Journal of Emerging Trends in Economics and Management Sciences (JETEMS) 8(2):82-95
© Scholarlink Research Institute Journals, 2017 (ISSN: 2141-7024)
jetems.scholarlinkresearch.com

Capital Structure-Firm Performance Relationship: Empirical Evidence from African Countries

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Abstract
Extensive studies on the relationship between capital structure and firm performance had been carried out in Nigeria with diverse Techniques of Analysis; but relatively few studies of this nature were reviewed and conducted in Sub-Saharan Africa. Hence, the need for the study. This study explores literature as well as the Generalized Method of Moments (GMM) for its analysis. From the review of literature beyond Nigeria, it was revealed that both positive and negative relationship exists between capital structure and firms' performance across African countries, with relatively high Agency costs among the firms. The results of the Generalized Method of Moments using data from Nigerian Stock Exchange, Fact Book between 1996 and 2014 on the Return on Assets (ROA), Returns on Equity(ROE), Earnings Per Share (EPS) and Tobin's Q as measures of firm performance; and Debt Ratio (DR) as a measure of capital structure also showed that capital structure has a negative and significant relationship with firms' performance in Nigeria. The study concluded that the agency costs among African firms are relatively high which is usually responsible for their negative performances; and also a mixed relationship was identified between Capital Structure and firms' performance across African countries

Keywords: capital structure; agency theory; firm performance; and generalized methods of moment (GMM)

INTRODUCTION

Capital structure is the mixture of types of debt and equity the company has in its balance sheet (Peavler, 2012). According to this definition, the capital structure of a firm can be ascertained by knowing how much of the ownership is held in debts and how much in equity. The company's debt might include both short-term debt and long-term debt (such as mortgages), and equity, including common stock, preferred shares, and retained earnings. In other words, capital structure can be described as the composition of long-term liabilities, specific short-term liabilities like bank notes, common equity, and preferred equity which makes up the funds with which a business firm finances its operations and its growth (Peavler, 2012).

In financial terms, capital structure can be regarded as the way firms finance their assets through the combination of equity, debt, or hybrid securities (Saad, 2010). It also refers to the mixture of debts including preference stock and equity; which is referred to as the firms' long term financing mix (Watson and Head, 2007). Broadly speaking, Capital structure is often referred to as a company's debt to equity ratio (Shoiab, 2011)

Furthermore, capital structure involves the decision about the combination of the various source of funds, a firm uses to finance its operations and capital investments. These sources include the use of long term debt finance, short term debt finance called debt financing, preferred stock and common stock also called equity financing (Abu-Rub, 2012).

Meanwhile, modern studies on firm's capital structure and performance begin with Modigliani and Miller's (1958) proposition, which states that in a world of perfect capital market and no taxes, a firm's capital structure, will not influence its cost of capital. Later in 1963, Modigliani and Miller came up with another proposition that states that firm's capital structure will affect the performance of firm because of tax advantage of debt.

Several other theories such as Trade-off theory (Kraus and Litzenberger,1976 and Myer, 1977); Pecking order theory (Myers, 1984); and Agency theory (Jensen and Meckling, 1976) have also emerged to explain the relationship between capital structure and firm performance but they presented no theoretical consensus. While Static trade-off theory assumes a

positive relationship between capital structure and firm performance, Pecking order theory claims a negative relationship between them, and Agency theory assumes both (Myers, 1984; Myers and Majluf, 1984; Karadeniz, 2009; and Chakraborty, 2010).

Also, the empirical studies on the relationship between capital structure and firm performance present no empirical consensus; while some studies found a positive relationship between capital structure and firm performance (Gosh, 2000; Hadlock and James, 2002; Franck and Goyal 2003; Berger and Bonaccors, 2006; Chen, 2004), others found a negative relationship between them (Kinsman and Newman, 1998; Tang and Jang, 2007; Ebaid, 2009).

However, Brigham and Gapenski (1996) argued that for every firm, an optimal capital structure can be attained because of tax advantage of debts. They also emphasized that managers of the firm should be able to identify when the optimal capital structure is achieved and try to maintain the structure at that level. This is the point when the financial costs and the cost of capital are minimized, thereby increasing firm performance. The optimal mix of debt and equity financing is crucial to company success, and there are considerations by management and stakeholders over what mix of debt and equity that are appropriate for firm performance. Should more debt financing be used in order to earn a higher return or more equity financing be used to avoid the risk of debt and bankruptcy? (Graham and Harvey, 2001; Bancel and Mitto, 2004 and Shoiab, 2011).

In addition, after the Modigliani and Miller's (1958) capital structure irrelevance propositions, other theories that emerged can be categorized into two groups namely, tax-based theories and non-tax based theories. Tax-based theories include bankruptcy and trade-off theory; while non-tax based theories include Agency, Signaling, and Pecking theories. Among these theories, agency theory has generated strong empirical support for examining the relationship between capital structure and firm performance. TheAgency theory states that capital structure is determined by agency costs arising from conflicts of interest between shareholders and managers. (Fama andFrench, 2002; Jensen and Meckling, 1976).

