

Capital Structure and Stock Price Nexus: Evidence from Financial and Real Sector Firms in Nigeria

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Abstract: *This study examines the relationship between capital structure strategies and stock prices of 30 selected firms in Nigeria. Panel regression technique was used to examine the effects of five capital structure variables on the stock prices of 15 financial institutions and 15 manufacturing firms quoted on the Nigerian Stock Exchange. The panel regression technique and random effects model are used to analyze the data of these 30 firms from 2008 to 2017 in order to establish the effects of five capital structure variables (equity ratio, debt ratio, gearing, earnings per share and dividend per share) on the stock prices of the selected firms. Findings reveal that three of the variables: equity ratio, debt ratio and gearing have negative but statistically insignificant relationship with stock price. The earnings per share has a positive but statistically insignificant relationship with stock price while dividend per share has a positive and statistically significant relationship with stock price. The study employs the Chow test of structural break to ascertain if the effect of capital structure on stock price in the financial sector is different from that of the real sector and finds that the effect of capital structure on stock price in the financial sector is different from what obtains in the manufacturing sector, that is, the effect is sector sensitive. It was discovered that the effect of capital structure on stock price differ between these two sectors in the Nigerian economy. Finally, the study employs the use of Granger causality test to examine if there exist any causal relationship between stock price and capital structure variables and the direction(s) of such effect/ relationship. Findings of the analysis reveal that there exists a uni-directional causality from stock price to earnings per share and a bi-directional causality between stock price and dividend per share. The study recommends that management of firms pay particular attention to equity in the capital structure (which results show has negative effect on stock price), earnings and dividend per share which have some causal relationships with stock prices.*

Key words: *Capital Structure, Stock Price, Panel Regression, Chow Test, Granger causality*

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I. Introduction

Capital structure is the mix of sources of financing of any organisation, traditionally excluding short term financing. The main problem of capital structure decision is to be able to decipher the effect of (or otherwise) capital structure on the value of the firm, usually measured in terms of the market value (price) of its shares and to so manage these effects in order to maximize the value of the firm. A capital structure of a firm can be a combination of debt, preferred stock, or ordinary stock (shares). One of the most controversial areas in finance theory and to which much attention has been given is the issue of capital structure and its relationship with the value of the firm or performance. Inconsistencies in the outcomes of studies conducted on the relationship between a firm's capital structure and its performance, as will be revealed in the review of literature, have necessitated the need to carry out more studies on the relationship. Efficient management of a company's capital in terms of sourcing and allocation, like any other aspect of organization management, is crucial to the achievement of the overall goal of the organization. The decision concerning the most optimal choice of financing sources is one of the most difficult financial decisions. The issue of the optimal capital structure (target capital structure) that maximizes firms' value remains unsolved in finance. Capital structure theory centres around the debate on whether or not a firm can have optimal capital structure in which the firm will maximize its value while at the same time minimizing its cost of capital. Firms use different levels of financial leverage in the search for an optimal capital structure that will maximize firms' performance. Capital structure policies are put in place to manage the risk-return trade-off associated with funds utilization. For instance, Ahmad, Fida and Zakaria (2013) argue that an increase in debt intensifies the risk of a firm's earnings, which leads to a higher rate of return to investors and that high risk tends to lower the stock's price, while a high rate of return increases it, so the firm's capital structure policy determines its returns.

The broad focus of this research is to examine the effect of capital structure strategies embarked upon by firms on the stock prices. However, the specific objective of the study is to analyze the effects of these

capital structure strategies in the real sector with that of the financial sector. Ahmad *et al* (2013) observe that capital structure, stock prices, and their determinants have garnered considerable attention among researchers in financial management. While ample literature exist on the relationship between capital structure and firm's value in Nigeria, to the best of this researcher knowledge, not much have been done to examine whether these relationships are sector-sensitive or not. That is, whether the relationships between capital structure and stock prices of the real sector of the economy (manufacturing firms) are significantly different from that of the financial sector (financial institutions). This is the gap that this study intends to fill. Succinctly stated, the objectives of this study are:

- i. to examine the relationship between capital structure and stock prices of real and financial firms in Nigeria;
- ii. to ascertain if the effect of capital structure on the stock prices of real sector firms is significantly different from that of financial sector firms in Nigeria; and
- iii. to determine whether any causal relationship exist between capital structure and stock price of real and financial sector firms in Nigeria

II. Literature Review

2.1 Theoretical Underpinnings

2.1.1 Modigliani and Miller (MM) Irrelevance Theory

The work of Modigliani and Miller (1958) was the first study to address the issue of whether capital structure decisions have significant effect on the firms' value. They attempted to answer the question of whether a particular combination of debt and equity capital can maximize the firm value, and if so, what factors could influence a firm's optimal capital structure. The Modigliani and Miller (1958) theory (also called M-M or Capital Irrelevant Theory) rests on some assumptions:

- i. No income taxes
- ii. No transaction cost in raising capital
- iii. Perfect capital market
- iv. No information asymmetries among various market players

The M-M proposition suggests that in a perfect market situation, a firm's value is not affected by its capital structure decision. That is, the capital structure of the firm is not affected either by selling debt or by issuing stocks because the cost of capital will remain the same.

