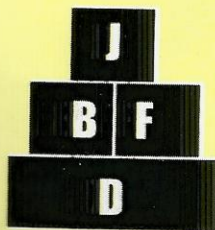


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## **CAPITAL STRUCTURE AND PERFORMANCE OF FIRMS IN THE NIGERIAN INSURANCE SECTOR**

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### **Abstract**

*The study examines the relationship between capital structure and financial performance of insurance companies in Nigeria using time series data for the period 2014-2015. Twenty (20) listed insurance firms were selected as sample size. The study uses unit root test to determine the stationary state of the variables. It also employs the Johansson co-integration and vector error correction model (VECM) statistical techniques to establish both short-run and long-run dynamic relationships between the dependent and independent variables. The findings reveal that there is negative and significant relationship between long term debt capital and return on equity in the long run in the insurance sector firms. Equity and short term debt capital were also observed to be negatively related to return on equity in the long run however, the relationship is observed to be statistically not significant. The short-run relationship indicates that one and two period lags of return on equity are observed to be inversely related to return on equity in current period. However, the relationship was not significant. The policy implication arising from the finding of the study suggest that the financing policy options of insurance firms in Nigeria may need to be subjected to periodic assessment by the Central Bank of Nigeria (CBN) to understand the suitable conditions before deciding on their financing options. The paper recommends that there is a need for proper and extensive consideration of factors before deciding on their financing options by insurance companies in Nigeria.*

**Keywords:** Long term debt capital, short-term debt capital, Equity capital, Return on equity.



## Introduction

Modigliani and Miller (1958) actually provided the foundation of capital structure theory in economics and finance after the initial attempt of David Durand (1955). Their seminar work has indeed underpins greater proportion of the numerous research done so far all these years and is still the basis for the modern theories in finance and finance related field of study. Every other theory takes its position and argument from it. It was in recognition of this Jensen and Meckling (1976) see the contribution of Modigliani and Miller (1958) as "path breaking". All the various theories that have been advanced in the study of finance and economics differ markedly in their predictions of firm's behaviour towards financing mix. No meaningful empirical testing of capital structure can be undertaken today elsewhere in the world without a referral to any of the hypothesis and theory for the purpose of validation. Irrespective of the link and interconnectedness of each of the various capital structure theories in shedding lights on firm's debt-equity financing choice, their individual juxtaposition has rendered the capital structure subject matter highly controversial, inconclusive and a puzzle. This is why researches on capital structure theories will continue to be infinitesimal and age-less bound as long as the corporate world is concerned.

Myriad of studies have been undertaken by researchers both in developed and developing countries such as Nigeria to ascertain the implication of capital structure on firm performance with varying samples and period as well as application of several and divergent statistical estimations ( Emeni&Ogbuli, 2012;

Ogbeide&Okpamen, 2015; Ong& The, 2015; Amara & Bilal, 2014). Different capital structure variables such as short term debt, long term debt, total debts and equity have been analyzed against performance measures vis-à-vis Return on Asset (ROA), Return on Equity (ROE), Profit before interest and tax (PIBT), profit after tax (PAT) and earnings per share (EPS), amongst others in the empirical fronts in the non- insurance sector.

There appears to be paucity of empirical studies that have clearly established the exact implication of capital structure on firm performance in the insurance sector in Nigeria using econometric tools like co-integration and vector error correction mechanism. This actually spelt out the gap on the empirical front this study intends to fill with a view to contributing to the debates and discussion in literature in this aspect. In attempt to investigate this, an econometric model is specified to explain this implication and nexus between capital structure and the performance of firms in the insurance sector of Nigeria. To this end, section of this paper concerned with a brief review of both theoretical and empirical existing literature; this is followed by section three which presents the methodology employed to undertake the study; next is section four which is devoted to the empirical analysis of data, interpretation of results and discussion of findings; and the last section presents conclusion and recommendations arising from empirical results obtained.

## Review of Related Literature

### Conceptual Review

The capital structure of a firm may be seen as the combination of debt and equity that make up the sources of corporate assets (Ahmadpar&Yahyasadehfar, 2010).



However, the size and magnitude of capital structure differ markedly from one firm to the other subject to the size. Decision taking as regard capital structure and how it affects the corporate performance is highly sensitive and critical to a financial manager. It is one of vital decisions a financial manager has to embark on with a view to maximizing shareholders wealth. Capital structure could be sourced for by firms either for short or long term basis; it has to be done correctly by choosing appropriate mix of debts and equity given the views and concepts of the various schools of thoughts. This is because inappropriate mix of the capital structure would have an 'effect' on the firm earnings and on the overall shareholders.

Capital structure has to do between relationship of debt to equity a firm employs in financing its operation with a view to achieving the set goals and objectives. Firm financial goals encompass profit maximization as well as shareholders wealth maximization. According to Damodaran (2001), capital structure decision is the mix of debt and equity that a company uses to finance its business. The capital structure of a firm is a mix of debt and equity that is used by a firm to enhance its operation (Zuraidah, Norhasuiza&Shashazrina, 2012).

