Capital Structure and Corporate Performance of Nigerian Quoted Firms: A Panel Data Approach

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Abstract: This paper presents empirical findings on the impact of leverage (debt's ratio) on firms' performance. Empirical results based on 2003 to 2007 accounting and marketing data for 101 quoted firms in Nigeria lend some support to the pecking order and static tradeoff theories of capital structure. The study employed panel data analysis by using fixed-effect estimation, random-effect estimation and a pooled regression model. The usual identification tests and Hausman's Chi-square statistics for testing whether the fixed effects model estimator is an appropriate alternative to the random effects model were also computed for each model. A firm's leverage was found to have a significant negative impact on the firm's accounting performance measure (ROA). An interesting finding is that all the leverage measures have a positive and highly significant relationship with the market performance measure (Tobin's Q). The study further reveals a salient fact that Nigerian firms are either majorly financed by equity capital or a mix of equity capital and short-term financing. It is therefore suggested that Nigerian firms should try to match their high market performance with real activities that can help make the market performance reflect on their internal growth and accounting performance.

1. Introduction

The financing decision mix of debt and equity represents a fundamental issue faced by financial managers of a firm. This study of capital structure has traditionally been carried out by finance researchers and at best there has been mixed results. According to Kochhar (1997), poor capital structure decisions may lead to a possible reduction/loss in the value derived from strategic assets. Hence, the capability of a firm in managing its financial policies is important if the firm is to realize gains from its specialized resources. The raising of appropriate funds in an organization will aid the firm in its operation; hence, it is important for firms in Nigeria to know the debt-equity mix that gives effective and efficient performance after a good analysis of business operations and obligations.

The research problem is to find out an optimum level of capital structure through which a firm can increase its financial performance more efficiently and effectively. Debt financing affects a company's performance because companies will usually agree to fixed repayments for a specific period. These payments occur regardless of the firms' performance. Although equity financing typically avoids these repayments, it requires companies to give an ownership stake in the company to venture capitalists or investors. Also, using excessive amounts of external financing can result in the over-leveraging of a company, which means the business has extensive obligations to institutional and individual investors who can disrupt the company's operations and financial returns.

The bulk of empirical studies on this topic were conducted in advanced countries where the stock markets function quite adequately. To the best of the researcher's knowledge very few studies have been conducted on this topic in the Nigerian context and from the studies carried out on Nigeria firms, it is obvious that a consensus has not been reached on the effect of capital structure on the value of the Nigerian firms. The findings from the past empirical results are at best mixed. Some researchers' findings led to the conclusion that capital structure has a positive effect on a firm's value, while some suggest a negative relationship. In the light of the mixed results from previous studies in this field, it seems imperative and logical that further studies be carried out on the issue. Therefore, there is a need for this research to be undertaken to study the effect of capital structure on the

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performance of Nigerian firms using current econometric technique (panel data analysis) in order to extend and improve on the other empirical analysis conducted so far on the impact of capital structure on the performance of Nigerian firms. The use of the panel data method will enable us to obtain estimates that are unbiased and efficient since it avoids loss of degree of freedom. This paper has five sections. Following this introduction section is Section 2 which looks at the literature review and theoretical framework. The estimation techniques and empirical models are provided in Section 3. Section 4 covers the results from the estimation process and the discussion on the results, while the last section is the conclusion.

2. Literature Review and Theoretical Framework

If there has been any area of finance theory that has attracted the greatest attention and caused the highest controversy, it is definitely the theory of capital structure and leverage and how they affect firms' performance. Modigliani and Miller (1958) were the first to raise the question of the relevance of capital structure for a firm. They argued that under certain conditions, the choice between debt and equity does not affect firm value and, hence, the capital structure decision is 'irrelevant'. The conditions under which the irrelevance proposition holds includes, among others, assumption such as no taxes, no transaction costs in the capital market, and no information asymmetries among various market players. Financial theorists have, however, since provided several possible explanations for the financing decisions of firms. Major hypotheses include tax effects, signalling effects, bankruptcy effects, agency issues and industry effects (see Harris and Raviv, 1991; Myers, 1984).