Njoki (2014) argues that while Modigliani and Miller (1958) derive conditions under which capital structure is irrelevant to a firm's value, the subsequent theoretical literature has contradicted this position by showing that firms can improve its value by maintaining an optimal debt-equity ratio.

2.1.2 The Net Income Approach Theory

Modigliani and Miller (1963) propose the Net Income (NI) Theory which affirms that the inclusion of debt in the capital structure will have positive effect on a firm's value indefinitely. This simply means the overall cost of capital or weighted cost can be increased or reduced changing the components of the capital structure of the firm. Also called the dependent hypothesis as it posits that the value of the firm depends on the use of debt, the theory assumes that:

- i. Cost of debt (K_d) is less than cost of Equity (K_e)
- ii. There are no taxes, and
- iii. The use of debt does not change the risk perception of the investors since the degree of leverage is increased to that extent.

M-M's argument in the NI approach is that a firm may increase the total value of the firm by lowering its cost of capital. The theory holds that at the lowest cost of capital, the value of the firm will be at maximum. This, the authors call the optimum capital structure for the firms and at this point, the market price per share is maximised. By reducing its cost of capital by the use of debt, a firm can achieve this same result. That is, if a firm uses more debt capital with a corresponding reduction in cost of capital, its value will be positively affected. This theory simply encourages a 100% debt capital structure because since as debt increases in the capital structure, the weighted average cost of capital falls and the total value of the firm will rise.

2.1.3 Net Operating Income Approach

Durand (1959) advocates the Net Operating Income (NOI) Approach premised on certain assumptions that:

- i. The overall capitalization rate of the firm K is constant for all degree of leverage
- ii. The capitalization of the Net operating income overall capitalisation rate to get the total market value of the firm.
- iii. Since K_d (cost of debt) is assumed to be constant, K_e (cost of equity) will be expressed as:

The NOI approach assumes most significantly K_e is constant regardless of the level of leverage. This means that the distinction between the ratio of debt and equity in the capital structure is not significant simply because the market capitalizes the value of the firm in totality. If cheaper debt is increased in the capital structure, any effect is nullified through an increase in the use of increased equity. The NOI approach submits that the weighted average cost of capital (WACC) remains the same for all levels of leverage.

2.1.4 Trade-off Theory

Myers (1984) proposes the trade-off theory and argues that the decision on the source of capital for a firm is evaluated based on the various costs and benefits associated with different sources of financing in their quest to obtain an optimal capital structure. The author states that the trade-off framework views the firm as having a targeted debt-equity ratio which it is working to achieve. In a trade-off consideration, managers regard the firm's debt-equity decision as a trade-off between interest tax shields of debt and the costs of financial distress. This is due to the tax deductibility nature of interest. According to Myers (1984), capital structure moves towards targets that reflect tax rates, assets type, business risk, profitability and bankruptcy costs. The author argues that when there are high debt related costs such as cost of bankruptcy, agency costs, and loss of non-debt tax shields, and assuming that the income from equity is not taxed, the marginal bondholder's tax rate will be less than the corporate rate making a net tax advantage possible. Hence, managers can reach an optimal capital structure for the firm by maintaining a favourable trade-off between the tax advantage of debt and various leverage-related costs. (Xiaoyan, 2008).

2.1.5 Agency Theory

The development of agency theory in the 1980s, coupled with detailed research into the extent and effects of bankruptcy costs, has led to the current mainstream view that corporations act as if there is a unique, optimal capital structure for individual firms that corporations act as if there is a unique, optimal capital structure for individual firms that results from a trade-off between the tax benefits of increasing leverage and increasing agency and bankruptcy costs that higher debt entails (Chen, 2003).

Theory based on agency costs illustrates that firm's capital structure is determined by agency costs, which includes the costs for both debt and equity issue. The costs related to equity issue may include: i) the monitoring expenses of the principal (the equity holders); ii) the bonding expenses of the agent (the manager); iii) reduced welfare for principal due to the divergence of agent's decisions from those which maximize the welfare of the principal. Besides, debt issue increases the owner-manager's incentive to invest in high-risk projects that yield high returns to the owner-manager but increase the likelihood of failure that the debt holders have to share if it is realized. If debt holders anticipate this, a higher premium will be required, which in turn increases the costs of debt. Then, the agency costs of debt include the opportunity costs caused by the impact of debt on the investment decisions of the firm; the monitoring and bond expenditures by both the bondholders and the owner-manager; and the costs associated with bankruptcy and reorganization. Since both equity and debt incur agency costs, the optimal debt-equity ratio involves a trade-off between the two types of cost (Xiaoyan, 2008). Chen (2003) notes that although remaining as the mainstream theory of capital structure, the trade-off theory has failed to explain the observed corporate behaviour particularly witnessed with the stock market reaction to leverage-increasing and leverage-decreasing transactions, which consistently yields stock prices increases and decreases.

2.1.6 Asymmetric Information Based Theory

Theories based on asymmetric information assumed that firm managers and insiders possess private information about the firm's characteristics of return stream or investment opportunities that are rarely known by outside investors. Leverage choice under this framework is either designed to mitigate the inefficiencies of investment decisions that are caused by information asymmetry (Myers and Majluf, 1984) or used as a signal to outside investors about the information of insiders (Ross, 1977).

