Effect of capital structure on firm performance: Evidence from Nigerian manufacturing industry

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Abstract: Capital structure decision is fundamental for the survival of business organizations. Previous researchers have reported conflicting results on the relationship between capital structure and performance. Thus, this study examines the effect of capital structure on firm performance in Nigeria. Data were obtained from annual reports of the companies from 2007-2011. Correlation analysis was employed in analyzing the data. The findings revealed that that each of DC, DCE, SDTD and AGE is significantly and positively related to ROE. Meanwhile, LDC is significantly but negatively related to ROE. Similarly, each of DC, DCE, SDTD and AGE is significantly and positively related to ROA. However, LDC is significantly and negatively related to ROA. The hypotheses tested confirmed that there is significant relationship between capital structure and financial performance using both ROA and ROE. The study contributes to the body of knowledge in financial management. Future researchers could carry out similar studies in small and medium scale industry.

Key words: Performance, Firm Survival, Shareholders’ Wealth, Capital Structure.
1. Introduction:

Capital structure represents a firm's financial framework which consists of the debt and equity used to finance the firm. Firms’ ability to carry out their stakeholders’ requirements is closely related to capital structure. Therefore, this foundation is an imperative piece of information that should not be disregarded. Capital structure in financial term means the way firms finance their assets through the mixture of equity, debt, or hybrid securities (Saad, 2010). In a nutshell, capital structure is a mixture of a company's debts (long-term and short-term), common equity and preferred equity (Akintoye, 2008). Capital structure is fundamentally on how a firm finances its overall operations and growth by using diverse sources of funds (Tsuji, 2011). The foremost contemporary theory of capital structure started with the article of Modigliani and Miller (1958). Since, then, various studies have been carried out to investigate the optimal capital structure in the absence of Modigliani-Miller’s assumption.

According to MM Theorem, capital structure theories function under perfect market condition. Different assumptions of perfect market have been identified and they include: absence of taxes, rational investors, perfect competition, absence of bankruptcy costs and efficient market. The theorem opines that capital structure of an organization is not connected to its worth in perfect market. In actual fact, capital structure of an organization is not easy to establish. Financial managers find it difficult to exactly determine the optimal capital structure. An incorporated organization has to issue a variety of securities in a numerous combination to come across particular combinations that can maximum its general worth which means optimal capital structure. Optimal capital structure implies that with a smallest amount weighted-average cost of capital there is maximization of the worth of the organizations. Although optimal capital structure is a concept that has been researched on severally, yet one cannot find any formula or theory that with certainty provides optimal capital structure for an organization (Tian and Zeitun, 2007).

Moreover, according to Barbosa and Louri (2005) various measures of performance have been identified in the literature, these include: productivity, profitability, customers’ satisfaction, etc.; these variables are inter-related in one way or the other. Meanwhile, financial measures are indicators of financial strength, weaknesses, opportunities and threats of any firm. The proxies of financial performance include: return on assets, return on investment, residual income, dividend per share and earning per share, among others.
1.1. Statement Of Problem:

Warokka, Herrera and Abdullah (2011) observed that the subject of optimal capital structure has been the focus of several studies. Capital structure of a firm is a blend of debt and equity employed in financing its operations. The capital structure decision is critical for the continued existence of any business organization as to the maximization of returns to stakeholders (Akintoye, 2008). Literature revealed that several studies have been carried out to investigate the relationship that exists between capital structure and performance (Onaolapo and Kajola, 2010; Warokka et al., 2011). However, the results of these previous studies have been conflicting. While some researchers reported positive relationship between capital structure and performance (Akintoye, 2008; Dare and Sola, 2010), others reported negative relationship (Iorpev and Kwanum, 2012). Yet still, some researchers reported that no relationship exists between capital structure and performance (Prahalathan and Ranjan, 2011). Thus, the relationship that exists between capital structure and performance remain controversial and open to further research.

1.2. Objective Of The Study:

The main objective of this study is to examine whether or not a relationship exists between capital structure and financial performance of firms in the Nigerian Manufacturing Industry. Specifically the study sets out to:

(i) Examine the nature of relationship that exist between capital structure and financial performance of firms in the Nigeria manufacturing industry between 2007 and 2011.
(ii) Identify the interdependence between capital structure and financial performance of firm in the Nigeria manufacturing industry between 2007 and 2011.