In this view, capital structure decisions therefore represent another important financial decision of a business apart from investment decisions. Capital structure in a simple term involves a firm employing huge amount of cash in form of debt and equity to finance its operation, and it has both short-run and long-run implications on that firm. There has to be a strategy the firm uses to organize the appropriate mix of the debt and equity although no theory or empiricism has been

established to specify the exactness of the debt or equity a firm should use to finance its operation and at what specific period and situation. This in real sense is one of the reasons studies as regard capital structure on firm performance has been on for decades and is expected to extend to decades of years to come. To stamp this line of argument, it is necessary to validate and establish both the long- run and short- run dynamic relationship on the empirical fronts using the Johansson and Juselius (1988) co-integration technique as well as the vector error correction mechanism (VECM).

Osuji and Ođita (2012), state that capital structure is the means by which an organization is financed; and it is the mix of debt and equity capital maintained by a firm. They shared the view that how an organization is financed is of paramount importance to both the managers of the firms and providers of fund. They also note that if a wrong mix of finance is employed, the performance and survival of the business enterprise may be seriously affected. Patrick, Joseph and Kemi (2013) aver that a firm's capital structure refers to the mix of its financial liabilities. This definition of capital structure above is quite revealing. First, they see debt and equity as the two major classes of liabilities, with debt holders and equity holders representing the two types of investors in the firm.

Each of these investors' investment is associated with varying level of benefits, risk and controls. For instance, the debt holders exert lower control on the management and utilization of the debt capital in a firm; and they only earn a fixed a determined rate of return (fixed interest charges) and by law are protected with contractual obligations as regards their



investments (i.e. debt capital they invest into a given firm). Similarly, the stock (equity) holders are the residual owners. They bear the highest risk and however possess a greater control of decision making in terms of the assets of the firm.

Furthermore, capital structure according to Hasan, Ahsan, Rahaman and Alam (2014), is the combination of a firm's long term debt, specific short term debt, common equity, preferred equity and retained earnings which are used to finance its overall operations and growth. The term capital structure is defined by Weston and Brigham (1979) as the permanent financing of the firm represented by long term debt, preferred stock and net worth. Van Home and Wachowicz (1995) state that capital structure is the mix of a firm's permanent long term financing, represented by debt, preferred stock and common stock equity.

Ong and The (2015), see capital structure as the firm's financial framework which consists of the debt and equity used to finance the firm. Capital structure in financial term means the way a firm finances their assets through the combination of equity, debt or hybrid securities (Saad, 2010). Subsequently Ong and The (2015) point out that capital structure is essential on how a firm finances its overall operations and growth by using different sources of funds. Taiwo (2012) defines capital structure as the means by which an organization is financed; it is also a company's proportion of short and long term debt and is considered when analyzing capital structure. He also sees capital structure as the mix of debt and equity maintained by a firm. Amara and Bilal (2014) see capital structure to be the blend of internal and external sources of funds used by the firms

to finance their assets. Capital structure is about putting in place the structure, processes and mechanism that ensure that the firm is being directed and managed in a way that enhances long term shareholder value through accountability of managers and enhancing organizational performance (Kajananthan&Nimalthasar, 2013).

From the above numerical definitions of capital structure, it can be observed out rightly that capital structure of a firm is somewhat difficult to determine. In other words, there is actually no real optimal capital structure a firm can maintain to enhance its value. Up till date, there is no formula or theory that was decisively provides optimal capital structure for a firm, hence the need to continually evaluates how it directly or indirectly influences the operations and performance of a firm from time to time.

### **Theoretical Framework**

This study relies on the trade – off and pecking order theories to explain how capital structure influences the financial performance of companies in the insurance sector in Nigeria. The trade-off theory refers to the idea that a company chooses how much debt finance and how much equity finance to use by balancing the costs and benefits. Trade-off theory allows the bankruptcy cost to exist. It states that there is an advantage to financing with debt (namely, the tax benefit) and that there is a cost of financing with debt (the bankruptcy costs and the financial distress costs of debt). The marginal benefit of further increases in debt declines as debt increases, while the marginal cost increases, so that a firm that is optimizing its overall value will focus on this trade-off when choosing how much debt and equity to use for financing. Empirically, this theory may explain differences in D/E ratios between



industries, but it may not explain differences within the same industry; neither have managers of companies constantly taken this into consideration any time financing decisions arises, hence the continued existence, debate and In the theory of firm's capital structure and financing decisions, the pecking order was first suggested by Donaldson in 1961 and it was modified by Myers and Majluf. It states that companies prioritize their sources of financing (from internal financing to equity) according to the principle of least effort, or of least resistance, preferring to raise equity as a financing means of last resort. Hence, internal funds are used first, and when that is depleted, debt is issued, and when it is not sensible to issue any more debt, equity is issued. Pecking Order theory tries to capture the costs of asymmetric information. It states that companies prioritize their sources of financing (from internal financing to equity) according to the law of least effort, or of least resistance, preferring to raise equity as a financing means "of last resort". Hence: internal financing is used first when that is depleted, then debt is issued and when it is no longer sensible to issue any more debt, equity is issued. This theory maintains that businesses adhere to a hierarchy of financing sources and prefer internal financing when available, and debt is preferred over equity if external financing is required (equity would mean issuing shares which meant 'bringing external ownership' into the company). Thus, the form of debt a firm chooses can act as a signal of its need for external finance. The pecking order theory is popularized by Myers, when he argues that equity is a less preferred means to raise capital because when managers (who are assumed to know

better about true condition of the firm than investors) issue new equity, investors believe that managers think that the firm is overvalued and managers are taking advantage of this over-valuation. As a result, investors will place a lower value to the new equity issuance.