According to Murphy *et al.* (1996), research on firm performance can be traced to organization theory and strategic management. Performance measures are either financial or organizational. Financial performance such as profit maximization, maximizing profit on assets and maximizing shareholders' benefits are at the core of firm's effectiveness (Chakravarthy, 1986; Tian and Zeitun, 2007). Tian and Zeitun (2007) said that 'in practice, firms' managers who are able to identify the optimal capital structure are rewarded by minimizing a firm's cost of finance thereby maximizing the firm's revenue'. This is because the firm financing policy is a crucial aspect of their survival and efficient corporate performance.

It has been theorized in literature that firms may actually have more debt in their capital structure than is appropriate for two reasons. First, higher levels of debt align the interests of managers and shareholders (Harris and Raviv, 1991). Second, managers may underestimate the costs of bankruptcy reorganization or liquidation (Gleason *et al.*, 2000). Both of these factors suggest higher than appropriate amounts of debt in the capital structure. If this is the case, then higher than appropriate levels of debt in the capital structure which may increase firms' value in the short run, could result in greater exposure to financial distress. Graham and Harvey (2001) found that firms issue equity rather than debt when their stock prices are high. Baker and Wurgler (2002) also found out that the level of a firm's stock price is a major determinant of which security to issue and Welch (2004) established that firms let their capital structure change with their stock prices rather than issuing securities to counter the mechanical effect of stock returns on capital structure.

In order to see if the Western models of capital structure theories are portable to developing countries, Singh and Hamid (1992) and Singh (1995) pioneered research into corporate capital structure in developing countries. Singh (1995) observed that firms in developing countries finance their activities differently, which is attributable to the differences in their financial environment. The basic conclusions are that first, the determinants of capital structure of corporations in developing countries follow an inverse pecking order theorem as the corporations rely heavily on external financing, the bulk of which is short-term finance. Secondly, top corporations in developing countries rely more heavily on equity issues than corporations in developed economies.

Literature has also shown that debt financing for quoted companies in Nigeria corresponds mainly to short-term debts. Salawu (2007) found out in his study of the capital structure of Nigerian firms that short-term debt is up to 60 per cent of the total structure. Myers (2001) also reports that external finance for US quoted firms covers only a small proportion of capital formation and that equity issues are minor, with the bulk of external finance being debt. Although the claims that equity issues are minor with debt forming the bulk of external finance do match the evidence for publicly quoted Nigerian firms during the period under study, the claims that external finance covers only a small proportion of capital formation is not true in the Nigerian case. External finance is much more significant for Nigerian listed firms in that it often far exceeds investments for most of the firms.

The theory of capital structure is closely related to the firm's cost of capital. The debate concerns whether or not there is an existence of optimal capital structure and the effect of the capital structure on the overall cost of capital on the one hand and the value of the firm on the other hand. The Net Income Approach Theory (Modigliani and Miller, 1963) affirms that the use of debt will positively affect the value of the firm indefinitely; that is, the overall cost of capital or weighted cost can be increased or reduced through the changes in the financial mix or capital structure of the firm. This approach is termed the dependent

hypothesis, since the cost of capital value of the firm depends on the use of debt. This hypothesis assumes that the cost of debt is less than the cost of equity and that corporate income tax does exist (Pandey, 1999). This hypothesis simply calls for 100 per cent debt finance. Brigham (1999) criticized this on the ground that it is artificial and incomplete.

On the other hand, the Net Operating Income Approach Theory posited that the weighted average cost of capital and the total value of the firm are independent of one another. It implies that no matter how modest or excessive the firm's use of debt is in financing, the common stock price will not be affected. Riahi-Belkaoui (1999), however, stated that financial risk is placed on the common stockholders as a result of the decision to use debt financing or financial leverage in the capital structure.

The two positions identified above were criticized on the ground of unrealistic assumption and this brought about the formulation of a more informed view of the possible situation. This approach is known as the traditional theory and is often referred to as the intermediate or moderate position. This theory assumes that there is an optimal capital structure at the point where the weighted average cost of capital is at a minimum. This is the optimal level of gearing and at this point the shareholders' wealth is maximized. An understanding of the underlying influences is provided by some more recent broad theories such as the agency cost theory, static trade-off and pecking order theories. The agency cost theory posited that optimal capital structure can be obtained by trading off the agency cost of debt against the benefit of debt (Riahi-Belkaoui, 1999). Agency costs are costs due to conflicts of interest. The Static Trade-off Theory postulated that the tax-deductibility of interest payment induces a company to borrow up to the margin where the present value of interest tax shield is just offset by the value loss due to agency cost from issuing risky debt as well as the cost of possible liquidation or reorganization. The Pecking Order Theory as presented by Myers (1984), relied heavily on information cost to explain corporate behaviour. It postulated that companies prefer internal to external financing, although they would embrace the latter if necessary to finance real investment with positive net present values. This study is, however, based within the static tradeoff and pecking order framework given the increased support for these theories in literature.

