

## Leverage ratio and corporate performance: Do marginal cost and marginal benefit of debt matter

Temple Akpa <sup>1</sup>, Itiri Idam Okpara <sup>1,\*</sup>, Olaide Monsurat Akano <sup>1</sup>, Tubosun Najim Oladosu <sup>2</sup> and Joachim Uchechukwu Okolo <sup>3</sup>

<sup>1</sup> Department of Business Education, Federal College of Education (Technical), Isu Ebonyi, Nigeria.

<sup>2</sup> Department of Accounting and Finance, University of Abuja, FCT Abuja, Nigeria.

<sup>3</sup> Department of Marketing, Institute of Management and Technology, Enugu State, Nigeria.

International Journal of Science and Research Archive, 2024, 12(01), 3014–3024

Publication history: Received on 03 May 2024; revised on 25 June 2024; accepted on 28 June 2024

Article DOI: <https://doi.org/10.30574/ijrsra.2024.12.1.1057>

### Abstract

This study examines leverage ratio and firm performance considering marginal benefits and marginal costs of debt to a firm. A total of 16 non-financial firms over a 15 year period (2001-2015) were randomly selected for the study. The panel data were subjected to Panel Least Square, Fixed Effects, and Random Effects regression estimations to test the formulated models in the study. Also the study employed Hausman Test to ascertain whether random effects model is the appropriate model or if fixed effects model is the appropriate model. The results shows that long term debt ratio (LTDR) have positive and significant influence on performance of Nigerian firms measured by Return on Asset (ROA) and Return on Equity (ROE). Short term debt ratio (STDR) on the other hand, established negative and significant effect on ROA, and negative and insignificant impact on ROE. STDR accounting for 75% mean value of the total debt ratio of the sampled firms, the researcher therefore, infer that financial structure has negative and significant influence on the performance of Nigerian firms. This outcome is attributed to mismatch of funds and high risk investment (asset substitution effect) resulting to marginal benefits of monitoring and bonding activities less than the marginal costs as noted by agency cost theory. The study therefore concludes that debt is valuable in reducing the agency costs of equity in professionally managed firm but at the same time debt is costly as it increase the agency cost of debt.

**Keywords:** Leverage Ratio; Firm Performance; Marginal Benefits; Agency Cost; Bankruptcy Cost

### 1. Introduction

Leverage ratios are suitable quantitative measures of financial structure. Leverage ratio is a portion of firm assets financed with any type of fixed-charge financing such as debt or leases (Javed et al., 2014). Thus, leverage is a tool if prudentially employed increase earnings potential of the residual owners. Leverage ratio is a measure of potential, rather than actual, capital gain. Therefore, leverage ratio suggest the effects of possible changes in price-pointing out which groups might be vulnerable to, or favoured by price changes of various type (Foo et al., 2015; Javed et al., 2014). In financial structure decisions, there is need to ensure that marginal benefit accrued from employment of external capital outweigh marginal cost of debt resulting from the use of this funds. A proper balancing of debt and equity is imperative in order to ensure a trade-off between risk and return to the shareholders (Khadka, 2006). This was also supported by the argument put forward by Afrasiabi and Ahmadina (2011) that “an issue that is strictly connected with the choice of financing sources is risk and return”.

Acute scarcity of Dollar has resulted to high cost of exchange rate and increase in foreign exchange risk of many firms. Nigeria being import dependent country has invariably trigger cost-pushed inflation with return on investment many

\* Corresponding author: Okpara Itiri Idam

firms severely affected. This claim is consistent with the findings of Uremadu and Efobi (2012) that high inflation rates and market risks in Nigeria business environment may not have enabled firms to optimize use of debt to maximize profitability. These have unvaryingly affected the rate of interest and diminishing marginal utility of capital and consumption decisions of investors. Therefore, Nigerian financial markets have been characterised by weak fundamentals, high probability expectations and in turn high weighted average cost of capital. This affirmation can be read in the context of Jeon and Nishihara (2015). Apparently, the economy has slide to recession with more than three decades lower GDP growth rate and stagflation staring at Monetary Policy Committee's helpless tools.

Many attempts have been made in the framework of capital structure of a firm to broaden our horizons of understanding various issues in the real world. For instance, a number of works emphasize the impact of capital structure on firm performance as well as determinants of capital structure. But little attention has been paid to marginal cost and marginal benefit of debt given prevailing economic fundamentals of the firm. In the present paper, we propose models that give us a comprehensive understanding of the essential issues that need to be considered; leverage ratio and corporate performance are determined, taking marginal cost and marginal benefit of debt into consideration.