1.3. Research Questions:

In order to pursue the objectives, the following research questions have been raised:

i. Is there any relationship between capital structure and corporate financial performance of firms in the Nigerian Manufacturing Industry?
ii. What is the nature of relationship that exists between capital structure and corporate financial performance of firms in the Nigerian Manufacturing Industry?
2. Review Of Related Literature:

There are many variables in a capital structure choice and structure of debt maturity which will affect a company’s performance (San and Heng, 2011). Debt maturity will influence a company’s option in investing. Furthermore, tax rate will also affect company’s performance. In the case of this, examine the impact of capital structure’s variables base on company’s performance will present prove for a company’s performance due to the effect of capital structure (Tian and Zeitun, 2007). A study had been done by Abor (2005) on the influence of capital structure on profitability of listed companies on the Ghana Stock Exchange during a five-year period. He found out that there is significant positively interrelated between SDA and ROE and shows that firms which earn a lot use more short-term debt to finance their business. In other words, short-term debt is an essential source of financing in favour of Ghanaian companies, by representing 85 percent of total debt financing. Yet, the results showed the adverse relation between LDA and ROE. The regression output showed that there is positive relationship between DA and ROE which measure the relationship between total debt and profitability. This indicates that firms which earn a lot are depending on debt as their key financing option.

Akintoye (2008) carried out a study on the sensitivity of performance to capital structure on selected companies in Nigeria. The study used Earnings before Interest and Taxes (EBIT), Earning Per Share (EPS) and Dividend Per Share (DPS) as measures of performance; and Degree of Operating Leverage (DOL), Degree of Financial Leverage (DFL) as measures of leverage. Ordinary least square model was used to estimate the regression equation and the results showed positive associations between debt ratio, firm size and growth, while asset tangibility, risk, corporate tax and profitability regularly related to debt ratio.

San and Heng (2011) conducted investigation on the relationship between capital structure and performance of Malaysian Construction sector. The result revealed a mixed relationship between the variables investigated. While for the big companies, the result showed a positive relationship between ROC and DEMV on one hand; and EPS and LDC on the other hand. Never the less, a negative relationship was reported between EPS and DC. Meanwhile, for medium size companies, a positive relationship was reported between OM and LDCE. However, a negative relationship was reported between EPS and DC in small size companies.

Ahmad et al., (2012) examined capital structure effect on performance of Malaysian Consumer and Industrial sectors. The study used return on asset (ROA) and return on equity
(ROE) as proxies for performance; and short-term debt (STD), long-term debt (LTD) and total debt (TD) as proxies for capital structure. Four variables found by literature to have an influence on firm operating performance, namely, size, asset grow, sales grow and efficiency, were used as control variables. 58 firms were identified as the sample firms and financial data from the year 2005 through 2010 were used as observations for this study, resulting in a total numbers of observations of 358. A series of regression analysis were executed for the models. Lag values for the proxies were also used to replace the non lag values in order to ensure that any extended effect of capital structure on firm performance was also examined. The result revealed that only STD and TD have significant relationship with ROA while ROE has significant on each of debt level. However, the analysis with lagged values shows that none of lagged values for STD, TD and LTD has significant relationship with performance.

There exists various theoretical frameworks on capital structure, but two main theories have been identified by previous researchers to guide discussions on capital structure (Prahalathan and Ranjan, 2011). These theories include the static trade-off theory and pecking order theory. The trade-off theory asserts that firm’s most favourable capital structure could be determined by the trade-off among the effects of corporate and personal taxes, bankruptcy costs and agency costs (Abor, 2005). The benefits of debt include tax savings brought about by the deductibility of interest expenses from profit-before-tax of the organization, reduction of agency cost through the threat of liquidation which causes personal losses to managers of salaries, reputation, perquisites (Frank and Goyal, 2003). Therefore more profitable business organizations have higher income to shield and should borrow more to take tax advantages. Thus, according to trade-off theory a positive relationship could be expected between debt level and firm’s performance. Some previous studies provide empirical evidence supporting this relationship (Tian and Zeitun, 2007; Tsuji, 2011).

Meanwhile, the pecking order theory, developed by Myers (1984) has asymmetric information as the base of its choice of financing. According to Frank and Goyal (2003), the main conclusion drawn from the pecking order theory is that there is a hierarchy of firm’s preference with respect to the financing of their investment. That is, issuing new shares may harm existing shareholders through value transfer from old to new shareholders. So, managers will prefer financing new investments by internal sources (i.e. retained earnings) first, if this source is not sufficient then managers seek for external sources from debt as second and equity as last. Thus, according to the pecking order theory firms that are profitable and, therefore, generate high earnings to be retained are expected to use less debt in
their capital structure than those that do not generate high earnings, since they are able to finance their investment opportunities with retained earnings.