2.1.7 The Pecking Order Theory

Myers and Majluf (1984) develop the pecking order hypothesis. This theory states that firms prefer internal funds external funds. For instance, firms will prefer retained earnings to short-term debt, short-term debt to long-term debt and long-term debt to equity. The reasoning behind this argument is that firms want to minimize the costs of raising capital when sourcing for funds from external sources.

The pecking order hypothesis states that firms will source for capital by ranking that follows this order: Internally generated funds, Short-term debt, Long-term debt; and, Equity.

The hypothesis proposes that if a firm must use external funds, it should follow the order: debt, convertible securities, preferred stock, and equity.

2.1.8 The Traditional Approach

Solomon and Weston (1963) advocate the Traditional Approach which is a kind of “middle of the way” argument on the relationship between capital structure and a firm’s value. It is believed that when debt is well managed in the capital structure, the firm’s value will be positively affected and the cost of capital will fall. In essence, an optimum capital structure can be achieved through the proper leveraging. An optimum capital structure is the point at which the value of the firm is highest and the cost of capital is lowest. This approach is usually regarded as an intermediate approach. Three fundamental propositions back the Traditional approach. They include that:

- i. The cost of debt, K_d , remains the same up to a certain level after which it starts to increase
- ii. The cost of equity, K_e , remains the same or rises slowly up to a certain level after which it starts to increase rapidly.
- iii. The average cost of capital, K , falls up to a certain level, remains constant more or less after which it starts to increase after attaining a certain level

Thus, the traditional position implies that the cost of capital is not independent of the capital structure of the firm and that there is an optimal capital structure. At that optimal structure, the marginal real cost of debt is the same as the marginal real cost of equity in equilibrium. Before the equilibrium point, the marginal real cost of debt is less than of equity, and after the equilibrium the marginal real cost of debt is greater than that of equity.

2.2 Empirical Literature

Much empirical works have been done to examine the impact of capital structure on firm’s performance. The inconsistencies in the results of researches carried out over the years simply point to two considerations: The need to continue to research and the need to be wary of generalizing research results.

Abdullah, Parvez, Karim and Tooheen (2015) examine the impact of financial leverage and market size on stock prices on the Dhaka stock exchange using the data of five manufacturing corporations on the Exchange. The researchers use OLS to analyze the average monthly stock prices vis-à-vis the leverage ratios of the selected stocks between 2008 and 2012 and find that there is a significantly negative relationship between leverage and stock return when the overall industrial data is considered.

Njoki (2014) studies the relationship between capital structure and stock prices of firms quoted in the Nairobi Securities Exchange using the data of 50 quoted firms listed on the Exchange. Employing the Pearson correlation analysis and a multiple regression model, the researcher finds that stock prices increase with increase in the leverage ratio of firms listed.

Ahmad, Fida and Zakaria (2013) use the generalized method of moments (GMM) model to analyze the data of 100 non-financial firms that were quoted in the Karachi Stock Exchange with the aim of examining the co-determinants of capital structure and stock prices. The researchers conclude that both capital structure and stock prices affect each other but that capital structure has a dominant effect on stock prices.

Muthukumar (2012), examining the impact of capital structure on stock prices performance of 35 construction firms quoted on the Indian stock exchange, concludes that there is a statistically significant positive relationship between leverage and stock prices because leverage risk factor contains significant information content and it can also be used as a strategic investment. Mohoho (2013) examines the relationship between the capital structure and value of 65 firms quoted on the Johannesburg Stock Exchange using panel analysis to analyze their data for the period 2002 – 2011. The researcher finds that firms’ value and capital structure have no statistically significant relationship. This is in sharp contrast to a study conducted by Idris and Bala (2015) to examine the relationship between firms’ specific characteristics and stock prices of 9 food and beverage firms listed on the Nigerian Stock Exchange. Using Ordinary Least Square (OLS) and panel regression, the authors report that leverage ratio positively and significantly affects stock prices. Still in Nigeria, Olokoyo (2013) examines the impact of capital structure on the performance of 101 quoted firms in the Nigeria Stock Exchange. The researcher employs panel data techniques to examine relationship between performance, captured from three different perspectives (return on assets, return on equity and Tobin’s Q); and leverage ratios (total debt to total assets; long-term debt to total assets and short-term debt to total assets). The researcher finds that there exists significant negative between leverage and firm’s accounting performance measure (ROA) and that leverage has a significantly positive relationship with the market performance (Tobin’s Q). Few of the studies that affirm the fact that significant relationships exist between capital structure and stock price in Nigeria are Babalola (2014), Adenuga, Ige and Keshinro (2016) and Ogbulu and Emeni (2012) for gearing only. Babalola (2014) finds an inverse relationship between gearing ratio and stock price but Ogbulu and Emeni (2012) find that the relationship between equity ratio and stock price is not significant.

III. Research Method

3.1 Theoretical Framework

This research work is premised on the theory of optimal capital structure as proposed by the Traditionalist approach to the relevance of capital structure to firms' value (Solomon & Weston (1963). The Traditionalists argue that an optimum capital structure can be achieved through the proper leveraging.