---

## 2. Review of related literature

Financial structure irrelevance theory as advocated by Modigliani and Miller (1958) argued that under very restrictive assumptions of perfect capital markets, investors' homogenous expectations, symmetric information and no bankruptcy cost, financial structure does not determine performance of a firm. The theory argued that "the market value of any firm is independent of its financing decision and is given by capitalizing its expected return..., and average cost of capital to any firm is completely independent of its financing decision and is equal to the capitalization rate of a pure stream of its class". In line with these arguments, Adelegan (2007) found negative insignificant relations between values and leverage in pooled regression estimation. Also, examining capital structure and financial performance of selected business companies in Colombo Stock Exchange, Paratheepkanth (2011) confirmed insignificant negative relationship between capital structure and financial performance.

The unrealistic nature of MM propositions coupled with their subsequent work in 1961 and 1963 triggered controversial arguments. This however, spawned the interest of many scholars who looked at diverse dimension to examine the effects of less restrictive assumptions on the relationship between financial structure and value of a firm. Ross (1977) points that the Modigliani and Miller assume the existence of symmetric information with the suggestion that there will be no systematic relationship between the financing decision and the value of the firm. But the conventional view assumes the existence of asymmetric information where financing decision affects market value (Leland and Pyle, 1977).

These theories with their varying predictions are evident in the world of imperfect capital markets where internal and external capital is not perfectly substituted. Thus relevance theories suggest that many factors such as tax effects, agency effects, bankruptcy costs, signalling effects, market timing and asymmetric information influence financing decisions and in turn the value of the firm (Jensen and Meckling, 1976; Myers and Maufliis, 1984; Ross, 1977; Leland and Pyle, 1977; Fama, 1980). Specifically, these theories that have been advanced to explain the financial structure of firms include the pecking order theory, tradeoff theory, the agency cost theory, signalling hypothesis, market timing hypothesis, and neutral mutation hypothesis. Many empirical studies using panel data regression estimation confirmed inverse and significant relationship between capital structure and firm performance (Foo et al, 2015; Cheng and Tzeng, 2011; Mwangi et al., 2014; Onaolapo and Kajola, 2010; Uremadu and Efobi, 2012).

Other bodies of knowledge have assumed that firm performance is a function of financial structure. Leland and Pyle (1977) assumed statistical positive but not causal relationship between debt and value of "seemingly similar" projects. Evidently, among others the work of Dare and Sola (2010), Abu-Rub (2012), Javed et al. (2014) confirmed capital structure to be positively related to firm performance. Abu-Rub (2012) evidently showed that return on equity, return on assets, earnings per share, market value of equity to the book value of equity and Tobin's Q as a measure of firm performance is positively related to capital structure. In similar result, Dare and Sola (2010) employing panel data regression analysis of Nigerian Petroleum Industry found significant positive relationship between leverage ratio and corporate performance.

In the same spirit, Jensen and Meckling (1976) argue that the net effect of the increased use of external debt increases the total agency costs and increases optimal fraction of external debt obtained from the sale of external equity. The use of debt rather than equity finance grows as the corporate tax rates rises. Therefore, high corporate tax rates may lead to greater corporate indebtedness owing to firm's need to enjoy debt tax shield benefit. The implications of corporate indebtedness at some certain level may result to negative performance; Khan (2012) found that strong covenants owing

to large dependent on leverage affected the performance of Pakistan firms. In the same view, Cheng and Tzeng (2011) studying leverage and efficiency of Taiwan Manufacturing firms from 2000-2009, found that leverage is negatively related to efficiency.

Miller (1977) documented that the year to year variation in debt ratio reflected primarily the cyclical movement of the economy. This outcome was strengthened with the study of 10 manufacturing firms, which documented that high corporate income tax regimes combined with high inflation rates in Nigeria business environment may not have enabled firms to optimize use of debts to maximize profitability (Uremadu and Efobi, 2012). Although these outcomes may be unsatisfactory on the assumption that financial liberalization results in the development of capital market and overall financial system, however, corporate investment depends mostly on output and profits than macroeconomic and other policy variables (Mahmud et al., 2009). Thus, firm's performance in most cases reflect its' corporate decisions in developed and most emerging financial system. Stock market development leads to substitution of equity for debt, the effect would be a decline in the debt-equity ratio; in a reverse case, the effect would result to an increase in the debt-equity ratio.