3. Model Specification and Estimation Techniques

The most common performance measure proxies that have been used by many authors are return on assets (ROA), return on equity (ROE) and/or return on investment (ROI) (see Gorten and Rosen, 1995; Mehran, 1995; Krishnan and Moyer, 1997; Ang *et al*., 2000; and Tian and Zeitun, 2007). However, the ROA is widely regarded as the most useful measure to test firm performance (Abdel Shahid, 2003; Tian and Zeitun, 2007). Other measures of performance called market performance measures are price per share to earnings per share (P/E) (Abdel Shahid, 2003) and Tobin's Q, which mixes market value with accounting value and has been used to measure the firm's value in many studies (see McConnel and Serveas, 1990; Zhou, 2001; and Tian and Zeitun, 2007). In this study, three measures of corporate performance will be used—ROA, ROE and Tobin's Q. Three measures of leverages will also be used, that is: (1) the ratio of total debt to total assets (TD/TA); (2) the ratio of long term debt to total assets (LD/TA); and (3) the ratio of short-term debt to total assets (SD/TA). Accordingly, a functional relationship between firms' performance (*PER*) and the chosen explanatory variables (different measures of leverage and size) is shown below:

$$PER = \mathrm{f}(LEV, S) \tag{1}$$

With: $(PER)' = (ROA, ROE, Tobin's Q)'$
$(LEV)' = (Lev1, Lev2, Lev3)'$

PER represents the different measures of performance (ROA, ROE and Tobin's Q), *LEV* shows the different measures of leverage (*Lev1, Lev2, Lev3*) and *S* is the size of the firm measured by log of turnover. *ROA* is return on assets (earnings before tax (EBIT) divided by total assets); *ROE* is return on equity (earnings before tax + pref. dividend divided by equity); *Tobin's Q* is the market value of equity plus total debt to total asset $[(E + TD)/TA]$; *Lev1* is the ratio of total debt to total asset (*TD/TA*); *Lev2* is the ratio of long-term debt to total asset (*LD/TA*); and *Lev3* is the ratio of short-term debt to total asset (*SD/TA*).

The relationships between the components of *PER* and the different independent variables can be rewritten implicitly as follows:

$$ROA = \mathrm{f}(Lev1_{it}, Lev2_{it}, Lev3_{it}, S, u_{it}) \tag{2}$$

$$ROE = \mathrm{f}(Lev1_{it}, Lev2_{it}, Lev3_{it}, S, \mu_{it}) \tag{3}$$

$$TobQ = \mathrm{f}(Lev1_{it}, Lev2_{it}, Lev3_{it}, S, v_{it}) \tag{4}$$

with: $i = 1, \ldots, N$; $t = 1, \ldots, T$ and u_{it}, μ_{it}, and v_{it} are error terms (the time-varying disturbance term is serially uncorrelated with mean zero and constant variance).

Hence:

$$u_{it} \cong iid \ N \ (0, \sigma^2 u)$$

$$\mu_{it} \cong iid \ N \ (0, \sigma^2 \mu)$$

$$v_{it} \cong iid \ N \ (0, \sigma^2 v)$$

Equations 2–4 depict short and long panel models with few time series and large cross sections (individual companies). Using this panel method in the estimation of the data obtained will enable us to obtain estimates that are unbiased and efficient since it avoids loss of degree of freedom. Hence, the analytical panel data model to be tested in this study consists of three equations which will be structured as follows:

Setting: $y_{it} = PER_{it}$ and $x_{it} = LEV_{it}$

$$y_{it} = \alpha_i + \beta_{ij} \ x_{it} + \mu_{it} \qquad (5)$$

where: y_{it} is a vector of dependent variables, such that $(y_{it})^1 = (ROA, ROE, Tobin's Q)^I$; x_{it} is a vector of the explanatory variables, such that $(x_{it})^1 = (Lev1, Lev2, Lev3)^I$; $i = 1, \ldots, 101$; $j = 1, \ldots, 4$; and $t = 2003–2007$.