3.2 Model Specification

This work used a panel data model that is built upon the existing empirical models to investigate the relationship between capital structure variables and stock prices of selected quoted firms in Nigeria. The study employed the panel data econometric technique to test the significance of various capital structure indicator variables on stock prices. The model used by Andow and Wetsi (2018) was adapted and modified for the purpose of the panel data analysis in this study. The researchers study the relationship between capital structure and share price of quoted deposit money banks in Nigeria. This study modified their model by expanding the scope of quoted firms and the explanatory variables in the model. whereas their model captures only deposit money banks, this research covers other non-financial firms in addition to financial institutions. The model is specified as follows:

$$STP = f(EQR, DCR, GRR, DPS, EPS) \dots\dots\dots(3.1)$$

Specifying equation (3.1) in econometric form, it becomes:

$$STP_{it} = a + \beta_1 EQR_{it} + \beta_2 DCR_{it} + \beta_3 GRR_{it} + \beta_4 DPS_{it} + \beta_5 EPS_{it} + \varepsilon_{it} \dots\dots\dots(3.2)$$

Where:

STP_{it} = Stock prices of selected firms t in period t

$EQR_{i,t}$ = Equity ratio of selected firms i in period t .

DCR = Debt ratio of selected firms i in period t .

GRR_{it} = Gearing ratio of selected firms i in period t .

DPS_{it} = Dividend per share of selected firms I in period it

EPS_{it} = Earnings per share

$\varepsilon_{i,t}$ = component unobserved error term.

a = constant term

$\beta_1 \dots\dots\dots \beta_4$ = are regression parameters

i = firms identifier

t = time variable

3.3 Definition of Variables

- a. Stock price: This refers to the stock price of selected firms. For the purpose of this study, the stock price is the price quoted on the stock exchange as at the last trading day of each year.
- b. Equity Ratio: This is defined as total capital employed by the firm divided by the equity component of the total capital. It is a measure of the actual percentage of the capital that is owned by the shareholders of the firm. The component of equity in this study includes share capital, share premium and retained earnings.
- c. Debt Ratio: Debt ratio is defined as total capital employed by the firm divided by the long term debt component of the total capital. It is a measure of the actual percentage of the capital that is owned by the long term creditors of the firm.
- d. Gearing Ratio: This is the ratio of long-term debt to equity in the capital structure. It measures the exposure of equity holders to risk. The higher the ratio, the higher the firm is said to be levered.
- e. Dividend Per Share (DPS): Dividend per share is the profit after interest and taxes that is attributable to ordinary share capital. It is obtained by dividing the net profit into the number of ordinary shares.
- f. Earnings Per Share (EPS): The EPS is the portion of a company's earnings apportioned to a unit of ordinary share. The EPS is the total number of ordinary shares divided by net profit or profit after tax.

3.4 Sources of Data

The data used in this study are from secondary sources. This study used the periodic data of 15 selected commercial banks and 15 other manufacturing firms in the real sector that are quoted on the Nigerian Stock Exchange spanning a ten-year period (2008 to 2017). The choice of 15 firms from each of the sectors and number of years is for convenience, availability of data and balanced representation. The selection of firms from the real sector was done to cover most of the groups on the Stock Exchange. The data was sourced from the Nigerian Stock Exchange daily price list and the annual reports of the selected firms. Table 2.1 shows the distribution of the firms selected.

3.5 Estimation Techniques

3.5.1 Panel Data Analysis

A panel data set contains n entities or subjects, each of which includes T observations measured at $1, \dots, t$ time period. Thus, the total number of observations in the panel data is nT . The data set for this research includes the stock price on the last trading day of each year, equity/total capital ratio, debt/total capital ratio, debt/equity ratio (gearing), the earnings per share and the dividend per share of selected quoted firms in Nigeria. The data cover a period of ten (10) years from 2008-2017 for a total of 30 quoted firms in Nigeria. The dependent variable is the stock price (STP) while the other capital structure variables are independent or explanatory variables.

Fixed and random effect test will be carried out on the regression result to determine the better choice. The fixed effects model is denoted as

$$y_{it} = \alpha + \beta'X_{it} + \mu_{it}, \quad (3.3)$$

$$\mu_{it} = \mu_i + v_{it}. \quad (3.4)$$

μ_i are individual-specific, time-invariant effects (for example in a panel of countries this could include geography, climate etc.) and because we assume they are fixed over time, this is called the fixed-effects model; while the random effects model assumes that:

$$\mu_i \approx i.i.d.N(0, \sigma_\mu^2) \quad (3.5)$$

and,

$$v_{it} \approx i.i.d.N(0, \sigma_v^2) \quad (3.6)$$

that is, the two error components are independent from each other.

3.5.2 Chow Test

The Chow test is a statistical and econometric test of whether the coefficients in two linear regressions on different data sets are equal. The Chow test is used to test for the presence of a structural break in order to check if the independent variables have different impacts on different subgroups of the population or different periods. This research used the Chow test to ascertain if whether the size variables have different effects on the performance variables in the financial and manufacturing sectors in Nigeria. The Chow (1960) test holds that if the research data is modelled as:

$$y_t = a + bx_{1t} + cx_{2t} + \varepsilon \quad (3.7)$$

and we then split our data into two groups, so that we have

$$y_t = a_1 + b_1x_{1t} + c_1x_{2t} + \varepsilon \quad (3.8)$$

and,

$$y_t = a_2 + b_2x_{1t} + c_2x_{2t} + \varepsilon \quad (3.9)$$

so that each model will take care of each group financial and manufacturing sectors data. The null hypothesis of the Chow test assumes that $a_1 = a_2$, $b_1 = b_2$, and $c_1 = c_2$, and that the model errors ε are independent and identically distributed from a normal distribution with unknown variance.

If S_c is the sum of squared residuals from the combined data, S_1 be the sum of squared residuals from the first group, and S_2 be the sum of squared residuals from the second group. N_1 and N_2 are the number of observations in each group and k is the total number of parameters.

Then the Chow test statistic is expressed as:

$$\frac{[S_c - (S_1 + S_2)]/(k)}{(S_1 + S_2)/(N_1 + N_2 - 2k)} \quad (3.10)$$

The test statistic follows the F distribution with k and $N_1 + N_2 - 2k$ degrees of freedom.

3.5.3 Panel Granger Causality Test

The study used Granger causality modelling to determine if there exists causation between stock prices and capital structure variables and also determine the direction of causation. The Granger causality test is performed as follows:

$$Y_t = \sum_{i=1}^k a_i X_{t-i} + \sum_{j=1}^k b_j Y_{t-j} + u_{1,t} \quad (3.11)$$

$$X_t = \sum_{i=1}^k c_i Y_{t-i} + \sum_{j=1}^k d_j X_{t-j} + u_{2,t} \tag{3.12}$$

X and Y in the equations are stationary time series.

The standard Granger causality test examines whether past changes in one stationary variable X_t help predict current changes in another stationary variable Y_t , beyond the explanation provided by past changes in Y_t itself (Granger, 1969). If not, then X_t does not “Granger cause” Y_t . From Equations (3.11) and 3.12), the hypothesis that X does not Granger cause Y is rejected if a_i and d_j are jointly significant.

3.6 Evaluation Techniques

This research is evaluated for significance and theoretical consistency. For this purpose, various criteria are employed which includes; the economic *a-priori* expectation, the statistical criteria (coefficient of multiple determination (R^2) and the test of overall significance (*F-test*)).

3.7 A-priori Expectation

Hypothetically, the study expects that there is a direct relationship between stock prices (STR), equity ratio (EQR), dividend per share (DPS) and earnings per share (EPS) while debt ratio (DCR) and gearing ratio (GRR) are expected to have inverse relationship with stock prices.

IV. Results And Discussion

4.1 Analysis of Pooled Regression Results

The Pooled Ordinary Least Square (OLS) regression estimation technique was used in this study. The pooled OLS, being a restrictive technique, assumes that the regression coefficients and constant estimates are the same for all cross sectional observations over time. The pooled regression technique does not recognize the possibility of heterogeneity in cross sectional data and time series.

4.1.1 Pooled OLS Regression Model

This study pooled all the 260 observations and ran the regression model without cognisance of the cross section and time series nature of data. Table 4.1 presents the results of the pooled regression analysis.

Table 4.1: Extracts from the Pooled OLS Regression Models Result

Dependent Variable = STP					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	-11.38812	73.20831	-0.155558	0.8765	
EQR	-0.090989	0.727692	-0.125038	0.9006	
DCR	0.364900	0.786215	0.464123	0.6430	
GRR	-0.002171	0.006752	-0.321527	0.7481	
EPS	0.616962	0.510119	1.209447	0.2276	
DPS	33.07547	1.355461	24.40164	0.0000	
<i>R-Squared</i>			0.764531		
<i>Adjusted R-Squared</i>			0.759896		
<i>F-Statistic</i>			164.9400		
<i>Prob (F-Statistic)</i>			0.000000		

Source: Authors’ computation (2018)

The first objective of this study is to examine the relationships that exist between capital structure variables (EQR, DCR, GRR, EPS and DPS) and the stock prices of selected firms (STP). The null hypothesis is that capital structure does not have significant effect on stock prices. From Table 4.1 which shows the result of the pooled OLS regression, while the equity ratio (EQR) and gearing ratio (GRR) have inverse effects on stock prices, the debt ratio (DCR), earnings per share ((EPS) and dividend per share (DPS) all have positive effects on stock prices. The parameter estimates show that among the variables, GRR, DCR, EPS and DPS conform to the expected *a-priori* expectations while EQR contradicts it.

From Table 4.1, a unit increase in equity ratio, debt ratio, gearing ratio, earnings per share and dividend per share will bring about an decrease of 0.090989, an increase of 0.364900, a decrease of 0.002171, an increase of 0.616962 and an increase of 33.07547 units in stock price respectively.

However, the respective t-Statistic and probabilities attached to the explanatory variables show that among the effects, only that of dividend per share (DPS) is significant at 5% level of significance with a probability of 0.0000. The R^2 value of 0.76745 means that about 76.45% of variations in the dependent variable is explained by the explanatory variables. The F-Statistic of 0.0000 also shows that the estimated model is statistically significant in its overall assessment.

These results, notwithstanding, the OLS assumption that the regression coefficients and constant estimates are the same for all cross sectional observations over time denies the fact that the firms selected may have some elements of individuality or heterogeneity. This problem thus necessitates the need to carry out the fixed and random effects analyses.

4.1.2 Fixed Effect (Least Square Dummy Variable) and Random Effects Tests

The fixed effect model recognizes heterogeneity or individuality among the 30 firms studied making each firm to have its own intercept value. Fixed effect is premised on the fact that although the intercept may differ across individual firms, the intercept is fixed over time, that is, it is time invariant. The purpose of the fixed effect test is to identify the effect of some variables that are not captured in the original pooled OLS model.

On the other hand, the random effect model assumes that the firms under study have a common mean value for the intercept, that is, the heterogeneity is random rather than fixed and that the random effect is incorporated into the error term, thus forming a composite error term. Table 4.2 shows the result of the fixed effects and the random effects models.

Table 4.2: Summary of the Fixed Effects and Random Effects Model Regression Results

Fixed Effects Model					Random Effects Model				
Dependent Variable = STP					Dependent Variable = STP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14.27019	67.78820	0.21051	0.8335	C	-5.071360	66.08114	-0.07674	0.9389
EQR	-0.061440	0.659070	-0.09322	0.9258	EQR	-0.026872	0.642204	-0.04184	0.9667
DCR	-0.526243	0.765960	-0.68704	0.4928	DCR	-0.010262	0.723578	-0.01418	0.9887
GRR	0.001574	0.005763	0.27319	0.7850	GRR	-8.25E-05	0.005678	-0.01453	0.9884
EPS	0.303620	0.438440	0.69250	0.4894	EPS	0.383079	0.434659	0.881333	0.3790
DPS	31.77797	2.546809	12.47756	0.0000	DPS	33.07644	1.928813	17.14860	0.0000
<i>R-Squared</i>			0.872829		<i>R-Squared</i>			0.579451	
<i>Adjusted R-Squared</i>			0.847513		<i>Adjusted R-Squared</i>			0.571173	
<i>F-Statistic</i>			34.47690		<i>F-Statistic</i>			69.99453	
<i>Prob(F-statistic)</i>			0.000000		<i>Prob(F-statistic)</i>			0.000000	

Source: Author’s computation, 2018.

Estimates on Table 4.2 show that out of the five explanatory variables, while three (DCR, EPS and DPS) conform to the expected *a-priori* relationship with the dependent variable in the fixed effects model, four (DCR, GRR, EPS and DPS) conform to the *a-priori expectation* in the random effects model. However, in order to ascertain the appropriate choice of either of these estimated models, the study employed the use of HausmanTest.

4.2 The Hausman Test

A technique called the Hausman (1978) test is used to test for the existence of model mis-specification in our analysis of panel data. This test primarily enables the choice of a better model between fixed and random effects models to be used in the analysis. This it does by determining whether there is substantial disparity between the estimates of the fixed and random effects estimators. The Hausman test statistic is estimated using the asymptotic chi-square distribution consisting of one null and one alternative hypothesis in the form:

H₀: Random effect model is preferred, therefore should be employed.

H₁: Fixed effect model is preferred, therefore should be employed.

The decision rule is that the null hypothesis cannot be rejected if the probability of the chi-statistic calculated is higher than the 5% level of significance, and vice-versa. The extracts from the result of the Hausman test (Appendix I(D)) is shown in Table 4.3

Table 4.3: Summary of Hausman Test Cross-section Random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.572768	5	0.7655

Source: Author’s Computation with E-Views 8 (2019).

Table 4.4 shows that the probability values of the Chi-square statistic is 0.7655 or 76.55% which is far higher than the 5% level of significance, implying that the null hypothesis cannot be rejected and the alternative hypothesis cannot be accepted, hence, the hypothesis that the random effect model is preferred cannot be rejected and is therefore used in the analysis.

From Table 4.2, the results of the random effect model in show that equity ratio (EQR), debt ratio (DCR) and gearing ratio (GRR) are all negatively related to stock prices, but these relationships are statistically insignificant. These variables have coefficients of -0.026872, -0.010262 and -8.25E-05 and probabilities of 0.9667, 0.9887 and 0.9884 respectively. Thus a unit increase in EQR, DCR and GRR will cause a statistically insignificant fall of 0.026872, 0.010262 and 0.000825 in stock price respectively. The earnings per share (EPS) though positively related to stock prices is also not statistically insignificant with a coefficient of 0.383079 and a probability of 0.379. A unit increase in EPS will cause a statistically insignificant rise of 0.383079 in stock price. Only the dividend per share (DPS) has a positive and statistically significant relationship with stock price with a coefficient of 33.07644 and a probability of 0.0000. For the DPS, a unit increase will bring about a significant increase of 33.07644 in stock prices. The R^2 value of 0.579451 implies that about 57.95% of the behaviour in stock price is explained by the capital structure variables. The F-Statistic of 0.0000 also implies that the estimated model is statistically significant on the whole.