On the latter scenario, high debt-equity (leverage) ratio reduces the agency costs of outside equity and increases firm value by constraining or encouraging managers to act more in the interests of shareholders (Jensen and Meckling, 1976). But the given incentive to the firm will benefit shareholders at the expense of debt-holders. The adjustment of leverage ratio to attain incremental value may lead to high agency cost if not rationally employed. Agency theory is most relevant in situations in which contracting problems are difficult (Eisenhardt, 1989). The choice of financial structure may help mitigate these agency costs. Long and Malitz (1985) opine, "firm's unobservable growth opportunities reduce the effectiveness of bond covenants, the only way in which owners of a firm with a high proportion of intangible investment opportunities can control the agency cost of debt is by limiting the amount of risk debt outstanding". As the debt ratio increase, so do firm's fixed interest charges, if the debt ratio becomes too high the cash flow the firm generates during economic recessions may not be sufficient to meet the interest payment. Profitable firms with strong growth opportunities and thus high market value can avoid agency problems by choosing lower leverage.

Shareholders of a firm incur agency cost in attempt to discourage self-interest of the managers by means of monitoring and control actions (Jensen and Meckling, 1976). Agency consideration assumes debt is valuable in reducing the agency costs of equity but at the same time debt is costly as it increase the agency cost of debt. However, debt-holders need to restrict and monitor the firm's behaviour. Onwumere et al. (2011) contend that the use of debt finance which is linked to assets of the firm create a problem for the firm because management may not want to run the risk of having conflicts with debt holders. Hence, costly monitoring devices of contractual covenants are incorporated into debt agreements to protect the debt-holders, it should increase the cost of capital offered to the firm. And also firms with riskier returns will have lower leverage ratio even when there are no bankruptcy costs.

However, agency cost arises due to conflict of interest between shareholders and managers (Jensen and Meckling, 1976; Eisenhardt, 1989), or between shareholders and bondholders (Jensen and Meckling, 1976). Agency problem between shareholders and bondholder arise due to asset substitution (Eisenhardt, 1989), in which shareholders prefer high risk projects, because they can fully benefit from high earnings, while bondholders that have a fixed claim prefer low risk projects. The adjustment of leverage ratio to attain optimal financial structure may lead to high agency cost if not rationally employed. As documented, the optimal financial structure decision has to do with balancing the trade-off between the benefit of debt and agency costs arising from mitigating the agency cost of managerial discretion against the agency cost of debt arising from "asset substitution effect" (Shahjahanpour et al. 2010). Therefore, high leverage ratio increases the bankruptcy cost, and agency cost of the firm as well rises, and it is through this argument that agency costs can be incorporated into the financial structure decision (Kim et al., 2006).

## 2.1. Method of Data Analysis

There are several studies performed in financial structure and firms' performance as well as agency cost theory and the researcher has gathered information from these studies to enhance this research work and to proffer solution to the research problem. It was conducted using 15-year annualized panel data spanning the period 2001-2015 for cross section of 16 firms from non-financial sectors. Financial sector was excluded because of the highly regulated nature of the institutions. The data were collated from the annual reports of the sampled firms and Nigeria Stock Exchange factbook. The items of interest in the financial statements are assets, liabilities, shareholders' funds, and earnings for each financial year covered. The researcher put many factors into consideration in the selection of the sample firms. Such factors were to guide against data omission and ensure uniformity in the presentation (balanced panel data).

The study employed Return on Assets (ROA) and Return on Equity (ROE) as firm performance measure, while Long Term Debt Ratio (LTDR) and Short Term Debt Ratio (STDR) were employed as financial structure measures. These measures have been employed by numerous researchers such as; Mwangi et al. (2014), Titman and Wessels (1988), Javed et al. (2014), Long and Malitz (1985), Foo et al (2015), Onaolapo and Kajola (2010), Zeitun (2009), Khan (2012), Ujunwa (2012), Kasozi and Ngwenya (2010), among others. Control variables employed in the study are firm characteristics which are intrinsic factors which impact on firm performance. These are firm size (SIZE) and firm age (AGE). The size of a firm determines economies of scale enjoyed by the firm. Larger firms that have a greater variety of capabilities can utilize the high leverage ratio efficiently with relative positive returns (Titman and Wessels, 1988). Several authors have suggested that performance of a firm is related to firm size. Cheng and Tzeng (2011), Onaolapo and Kajola (2010), Zeitun (2009), and Khan (2012) provide empirical evidence that the size of a firm appear to determine a larger proportion of firms’ performance. The size of a firm is measured by natural logarithm of total assets (Onaolapo and Kajola, 2010). On the other hand, firm age is measured as the log of number of years since inception to the date of observation. Zeitun (2009), Onaolapo and Kajola (2010) employed this measures as intrinsic factors that impact on the performance of a firm.