Two different analytical techniques were employed in this study. They include the use of descriptive statistics and an econometric technique of the panel data method.[1] The regression model will take the form of the fixed effects model, random effects model and the pooled ordinarily least squares (POLS) model in order to establish the most appropriate regression with the highest explanatory power that is better suited to the data set employed in the study, that is, a balanced panel (Greene, 2003; Chen, 2004; Salawu, 2007).

4. Estimation and Interpretation of Results

The paper employed the use of econometric tools in the analyses of the variables shown in the model. The data used in the estimation were sourced from the Nigerian Stock Exchange Factbook and individual firms' annual reports for the period 2003–2007. From the population of 226 firms from 32 subsectors listed on the Nigerian Stock Exchange (NSE) market, a sample of 101 non-financial quoted companies from 26 subsectors were purposively selected for analysis. The E-views package was used in the estimation process and results are presented in tables.

4.1 Descriptive Statistics

Table 1 reports the summary statistics for the variables used in the study. A critical examination of the descriptive statistics for the dependent and explanatory variables reveals several issues. The first accounting measure of performance (ROA) shows that Nigerian companies have a very low accounting performance. The very high ratio of ROE of 457 per cent recorded may reflect the impact of a relatively small number of very large corporate conglomerates that control a large percentage of the Nigerian public corporations. Some of these conglomerates maintain tight control by selecting boards of directors that are dominated by insiders. The high average return to equity may also reflect the lower corporate income tax rate to which Nigerian firms are subject, compared to the corporate tax rate paid in other economies. For instance, the corporate tax rate for large firms in Nigeria is 30 per cent (Chartered Institute of Taxation of Nigeria), compared with 35 per cent for large firms in US (Don Moyer, 2009).

The measure of market performance (Tobin's Q) also shows a high percentage of performance when compared with the accounting measure. The average value for Tobin's Q is 93.32 per cent. This high ratio for the market performance measure could be as a result of the increase in firms' share prices and equity without any increase in the real activities performance of the firms. This result therefore reveals that the companies under review will prefer less debts and more equity and this is evidenced by the high percentage value of ROE and Tobin's Q.

Table 1: Descriptive statistics for dependent and explanatory variables (2003–2007)

Variables	Obs	Mean	Median	Std Dev.	Minimum	Maximum
ROA	505	0.0804	0.0927	0.4480	−6.0208	3.7104
ROE	505	4.5907	0.7070	77.3011	−696.3400	1558.6100
TOB Q	505	0.9332	0.7038	0.9872	0.0871	7.1684
Lev1	505	0.7350	0.5210	0.9195	0.0143	6.8064
Lev2	505	0.2757	0.1377	0.4704	0.0000	6.5521
Lev3	505	0.4592	0.2642	0.6930	0.0000	5.5809
SIZE	505	6.1719	6.3017	1.2999	0.0000	8.1378

Note: *ROA* = the return on assets (EBIT/total assets); *ROE* = return on equity (EBIT/total assets); *Tob Q* (Tobin's Q) = Market value of equity + book value of debt/book value of assets; *Lev1* = total debt divided by total assets (TDTA); *Lev2* = long-term debt divided by total assets (LTDTA); *Lev3* = short-term debt divided by total assets (STDTA); *SIZE* = log of turnover.

A quick review of the measures of leverage shows that the total liabilities of the firms on average amount to about 74 per cent of total assets value. Examining the second measure of leverage—long-term debt to total assets (LTDTA)—the reported mean value of 27.6 per cent for Nigerian firms is low when compared to firms in developed countries. US companies have about three-quarters of their debt in long term while the ratio for Germany firms is 55 per cent (Claessens *et al.*, 1998). This supports earlier studies that have been conducted on Nigerian firms (see Salawu, 2007). The result also suggests that large and small firms have particular difficulty in accessing long-term finance with low and declining leverage ratios. This could also be attributed to the low return on assets recorded because long-term finance is needed for capital projects. However, in contrast to Salawu's (2007) results that showed a very close standard deviations between TDTA and LTDTA values, this study revealed that the standard deviation of the second measure of leverage—LTDTA of 0.4704—is significantly different from the standard deviation of TDTA of 0.9195. This observation predicts that companies in every stock market do reflect large differences in their long-term debt holding. The mean value of the short-term debt to total assets (STDTA) of 45.92 per cent as compared to 27.57 per cent mean value of the long-term debt shows that debt financing for listed companies in the sample corresponds mainly to a short-term nature. This reveals a salient fact that Nigerian firms are either financed by equity capital or a mix of equity capital and short-term financing. This short-term leverage mean value of 45.92 per cent is, however, lower than the mean value of 60 per cent reported by Salawu (2007). The companies also experienced high growth in size up to 8.13 per cent maximum value and there was no decrease in size growth for the period studied. It could, however, be noted that this growth in size did not really translate to higher returns as the companies recorded low average returns (ROA) for the period.