3. Methodology:

Three manufacturing companies were selected randomly from the Food and Beverages categories. These include: Guinness Nigeria Plc, Honey Well Flour Mills Plc, and Tantalizers Plc. Data were obtained from 5 years audited financial statements (2007-2011) of the selected manufacturing companies. The variables of the study consist of dependent variables which include ROA and ROE as measures of financial performance and the independent variables which include LDC, DC, DCE and SDTD as measures of capital structure. Meanwhile, the age of firm represents the control variable, measured by the number of years in which the company has been in existence as an incorporated entity.

The models below have been formulated so as to be able to test the hypotheses.

\[
\begin{align*}
\text{ROE}_{it} &= \beta_0 + \beta_1 \text{LDC}_{it} + \beta_2 \text{DC}_{it} + \beta_3 \text{DCE}_{it} + \beta_4 \text{SDTD}_{it} + \beta_5 \text{AGE}_{it} + \epsilon_{it} \\
\text{ROA}_{it} &= \beta_0 + \beta_1 \text{LDC}_{it} + \beta_2 \text{DC}_{it} + \beta_3 \text{DCE}_{it} + \beta_4 \text{SDTD}_{it} + \beta_5 \text{AGE}_{it} + \epsilon_{it}
\end{align*}
\]

Where: \(\text{ROE}_{it}\) = Return on Equity for firm \(i\) at time \(t\) (in years), used as a proxy for performance; \(\text{ROA}_{it}\) = Return on Asset for firm \(i\) at time \(t\) (in years), used as a proxy for performance; \(\text{LDC}_{it}\) = Long-term Debt to Capital; \(\text{DC}_{it}\) = Debt to Capital; \(\text{DCE}_{it}\) = Debt to Common Equity; \(\text{SDTD}_{it}\) = Short-term Debt to Total Debt; \(\text{AGE}_{it}\) = Age of the Firm (Control variable); \(\epsilon_{it}\) = Stochastic or disturbance term; \(\beta_0\) = Constant or Intercept; \(\beta_1, \ldots, \beta_5\) = Coefficients to be estimated or the Coefficients of slope parameters.

Two hypotheses formulated in this study are as follows:

- \(H_{Oi}\): There is no significant relationship between capital structure and corporate financial performance using ROE.
- \(H_{Oii}\): There is no significant relationship between capital structure and corporate financial performance using ROA.

There is a relationship between capital structure and corporate financial performance of a company if \(\beta\) is positive or negative and statistically significant at the confidence level of 95%.
4. Analysis And Discussions:

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Min.</th>
<th>Max.</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>1.07112</td>
<td>0.8671</td>
<td>1.3408</td>
<td>0.239827</td>
</tr>
<tr>
<td>ROE</td>
<td>2.05062</td>
<td>1.9265</td>
<td>2.2245</td>
<td>0.136689</td>
</tr>
<tr>
<td>LDC</td>
<td>0.44946</td>
<td>0.3297</td>
<td>0.7103</td>
<td>0.150215</td>
</tr>
<tr>
<td>DC</td>
<td>1.2661</td>
<td>1.0255</td>
<td>1.4141</td>
<td>0.145479</td>
</tr>
<tr>
<td>DCE</td>
<td>1.2661</td>
<td>1.0255</td>
<td>1.4141</td>
<td>0.145479</td>
</tr>
<tr>
<td>SDTD</td>
<td>0.6461</td>
<td>0.4666</td>
<td>0.7198</td>
<td>0.102861</td>
</tr>
<tr>
<td>AGE</td>
<td>1.76332</td>
<td>1.7482</td>
<td>1.7782</td>
<td>0.011859</td>
</tr>
</tbody>
</table>

*Source:* Audited annual reports for the various years.

*Table 1: Summary of Descriptive Statistics*

Table 1 provides a summary of the descriptive statistics for the dependent and independent variables for the sample of firms. It shows that return on assets (ROA) for the sample has an average value 1.07112 and a standard deviation of 0.239827. The highest ROA is 1.3408 and the lowest ROA is 0.8671. The average return on equity (ROE) is 2.05062 with a standard deviation of 0.136689. The highest of value for ROE is 2.2245 and the lowest is 1.9265.