**2.2. Model Specification**

Due to study of this nature this paper employed cross sectional time series (panel) data to determine the outcome of the presumptions of the researcher. Therefore, Panel Least Square, Fixed Effects and Random Effects regression models were adopted as the technique for analysis. Thus allows us to take into account the unobservable and constant heterogeneity, that is, the specific features and time invariant effect of the dataset (Gujarati, 2013). These measures have been employed by notable studies such as the work of Javed et al. (2014), Foo et al (2015), Mwangi et al. (2014) and Onaolapo and Kajola (2010) in the examination of panel study of this nature. Ujunwa (2012) opines that coefficient of estimations are reliable when regression parameters do not change over time and do not differ between various cross-sectional units. Therefore, when the regression estimation differ widely between the two models (Fixed and Random Effects models), the adoption of Hausman test will be essential (Gujarati, 2013).

Specifically, the models shown below are formulated relatively to the researcher’s objective as highlighted earlier. We estimate equation (1) - (3) as depict below to examine the assumption that financial structure has positive and significant effect on return on asset (ROA), respectively for Panel Least Square, Fixed Effects and Random Effects estimations. On the same note, the estimation for equation (4) – (6) as depicted below examine the postulation that financial structure has positive and significant effect on return on equity (ROE), respectively for Panel Least Square, Fixed Effects and Random Effects estimations.

$$ROA_{it} = \beta_{1it} + \beta_2LTDR_{it} + \beta_3STDR_{it} + \beta_4SIZE_{it} + \beta_5AGE_{it} + \mu_{it} \dots\dots\dots(3.4.1)$$

$$ROA_{it} = \beta_{1i} + \beta_2LTDR_{it} + \beta_3STDR_{it} + \beta_4SIZE_{it} + \beta_5AGE_{it} + \mu_{it} \dots\dots\dots(3.4.2)$$

$$ROA_{it} = \beta_1 + \beta_2LTDR_{it} + \beta_3STDR_{it} + \beta_4SIZE_{it} + \beta_5AGE_{it} + w_{it} \dots\dots\dots(3.4.3)$$

$$ROE_{it} = \beta_{1it} + \beta_2LTDR_{it} + \beta_3STDR_{it} + \beta_4SIZE_{it} + \beta_5AGE_{it} + \mu_{it} \dots\dots\dots(3.4.4)$$

$$ROE_{it} = \beta_{1i} + \beta_2LTDR_{it} + \beta_3STDR_{it} + \beta_4SIZE_{it} + \beta_5AGE_{it} + \mu_{it} \dots\dots\dots(3.4.5)$$

$$ROE_{it} = \beta_1 + \beta_2LTDR_{it} + \beta_3STDR_{it} + \beta_4SIZE_{it} + \beta_5AGE_{it} + w_{it} \dots\dots\dots(3.4.6)$$

**2.3. Priori Expectation**

The researcher expects the following outcomes for each of the explanatory variables employed in the study.

It is expected that LTDR will have positive and significant impact on the firm performance (ROA and ROE). That is f(LTDR) is expected to be > 0. This implies that an increase in LTDR will result to an increase in firm performance (ROA and ROE).

STDR is expected to have positive and significant influence on the performance of Nigerian firms (ROA and ROE). Thus, f(STDR) is expected to be > 0. This shows that an increase in STDR will result to an increase in firm performance (ROA and ROE).

On the same note, SIZE is expected to have positive and significant impact on the performance of Nigerian firms (ROA and ROE). Thus  $f(\text{SIZE})$  is expected to be  $> 0$ . This is an indication that firm size will result to an increase in firm performance (ROA and ROE).

It is also expected that AGE will have positive and significant effect on the firm performance (ROA and ROE). That is  $f(\text{AGE})$  is expected to be  $> 0$ . This implies that an increase in firm age will result to an increase in firm performance (ROA and ROE).

### 3. Data Analysis

#### 3.1. Descriptive Statistics

**Table 1** Summary Descriptive Statistics of the Employed Variables, 2001 – 2015

Variable	ROA	ROE	LTDR	STDR	SIZE	AGE
Mean	0.14	0.44	0.13	0.39	20.03	3.74
Median	0.13	0.32	0.11	0.38	20.31	3.85
Maximum	0.54	4.36	0.53	1.09	25.09	4.49
Minimum	-0.40	-8.35	0.00	0.00	13.27	2.30
Range	0.93	12.71	0.53	1.09	11.82	2.19
Variance	0.02	0.88	0.01	0.05	9.35	0.16
Std. Dev.	0.12	.94	0.11	0.22	3.06	0.40
Skewness	-0.12	-2.60	1.02	0.31	-0.41	-1.10
Kurtosis	5.99	37.49	3.95	2.74	2.18	4.10
Jarque-Bera	90.08	12161.92	49.82	4.55	13.14	60.36
Prob	0.00	0.00	0.00	0.10	0.00	0.00
Sum	32.63	105.04	30.56	92.86	4807.34	897.21
Sum Sq. Dev.	3.49	210.85	2.70	12.08	2234.35	38.33