LITERATURE REVIEW

Modigliani-Miller Theory

The initial study on capital structure of firms began with Modigliani and Miller, (1958). The theory rests on the assumption that there is perfect capital market. According to the theory, market exists and operates without bankruptcy cost, transaction cost; and information is adequately available for everyone in the market. Modigliani and Miller (1958) further asserted that financing decision of firm do not affect the value and the performance of the firm. Decisions are taken without tax but with identical interest rate. As resultant effects, the cost of leverage is the same for both leverage and non-leverage firms and premium is included for the non-leverage firm. However, in 1963, Modigliani and Miller came up with another proposition that states that capital structure of firm will affect its firm performance because of tax advantage of debts (Modigliani and Miller, 1963). Other studies after Modigliani and Miller, (1958) were conducted and premised on less limiting conditions. One main consideration was that taxation was included as one of the determinants of capital structure. These includes tax rate on corporate earnings and dividend income. Tax incentive is also vital for corporate borrowings as it is able to take advantage of interest tax shields (Myres, 2003; Weston and Copeland, 1998)

Trade-Off Theory

Trade-off theory was initiated by Kraus and Litzenberg (1976) and Myers (1977).The theory disagreed with Modigliani and Miller's argument that capital structure does not exist in a perfect market because in the real world, market imperfections are apparent (Kraus and Litzenberg, 1976); and (Myers, 1977).Although in 1963, Modigliani and Miller have altered the first underlying argument of their classical proposition of capital structure. They included the corporate income tax and contend that the value of the firm, if levered, equals the value of the firm if unlevered plus the value of the generated tax benefit. But, like Modigliani and Miller, (1958), Modigliani and Miller, (1963) also did not include the agency and bankruptcy costs of debt. To certain limits, the presence of agency and bankruptcy costs of debt may outweigh its tax benefit, suggesting the existence of an optimal target financial debt ratio, under which the firm's value is maximized (Kraus and Litzenberg, 1976 and (Myers, 1977). The static trade-off theory (STT) implies that firms have a target debt ratio and try to move towards this target. According to Myers (2003), the optimal point can be attained when the marginal value of the benefits associated with debt issues exactly offsets the increase in the present value of the costs associated with issuing more debt. The benefits include the tax shield whereas the costs include expected financial distress costs.

Furthermore, the term trade-off theory is used by different researchers to describe a family of related theories. It is based on firm's choice of source of financing after equating the cost

and benefits of each source, i.e. marginal costs and marginal benefits (Frank and Goyal, 2003). The balancing of both marginal costs and marginal benefits determines the optimal capital structure of firms, Seifert and Gonenc, 2008). According to trade-off theory, a taxable firm should increase its debt level to the point where its tax advantages of borrowing relative to the costs of financial distress is balanced. Debt level is expected to be increased to the limit where marginal value of tax shield equals or less than present value of possible financial distress costs (Delcoure, 2007). However, since the theory is designed under the fact that optimal capital structure is reached when the advantage of the tax shield benefits of debt is the same as the increased likelihood of incurring debt-related bankruptcy costs, then a firm's debt ratio level should be at the point where the tax benefits of additional debt are equal to, or greater than the costs of possible financial distress (Myres, 2003; Beattie, Goodacre and Thomson, 2006).

The theory emphasized that firms with sound tangible assets would borrow more than firms with high intangible assets. Therefore the debt ratio target would be different for firms depending on each firm's tax advantage and the danger of bankruptcy. The theory further emphasized that mature firms, which usually have many tangible assets, are more indebted than firms whose main business growth is largely based on research and development of technology and advertising. Therefore, the most profitable firms are more indebted. Trade-off theory further explains that debt financing is a better financing choice given its ability to provide a tax shield. That is, in debt financing, firms would incur interest expenses that are deductible from earnings before tax, which reduce the taxable income of the firms.

Debt financing is exposed to default risk that points towards probability of bankruptcy. Hence, a firm should weigh these two aspects in deciding its optimal capital structure level. The limitation of trade-off theory is apparent from its failure to explain stock market reaction to leverage-increasing and leverage-decreasing transactions (Seifert and Gonenc, 2008). Besides, trade-off theory of capital structure argued that firms balance the corporate tax benefit of debt against various costs. The theory yields an intuitively pleasing interior optimum for firms, and gives a rationale for cross-sectional variation of debt ratio. Also, the theory shows that firms with different amounts of alternative tax shields will have different marginal tax benefits of debt, thus implying different levels of optimal debt ratios. While there is less than total agreement on the exact costs and benefits of leverage, and what role they explicitly play in firms' capital structure decisions, most financial economists accept some version of the trade-off theory. This was because early empirical evidence on the trade-off theory yielded mixed results (Bradley, Jarrell and Kim, 1984).

However, recent studies examining capital structure responses to changes in corporate tax exposure. Givoly, Hahn, Ofer and Sarig (1992);MacKie-Mason (1990) and Trezevant (1992) provided evidence supporting the trade-off theory. But an apparently serious problem with the trade-off theory is that the debt ratios seemingly predicted by the theory are significantly higher than those observed. Thus, observed debt ratios seem much too low relative to what the trade-off theory predicts, based on the relative magnitudes of debt's benefits and costs, which Myers, (1977) referred to as 'horse and rabbit stew'. Also, Myers, (1984) argues that the Trade-off theory fails to predict the wide degree of cross-sectional and time variation of observed debt ratios.

Pecking Order Theory

The Pecking Order theory was developed by Myers, (1984) as alternative to capital structure theory. It predicts that, due to asymmetric information and transactions costs, firms adopt a hierarchical order of financing preferences so that internal financing is preferred over external financing. If external financing is needed, firms first seek debt funding. Equity is only issued as a last resort. This ranking was initiated with reference to the Myers and Majluf, (1984)adverse selection problem which arises because managers are more knowledgeable than outsiders (investors).Myers and Majluf, (1984)also claimed that if the firm finances its new project by issuing new securities, these securities will be underpriced. This is because managers cannot credibly convey the quality of their existing assets and available investment opportunities to potential investors. As a result, outsiders may not be able to discriminate between good and bad projects, and as such difficult to interpreting the firm's decision to issue new securities as a sign of possible bad news and then pricing new securities accordingly(Myers and Majluf, (1984).

As noted by Myers (1984), if bankruptcy cost and asymmetric information elements are included in trade-off theory then it's very similar to pecking order theory. The pecking order hypothesis describes a hierarchy of financial choices of a firm, which starts from internally generated financing to debt and lastly, outside equity (Seifert and Gonenc, 2008). Pecking order theory suggests that management would

prefer a capital structure of equity financing in favour of debt financing in the presence of information asymmetry and reduced transactions costs. Based on this theory, highly profitable firms will tend to use internal funding, whereas firms with low profitability tend to use external financing. Thus, in the context of internal finance, internal fund such as retained earnings is preferred and as for external financing, debt is chosen over equity (Myers and Majluf, 1984; Tang and Jang, 2007).

Pecking order theory can be related to agency costs, taxes, transaction costs and information asymmetries (Seifert and Gonenc, 2008). The theory postulates a negative relationship between profitability and debt usage. According to Tangand Jang (2007), if a firm's use of external financing would indicate that the firm is not profitable, its stock price may be adversely affected. This is related to information asymmetry where managers usually have more information about the firm than outsiders. Information asymmetry also occurs when external financing signals a problem which may affect the share price. Hence, new shares would be issued to militate against the problem. But this may be wrongly interpreted by the public as the firm is not profitable but only sourcing for external financing. In such cases, debt would be used first instead of new stock issuance for meeting financing requirements. Large cash reserves and availability of financial slack are resultants of this corporate practice (See also Seifert and Gonenc, 2008).

Besides, in the presence of information asymmetry, easy access to internal funds and lower transaction costs are reasons for the preference of internal funds over debt financing (Chen, 2004). It is also argued that profitable firms borrow less because they have access to their own internal funds first (Myers, 2003). The pecking order theory also does not support optimal capital structure as it is believed to be dynamic over time. Nevertheless, in the long run, firms are expected to identify their capital structure that is consistent with trade-off models of capital structure choice (Hovakimian, Opla and Titman, 2001).

The theory further postulates that firms prefer internal financing over external financing, but in the presence of profitable investment opportunities they choose external financing. They adapt their payout ratio of dividends to their investment opportunities, and the policy is rigid in order to have a sufficient cash flow, which enables it to finance its investment opportunities. A Firm develops a rigid dividend policy and unpredictable fluctuations in profitability and investment opportunities, which suggests that internal cash flows may be higher or lower than investments. If they are lower, the firm primarily uses its liquidity or its portfolio of securities. If they are higher, the firm repays its debt or invests in liquid assets or marketable securities. If the surplus continues, it may gradually increase its payout ratio target. Also, if external funding is necessary, the firm issues less risky funding, first, the debt, then hybrid securities such as convertible bonds and at the last, it issues new shares (Myers and Majluf,1984;Hovakimian*et al.*,2001;Tang and Jang,2007andTamulyte, 2012Pecking).

Order theory does not predict a ratio of debt (a mix of debt and equity) because there are two types of capital, namely internal and external capital. The debt ratio represents the accumulated firm's external financing needs. Also, the theory focuses only on the reduction of cost of capital and ongoing performance, but ignores firm's long-term reputation of reliability (regular debt payments) and profitability (stable or increasing dividends), and performance (Myers and Majluf, 1984;Hovakimian*et al.*,2001; Tang and Jang, 2007 and Tamulyte, 2012).

Empirical Evidence

The empirical review of the study begins with Abor (2005), who conducted a research on capital structure and performance of 22 firms listed in Ghana Stock Exchange from 1998 to 2002. The study measured firm performance by ROE and capital structure by short term debt, long term debt and total debt. The study revealed a significantly positive relationship between short term debt and ROE, and with long term debt, the results showed a significant negative relationship. Thus, this implies that short term debt is less expensive and induces high firm performance, but an increase in the long term debt will lead to a decrease in firm performance, thus long term debt is relatively more expensive and lead to lower performance. The result for total debt revealed a significant positive relationship. This means that, an increase in the level of debt will lead to an increase in firm performance. Thus, the higher the debt level, the higher the firm performance. Also, the result showed a positive relationship between firm size and sales growth. This result supports the findings of Hadlock and James, (2002).

Abor (2007) also carried out a study on relationship between capital structure and performance of small and medium-sized enterprises in Ghana and South Africa from 1998 to 2003. The study used a sample of 92SMEs firms from Ghana and 68firms from South Africa. The study measured financial performance by return on

assets and capital structure by short term debt ratio, long term debt ratio and total debt ratio. The study used Generalized Least Square (GLS) panel model for the estimation. Using return on asset as the performance measure, on the sample on Ghana, the result revealed a significant negative relationship between all the measures of capital structure and firm performance. Abor concluded that for Ghanaian SMEs, using high debt level significantly, lead to lower performance; that is increasing the level of debt in the firm's capital structure results in high bankruptcy and this leads to negative impact on firm performance. Also, the study found firm size to be significant and negatively related with return on assets. On the South Africa sample, the result showed a significant positive relationship between short term debt and return on asset. Thus, it revealed that short term debt seemed to be relatively less costly, thus increasing the short term debt will induce high level of profit. For long term debt and total debt, the result revealed a significant negative relationship with firm performance. Thus, it showed that the cost of long term debt is high and this will lead to low level of firm performance. The study also confirmed that firm size has positive and significant effect on return on asset. This finding also supports the study of Abor, (2005).

Samuel (2013) also conducted research on the relationship between capital structure and firm performance in South Africa. Using panel data consisting of 257 South African firms over the period 1998 to 2009, the study measured capital structure in terms of Leverage and firm performance in terms of ROA and Tobin's Q. Using panel data analysis, the results found financial leverage to be positively related to firm performance. However, Ebaid (2009) in Egypt, researched on the impact of capital structure choice on firms' performance from 1997 to 2005. Using 64 firms, the study employed three accounting-based measures which includes ROA, ROE and gross profit margin, and found that capital structure generally, had a weak-to-no impact on firm performance.

Also, in Nigeria various studies were also carried out on the relationship between capital structure and firm performance; and among such studies include Simon-Oke and Afolabi (2008), who investigated capital structure and industrial performance from 1999-2007. Using five quoted firms, the study used Debt financing, equity financing, debt-equity ratio as a proxy for capital structure and profitability index as measures of performance. The study also employed panel data analysis and reported a positive relationship between firm performance and equity financing and also a positive relationship between firm performance and debt/equity ratio; while a negative relationship between firm performance and debt financing was reported as well. This study shows a high cost of borrowing in the country and suggested an efficient management of borrowed funds.

Similarly, Salawu (2009) also conducted a study on the determinants of capital structure of large non-financial listed firm in Nigeria (1990-2004). The study measured capital structure by Short term debt, long term debt, and total debt, and firm performance by ROA. Using a panel sample of 33 large firms, the study found capital structure measured by short term debt to be negatively related to profitability measured by ROA, while both long term debt and total debt were positively related to profitability measured by ROA using panel data analysis. The study concluded that the financing decisions of large firms in Nigeria can be explained by the determinants suggested by trade-off theory. Salawu also in2009 investigated the effect of financial risk and capital structure on the performance of Nigerian listed companies from 1990 to 2006. Using seventy companies, the study measured capital structure by long term debt and firm performance by return on asset (ROA). Using ordinary least square and Generalized Method of Moment, the study found a positive and significant relationship between capital structure measured by long term debt and firm performance measured by return on asset (ROA).

Onaolapo,Adekunle and Kajola(2010) while examining the impact of capital structure on firm's financial performance, using sample of thirty non- financial firms listed on the Nigerian Stock Exchange between 2001 and 2007, measured capital structure by debt ratio and firm performance by ROA and ROE respectively. The study employed ordinary least square method, and the results showed that a firm's capital structure surrogated by Debt Ratio has a significantly negative impact on the firm's financial measures (Return on Asset (ROA) and Return on Equity (ROE).

In contrast, Omorogie and Erah (2010) examined capital structure and corporate performance in Nigeria from 1995-2009, using the profitability and earnings as proxies for firm performance and debt ratio as a measure of capital structure. The study however, reported a positive relationship between firm performance and capital structure. Also in the same vein, Ishola (2008), while considering the sensitivity of performance to capital structure from 2000-2004,usingDegree of Operating Leverage (DOL), Degree of Financial Leverage (DFL), Degree of Combined Leverage (DCL), as a proxy for capital structure; and Dividends Per Share (DPS), Earnings Before Interest and Taxes (EBIT) as measures of firm

performance. Based on the data from selected foods and Beverages Company, the study analyzed the degree(s) of leverage ratio and the percentage change in DPS relative to percentage change in EBIT, and reported a positive relationship between capital structure and firm performance. The study concluded that irrespective of the dividend policy adopted by a firm, the rate of change in capital structure is a major determinant of firm's performance.

Also, Adeyemi and Oboh, (2011) examined the empirical effects of corporate capital structure (financial leverage) on the market value of a selection of firms listed on the Nigerian Stock Exchange. Both primary and secondary data were obtained from a sample size of 150 respondents and 90 firms. Both descriptive and inferential statistics were employed as analytical method; while the study revealed a positively significant relationship between a firm's choice of capital structure and its market value in Nigeria.

The empirical review of most studies on capital structure and firm performance from Sub-Saharan African countries (such as Ghana, South Africa, Egypt and Nigeria) revealed that a relationship exists between capital structure and firm performance; without consensus on the nature of the relationship across these countries. Some of the studies show positive relationship (Abor,2005; Simon-Oke and Afolabi, 2008; Ishola, 2008;Salawu, 2009; Omorogie and Erah, 2010; Adeyemi and Oboh, 2011and Samuel, 2013);while other revealed negative relationship (Ebaid,1997;Abor,2007 ; Onaolapo *et al.*,2010). Many of these studies also feature problem of endogeneity in their analysis; and with measures of firm performance limited to only ROA and ROE.

In order to address the problem of endogeneity associated with regression analysis; the study also examines data from Nigeria on the relationship between capital structure and firm performance, using Generalized Method of Moments (GMM) Analysis

METHODOLOGY

Model Specification

Agency cost theory predicts that higher leverage is expected to lower agency costs, reduce inefficiency and thereby lead to improvement in firm's performance (Jensen et al., 1976). Berger and, Bonaccorsi di Patti (2006) also argued that increasing the leverage ratio should result in lower agency costs of outside equity and improve firm performance. Therefore, this study adopts the model used by Onaolapo *et al.* (2010), Ali-Akbar, Sayed and Pejman, (2013)because of the consistency of control variables in the model with the standard capital structure theories; therefore the model for the study is specified thus:

$Y_{it} = \alpha_{it} + \beta_1 DR_{it} + \beta_2 Z_{it} + \mu_{it} + \varepsilon_{it}$ eqn. (1)

Where;

Y_{it} represents firm performance

DR_{it} is a vector of standard capital structure variables,

X_{it} is a vector of corporate governance characteristics,

Z_{it} represents control variables

α_{it} represents constant term while β_1 and β_2 are coefficient of explanatory variables.

μ_{it} is the unobserved firm specific effect and

ε_{it} is the error term. It has zero mean, constant variance and is non-auto correlated.

Logarithms of both dependent and independent variables are taken because of the possibility of non-linear relationship between capital structure and firm performance

Estimation Techniques

The study also employed the Generalized Method of Moments (GMM) estimators for the dynamics of adjustment that were developed by Arellano and Bond (1991) and Blundell and Smith (1991). The reason for this technique is to correct the endogeneity problem associated with regression model. Estimating equation (1) using ordinary least square could give biased result based on endogeneity problem, where both the dependent and independent variable could influence each other. In order to solve this endogeneity problem, exogenous instrument variables are needed, but using such exogenous variable for a two-staged least squares estimation could also produce biased estimates as exogenous instrument variable may be weak. To solve this problem, Arellano and Bond (1991) proposed the use of Generalized Method of Moments (GMM) in order to have more efficient estimates where lagged values of the independent variables serve as instrument variables. This approach is adopted with lagged value of independent variables used as instrument variables such that;

$ROA_{it} = \lambda ROA_{i,t-1} + \beta_1 DR_{it} + \beta_2 TOV_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \beta_5 TANG_{it} + \mu_{it} + \varepsilon_{it}$ Eqn. (2)

$ROE_{it} = \lambda ROE_{i,t-1} + \beta_1 DR_{it} + \beta_2 TOV_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \beta_5 TANG_{it} + \mu_{it} + \varepsilon_{it}$ Eqn. (3)

$P/E_{it} = \lambda P/E_{i,t-1} + \beta_1 DR_{it} + \beta_2 TOV_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \beta_5 TANG_{it} + \mu_{it} + \varepsilon it$ Eqn. (4)

$Tobins'q_{it} = \lambda Tobins'q_{i,t-1} + \beta_1 DR_{it} + \beta_2 TOV_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \beta_5 TANG_{it} + \mu_{it} + \varepsilon_{it}$ Eqn. (5)

$Performance\ Index_{it} = \lambda PI_{i,t-1} + \beta_1 DR_{it} + \beta_2 TOV_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \beta_5 TANG_{it} + \mu_{it} + \varepsilon_{it}$ Eqn. (6)

Where; DR = Debt Ratio

Tov = Turnover

Tang = Tangibility

To eliminate the firm-specific effect and the correlation between the lagged dependent variable and error term for all equations, we take the first-difference transformation of the equations and estimate the dynamic GMM, where lagged values of independent variables are used as instruments such that;

$\Delta Y_{it} = \lambda \Delta Y_{it-1} + \beta_1 \Delta DR_{it} + \beta_2 \Delta Z_{it} + \Delta u_{it}$ ..... Eqn.(7)

The performance index variable was also captured in the model through the principal component analysis basically to reduce the number of variables used to measure firm performance without losing too much information. It is efficient in generating fewer numbers of variables that explain most of the variation in the original measures of firm performance (ROA, ROE, ES, and Tobin's Q). Each of the original measures of firm performance's weaknesses differ from one another. In order to limit these weaknesses the computation of Performance Index through Principal Component Analysis is essential.

Measurement of variables

Performance Index represents firm performance computed through principal factor analysis.

ROA represents Return on Asset, and is measured by Profit after tax/ Total Asset.

ROE represents Return on Equity, and is measured by Profit after tax/ Average Equity.

ES represents the Price Earnings ratio, and is measured by price per share/ earnings per share

Tobin's is named after James Tobin and can be defined as the ratio of market value of debt and equity of the firm to the replacement cost of the firm. Modified Q is measured by Year-end market capitalization / the book value of total asset.

DebtRatio (Dr) represents capital structure (leverage ratio), and is measured by Debt/Equity.

Assets Turnover is Sales/Total Asset

Size represents the Natural logarithm of total assets

Asset Tangibility is Net Fixed Asset/Total Asset

Growth is the change in the natural logarithm of total asset.

RESULTS AND DISCUSSION

The results of the unit root test of all the variables using both the first Generation Panel Unit Root Test (MW) (Maddala and Wu, 1999) and second Generation Panel Unit Root Test (CIPS) (Pesaran, 2006) respectively showed that the variables were stationary at all levels as shown in the Appendix 1 and 2 below.

Meanwhile, Table 1 shows the result of Generalized Method of Moments for the relationship between capital structure and firm performance in Nigeria; where Asset Turnover revealed a positive relationship with Return on Assets (ROA) at 5% level of significance. This implies that a per cent increase in asset turnover will induce 38.3% increase in firm performance measured by ROA. Firm Size however showed a negative significant relationship with ROA at 5% level. This implies that one per cent increase in firm size will lead to 144 per cent decrease in firm performance measured by ROA. However, growth has a positive insignificant relationship with Return on Asset, while Asset Tangibility has a negative significant relationship with ROA at 5% level of significance. The implication is that one per cent change in growth level of firm and a rise in asset tangibility will induce 61.1% and 33.5% increase in firm performance respectively measured by ROA.

The coefficient of determination (R^2) indicates that 85.5% of the Firm's Return on Assets is explained by the independent variables in the model. The model is statistically significant at 5% level. Table 1 also revealed that the firm performance measured by Return on Assets in the previous year has a negative relationship with the performance of firm in the current year. This implies that one per cent increase in the performance of firms in the previous period will induce 13% decrease in the performance of the current period. Capital Structure measured by Debt Ratio also has a negative relationship with ROA but not significant. This findings is consistent with Onaolapo*et al.* (2010), Salawu (2009), Abor (2007), Kinsman and Newman (1998), Friend and Lang, (1988); Rajan and Zingales (1995); and Wald, (1999)

Table 1: Difference and System GMM of Capital Structure and Firm Performance

	Dependent Variable				
	ROA	ROE	ES	TOBIN'S Q	PERF INDEX
L1	-.1385404** (-2.67)	-.2318928** (-8.17)	.0778505** (2.51)	.1240228** (4.20)	-3.35e-15** (-14.77)
Dr	-.0923025 (-0.75)	-17.00439** (-18.79)	-1.039174 (-0.32)	-.4462455 (-0.28)	-4.19e-15** (-17.96)
Tov	.3829525** (6.44)	-6.52e-07** (-2.68)	.234097** (2.87)	2.50e-07 (0.74)	5.72e-23** (4.08)
Size	-1.445345** (-8.93)	20.42436** (3.86)	-.397768** (-1.85)	-66.01942** (-6.66)	-1.84e-15** (-7.25)
Growth	.6108488 (-0.98)	10.61249** (2.32)	23.71825 (0.45)	47.01748** (5.79)	2.01e-15** (8.72)
Tang	-.334969** (-22.34)	-1.02386** (-13.88)	-.1753215** (0.045)	4.526098** (14.98)	-7.48e-17** (-9.75)
Constant	5.974835 (1.29)	-108.1245** (-3.37)	4.456481** (3.74)	420.2519** (6.97)	2.10e-14** (5.48)
Instrument Rank	127	127	127	127	127
J-Statistics	955.34**	1105.31**	997.79**	1095.01**	2730.09**
No of observation	1020	1020	999	1020	1119
R	0.8545	0.8556	0.8474	0.7367	0.5201
F	75.21**	75.86**	71.10**	35.81**	142.25

** indicates 5% level of significance. Figures in parenthesis are Z-statistics. Source: Data Analysis, 2016.

Also, column two of Table 1 shows the regression results between Return on Equity (ROE) and the explanatory variables. The coefficient of determination (R^2) indicates that 85.6% of the variation in Return on Equity can be explained by the variation on the explanatory variables in the model. The model is statistically significant at 5% level. The column also reveals that the firm performance measured by Return on Equity in the previous year has a negative relationship with the performance of firm in the current year. This implies that one per cent increase in the performance of previous period will induce 23 per cent decrease in the performance of current period.

The result further revealed that Capital Structure measured by Debt Ratio has a negative relationship with firm performance variable ROE, at 5% level of significance. This implies that one per cent increase in Debt Ratio will induce 1700 per cent decrease in firm performance measured by ROE. This is in agreement with the agency cost theory and Onaolapo *et al.* (2010); Abor (2007); Kinsman and Newman (1998); Rajan and Zingales, (1995); and Wald (1999).

Still from Table 1 column two, both Firm Size and Growth were positively related with firm performance, measured by ROE at 5% level of significance; while asset tangibility has a negative relationship with firm performance (ROE) at 5% level of significance. This shows that one per cent increase in Firm Size will induce about 2042 per cent increase in firm performance measured by ROE. Also, one per cent change in Growth level of firm will induce 1061 per cent increase in firm performance measured by ROE. In addition, one per cent increase in asset tangibility will also induce 102 per cent increase in firm performance measured by ROE. Asset Turnover also has a negative relationship with firm performance measured by ROE at 5% level of significant. This also implies that a per cent increase in Asset Turnover will induce 652 per cent increase in firm performance measured by ROE. However, since Firm Size and Growth produced positive relationship with firm performance (ROE) and also significant at 5% level, it confirmed both variables as important determinants of firm performance. This also supports Structure-Conduct-Performance paradigm as well as Onaolapo *et al.* (2010); Gleason, Mathur and Mathur (2000) and Zeitun and Tian (2007).

Contrary to the theoretical expectation, Asset Turnover has a negative relationship with firm performance (ROE) at5% level of significance. It implies that Asset Turnover is not a major determinant of the performance of sampled firms.

Furthermore, using Earnings per Share (ES) as a measure of firm performance in relation to Debt Ratio, Table 1, column three shows negative relationship between firm performance variable (ES) and Debt Ratio (Dr). Also both Firm Size and Asset Tangibility have negative relationships with firm performance variable (ES) at 5% level of significance. This implies that a per cent increase in Debt Ratio, Firm Size and Asset Tangibility will induce 103, 39.78 and 17.5 per cent decrease in firm performance measured by Earnings per Share (ES). Asset Turnover however has a positive

relationship with firm performance (ES) at 5% level of significance. This shows that a per cent increase in Asset Turnover will induce 23.4 per cent increase in firm performance measured by ES. Growth also revealed a positive relationship with firm performance showing the importance of Asset Turnover and Growth in the determination of firm performance. The findings also aligned with of Onaolapo *et al.* (2010);Abor (2007);Kinsman and Newman (1998);Friend and Lang, (1988);Sheridan and Wessels, (1988); Rajan and Zingales (1995); and Wald (1999).

In addition, Table 1, column three also revealed that the firm performance measured by Earnings per shares (ES) in the previous year has a positive significant relationship with the performance of firm in the current year at 5% level of significance. This denotes that one per cent increase in Firms' performance of previous period will induce about 77 per cent increase in the performance of Firms in the current period. Also, the R^2 indicates that 84.7% of the firms' earnings per share price is explained by the explanatory variables in the model. The model is statistically significant at 5% level of significance.

Column four of Table 1 also shows the regression results between Tobin's q and the explanatory variables in the model. The coefficient of determination (R^2) reveals that 73.7% of the variation in Tobin's q can be explained by the variation on the explanatory variables in the model, and the model is statistically significant at 5% level. It was also confirmed that firms' performance measured by Tobin's q in the previous year has a positive and significant relationship with the performance of firms' in the current year at 5% level of significance. This means that one per cent increase in the performance of previous period will induce 12 per cent increase in the performance of current period.

Furthermore, Capital Structure measured by Debt Ratio has a negative relationship with firm' performance measured by Tobin's q. This implies that a per cent increase in Debt Ratio will induce 44.6 per cent decrease in firms' performance. Firm Size also has a negative significant relationship with firms' performance (Tobin's q) at 5% level of significance. This shows that one per cent increase in Firm Size will induce about 6601 per cent decrease in firms' performance measured by Tobin's q. This also supports agency cost theory, Rajan and Zingales (1995); Gleason *et al.* (2000); Booth, Aivazian, Hunt and Maksimovic (2001);Margaritis and Psillaki (2006);Huang and Song (2006), Krishnan (1999); Akintoye (2008), Karadeniz, Kandir, Balcilar and Onal (2009); Chakraborty (2010);Onaolapo *et al.* (2010); Abor (2007); Kinsman and Newman (1998) and Wald (1999).

However, the relationship between Tobin's q and Asset Tangibility was positive and significant at 5% level. This also shows that one per cent increase in Asset Tangibility will induce 452. per cent increase in firms' performance measured by Tobin's q. This further provides evidence that the sampled firms were able to use their fixed asset composition in the total asset effectively to impact on their performance. The relationship between Asset Turnover and Tobin's q was positive but insignificant; while the relationship between Tobin's q and firms' growth was positive and significant at 5% level. It is also implies that one per cent increase in Asset Turnover and growth of a firm will induce about 250 and 4701per cent increase in firms' performance measured by Tobin's q.

Column five of Table 1 also revealed the regression results between the explanatory variables and performance index (PI) as a measure of firm performance. The coefficient of determination (R^2) indicates that 52. % of the variation in performance index can be explained by the variation on the explanatory variables in the model. The model is statistically significant at 5% level. The column reveals that the firm performance measured by Performance Index in the previous year has a negative relationship with the performance of firm in the current year. This implies that one per cent increase in the performance of previous period will induce 335 per cent decrease in the performance of Firms' in the current period. In addition, the column shows that Capital Structure measured by Debt Ratio has a negative relationship with Firms' Performance Index at 5% level of significance. This implies that one per cent increase in Debt Ratio will induce 419 per cent decrease in firms' performance measured by Performance Index (PI). The result also supports agency cost theory as well as Onaolapo*et al.* (2010); Abor (2007); Kinsman and Newman (1998); Rajan and Zingales (1995) and Wald (1999).

The results in column five of Table 1 also shows that Firm Size has a negative relationship with firms' performance; while Growth maintained positive and significant relationship with firms' performance measured by performance index (PI) at 5% level of significance. This shows that one per cent increase in Firm Size and Growth will induce about 184 decrease and 201 per cent increase respectively in firms' performance. Asset Tangibility also has a negative relationship with firms' performance; while Asset turnover related positively with firms' performance Index at 5% level of significant. It shows that one per

cent increase in Asset Tangibility and Turnover will induce about 748 per cent decrease and 572 per cent increase in firms' performance respectively. The findings also aligned with Onaolapo *et al.* (2010); Gleason et al. (2000) and Zeitun and Tian (2007).

CONCLUSION

This study explores the empirical literature anda Generalized Method of Moments Technique (GMM) to examine the relationship between capital structure and firms' performance in African countries. The study concludes based on the empirical review that both positive and negative relationship exists between Capital Structure and Firms' Performance among African Countries, Also, based on the results of the Generalized Method of Moments Capital Structure, measured by Debt Ratio has a negative and significant relationship with all the measures of firms' performance (such as ROA, ROE, ES, TOBIN'SQ, PERF.INDEX) in Nigeria. It was also concluded that the agency costs in firms across Africa are relatively high, and this is usually responsible for their negative performances

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APPENDIX 1

First Generation Panel Unit Root Tests

Maddala and Wu (1999) Panel Unit Root test (MW)

Specification without trend				Specification with trend			
Variable	lags	chi_sq	p-value	Variable	lags	chi_sq	p-value
roa	0	837.667	0.001	roa	0	737.838	0.001
roa	1	469.549	0.001	roa	1	403.777	0.001
roa	2	392.482	0.001	roa	2	316.345	0.001
roe	0	772.968	0.001	roe	0	689.958	0.001
roe	1	409.290	0.001	roe	1	358.747	0.001
roe	2	268.311	0.001	roe	2	230.223	0.001
es	0	708.781	0.001	es	0	624.013	0.001
es	1	432.970	0.001	es	1	371.363	0.001
es	2	261.386	0.001	es	2	214.345	0.001
tobinq	0	823.471	0.001	tobinq	0	740.667	0.001
tobinq	1	418.476	0.001	tobinq	1	371.515	0.001
tobinq	2	271.498	0.001	tobinq	2	239.136	0.001
dr	0	870.215	0.001	dr	0	763.238	0.001
dr	1	442.832	0.001	dr	1	373.261	0.001
dr	2	305.103	0.001	dr	2	247.572	0.001
size	0	819.034	0.001	size	0	706.071	0.001
size	1	528.076	0.001	size	1	442.009	0.001
size	2	251.905	0.001	size	2	191.377	0.001
tov	0	921.013	0.001	tov	0	806.408	0.001
tov	1	542.508	0.001	tov	1	461.415	0.001
tov	2	319.800	0.001	tov	2	255.603	0.001
tang	0	922.010	0.001	tang	0	804.418	0.001
tang	1	543.517	0.001	tang	1	462.425	0.001
tang	2	320.801	0.001	tang	2	254.673	0.001
growth	0	921.113	0.001	growth	0	816.418	0.001
growth	1	512.528	0.001	growth	1	460.405	0.001
growth	2	300.700	0.001	growth	2	251.613	0.001

Appendix 2

Second Generation Panel Unit Root Tests

Pesaran (2007) Panel Unit Root test (CIPS)

Specification without trend				Specification trend			
Variable	lags	Zt-bar	p-value	Variable	lags	Zt-bar	p-value
roa	0	-18.565	0.001	roa	0	-18.374	0.001
roa	1	-16.422	0.001	roa	1	-15.415	0.001
roa	2	-12.514	0.001	roa	2	-11.184	0.001
roe	0	-18.565	0.001	roe	0	-18.374	0.001
roe	1	-15.139	0.001	roe	1	-14.568	0.001
roe	2	-10.569	0.001	roe	2	-9.681	0.001
es	0	-18.070	0.001	es	0	-17.603	0.001
es	1	-14.952	0.001	es	1	-14.040	0.001
es	2	-10.801	0.001	es	2	-9.678	0.00
tobinq	0	-17.951	0.001	tobinq	0	-17.652	0.001
tobinq	1	-14.786	0.001	tobinq	1	-13.697	0.001
tobinq	2	-10.675	0.001	tobinq	2	-9.595	0.001
dr	0	-18.565	0.001	dr	0	-18.374	0.001
dr	1	-16.071	0.001	dr	1	-15.002	0.001
dr	2	-11.401	0.001	dr	2	-9.993	0.0001
size	0	-18.565	0.001	size	0	-18.374	0.001
size	1	-17.396	0.001	size	1	-16.673	0.001
size	2	-9.766	0.001	size	2	-8.085	0.001
tov	0	-18.565	0.001	tov	0	-18.374	0.001
tov	1	-14.641	0.001	tov	1	-13.205	0.001
tov	2	-9.433	0.001	tov	2	-7.703	0.001
tang	0	-17.465	0.001	tang	0	-17.374	0.001
tang	1	-13.541	0.001	tang	1	-12.205	0.001
tang	2	-8.233	0.001	tang	2	-6.713	0.001
growth	0	-18.225	0.001	growth	0	-18.444	0.001
growth	1	-14.141	0.001	growth	1	-13.555	0.001
growth							