4.2 Correlation Matrix

The correlation matrix for the variables is reported in Table 2 in order to examine the correlation that exists among variables.

The results show that there is a negative relationship between ROA and three of the explanatory variables, that is, the three measures of leverage—total leverage, long-term leverage and short-term leverage, which ranges from 15.48 per cent to 49.49 per cent. However, it is positively correlated with size of the firms at 22.15 per cent. The return on equity (ROE) is also negatively correlated with all the explanatory variables except size but at a lower percentage of 1.55 per cent. These results imply that leverage has a negative influence on the accounting performance of Nigerian firms.

The market performance measure, Tobin's Q, is positively correlated with the three leverage measures and size with high coefficients ranging from 96.62 per cent to 33.6 per cent. This result implies that leverage has a positive strong degree of association with the market performance of Nigerian firms. The results further show that size has a positive relationship with the two accounting performance measures (ROA and ROE) as well as the market performance measure (Tobin's Q). This implies that Nigerian firms (which are small relative to firms in a developed economy) have high opportunity for growth in size which is consistent with Myers (1984). Size, however, has a negative relationship with all leverage ratios. This is contrary to the findings of Tian and Zeitun (2007) who reported a positive relationship between size and all leverage ratios, but supports the findings of Salawu (2007) who reported a negative relationship between size and short-term leverage in his study of the capital structure of selected quoted companies in Nigeria. This implies that Nigerian companies tend to have a lower leverage ratio when they get

Table 2: Correlation matrix of the variables (2003–2007)

	ROA	*ROE*	*TOB*	*TDTA*	*LTDTA*	*STDTA*	*SIZE*
ROA	1.0000						
ROE	0.0639	1.0000					
TOB Q	−0.3665	−0.0688	1.0000				
TDTA	−0.3721	−0.0623	0.9663	1.0000			
LTDTA	−0.4994	−0.0584	0.6705	0.6781	1.0000		
STDTA	−0.1548	−0.0429	0.8271	0.8666	0.2209	1.0000	
SIZE	0.2218	0.0155	0.3360	−0.2697	−0.2521	−0.1867	1.0000

Note: *ROA* = the return on assets (EBIT/ total assets); *ROE* = return on equity (EBIT/total assets); *Tob Q* (Tobin's Q) = Market value of equity + book value of debt/book value of assets; *Lev1* = total debt divided by total assets (TDTA); *Lev2* = long-term debt divided by total assets (LTDTA); *Lev3* = short term debt divided by total assets (STDTA); *SIZE* = log of turnover.

larger in size. It can also be seen from Table 2 that most cross-correlation terms for the independent variables are fairly small, thus giving little cause for concern about the problem of multicollinearity among the independent variables.

4.3 Regression Results

The results of the pooled ordinary least squares, fixed effects and the random effects estimation models for the panel data for each of the performance measures and for the full sample of observations for the period 2003 to 2007 are displayed in Tables 3–8. The regression model results using return on equity (ROE) is not significant using any measure of capital structure and hence is not reported and not fully discussed. These results make the ROA and the Tobin's Q the most useful and powerful measures of performance in the Nigerian case. Therefore, the discussion of results is more concentrated and centred on these two measures of performance.