Source: Descriptive Statistics Results using E-view (Version 7.0)

The mean of ROA for the sample firms is 0.14, this indicates that for every ₦100 worth of total assets of the firms, ₦14 was earned as profit before interest and tax. Thus implies that Nigerian firms using this accounting measure of firm performance have a very low performance. Invariably, lower returns on ROA may have also been affected by the financing mix of the firms. For example, the LTDR recorded a mean of 13% and STDR accounted for 39%, which implies 50% depletion in assets of Nigerian quoted firms will affect bondholders' funds since owners stake in the firm cover 48% of the firm's assets and thus contributing to high agency cost and reorganization cost. The average value of 0.44 for ROE showed that for every ₦1 worth of shareholders' fund employed by the sample firms, ₦0.44 was return to owners of the firm. As highlighted earlier, the mean of LTDR having lower value of 13% compare to STDR value of 39% depicted mismatch of funds confirming high cost of debt finance incurred by the sample firms due to refinancing cost to undertake their long term investment needs. The outcomes from other indicators such as median, maximum, minimum and range strengthen the researcher deductions as depicted above.

The evidence obtained from the variance of the adopted variables depicted high volatility of data set from the mean within the period under study. In the same note, the standard deviation in table 1 confirmed the volatile nature of the data set. The with negative value for most of the data set revealed that the data points are skewed to the left of the data average, except for the two measures of financial structure with positive skewness which implies that data points are skewed to right of the data average. Thus, the variables indicated that the data are not normally distributed as a result of sets of data not balanced normal distribution (skewness of zero). Kurtosis of the results in table 4.1 showed that the variables are normally distributed which revealed symmetric distribution with well-behaved tails excluding STDR and SIZE with less than expected value of 3 indicting that symmetric distribution is not well-behaved. Although kurtosis confirmed that all the variables are heavily-tailed distribution with positive expected values. For Jarque-Bera test

statistic of the variables revealed the critical value at 5% significance level, leading to the conclusion that the adopted variables follow a normal distribution. The p-value for most of variables less than 0.05 significance level depicted significant outcome with exception for STDR with the p-value greater than 5% level of significance.

### 3.2. Correlation Analysis

The results of correlation matrix for the variables are reported in order to examine the correlation between the dependents and explanatory variables. The results show that there is a positive relationship between ROA and financial structure measures (LTDR and STDR). This implies that financial structure does improve firm performance using this measure of performance but outcome was not significant using STDR as proxy for financial structure. On the similar note, the relationship between ROA and firm characteristics measures (firm size and age) documented that firm size have positive and significant relationship but firm age was found to be negative and insignificant. Apparently, using ROE as alternative measure of firm performance were found to be positively correlated with LDTR, STDR, firm size and firm age, but STDR and firm age were insignificantly correlated with ROE.

**Table 2** Pearson Correlation Matrix

	ROA	ROE	LTDR	STDR	SIZE	AGE
ROA	1					
ROE	0.553**	1				
LTDR	0.153*	0.187**	1			
STDR	0.029	0.094	0.059	1		
SIZE	0.396**	0.294**	0.281**	0.330**	1	
AGE	-0.048	0.053	-0.056	0.211**	-0.041	1

Source: Pearson Correlation Matrix Results using SPSS 16.0

Note: \*\*. Correlation is significant at the 0.01 level (2-tailed) and \*. Correlation is significant at the 0.05 level (2-tailed).

### 3.3. Regression Results

**Table 3** Regression Results for RO

Dependent Variable: ROA				
Total pool (balanced) observations: 3840				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.174547	0.021361	-8.171473	0.0000
LTDR	0.046141	0.017448	2.644478	0.0082
STDR	-0.059809	0.008628	-6.931694	0.0000
SIZE	0.016640	0.000645	25.80590	0.0000
AGE	-0.001478	0.004577	-0.322875	0.7468
R-squared	0.169882	Mean dependent var		0.135971
Adjusted R-squared	0.169016	S.D. dependent var		0.120607
S.E. of regression	0.109943	Akaike info criterion		-1.576401
Sum squared resid	46.35576	Schwarz criterion		-1.568259
Log likelihood	3031.690	Hannan-Quinn criter.		-1.573509
F-statistic	196.2058	Durbin-Watson stat		0.731766
Prob(F-statistic)	0.000000			

Source: Regression Analysis Results using E-View 7.0; Note: (1) Regression significant at 5% level of significance; (2) The Larger the value of t (t > P-value) the stronger the evidence that the coefficient is significant; (3) The closer the value of R is to one (1), the stronger the agreement.

$$ROA = - 0.175 + 0.046LTDR - 0.060STDR + 0.017SIZE - 0.001AGE$$

The results above revealed the outcome for equation (1), the intercept (-0.175) is negative and statistically significant since P-value is less than 0.05 level of significant, indicating that ROA will decrease by 0.175 units when there is no change in explanatory variables. This is indication that Nigerian firms will possibly loss 17.50% of its value at zero leverage ratios. The coefficient of LTDR revealed expected results in both direction and magnitude. The coefficient value of 0.046 implies that 1 time change in LTDR holding other variables constant resulted to 4.60% marginal increase in return on asset. Therein, the p-value of 0.008 less than 0.05 level of significant strengthened the outcome. The negative coefficient of STDR (-0.060) is inconsistent as expected. This outcome depicted that a unit change in STDR holding other variables unchanged contributed to marginal decrease in return on asset by 6%, which was found to be significant at 5% level.

The control variables introduced indicates that firm size had positive and significant impact on return on asset, while firm age had negative and insignificant impact on return on asset within the period under review. The coefficient of determination which measures the goodness of fit of the regression model as revealed by R-square in table 3 above indicates that 16.99% of the variations observed in the dependent variable were explained by variations in explanatory variables. This is relatively indicating that the remaining 83.01% variation in ROA is attributed other factors not included in the regression mode. The outcome between the three models (Panel Least Square, fixed effects and random effects model) do not differ in any approach, therefore, there is no need for further depiction and/or analysis. This evidence was also confirmed in Hausman test with zero variance as contain in table 4 below. Hausman test revealed that, if composite error term is correlated with the explanatory variables, that is, whether random effects model is the appropriate model or if fixed effects model is the appropriate model. According to Gujarati (2013), in relation to this outcome (zero variance), the choice between fixed effects model and random effects model is based on computational convenience.

**Table 4.** Hausman Test for ROA

Correlated Random Effects - Hausman Test				
Pool: ROA				
Test cross-section random effects				
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	
Cross-section random	0.000000	4	1.0000	
* Cross-section test variance is invalid. Hausman statistic set to zero.				
** WARNING: estimated cross-section random effects variance is zero.				
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
LTDR	0.046141	0.046141	-0.000000	NA
STDR	-0.059809	-0.059809	-0.000000	NA
SIZE	0.016640	0.016640	-0.000000	NA
AGE	-0.001478	-0.001478	0.000000	1.0000

**Table 5.** Regression Results for ROE

Dependent Variable: ROE		
Method: Panel Least Squares		
Date: 05/28/16 Time: 18:00		

Sample: 2001 2015				
Included observations: 240				
Cross-sections included: 16				
Total pool (balanced) observations: 3840				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.974420	0.172566	-11.44152	0.0000
LTDR	1.025226	0.140958	7.273252	0.0000
STDR	-0.074832	0.069706	-1.073548	0.2831
SIZE	0.082941	0.005209	15.92176	0.0000
AGE	0.173644	0.036977	4.696027	0.0000
R-squared	0.103212	Mean dependent var		0.437667
Adjusted R-squared	0.102276	S.D. dependent var		0.937434
S.E. of regression	0.888202	Akaike info criterion		2.602067
Sum squared resid	3025.445	Schwarz criterion		2.610209
Log likelihood	-4990.969	Hannan-Quinn criter.		2.604959
F-statistic	110.3430	Durbin-Watson stat		1.429818
Prob(F-statistic)	0.000000			

Source: Regression Analysis Results using E-View 7.0; Note: (1) Regression significant at 5% level of significance; (2) The Larger the value of t (t > P-value) the stronger the evidence that the coefficient is significant; (3) The closer the value of R is to one (1), the stronger the agreement.

$$ROE = - 1.974 + 1.025LTDR - 0.075STDR + 0.083SIZE - 0.174AGE$$

The regression results as obtained in table 5 above shows the outcome of our regression estimation using ROE as a measure of firm performance. The evidence on the regression intercept with the value of -1.974 established that at zero change in explanatory variables shareholders’ funds were down by 1.97 times. Thus, this is observed to be statistically significant, therein, p-value of 0.00 less than 5% level of significant. The coefficient of LTDR (1.025) and p-value of 0.00 shows that long term debt ratio resulted to positive and significant impact on return on equity within the period of study. The obtained results is an indication that 1 time change in long term debt ratio holding other variables constant resulted to 1.025 time increase in return on equity. The coefficient of STDR with value of -0.075 revealed that a percent change in short term debt of Nigerian firms holding other variables constant contributed negatively to return on equity at marginal value of 0.075 percent within the period under review. Therein, p-value of 0.283 substantially greater than 0.05 level of significant established that the outcome is insignificant.

Examining firm characteristics and return on equity, the study ascertained that firm size and firm age brought about increase in return on equity of our sample firm within the period under review. These were significant with p-value of 0.00 less than 5% level of significant. The coefficient of determination (R<sup>2</sup>) explaining the fitness of our regression estimation shown in table 4.3.3 established that 10.32% of the variation in our dependent variable was as a result of our regression model. Therefore, the remaining 89.68% variation in return on equity is attributed to other factors which were not considered in the formulated model. However, the result between the three models (Panel Least Square, fixed effects and random effects model) do not vary in any approach, then, there is no requirement for further interpretation and/or analysis. This indication was also justified in Hausman test with zero variance as depicted in table 6 below.

**Table 6** Hausman Test for ROE

Correlated Random Effects - Hausman Test			
Pool: ROE			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.



Cross-section random	0.000000	4	1.0000	
* Cross-section test variance is invalid. Hausman statistic set to zero.				
** WARNING: estimated cross-section random effects variance is zero.				
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
LTDR	1.025226	1.025226	-0.000000	NA
STDR	-0.074832	-0.074832	-0.000000	NA
SIZE	0.082941	0.082941	-0.000000	NA
AGE	0.173644	0.173644	0.000000	1.0000

#### 4. Conclusion

The performance of Nigerian firms as a result of financial structure (LTDR and STDR) has established significant results. This outcome depicted a mixed results, LTDR revealed positive implication while STDR with the mean of 39% (75 percent of the sample firms' total debt ratio) was negative. This confirmed that Nigerian firms borrows to point where the marginal value of tax shields benefits on additional debt could not offset the incremental cost of debt capital thereby contributing negatively to firms' earnings. The outcome is an indication of mismatch of funds resulting high monitoring and bonding costs and residual loss. In view of this, the regression results provide strong supports for high agency cost of Nigerian firms. However, regardless of the substantial loss on firms' returns at the absence of financial leverage, value maximization firm in Nigeria needs to maintain financial structure that tax benefits of debt overwhelmed bankruptcy cost and agency cost associated with debt.

#### Compliance with ethical standards

##### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

#### References

- [1] Abu-Rub, N. (2012), Capital Structure and Firm Performance: Evidence from Palestine Stock Exchange, *Journal of Money, Investment and Banking*, Issue 23: 109-117.
- [2] Adelegan, O. (2007), Effect of Taxes on Business Financing Decisions and Firm Value in Nigeria, *International Research Journal of Finance and Economics*, Issue12: 189-213.
- [3] Afrasiabi, J. and Ahmadinia, H. (2011), How Financing Effect on Capital Structure, Evidence from Tehran Stock Exchange (TSE), *International Journal of Academic Research*, 3(1).
- [4] Cheng, M. and Tzeng, Z. (2011), Does Leverage and Efficiency Affect Each Other, *Journal of Accounting, Finance and Economics*, 1(1): 77-95.
- [5] Dare, F. D. and Sola, O. (2010), Capital Structure and Corporate Performance in Nigeria Petroleum Industry: Panel Data Analysis, *Journal of Mathematics and Statistics* 6(2): 168-173.
- [6] Eisenhardt, K. M. (1989), "Agency Theory: An Assessment and Review," *The Academy of Management Review*, 14(1): 57-74.
- [7] Fama, E. F. (1980), Agency Problems and the theory of the Firm, *The Journal of Political Economy*, 88(2): 288-307.
- [8] Foo, V., Jamal A. A. A., Karim, M. R. A. and Ulu, Z. K. A. B. (2015), Capital Structure and Corporate Performance: Panel Evidence from Oil and Gas Companies in Malaysia, *International Journal of Business Management and Economic Research*, 6(6), 371-379.
- [9] Javed, T., Younas, W. and Imran, M. (2014), Impact of Capital Structure on Firm Performance: Evidence from Pakistani Firms, *International Journal of Academic Research in Economic and Management and Sciences*, 3(5): 28-52

- [10] Jensen, M. C. and Meckling, W. H. (1976), Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure, *Journal of Financial Economics*, 3(4): 305-360.
- [11] Kasozi, J. and Ngwenya, S. (2010), “The Capital Structure Practices of Listed Firms in South Africa”, *International Research Symposium in Service Management*, ISSN 1694-0938.
- [12] Khan, A. G. (2012), The Relationship of Capital Structure Decisions with Firm Performance: A Study of the Engineering Sector of Pakistan, *International Journal of Accounting and Financial Reporting*, 2(1): 245-262.
- [13] Kim, H. Hestimati, A. and Aoun, D. (2006), “Dynamics of Capital Structure: The Case of Korean Listed Manufacturing Companies”, *Korean Economic Research Institute (KERI)*.
- [14] Leland, H. E. and Pyle, D. H. (1977), Informational Assymetries, Financial Structure, and Financial Intermediation, *The Journal of Finance*, 32(2): 371-387.
- [15] Long, M. S. and Malitz, I. B. (1985), *Investment Patterns and Financial Leverage*, Chicago: University of Chicago Press, 325-352.
- [16] Mahmud, M., Herani, G. M., Rajar, A. W. and Farooqi, W. (2009), Economic Factors Influencing Corporate Capital Structure in Three Asian Countries: Evidence from Japan, Malaysian and Pakistan, *Indus Journal of Management & Social Sciences*, 3(1): 9-17.
- [17] Miller, M. H. (1977), Debt and Taxes, *Journal of Finance*, 32(2): 261-275.
- [18] Modigliani, F. and Miller, M. H. (1958), “The Cost of Capital, Corporation Finance and the Theory of Investment”, *The American Review*, 48(3): 261-297.
- [19] Mwangi L. W., Makau, M. S. and Kosimbei G. (2014), Relationship between Capital Structure and Performance of Non-Financial Companies Listed in the Nariobi Securities Exchange, Kenya, *Global Journal of Contemporary Research in Accounting, Auditing and Business Ethics*, 1(2), 72-90.
- [20] Myers, S. C. and Majluf, N. S. (1984), Corporate Financing and Investment Decisions When Firms Have Information that Investors do not Have, *Journal of Financial Economics*, 13: 187-221.
- [21] Onaolapo, A. A. and Kajola, S. O. (2010), Capital Structure and Firm Performance: Evidence from Nigeria, *European Journal of Economics, Finance and Administrative Sciences*, Issue 25.
- [22] Onwumere, J. U. J., Ibe, I. G. and Okpara, G. C. (2011), Debt Financing and Ability of Firms to Maximize Asset Use, *IJEMR*, 1(5): 1-15.
- [23] Ross, S.A. (1977), The Determination of Financial Structure: The Incentive Signalling Approach, *The Bell Journal of Economics*, 8(1): 23-40.
- [24] Shahjahanpour, A., Ghalambor, H. and Aflatooni, A. (2010), The Determinants of Capital Structure Choice in the Iranian Companies, *International Research Journal of Finance and Economics*, Issue 56, Euro Journals Publishing, Inc.
- [25] Titman, S. and Wessels, R. (1988), The Determinants of Capital Structure Choice, *The Journal of Finance*, 43(1): 1-19.
- [26] Ujunwa, A. (2012), Board Characteristics and the Financial Performance of Nigerian Quoted Firms, *Emerald Corporate Governance*, 12(5): 656-674.
- [27] Uremadu, S. O. and Efobi, R. U. (2012), The Impact of Capital Structure and Liquidity on Corporate Returns in Nigeria: Evidence from Manufacturing Firms, *International Journal of Academic Research in Accounting, Finance and management Sciences*, 2(3): 1-16.

## Appendix

S/N	SAMPLE FIRMS	SECTOR
1	OKOMU OIL PALM CO. PLC	AGRICULTURE/AGRO-ALLIED
2	PRESCO PLC	AGRICULTURE/AGRO-ALLIED
3	GUINNESS NIG. PLC.	BREWERIES
4	NIGERIAN ROPES PLC.	BUILDING MATERIALS

5	BERGER PAINTS NIGERIA PLC.	CHEMICAL&PAINTS
6	TRANS-NATIONWIDE EXP. PLC.	COMMERCIAL/SERVICES
7	NCR (NIGERIA) PLC.	COMPUTER AND OFFICE EQUIPMENT
8	CHELLARAMS PLC.	CONGLOMERATES
9	UNILEVER NIG. PLC.	CONGLOMERATES
10	SMART PRODUCTS NIG. PLC	EMERGING MARKETS
11	CUTIX PLC	ENGINEERING TECHNOLOGY
12	NESTLE NIG PLC.	FOOD/BEVERAGES&TOBACCO
13	FIRST ALUMIN. NIG. PLC.	INDUSTRIAL/DOMESTIC PRODUCT
14	VITAFOAM NIG. PLC.	INDUSTRIAL/DOMESTIC PRODUCT
15	BETA GLASS CO. PLC.	PACKAGING
16	MOBIL OIL NIG. PLC.	PETROLEUM(MARKETING)