Long-term debt to capital (LDC) which is measured by the ratio of long-term debt to total capital has an average value of 0.44946. Its standard deviation is 0.150215, while the maximum value is 0.7103 while the lowest value is 0.3297. The average debt to capital (DC), measured by the ratio of total debt to total capital, is 1.2661, and its standard deviation is 0.145479. The minimum value DC is 1.0255, while the maximum value is 1.4141. The total debt to equity capital (DCE) has a mean score of 1.2661 and standard deviation of 0.145479. Meanwhile the highest DCE score is 1.4141 and the lowest is 1.0255. The short term debt to total debt (SDTD) has a mean value of 0.6461 and a standard deviation of 0.102861. Meanwhile, it has a minimum value of 0.4666 and a maximum value of 0.7198. For age (AGE), measured by the logarithm of number of years of incorporation, the mean score is 1.76332 and the range is from a low 1.7482 to the highest 1.7782. The standard deviation for age is 0.011859.
Table 2: Pearson Correlation Matrix among the Variables

<table>
<thead>
<tr>
<th></th>
<th>ROA</th>
<th>ROE</th>
<th>LDC</th>
<th>DC</th>
<th>DCE</th>
<th>SDTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROE</td>
<td>0.992489</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LDC</td>
<td>-0.38993</td>
<td>-0.37034</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC</td>
<td>0.475898</td>
<td>0.431189</td>
<td>0.416132</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCE</td>
<td>0.918108</td>
<td>0.934102</td>
<td>-0.08231</td>
<td>0.654307</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SDTD</td>
<td>0.587769</td>
<td>0.552525</td>
<td>-0.95269</td>
<td>-0.12021</td>
<td>0.313815</td>
<td>1</td>
</tr>
<tr>
<td>AGE</td>
<td>0.885953</td>
<td>0.895059</td>
<td>-0.73366</td>
<td>0.062629</td>
<td>0.715693</td>
<td>0.825775</td>
</tr>
</tbody>
</table>

Source: Audited annual reports for the various years.

Pearson correlation analysis shows the results as in Table 2. In this study, it studies seven interval-level variables and estimates the relationships among all of them. Correlation analyses provide early sign that each of DC, DCE, SDTD and AGE is significantly and positively related to ROE with r values of 0.431189, 0.934102, 0.895059 and 0.552525 respectively. Meanwhile, LDC is significantly but negatively related to ROE with r value of -0.37034.

Similarly, each of DC, DCE, SDTD and AGE is significantly and positively related to ROA with r values of 0.475898, 0.918108, 0.918108 and 0.885953 respectively. However, LDC is significantly and negatively related to ROA with r value of -0.38993. Finally, the analysis also shows that there is significant correlation between several independent variables such as between DC and LDC on one hand, and DC and DCE on the other indicating possible multicollinearity problem.
### Table 3: Output of Regression Analysis with ROA as Dependent Variable

<table>
<thead>
<tr>
<th>Model 2 Coefficient (P-value)</th>
</tr>
</thead>
</table>
| **Constant**                | 0.1416 \( (0.127) \)  
| **LDC**                     | -30.986 \( (0.083) \)  
| **DC**                      | 9.349112 \( (0.265) \)  

*Source: Audited annual reports for the various years.*
DCE | 0.023964 (0.098)  
SDTD | -41.3655 (0.023)  
AGE | 10.31661  
$R^2$ | 0.801131  
F-Stat | 12.08528  

**Source:** Audited annual reports for the various years.

**Table 4: Output of Regression Analysis with ROE as Dependent Variable**

F-test is used to test the hypothesis that the variation in the independent variable explained a significant portion of the variation in the dependent variable in the overall model. The F-tests as shown in Table 3 and 4 indicate that all the models are significant in explaining the firms' performance, furthermore the explanatory power of the models as shown by the adjusted $R^2$-square value is very high, ranging from only 78% to 80%. This connotes that 78% and 80% variations in performance respectively were explained by capital structure.

5. Conclusion:

The objective of this study is to examine the effect of capital structure on firm performance among quoted manufacturing companies in Nigeria. Literature was reviewed to identify the measures of capital structure and financial performance. Subsequently, return on asset (ROA) and return on equity (ROE) were used as the measures of firm performance. Capital structure is represented by Long-term Debt to Capital (LDC), Debt to Capital (DC), Debt to Common Equity (DCE), and Short-term Debt to Total Debt (SDTD); meanwhile, age of the firm is used as control variable. Two regression models were utilized, one with ROA as the dependent variable and the other one with ROE as the dependent variable, to assess the effect of debt on firm performance. Regression analysis was executed for each model, where either one of the capital structure proxies is included in each analysis. The study shows that the models tested have a very high explanatory power on firm performance. Thus, it could be
concluded that there is significant relationship between capital structure and corporate financial performance using both ROA and ROE.

6. Recommendations

Management should strive to improve on their companies’ financial leverage ratio, as this will go a long way in determining their survival. Future researchers could expand the scope of the study by increasing the sample size and the number of performance indicators. Instead of quoted firms, focus could also be shifted to the study of small and medium scale enterprises. Future researchers could carry out similar studies in small and medium scale industry.
References:


