in return on equity. Total debt to total assets ratio has a coefficient of -0.000908 suggesting that a percentage surge in total debt to total assets ratio led to 0.091 depreciation in return on equity. This confirms the works of [18] and [22] for construction firms in China and Pakistan respectively. The growth opportunity coefficient of 9.51E-06 envisages that a unit increase in turnover would increase the return on assets by a factor of 951. This shows that firms with high turnover tends to rely mostly on internal financing. Taxation has negative effect on performance as a unit increase in tax rate would reduce return on assets by a factor of 0.0175.

The coefficient of the Adjusted R-squared in Table 4.5b indicated that only -3.40% of fluctuation in return on equity were accounted by total debt to equity ratio, total debt to total assets ratio, short term debt to total equity ratio, growth opportunity and taxation. Put differently, total debt to equity ratio, total debt to total assets ratio, short term debt to total equity ratio, growth opportunity and taxation have not in way contributed positively to return on equity. Thus, financial structure variables has negatively affected shareholders wealth in construction and real estate sector of the economy. This gives credence to the perking order theory that firms prefer internal financing over debt as financial structure negatively correlates with firm corporate performance.

The critical value of F-distribution at 5% level of significance at 15 degree of freedom, i.e. $F_{(6, 1)}$ is 2.79. F-statistic calculated as divulged in Table 4.5b is 0.033461. This value is less than the tabulated F-statistic of 2.97. Furthermore, the probability of the F-statistic 0.99 is insignificant. The Durbin Watson (d*) statistic of 2.0 indicates that there is no autocorrelation between the dependent and explanatory variables.

The overall result this paper as evidenced in Johansen Co-integration test discloses that there is a significant relationship between corporate performance of construction and real estate firms in Nigeria and financial structure. The regression analysis in Tables 4.5a and 4.5b showed that when return on assets was used as a measure of corporate performance of firms, only debt to equity ratio and growth opportunity exhibited a positive relationship while total debt to total

assets ratio, short term debt to total equity ratio and taxation indicated a negative relationship. On the other hand, when return on equity was applied as corporate performance proxy, all the financial structure variables (total debt to equity ratio, total debt to total assets ratio and short term debt to total equity ratio) and taxation (control variable) signalled a negative relationship while growth opportunity showed a positive relationship. Therefore, the findings disclosed that firm's corporate performance and financial structure are correlated and financial structure negatively affect firm corporate performance. The result supports the perking order theory of financial structure by [14] that firms prefer to use internal financing before resorting to any form of external funds. Internal funds incur no flotation costs and require no additional disclosure of proprietary financial information that could lead to more severe market discipline and a possible loss of competitive advantage.

5. CONCLUSION

This paper attempts to assess the relationship between corporate performance of construction and real estate firms in Nigeria and financial structure as well as the effect of financial structure on their corporate performance by which scholars can develop new idea for further research on the nexus between financial structure and corporate performance of firms. This paper was guided by the premises of the pecking order theory of financial structure. This paper used twenty one (21) year's annual/yearly financial data from seven (7) randomly selected construction and real estate firms listed on the Nigeria Stock Exchange. The result of the econometric analysis revealed that there is significant relationship between financial structure and corporate performance. One hypothesis was formulated to guide and direct the study and was stated in the null format. The findings in Table 4.3a and 4.3b rejected null hypothesis of no significant relationship between corporate performance of Nigeria construction and real estate firms and financial structure. The null hypothesis was rejected on the premise that the Trace and Maximum Eigen value statistics in Table 4.3a and 4.3b shows the present of five (5) co-integrating equations and statistically significant at 5% (0.05) level of significance thus, indicating the presence is a long run relationship between corporate performance of Nigeria construction and real estate firms and financial

structure. The finding also revealed that financial structure has negative effect on corporate performance of construction and real estate firms. The negative coefficient value of Total Debt to Total Equity (TDTE), Total Debt to Total Assets (TDTA) and Short Term Debt to Total Equity in Table 4.5a and 4.5b buttress the negative correlation between corporate performance and financial structure. Furthermore, the negative value of the Adjusted R-squared in Table 4.5b where Return on Equity (ROE) is the dependent variable reflected unequivocally the negative effect of financial structure on corporate performance of firms. The overall result of this paper supports the perking order theory and consistent with previous studies that financial structure and corporate performance are negatively related. In addition, the result indicated that financial structure has not in any magnitude contributed positively to shareholders wealth in the construction and real estate sector of Nigeria economy. Based on the findings, we may conclude that the optimal financial structure may not have such importance in the construction and real estate firms listed in Nigeria Stock Exchange. The findings if this paper will assist financial managers in making heathier decisions and scholars can develop new idea for further research on the nexus between financial structure and corporate performance of firms.

This paper has some defects which can be addressed in future studies. Firstly, the study is limited to only construction and real sector of the Nigeria economy. Other sectors of the economy should be looked into to understand the mechanism of firm's financial structure. Secondly, the sample size is seven (7) firms out of the total nine (9) firms listed on construction and real estate sector of the Nigerian Stock Exchange (NSE). Future studies on all the firms listed in construction/real estate sector of Nigeria economy will improve and provide robust results on the nexus between financial structure and corporate performance. Thirdly, the financial structure and performance indicators/proxies applied in this study are constructed proxies and cannot replicate a firm's optimal financial structure and desired measure of corporate performance.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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