### **Empirical Review**

A lot of empirical studies have been done to explore if there is any positive, negative or no relationship between firms' performance and capital structure in both developed and developing countries of the world; most of the results have rather produced mixed results. Similarly, there are very scanty or no studies that have advanced econometric estimation to establish both the long- run and short- run dynamic relationships between capital structure and financial performance of firms in Nigeria, particularly in the insurance sector to the best of the knowledge of the researchers. For example, Pathak (2011) in his study find out that the level of debt has significant negative association with firm performance. Kester (1986) found a negative relationship between capital structure and performance (profitability) in the US and Japan. Similar results were reported by Friend and Lang (1988), Titman and Wessels (1988), from the US firms, Rajan and Zingales (1995) in the G-7 countries, Wald (1999), Haung and Song (2006) too ascertain a negative correlation between leverage and performance (Earnings before interest and tax to total assets of China firms. Ebaid (2009) find a weak-to-no impact of capital structure on firm performance.

Champion (1999) suggests that the use of leverage is one way to improve the performance of the firm. Mesquita and Lara (2003) find long term debt is not significantly related to ROE and it has



negative sign, showing potential inverse relationship. Gilason, Mathur, and Mathur (2000) had examined the relationship between performance and leverage by using return on asset. The result indicates that total debt has a significant negative influence on performance.

Ebrati, Emadi, Balasong and Safari (2013) explore the relationship between capital structure and firm performance on the non-financial listed companies of the Tehran stock exchange for the period 2006-2011. The empirical results indicate that capital structure is negatively related with EPS and ROA as performance measure. Onalapo and Kajola (2010) investigate the effect of capital structure on financial performance of companies listed on Nigeria Stock Exchange. The study was performed on 30 non-financial companies in 15 industry sectors in a 7-year period from 2001 to 2007. The result shows that capital structure was a significant negative effect on financial measures such as ROA and ROE of these companies. Roden and Lewellen (1995) examined the relationship between capital structure and profitability of firms and ascertained a positive relationship between profitability and capital structure in U.S. Hadlock and James (2002) in their view suggest corporations with high level of profitability use high level of debts. Abor (2005) reports a positive relationship between capital structure and performance of firms over the period 1998 – 2002 in Ghanaian firms. Arbiyan and Safari (2009) investigate the impact of capital structure on profitability of Iranian listed firm from 2001 to 2007 and found short term and total debts are positively related to profitability using return on equity (ROE).

Saheed, Gull and Rasheed (2013) studied the impact of capital structure on

performance of listed banks of Karachi Stock Exchange in Pakistan for the period of 2007-2011. The result capital structure had strong positive relationship with the firms' performance. Tianyu (2013) examined the influence of capital structure on firms' performance. The result indicates significant positive effect.

Gleason, Lynette and Ike (2000) concluded that high levels of debt in the capital structure would reduce the firm's performance. They observed that firm's capital structure has a statistically significant negative effect on firm's performance matrixes, i.e. return on assets (ROA), growth in sales (Gsales), and pretax income (Ptax).

A negative link between capital structure and firm's performance was also witnessed by Fama and French (2002). They observed that highly profitable firms with lower risk of financial distress are actually less levered which contradicts with the trade-off theory.

Nor and Fatimah (2012) tried to explore the impact of debt and equity financing on the performance of the firms listed in Bursa Malaysia. Using a sample of 130 firms for the period 2001-2010 combined with multiple regression analysis, they cited a statistical significant negative relation between capital structure and firms' performance.

Using a sample of 237 Malaysian companies during 1995-2011, Salim and Yadav (2012) studied the relationship between capital structure and firm performance. Their analysis revealed that firm performance measured by ROAD, ROE and EPS have negative relationship with the capital structure while Tobin's Q has significantly positive relationship with STD and LTD. Similar result was observed by Zeitun and Tian (2007) in their



study for a sample of 167 Jordanian companies during 1989-2003.

Ali and Iman (2011) observed that firm's performance, calculated by EPS and Tobin's Q, is positively related with the capital structure, while they got a negative relation between capital structure and ROA. However, they witnessed no significant relationship between ROE and capital structure. Same result was also found by Ebrati, Farzad, Reza, and Ghorban (2013).

Abor (2005) also investigated the link between capitals structure and profitability of firms listed in Ghana Stock Exchange for the period 1998-2002. Using regression analysis, he witnessed a significantly positive relation among ROE and the short-term debt and total debt ratio, while, a negative relation with long-term debt.

Ibrahim (2009) also examined the influence of capital-structure choice on firm performance in Egypt. His study based on a sample of non-financial listed firms for the period 1997 to 2005 and used multiple regression analysis. Results suggested that firm performance has weak to no relationship with capital structure choice. Likewise, Khalaf (2013) also found negative and insignificant relationship between short-term and long-term debt ratio, and ROAD and profit margin. One thing stands out clear from the above literatures reviewed; and that is, none of them examined empirically the nexus between capital structure and insurance firms' performance. This existing lacuna engenders the need for this study.