Table 3: Estimation results for Tobin's Q using TDTA

Dependent variable: *TOB*

Independent variables	Fixed effects	Random effects	Pooled OLS
Constant	0.2632	0.3563	0.5692
	(-2.4153)**	(4.1274)***	(4.3276)***
TDTA	1.0008	1.0014	1.0139
	(5.869)***	(6.204)***	(6.058)***
SIZE	0.0106	0.0257	0.0618
	(0.6133)	(1.9962)**	(3.2771)**
No. of observations	505	505	505
Adjusted R^2	0.9856	0.9669	0.9397
F-statistics	340.15	736.98	393.03
Prob. (*F*-statistics)	(0.0000)	(0.0000)	(0.0000)
D-Watson statistics	1.7661	1.4088	1.3616
Hausman χ^2 test	6.114	3.2433	3.2212
p-value (χ^2)	(0.047)**	(0.1976)	(0.1998)

Note: *** Significant at 1% level; ** Significant at 5% level and * Significant at 10% level. Numbers in parentheses are the asymptotic *t*-values of the coefficient. *TOB* (Tobin's Q) = Market value of equity + book value of debt/book value of assets; *TDTA* = total debt divided by total assets; *SIZE* = log of turnover.

Table 4: Estimation results for Tobin's Q using LTDTA

Dependent variable: *TOB*

Independent variables	Fixed effects	Random effects	Pooled OLS
Constant	1.3555	1.4028	1.407
	(2.6614)***	(4.1673)***	(4.1623)***
LTDTA	1.2307	1.2615	1.3127
	(5.227)***	(6.4157)***	(7.4158)***
SIZE	0.1234	0.1325	0.1354
	(1.5943)	(2.6892)***	(2.7147)***
No. of observations	505	505	505
Adjusted R^2	0.6945	0.4886	0.4772
F-statistics	12.232	190.26	231.03
Prob. (*F*-statistics)	(0.0000)	(0.0000)	(0.0000)
D-Watson statistics	1.5899	1.2792	1.7499
Hausman χ^2 test	0.3966	0.4996	0.4979
p-value (χ^2)	(0.8301)	(0.7790)	(0.7796)

Note: *** Significant at 1% level; ** Significant at 5% level and * Significant at 10% level. Numbers in parentheses are the asymptotic *t*-values of the coefficient. *TOB* (Tobin's Q) = Market value of equity + book value of debt/book value of assets; *LTDTA* = long-term debt divided by total assets; *SIZE* = log of turnover.

4.4 Discussion on Findings

From the regression results in Table 6, Table 7 and Table 8, as expected the coefficients of the leverage measures TDTA and LTDTA are significantly and negatively related to the accounting measure ROA. These results show that a higher level of leverage leads to a lower ROA. Furthermore, it may provide support for the proposition that due to agency conflicts, companies over-leverage themselves, thus affecting their performance negatively. These findings are consistent with the finding of previous studies such as Tian and Zeitun (2007), Salawu (2007), Chen (2004), Tzelepis and Skuras (2004), Gleason *et al*. (2000), Krishnan and Moyer (1997) and Rajan and Zingales (1995) among others. The negative and significant coefficient of LTDTA does not support Brick and Ravid's (1985) argument that long-term debt increases a firm's value, which could, however, be due to

Table 5: Estimation results for Tobin's Q using STDTA

Dependent variable: *TOB*

Independent variables	Fixed effects	Random effects	Pooled OLS
Constant	1.2812	1.2958	1.2967
	(2.909)***	(3.9363)***	(4.3743)***
STDTA	1.1001	1.1065	1.1283
	(5.0124)***	(5.1756)***	(6.6343)***
SIZE	0.1383	0.1411	0.1428
	(1.916)*	(2.7233)***	(3.0831)***
No. of observations	505	505	505
Adjusted R^2	0.8771	0.7764	0.7171
F-statistics	36.26	74.26	63.99
Prob. (*F*-statistics)	(0.0000)	(0.0000)	(0.0000)
D-Watson statistics	2.3247	1.8679	1.8098
Hausman χ^2 test	0.8158	0.3493	0.0839
p-value (χ^2)	(0.6650)	(0.8397)	(0.9589)

Note: *** Significant at 1% level; ** Significant at 5% level and * Significant at 10% level. Numbers in parentheses are the asymptotic *t*-values of the coefficient. *TOB* (Tobin's Q) = Market value of equity + book value of debt/book value of assets; *STDTA* = short-term debt divided by total assets; *SIZE* = log of turnover.