4.3 Chow Test

The second objective of the study is to ascertain if the effects of capital structure strategies on the stock prices of financial institutions are significantly different from that of the manufacturing firms in Nigeria. This is done by employing the Chow test of *poolability*. The test is used to examine the structural change between the two groups (financial and manufacturing sectors) examined in this study. The F-test shall be employed to ascertain if there exist significant structural changes between these two groups.

$$\text{Financial Sector Group: } Y_t = \lambda_1 + \lambda_2 X_t + \mu_{1t} \quad n_1 = 132 \dots\dots\dots (4.1)$$

$$\text{Real Sector Group: } Y_t = \gamma_1 + \gamma_2 X_t + \mu_{2t} \quad n_2 = 100 \dots\dots\dots (4.2)$$

$$\text{The Two Groups: } Y_t = \phi_1 + \phi_2 X_t + \mu_{3t} \quad n = (n_1 + n_2) = 232 \dots\dots\dots (4.3)$$

Model (4.3) states that there exists no difference between the two groups (sectors) and therefore it is the estimate of the relationship between stock price and the explanatory variables for the two groups consisting of 232 observations. This means that the regression model holds that the intercept as well as the slope coefficient remains the same for the two groups over the entire period; that is, there is no structural break. Holding this assumption as true, then, $\phi_1 = \lambda_1 = \gamma_1$ and $\phi_2 = \lambda_2 = \gamma_2$. On the other hand, equations (4.1) and (4.2) assume that the regressions in the two groups are different; signifying that the intercept and the slope coefficients are different. For the purpose of examining the difference between the effect of capital structure on stock prices of financial and the manufacturing (real) sector firms in the Nigeria, the 30 firms under study were divided into two equal groups of 15 firms each. The Chow test hypothesis is stated as:

H_0 : There is no significant structural change/break between the groups.

H_1 : There is significant structural change/break between the groups

and the *F*-Statistic is estimated as:

$$F = \frac{(RSS_R - RSS_{UR})/k}{(RSS_{UR})/(n_1 + n_2 - 2k)} \approx F[k, (n_1 + n_2 - 2k)] \dots\dots\dots (4.4)$$

where:

$$RSS_R = \text{Residual Sum of Square} = 1178349.709$$

$$RSS_{UR} = \text{Unrestricted Residual Sum of Square (RSS}_1 + \text{RSS}_2) = 8652513 + 16181364 = 10270877$$

$$F = \frac{(1178349.709 - 10270877)/5}{[(10270877)/(100+132-2(5))]} = \frac{1818505.458}{46265.21171}$$

$$= 39.30610908$$

The F value of 39.30610908 is the calculated value of F. The decision in Chow test is not to reject the null hypothesis if the value of F calculated is less than its critical (Table) and vice-versa. From the *F* Table, the 5% critical value of *F* for $k=5$ and $n = 222$ ($n_1 + n_2 - 2k$) degree of freedom is 2.26 which is far lesser than the calculated value of *F* (i.e 39.31). This means that we cannot accept the null hypothesis of parameter stability. In essence, the hypothesis that there exists a structural break between the two groups (regressions 4.1 and 4.2) cannot be rejected, that is, the effect of capital structure variables on stock prices differ between the financial and real (manufacturing) sectors of the Nigerian economy.

These results have sufficiently addressed the second objective of the study.

4.4 Panel Causality Test

The third and final objective of this research work is to ascertain if causality exists and the direction of such causality between capital structure variables and stock prices of selected quoted firms in Nigeria. The third hypothesis states that there is no causal relationship between capital structure variables and stock prices of selected quoted firms in Nigeria

The decision rule of the causality test states that if the probability value of the estimate is higher than the 5 percent (0.05) level of significance, we do not reject the null hypothesis, and vice versa. Table 4.3 shows the extracts from the results of the Granger causality test.

Table 4.4 Granger Causality Test Results

Pairwise Granger Causality Tests
 Date: 11/21/18 Time: 14:34
 Sample: 2008 2017
 Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
EQR does not Granger Cause STP	214	0.53390	0.5871
STP does not Granger Cause EQR		0.33417	0.7163
DCR does not Granger Cause STP	214	0.62496	0.5363
STP does not Granger Cause DCR		0.59734	0.5512
GRR does not Granger Cause STP	212	0.00377	0.9962
STP does not Granger Cause GRR		0.08112	0.9221
EPS does not Granger Cause STP	216	2.26700	0.1061
STP does not Granger Cause EPS		5.94418	0.0031
DPS does not Granger Cause STP	195	23.3808	8.E-10
STP does not Granger Cause DPS		35.4082	9.E-14

Source: Author’s Computation from E-Views 8 (2018)

The results of the Granger causality test (Table 4.3) show that out of the explanatory variables, only two (Earnings per share and Dividend per share) have causal relationship with stock prices. While earnings per share has a uni-directional causality with stock price (which originates from stock price), dividend per share and stock price have a bi-directional causality, that is, these variables Granger cause each other.

V. Summary of Findings, Conclusions And Recommendations

5.1 Summary and Conclusion

This study set out to examine the nexus between capital structure and stock prices of 30 selected quoted firms in Nigeria. Specifically, the study addressed three objectives: examined the effect of capital structure variables on stock prices of financial and real (manufacturing) sector firms in Nigeria; compared the effects of these capital structure variables between the two sectors; and examined if there exist causality between the capital structure variables and stock price the direction of such causality. The findings of the research show that out of the five capital structure variables examined, three (equity ratio, debt ratio and gearing ratio) have negative but insignificant relationship with stock price; one (earnings per share) has a positive but insignificant effect on stock price while one (dividend per share) has positive and significant effect on stock prices. Out of the five capital structure variables, only equity ratio (EQR) fails to conform with the *a-priori* expectation. The EQR was discovered to have inverse relationship stock prices. The reason for this cannot be far-fetched. The last decade has witnessed persistent crashes in stock price on the Nigerian Stock Exchange. The stock price boom that attended the market between 2004 and 2006 soon gave way to consistent fall from 2007 till date. The inverse effect of debt and gearing ratios are expected as risk-averse investors are cautious in investing in highly levered firms. However, this inverse relationship contradicts some earlier studies that arrived that at the conclusion that leverage positively affects firms’ value. It should be noted that these inverse relationships are by no means significant. The positive effect of earnings per share and dividend per share on stock prices is also expected as dividend payments and earnings/profits are signals to investors that a firm is doing well.

Furthermore, the results of analysis using the Chow test reveal that the effect of capital structure on stock price is different between firms in the financial sector and those in the real/manufacturing sector of the Nigeria economy. The major gap identified in literature is that, to the best of this researcher's knowledge, past empirical works arrive at general conclusion for all category of firms. An analysis based on sectors is important to show whether findings can be generalized across all sectors. This study shows that such findings cannot be generalized but that the effects of capital structure on stock price can be sector-sensitive. The implication of this finding is that management must develop and implement capital structure strategies that are most suitable for their firms and sectors. Most banks do not obtain long-term debt unlike other firms. This is because customers' deposits which are the main source of funds to them are not regarded as long term debt.

Finally, the results of the causality test carried out in this study reveal that dividend per share and stock price have bi-directional causality. There is no gainsaying that expectation of dividend, its payments and/or announcements influences potential and existing investors to buy the stocks of such firms. The study observed that most of the firms that did not pay dividend over time due to harsh operating environment have relatively inactive price movements. The importance of favourable dividend policy to investors and stock prices cannot be over-emphasized.

This study generally examined the effect of capital structure on the stock prices of financial and manufacturing firms in Nigeria. The specific objectives are to examine the nexus of capital structure strategies on the stock price of selected quoted firms in Nigeria; to examine the effect of these capital structure strategies on firms stock price by making a sector-based analysis on financial versus manufacturing sector basis; and to ascertain the direction of causality between capital structure variables stock price of quoted firms in Nigeria. The study used panel regression, the Chow test and Granger test of causality to analyze the data of thirty (30) selected firms comprising of fifteen (15) commercial banks (representing the financial sector) and fifteen (15) manufacturing firms (representing the real sector) of the Nigerian economy over a period of 10 years (2008-2017).

The study concludes that capital structure variables affect stock price but the effects are largely insignificant. Out of the five explanatory variables examined, only dividend per share (one out of five) has a significant effect on stock price, while the rest do not significantly affect stock price. This is in conformity with the traditionalist view of capital structure theory on the relevance of capital structure to the value of the firm. Of particular interest is the finding of the test of structural break (Chow) which reveals the effect of capital structure on the stock price of financial firms (banks) is different from that of the manufacturing firms, hence the need not to generalize results of studies but be sector sensitive. Finally, the study concludes that stock price propels earnings per share and dividend per share.

5.2 Recommendation

Based on the findings and conclusions arrived at in this study, the following recommendations are made.

- i. Capital structure decisions may have unpronounced effects on the stock prices of both the financial sector and real sector firms in Nigeria. This necessitates the need for management of firms to tailor their capital structure strategies towards having the desirable effects on their stock prices. All the core capital structure variables examined in this study have negative effects on the stock prices of firms under study. The coefficient of equity ratio, which is hypothetically expected to have positive and significant effect on stock price, in this study is negative and insignificant. This should call for a more pragmatic approach to equity management in the capital structure. A look at the trend of the equity ratio (Appendix 1) shows that a greater percentage of the firms under study have higher equity ratios than debt ratios. This implies that managements may need to consider divestment or reduction in their equity structure in order to boost their stock prices.
- ii. The persistent decline in the stock prices of most of the firms under study over the years should attract the attention of the Federal Government of Nigeria (FGN), the Nigeria Stock Exchange (NSE) and the Stock Exchange Commission (SEC). An attempt to estimate the stock returns of these firms shows that most of them have negative stock returns due to the persistent crash in their stock prices for the period under study. The FGN must take necessary urgent steps to strengthen the Nigeria capital market
- iii. Decisions on capital structure policies should be sector-sensitive and not generalized. Cognizance must be taken of the inter-sector peculiarities of capital structure variables so that management can design capital structure strategies with respect to such peculiarities. Financial institutions and manufacturing firms face different financial and operational challenges that should be addressed from different perspectives.
- iv. Dividend policy relates to both capital structure and stock prices. This study finds that effective and regular payments of dividend propel stock prices. Appendix 1 reveals that some firms fail to pay dividend regularly even when they declare profits after taxes. Management and directors should make payment of dividends a priority when they declare profits.

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