### Hypothesis to be tested

The following hypothesis was specified for the purpose of the study;

H1: There is no significant relationship

between Equity and firm performance in the Nigerian Insurance sector.

H2: There is no significant relationship between Long term debt-capital ratio and firm performance in the Nigerian Insurance sector.

H3: There is no significant relationship between Short term debt-capital ratio and firm performance in the Nigerian Insurance sector.

### Methodology

The focus of this study is to examine the relationship between capital structure and financial performance of insurance firms in Nigeria. Annual data set for the period 2014-2015 were extracted from the financial statement of twenty (20) insurance companies listed on the floor of the Nigerian Stock Exchange and used for the econometric analysis. The statistical technique employed in this study includes Johansen and Juselius (1988) co-integration and Vector error correction (VECM) approach to examine the long-run and short-run relationships among the variables. Prior to estimation of the model; stationarity tests are conducted in order to avoid estimating spurious regressions results since estimating regressions using non-stationary variables based on ordinary least square could lead to spurious and inconsistent results (Aiyedogbon, 2012). The stationarity properties of the time series data are investigated in this study using the Augmented Dickey-Fuller (ADF) test. The null hypothesis of the existence of unit roots is rejected against the alternative if the ADF test statistic is greater than the critical value otherwise the test fails to reject the null hypothesis at 5% level of significance.



### Model Specification

The model employed in this study is expressed in a deterministic form as: Financial performance = F(capital structure). It is stated in its econometric form as:

$$ROE_t = \beta_0 + \beta_1 LTDCAP_t + \beta_2 STDCAP_t + \beta_3 EQUITYCAP_t + ut$$

Where

$\beta_1 - \beta_3$  are coefficients of parameters estimation.

ROEt = represents return on equity, a proxy for financial performance and is the dependent variable.

LTDCAP = Long term debt capital.

STDCAP = Long term debt capital

EQUITYCAP = Equity capital.

ut = is the error term

t = represents the time period

$\beta_0$  = the intercept term

An a priori expectation in this study is  $\beta_1 - \beta_3 > 0$

### Empirical Analysis

In this section, the empirical background is provided upon with the evaluation of the relationship between capital structure and performance of insurance firm. The model specified in the previous section is estimated and characteristically analyzed using the co-integration and error correction methodology (ECM) this is because of the spurious regression trap associated with non-stationary and non-cointegrated series. Four analytical procedures are involved in the co-integration and error correction model. First, the descriptive statistics for the data is presented. After that, the unit root test is carried out for each of the variables. This is to ensure that the variables are stationary and that shocks are only temporary and will dissipate and revert to their long-run mean. Next, the test of Co-integration is performed in order to discover the long run

rational properties of the data. The third step is to obtain the error correction representation for the model which helps to analyze the dynamic short run and long run behaviour of the model.

### Diagnostic tests

Variance inflation factors (VIFs)		
LTDCAP	0.000181	5.211232
EOITY	0.418750	7.136975
STDCAP	14.42248	1.777114
ROE	745.8956	2.056530
Breusch Godfrey serial correlation LM test		
F-statistic = 0.316418	Prob. F(2, 9)	0.7365
Obs * R-squared = 1.116828		Pro. Chigume (2) 0.5721
Heteroskedasticity test Harvey		
F-statistic 2.913026	Prob. F(4, 12)	0.0675
Obs * R-squared 8.374974	Prob. Chi-square 0.0788	0.0788
Ramscv Resct Test		
t-statistic = 5.316354	Df = 10	0.0003
F-statistic = 28.26362	Prob. F(1, 10)	0.0003

Source: Researchers' compilation from Eview 7.0 (2016)

The diagnostic table above shows that the variance inflation factor statistic is less than 10 (centered  $vif < 10$ ) for each of the variables. This indicates absence of multicollinearity among the explanatory variables. The ARCH (Harvey) for heteroskedasticity test shows the presence of homoscedasticity ( $0.07885 > 0.05$ ), thus confirming the constant variance assumption of the ordinary least square estimator. The Breusch-Godfrey serial correlation LM test result of  $0.5721 > 0.05$  points out the absence of higher order correlation. The Ramsey Reset Test result of ( $0.003 > 0.05$ ) substantiate validity of the regression model.

Table 1 Descriptive statistics

	LTDCAP	EQUITY	ROE	STDCAP
Mean	15.169018	17006834	41.04000	10.81106
Maximum	47.908	9829271	82.00000	68.21334
Minimum	11.00000	90492.00	7.000000	18.00000
Std. Dev.	67.67272	2269.0384	20.41004	14.01028
Jarque-Bera	42.34.984	68.76338	2.370254	133.8567
Probability	0.000000	0.000000	0.305707	0.000000
Observations	50	50	50	50

Source : Eviews 7.0



Where LTDCAP= Ratio of long term debt to capital, ROE= Return on equity, STDCAP=Short term debt capital.

Table I presents the result for the descriptive statistics for the variables. As observed, LTDCAP has a mean value of 15.16% for the time period examined and a standard deviation of 67.672. The maximum and minimum values stood at 47.90% and 11.00% respectively. The Jarque-Bera statistic value of 4234.984 and p-value of 0.00 confirms the normality of the data and suitability for generalization. It also indicates the absence of outliers in the data. The mean value for Equity stood at 170, 08843 with a standard deviation of 2269 suggesting the presence of considerable spread of equity values from the average. The maximum and minimum values for the period under review were 98, 29271 and 90492.00 respectively. The Jarque-Bera statistic value 68.763 and p-value of 0.00 also confirms the normality of the data and suitability for generalization. ROE was observed to have a mean value of 14.04% and a standard deviation 20.41. The maximum and minimum values were 82.00% and 7.00% respectively while the Jarque-Bera statistic value of 2.370 and p-value of 0.34 suggest the non-normality of the series. ROE was observed to have a mean value of 14.04% and a standard deviation 20.41. STDCAP was observed to have a mean value of 10.81% and a standard deviation 14.01. The maximum and minimum values were 68.21% and 18.000% respectively while the Jarque-Bera statistic value of 133.8567 and p-value of 0.00 confirms the normality of the data.

Table 2 Correlation Matrix

	LTDCAP	EQUITY	ROE	STDCAP
LTDCAP	1.000000	-0.117828	0.126684	-0.071570
EQUITY	-0.117828	1.000000	0.354071	0.531700
ROE	0.126684	0.354071	1.000000	0.239931
STDCAP	-0.071570	0.531700	0.239931	1.000000

Source: Eviews 7.0

From table 2 above, the correlation coefficients of the variables are examined. However of particular interest is the correlation of the variables with Returns on equity. As observed, a positive association exists between ROE and LTDCAP (0.126), EQUITY and ROE (0.354) and ROE and STDCAP (0.239). In addition, the correlation coefficients indicates that the existence of a negative association between LTDCAP and EQUITY (-0.118), LTDCAP and STDCAP (-0.0716), while STDCAP and EQUITY exhibits positive association (0.532). We proceed to examine the time series properties of the data in order to investigate the inter-temporal relationship between the variables. The Augumented Dicky fuller (ADF) test is carried out in this regard. The results are presented in table 3a and 3b below.

**Summary of the unit root test at 5% of all variables in the model**

Table A

Variables	ADF statistics	T-critical values	Remark
ROE	-4.012	-4.158	Not stationarv at level
STDCAP	-4.012	-4.158	Not stationarv at level
EQUITY	-3.133	-4.158	Not stationarv at level
LTDCAP	-1.142	-4.158	Not stationary at level

Variables	ADF statistic	T- critical value	Remark
ROE	-6.941	-4.163	Stationary at first difference
STDCAP	-5.539	-4.163	Stationery at first difference
EQUITY	-8.836	-4.163	Stationery at first difference
LTDCAP	-7.639	-4.163	Stationery at first difference

Source: E-views 7.0

Table 3a shows the result of the unit root test at levels with intercept and with intercept & trend. As shown in the tables, all the variables with intercept had ADF values less than the critical ADF at 1% significance level. ROE (ADF=-2.773), STDCAP (ADF=-3.208), EQUITY (ADF=-1.932), LTDCAP (ADF=1.484) were all observed to be less than the critical ADF of -3.571. Examining the variables at levels with intercept and trend, it is also observed that ROE (ADF=-4.012), STDCAP (ADF=-4.012), EQUITY (ADF=-3.133) and LTDCAP



(ADF=-1.142) are all less than the critical ADF of -4.158. This indicates that the variables are non-stationary at levels as earlier suspected by the behaviour of the residuals.

Table 3b shows the result for unit root at first difference with intercept and with trend & intercept. As shown in the table, at levels ROE (ADF=6.912), EQUITY (ADF=-8.934), LTDCAP (ADF=-7.726) and STDCAP (-5.598) all exceeds the critical ADF value of -3.575 at 1% significance level and this indicates that the variables are all stationary at first difference i.e. I(1) with intercept. Examining the variables at first difference with

intercept and trend reveals that ROE (ADF=6.941), EQUITY (ADF=-8.836), LTDCAP (ADF=-7.639) and STDCAP (-5.539) all exceeds the ADF critical at 1% significance levels. Thus the variables are stationary at first difference i.e. I(1).

• **Cointegration Test**

The cointegration tests are carried out based on the Johansen (1988) and Johansen and Juselius (1992) maximum likelihood framework. The aim is to establish whether long-run relationship exists among the variables. The result of the tests is presented in table 5 and 6 below.

Table 5 Unrestricted Cointegration Rank Test (Trace)

Series: LTDCAP EQUITY ROE STDCAP

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.492915	57.13696	47.85613	0.0053
At most 1	0.274990	24.54127	29.79707	0.1785
At most 2	0.104667	9.105951	15.49471	0.3557
At most 3	0.076097	3.799095	3.841466	0.0513

Trace test indicates 1 cointegrating equation(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

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

Source : Eviews

7.0

Table 6 Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.492915	32.59569	27.58434	0.0104
At most 1	0.274990	15.43532	21.13162	0.2596
At most 2	0.104667	5.306856	14.26460	0.7027
At most 3	0.076097	3.799095	3.841466	0.0513

Max-eigenvalue test indicates 1 cointegrating equation(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