Table 6: Estimation results for ROA using TDTA

Dependent variable: *ROA*

Independent variables	Fixed effects	Random effects	Pooled OLS
Constant	0.2061	–0.0404	–0.0776
	(0.5240)	(–0.1940)	(–0.4320)
TDTA	–0.2258	–0.1773	–0.1641
	(–1.6132)	(–1.8662)*	(–1.833)
SIZE	0.0065	0.0407	0.0451
	(0.1344)	(1.6012)	(2.0316)**
No. of observations	505	505	505
Adjusted R^2	0.4022	0.1479	0.1544
F-statistics	2.6512	43.5601	45.8274
Prob. (*F*-statistics)	(0.0000)	(0.0000)	(0.0000)
D-Watson statistics	2.4103	1.9452	1.7447
Hausman χ^2 test	0.6185	63.8499	0.4077
p-value (χ^2)	(0.600)	(0.00)***	(0.8931)

Note: *** Significant at 1% level; ** Significant at 5% level and * Significant at 10% level. Numbers in parentheses are the asymptotic *t*-values of the coefficient. *ROA* = the return on assets (EBIT/ total assets); *TDTA* = total debt divided by total assets; *SIZE* = log of turnover.

the lower ratio of long-term debt in the capital structure of Nigerian companies. These findings support the pecking order theory of capital structure which suggests that profitable firms initially rely on less costly internally generated funds before looking out for external finances. It is, therefore, expected that highly profitable Nigerian firms will require less debt finance. The significant negative relationship further reflects that the bond market in the Nigerian economy might be underdeveloped and is consistent with signs of an underdeveloped bond market in all markets. It could also be due to decisions by the firms to avoid underinvestment problems and mispricing of new projects. More so, listed firms in Nigeria are most times attracted by equity finance due to the substantial capital gains in the secondary market. Hence, there could be a little deviation from the reasons proposed by the pecking order theory. It is interesting to note, however, that there is empirical evidence of a highly positive relationship between the firms' leverage and their market performance measure, Tobin's Q, indicating that higher levels of debt in

Table 7: Estimation results for ROA using LTDTA

Dependent variable: *ROA*

Independent variables	Fixed effects	Random effects	Pooled OLS
Constant	0.4415	0.0661	–0.0132
	(1.3243)	(0.3038)	(–0.0709)
LTDTA	–0.6960	–0.5184	–0.4509
	(–3.312)***	(–2.5515)**	(–2.4384)**
SIZE	–0.0275	0.0254	0.0353
	(–0.5617)	(0.8746)	(1.4252)
No. of observations	505	505	505
Adjusted R^2	0.525	0.2703	0.259
F-statistics	4.3555	92.978	87.821
Prob. (*F*-statistics)	(0.0000)	(0.0000)	(0.0000)
D-Watson statistics	2.1941	1.7872	1.5662
Hausman χ^2 test	0.7085	25.5321	25.3484
p-value (χ^2)	(0.1116)	(0.00)***	(0.00)***

Note: *** Significant at 1% level; ** Significant at 5% level and * Significant at 10% level. Numbers in parentheses are the asymptotic *t*-values of the coefficient. *ROA* = the return on assets (EBIT/ total assets); *LTDTA* = long-term debt divided by total assets; *SIZE* = log of turnover.

Table 8: Estimation results for ROA using STDTA

Dependent variable: *ROA*

Independent variables	Fixed effects	Random efects	Pooled OLS
Constant	−0.2441	−0.3036	−0.03098
	(−1.4846)	(−3.2632)***	(−3.442)***
STDTA	−0.0855	−0.0779	−0.075
	(−1.1252)	(−1.365)	(−1.4151)
SIZE	0.0589	0.068	0.0688
	(2.3790)**	(4.9331)***	(5.1475)***
No. of observations	505	505	505
Adjusted R^2	0.3189	0.4745	0.5878
F-statistics	1.846	13.5525	16.7398
Prob. (*F*-statistics)	(0.000016)	(0.000002)	(0.0000)
D-Watson statistics	2.4529	1.9712	1.7814
Hausman χ^2 test	0.8032	1.0254	0.2011
p-value (χ^2)	(0.6692)	(0.5989)	(0.9044)

Note: *** Significant at 1% level; ** Significant at 5% level and * Significant at 10% level. Numbers in parentheses are the asymptotic *t*-values of the coefficient. *ROA* = the return on assets (EBIT/total assets); *STDTA* = short-term debt divided by total assets; *SIZE* = log of turnover.