Source: Eviews. 7.0



The most general method of selecting an optimal lagged length  $k$  to examine cointegration is the Akaike information criteria (AIC) and the Schwartz Bayesian criterion (SBC). Enders (2004) notes that if the lag length is too long, it may suggest skepticism about the validity of the cointegrating equations. In line with Enders (2004), the study selects a lag length of between 1-3. Table 5 and 6 shows the test of cointegration using the Trace statistics and the Eigen statistics respectively. The result indicates that the hypothesis of no cointegration is rejected at 5% level thereby confirming the existence of a long-run equilibrium relationship between the variables and with this result we proceed to specify the long run and short run dynamic equation. According to Engle and Granger (1987), when a set of variables are  $I(1)$  and are cointegrated then short-run analysis of the system should incorporate error correction term (ECT) in order to model the adjustment for the deviation from its long-run equilibrium. The vector error correction model (VECM) is therefore characterized by both differenced and long-run equilibrium models, thereby allowing for the estimates of short-run dynamics as well as long-run equilibrium adjustments process. The Vecm is presented below.

Table 7 Long Run Vecm Model Normalized On ROE

ROE(-1)	Constant	LTD CAP(-1)	EQUITY(-1)	STDCAP(-1)
1.0000	-20.129	-4.14	-3.77	-6.55
		(-5.20)	(-1.494)	(-1.537)

Error Correction:	D(ROE)
ECM(-1)	-0.206397 (0.15750) (-1.31046)
D(ROE(-1))	-0.186431 (0.19279) (-0.96701)
D(ROE(-2))	-0.031519 (0.17149) (-0.18379)
D(LTD CAP(-1))	-9.93E-08 (5.1E-08) (-1.95460)
D(LTD CAP(-2))	-3.06E-11 (3.9E-08) (-0.00080)
D(EQUITY(-1))	-3.70E-07 (1.6E-07) (-2.38456)
D(EQUITY(-2))	-3.55E-07 (1.8E-07) (-1.93205)
D(STDCAP(-1))	1.69E-06 (2.8E-06) (0.60919)
D(STDCAP(-2))	-1.39E-06 (2.2E-06) (-0.63263)
C	-0.389126 (2.48750) (-0.15643)
R-squared	0.356772
Adj. R-squared	0.200312
F-statistic	2.280267
Autocorrelation Test	0.75
heteroskedasticity	0.60

Source: Eviews 7.0



Table 7 presents the long-run coefficients of the cointegrating vector normalizing on ROE and the Parsimonious VECM Model. The adjusted  $R^2$  of 0.356 indicates that the VECM explains about 35.6% of the systematic variations in the dependent variable. The adjusted  $R^2$  which accounts for the inclusion of subsequent exogenous variables in the model stood at 0.20. The f-statistic of 2.28 is observed to be statistically insignificant at 5%. An evaluation of the long run slope coefficients indicates that there appeared to be negative and significant relationship between LTDCAP and ROE in the long run as depicted by the slope coefficient of -4.14 and t-value of -5.20. EQUITY and STDCAP were also observed to be negatively related to ROE in the long run as depicted by the slope coefficient of -3.77 and -6.55 respectively. However, the relationship is observed to be insignificant at 5% level as the t-value of -1.494 and -1.537 respectively is less than the t-critical of 2.57.

An evaluation of the short-run relationship indicates that one and two period lags of ROE [ROE (-1), (ROE (-2))] are observed to be inversely related to ROE in current period as depicted by the coefficient values of -0.186 and -0.031 respectively. However, the relationship was observed to be insignificant given their t-values of -0.96 and -0.183 and this suggest that short run shocks in previous years ROE may not exert a significant effect on current performance of ROE. Furthermore, one and two period lags of LTDCAP [LTDCAP (-1), LTDCAP (-2)] is observed to be inversely related to ROE and was also observed to be insignificant at 5% level given their t-value of -0.00 and -1.954 respectively and this indicates the plausibility that short run shocks or changes in LTDCAP may not exert significant effects on ROE. Also, one and two period lags of EQUITY [EQUITY (-1)],

(EQUITY (-2))] was observed to be both inversely related to ROE with none being significant at 5% as their t-values of -2.384 and -1.932 is less than the critical t-value of 2.57 and hence there is some likelihood that short run shocks in EQUITY will not significantly influence ROE performance among firms in the Nigerian sector. The one and two period lags of STDCAP [STDCAP (-1)], STDCAP (-2)] are observed to be positively and negatively related respectively to ROE with none relating significantly and this suggest that short-run shocks in STDCAP may not significantly influence ROE performance.

Finally, the specified error correction term ( $ECT_{t-1}$ ) is to examine the short-run correction mechanism behaviour of the relationship between the capital structures from its long-run equilibrium as a result of the error term (white noise) shock. The error correction coefficient term coefficient of -0.206 is rightly signed (negative) as stated by Wickens (1996). It measures the speed of adjustment towards long-run equilibrium although it is not significant at 5% level. The LM test for the presence of autocorrelation reveals that the p-value of 0.75 is greater than the critical value of 0.05 at 5% significance level and this shows the non -existence of autocorrelation. In addition, the test for Heteroskedasticity reveals that the p-value of 0.60 is greater than the critical value of 0.05. This shows that there is no evidence for the presence of heteroskedasticity since the p-values is considerably in excess of 0.05.

An evaluation of the long run slope coefficients indicates that EQUITY is observed to be negatively related to ROE in the long run as depicted by the slope coefficient of -3.77. However, the relationship is observed to be insignificant at 5% level as the t-value of -1.494 is less than the 2-tailed t-critical of 2.57 and hence HI



which states that there is no significant relationship between Equity and firm performance is accepted. A negative and significant relationship between LTDCAP and ROE in the long run is observed as depicted by the slope coefficient of -4.14. The relationship is also significant at 5% given its t-value of  $-5.20$  exceeds the two tailed t-critical value of 2.57 and hence the hypothesis that there is no significant relationship between LTDCAP and firm performance (H2) is rejected. STDCAP was also observed to be negatively related to ROE in the long run as depicted by the slope coefficient of -6.55. However, the relationship is observed to be insignificant at 5% level as the t-value of 1.537 is less than the t-critical of 2.57 and hence H3 is accepted.

From the analysis, it is observed that the long run relationship between capital structure and firm performance is negative and insignificant for EQUITY and STDCAP while it is significant for LTDCAP. The finding is consistent with findings of Shah, et. al. (2011) Onaolapo and Kajola, (2010) Shoaib, (2007), Narendar, et. al. (2007) Pratheepkanth, (2011).

### Discussion of findings

The study finding indicates that the long run relationship between capital structure and firm performance is negative and insignificant for EQUITY and STDCAP while it is significant for LTDCAP among firms in the Nigerian Insurance sector. The finding is somewhat and indirectly consistent with findings of Shah, et. al. (2011) Onaolapo and Kajola, (2010) Shoaib, (2007), Narendar, et. al. (2007) Pratheepkanth, (2011). Though several studies ((Tian, et. al. 2007; Tsangyaae, et. al. 2009; Saeedi and Mahmoodi, 2011; Abor, 2005; Oke and Afolabi, 2008), have also

highlighted the presence of mixed findings. Though the statistical significance of LTDCAP in increasing firm performance is not supported by our findings, it nevertheless agrees with theory (Agency-cost hypothesis) that higher ratio of long term debt-capital in the long run may be able to mitigate conflicts between shareholders and managers concerning the choice of investment (e.g., Myers 1977), the amount of risk to undertake (e.g., Jensen and Meckling 1976, Williams 1987), the conditions under which the firm is liquidated (e.g., Harris and Raviv 1990), and dividend policy (e.g., Stulz 1990). This is in line with agency cost theory that the choice of capital structure may help mitigate agency costs. The non-statistical significance of STDCAP and EQUITY in influencing firm performance sets precedence for discourse on the effects of short term debts and equity as significant determinants of firm performance of firms in Nigeria. In retrospect however, the pecking order theory already indicates the importance of internal financing as a better option especially within the context of information asymmetry challenges. Nonetheless, these are areas demanding more investigation especially in the Nigerian corporate environment.

### Policy Implications

The policy implications of the study are in two major areas; financing policy options and agency cost implications considered below;

- I. The finding of the study suggest that the financing policy options of insurance firms in Nigeria may need to be subjected to periodic assessment to understand the suitable conditions before deciding on their financing options. For example the presence of significant information asymmetry in the stock market may undermine the effectiveness of equity



financing as shares face the possibility of being under-valued. The Pecking order theory has suggested a sequential financing structure options for firms beginning from retained earnings, then with debt, and finally with an issue of new equity.

ii. A key policy implication for insurance companies especially with reference to the implications of financing options on agency cost is the role of higher ratio of long term debt-capital in the long run in mitigating agency conflicts between shareholders and managers concerning the choice of investment (e.g., Myers 1977), the amount of risk to undertake (e.g., Jensen and Meckling 1976, Williams 1987), the conditions under which the firm is liquidated (e.g., Harris and Raviv 1990), and dividend policy (e.g., Stulz 1990). Debt holders have legal redress if management fails to make interest payments when they are due, hence managers concerned about potential loss of job, will be more likely to operate the firm as efficiently as possible in order to meet the interest payments, thus aligning their behaviour closer to shareholder wealth maximization. The moral hazard problem is a challenge in the Nigerian corporate environment and hence it is suggestive that the choice of capital structure may be an instrument in addressing agency issues however within the context of the firm specific characteristics and broad objectives. A vast literature on such agency-theoretic explanations of capital structure has developed (see Harris and Raviv 1991; Myers 2001).

### Conclusion

Capital structure refers to combination of different sources of funds that firm uses to

finance its overall operations and growth. Capital structure is a financial term and it is a mean to finance company's overall assets by selecting the appropriate mixture of debt (long term and short term) and equity (common equity and preferred equity). The study examines the relationship between capital structure and financial performance of firm in the Nigerian insurance sector using selected quoted companies in Nigeria. Unlike prior studies, the model specified for the study is estimated using the co-integration and error correction methodology (ECM) this is because of the spurious regression trap associated with non-stationary and non-cointegrated series and this a significant contribution of this study to extant researches in this regards. The summary of the study findings are presented below;

Firstly, an evaluation of the long run slope coefficients indicates that there appeared to be negative and significant relationship between LTDCAP and ROE in the long run as depicted by the slope coefficient of -4.14 and t-value of -5.20. EQUITY and STDCAP were also observed to be negatively related to ROE in the long run as depicted by the slope coefficient of -3.77 and -6.55 respectively. However, the relationship is observed to be insignificant at 5% level

Secondly, an evaluation of the short-run relationship indicates that one and two period lags of ROE [ROE (-1), (ROE (-2))] are observed to be inversely related to ROE in current period. However, the relationship was observed to be insignificant and this suggests that short run shocks in previous years ROE may not exert a significant effect on current performance of ROE. Furthermore, one and two period lags of LTDCAP [LTDCAP (-1), LTDCAP (-2)] are observed to be inversely related to ROE and



was also observed to be insignificant at 5% level and this indicates the plausibility that short run shocks or changes in LTDCAP may not exert significant effects on ROE. Also, one and two period lags of EQUITY [EQUITY (-1), (EQUITY (-2))] was observed to be both inversely related to ROE with none being significant at 5% and hence there is some likelihood that short run shocks in EQUITY will not significantly influence ROE performance. The one and two period lags of STDCAP [STDCAP (-1), STDCAP (-2)] are observed to be positively and negatively related respectively to ROE with none relating significantly and this suggest that short-run shocks in STDCAP may not significantly influence ROE performance. Finally, the specified error correction term (ECT<sub>t-1</sub>) is to examine the short-run correction mechanism behaviour of the relationship between the capital structures from its long-run equilibrium as a result of the error term (white noise) shock. The error correction coefficient term coefficient of -0.206 is rightly signed (negative) although it is not significant at 5% level.

The findings of this study contribute towards a better understanding of the relationship between capital structure and firm performance in Nigerian companies. The study examines the relationship between capital structure and firm performance using selected quoted companies in Nigeria. Unlike prior studies, the model specified for the study is estimated using the co-integration and error correction methodology (ECM) this is because of the spurious regression trap associated with non-stationary and non-cointegrated series and this a significant contribution of this study to extant researches in this regards. The findings reveal that there appeared to be negative and significant relationship between LTDCAP and ROE in the long run. EQUITY and

STDCAP were also observed to be negatively related to ROE in the long run however, the relationship is observed to be insignificant at 5% level. The short-run relationship indicates that one and two period lags of ROE [ROE (-1), (ROE (-2))] are observed to be inversely related to ROE in current period. However, the relationship was observed to be insignificant. Furthermore, one and two period lags of LTDCAP [LTDCAP (-1), LTDCAP (-2)] are observed to be inversely related to ROE and was also observed to be insignificant at 5% level. Also, one and two period lags of EQUITY [EQUITY (-1), (EQUITY (-2))] was observed to be both inversely related to ROE with none being significant at 5%. The one and two period lags of STDCAP [STDCAP (-1), STDCAP (-2)] are observed to be positively and negatively related respectively to ROE with none relating significantly. The error correction coefficient term coefficient of -0.206 is rightly signed (negative) although it is not significant at 5% level.

### **Recommendation**

The major recommendation from the study finding is that management with regards to the choice of financing options. There is a need for proper and extensive consideration of factors before deciding on their financing options by insurance companies in Nigeria. As observed earlier, the presence of significant information asymmetry in the stock market for example may undermine the effectiveness of equity financing as shares face the possibility of being under-valued.

In addition, balancing the interest of shareholders and debt holders is also a consideration in order to reduce the agency cost associated with equities versus debt option in the insurance sector. However, the Pecking order theory has suggested a



sequential financing structure options for Nigerian insurance firms beginning from retained earnings, then with debt, and finally with an issue of new equity. These are all issues for consideration by management with a view to maximizing wealth of the shareholders in insurance sector.

## APPENDIX

The ADF unit root test for the Variables at Levels at 5% sig level

Variable	Intercept		Trend and Intercept	
	ADF value	Critical value	ADF value	Critical
ROE	-2.773	-3.571	-4.012	-4.158
STDCAP	-3.208	-3.571	-4.012	-4.158
EQUITY	-1.932	-3.571	-3.133	-4.158
LTDCAP	-1.484	-2.949	-1.142	-4.158

\*Significant at 5%

The ADF unit root test for the variables at 1<sup>st</sup> difference at 5% sig level

Variable	Intercept		Trend and Intercept	
	ADF value	Critical value	ADF value	Critical
ROE	-6.912*	-3.575	-6.941*	-4.163
STDCAP	-5.598*	-3.575	-5.539*	-4.163
EQUITY	-8.934*	-3.575	-8.836*	-4.163
LTDCAP	-7.726*	-3.575	-7.639*	-4.163

\*Significant at 5%

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**List of Insurance Firms used as sample**

1. African Alliance Insurance PLC
2. Consolidated Hall mark Insurance PLC
3. Continental Re-insurance PLC
4. Cornerstone Insurance PLC
5. Crusader Insurance PLC
6. Equity Assurance PLC
7. Great Nig. Insurance PLC
8. Lassaco Assurance PLC
9. Lawunion and Rock Insurance PLC
10. Linkage Assurance PLC



11. Mansard Assurance PLC
12. Mutual Benefit Assurance PLC
13. NEM Insurance PLC
14. Niger Insurance PLC
15. Oasis Insurance PLC
16. Prestige Assurance PLC
17. Regency Alliance Insurance PLC
18. Royal Exchange Insurance PLC
19. Sovereign Trust Insurance PLC
20. Standard Alliance Insurance PLC