the capital structure of Nigerian firms are associated with a higher level of market performance as measured by Tobin's Q as shown in Tables 3–5. This empirical evidence shows that the impact of leverage varies among different performance measurements for Nigerian firms. The positive relationship further suggests that debt improves the market performance of Nigerian firms which may not reflect on their profitability. This empirical evidence of a significant relationship between firms' leverage and Tobin's Q as a market performance measure supports the static tradeoff theory of capital structure. These findings indicate that leverage negatively affects the accounting performance measure but positively affects the market performance measure. Based on this discussion, therefore, we come to two conclusions:

1. The study accepts the null hypothesis that a firm's capital structure has a negative influence on its accounting performance ROA.
2. This study also rejects the null hypothesis that a firm's capital structure has a negative influence on its market performance Tobin's Q.

From the regression results in Table 5 and Table 8, the coefficients of the short-term leverage STDTA are contrary to the prediction under the different regression models. Though the STDTA shows a negative relationship as expected, the relationship is not significant with the accounting measure ROA. The insignificant relationship with the performance measure ROA indicates that short-term debt has no significant impact on returns of Nigerian companies. However, while STDTA is found to have an insignificant negative effect on ROA, it has a highly significant positive relationship with Tobin's Q using the different estimation models. These findings indicate that the STDTA ratio has no significant effects on the accounting performance of Nigerian companies which suggests that short-term debt may not necessarily expose these firms to the risk of refinancing as it does for firms in a developed economy. This supports the arguments of Myers (1984) that firms with high short-term debt to total assets have a high growth rate and high performance. This finding is contrary to the findings of Pandey (2001), and Stohs and Mauer (1996). Interestingly, the highly significant positive relationship between STDTA and Tobin's Q indicates that a higher level of short-term debt in the capital structure of Nigerian firms is associated with a higher market performance. Therefore, the hypothesis that short-term debt decreases firm performance is rejected and the study concludes that short-term debt increases the market performance of Nigerian firms.

The coefficient of firm's size is found to be positive and highly significant for both the accounting performance measure and the market performance measure. The significance of firm's size on performance indicates that large firms earn higher returns compared to smaller firms, presumably as a result of diversification of investment and economies of scale. This result is consistent with previous findings such as Tian and Zeitun (2007), Gleason *et al.* (2000) and Krishnan and Moyer (1997). The significant positive relationship does not support the findings of Tzelepsis and Skuras (2004), Durand and Coeurderoy (2001), Lauterbach

and Vaninsky (1999) and Mudambi and Nicosia (1998). It can also be observed from Table 8 that the best significant results for size are recorded in the ROA model with short-term leverage (STDTA). This may suggest the fact that larger firms are more able to access short-term debts from banks and also extract trade credits from suppliers. This could also indicate that larger firms are perceived to have lower default risk. Going by this discussion, the null hypothesis of a negative influence of size on firm's performance is therefore rejected and this paper concludes that the size of Nigerian firms has a positive impact on their performance.

5. Conclusion

A remarkable difference between the capital structure of Nigerian firms and firms in developed economies is that Nigerian firms presumably prefer short-term finance and have substantially lower amounts of long-term debt. This reveals that Nigerian firms rely heavily on short-term financing rather than long-term finance. This difference in long- versus short-term debt, to an extent, might limit the explanatory power of the capital structure theories in Nigeria. It suggests that the theoretical underpinnings of the observed correlations are still largely unresolved.

The results of this empirical study suggest that some of the insights from modern capital structure theories are portable to Nigeria in that certain firm-specific factors that are relevant for explaining capital structure and corporate performance in the Western countries are also relevant in Nigeria. This is true despite profound institutional differences that exist between Nigeria and the Western countries. Overall, the empirical results from this study offer some support for the pecking order theory and static tradeoff theory of capital structure. Therefore, in line with the findings of this study, it is suggested that Nigerian firms should try to match their high market performance with real activities that can help make the market performance reflect on their internal growth and accounting performance. The firms should rely less on short-term debt, which forms the major part of their leverage, and focus more on developing internal strategies that can help improve their accounting performance as their accounting performance for the period studied was very low. The firms should also use more of equity to maximize their market performance in such a way that it yields growth opportunities.

Notes

1. Further research could be done to evaluate the presence of measurement errors (see Racicot and Theoret, 2012).

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