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# FIRM LEVERAGE AND MARKET VALUE OF QUOTED NIGERIAN PHARMACEUTICAL COMPANIES

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**Abstract**

*There are over 120 pharmaceutical companies in Nigeria and the industry is experiencing an annual growth rate of between 10% and 15% since 2001, and expected to grow at a much faster rate until 2020. Therefore, positive initiatives have to be put in place to boost the pharmaceutical sector of the Nigerian economy. However, major debates have centered on whether there is an optional capital mix (firm leverage) for an individual company, or whether the proportion debt usage is relevant to an individual firm's market value. Therefore, the capital mix decision is significant because it affects the costs of capital and market values of the companies. This study is an attempt to examine firm leverage and its effect on the market value of quoted pharmaceutical companies by using correlation research design for a sample of six (6) quoted pharmaceutical companies listed on the Nigerian Stock Exchange (NSE) between 2007 and 2013. Secondary data was obtained from the annual financial reports and accounts of the quoted companies. The ordinary least squares (OLS) multiple regression technique of data analysis was employed and the results from the regression shows a positive significant relationship between market value and short-term leverage on the one hand and long-term leverage on the other hand. Based on this conclusion the study recommends that pharmaceutical companies should employ both short-term and long-term leveraging in the financing of its operations in order to improve the company's market values.*

**Keywords:** Firm leverage, market value, capital mix, short-term debt, long-term debt.

## 1.1 Introduction

Financing is required to provide for a company's working capital and fixed assets requirements; as such companies finance their investments by increasing either creditors' claims or owners' claims. Creditors' claims are thus increased when companies issue debts, while owners' claims are increased when companies issue equity. The debate over the significance of a company's choice of capital mix concerns its effect on the total market value of the company's combined value of its debt and equity mix. In Nigeria, financial constraints have been one of the major factors that affects company's performance, and according to Salawu and Agboola (2008), the move towards a free market economy coupled with the widening and deepening gaps observed in financial market performance has provided a basis for companies to determine an optimal capital mix. Several theories have emerged explaining company's capital mix and the resulting effects on their market values. However, debates have centered on whether there is an optional capital mix for an individual company or whether the proportion of debt usage is relevant to an individual company's market value, as such, the capital mix decision is significant because it affects both the costs of capital and the market value of associated companies (Baxter, 1967 and Lawal, 2014),.

The corporate sector is characterized by a large number of companies operating in a largely deregulated and increasingly competitive environment (Salawu and Agboola, 2008). A company's choice of capital mix determines the allocation of its operational cash-flows for each period between debt holders and equity holders. Increasing the proportion of debt in the company's capital mix would increase market value up to a point, but beyond that point, further increase in leverage would increase the company's overall cost of capital and decrease market value (Hoque, Hossain and Hossain, 2014). Though, there have been substantial studies to determine what seems to be an optional capital mix for firms, there is yet no universally accepted theory explaining the debt-equity choice for companies (Alfred, 2007; Bokpin and Isshaq, 2008; Isaac, 2014).

However, the extent to which a company's choice of capital mix affects its market value is important given that one of the major challenges faced by the government is the provision of adequate healthcare to its citizens. Unsatisfactory and inadequate access to essential drugs is a key limitation that impacts on people's health. According to a study conducted by United Nations Industrial Development

Organization (UNIDO Report, 2011), there are over 120 pharmaceutical companies in Nigeria, however, only seven (7) are listed on the NSE, even though that the pharmaceutical industry in Nigeria had experienced an annual growth rate of between 10% to 15% since 2001, and it is expected to grow at a much faster rate until 2020 (UNIDO Report, 2011). Therefore positive initiatives have to be put in place to boost the pharmaceutical sector of the economy.

Several foreign studies had established the effects of a company's capital mix on its market value. However, only a limited few had focused on Nigeria companies, and to the best of our knowledge none had attempted to categorize firm leverage into short-term and long-term measures and their relationships (Stulz, 1988; Aggarwal and Kyaw, 2006; Bokpin and Issaq, 2008). The overall objective of this work is to establish the relationship between a firm leverage and its effect on the market value of quoted pharmaceutical companies operating in Nigeria. Thus, the study highlight the following specific objectives as;

(i) examine the effect of short-term debt on the market value of quoted pharmaceutical firms in Nigeria.
(ii) analyze the effect long-term leverage on the market value of quoted pharmaceutical companies in Nigeria.

In line with the above objectives, the following hypotheses would be tested;

**$H_{01}$:** There is no significant relationship between short-term debt and market values of quoted pharmaceutical companies in Nigeria.

**$H_{02}$**: There is no significant relationship between long-term debt and market value of quoted pharmaceutical companies in Nigeria.

## 2.1 Review of Related Literature

Capital structure is the mix of a company's long-term debt, specific short-term debt, common equity and/or preferred equity to achieve an overall operational growth of the company. According to Pandy (2004), capital mix refers to the percentages of capital at work in a business by type. There are thus two forms of capital; equity capital and debt capital. Each has its own benefits and drawbacks, and one of management's objective is to find the perfect capital mix in terms of risk and reward payoff for shareholders. In a study, Alfred (2007) found that a company's capital mix implies the portion of debt and equity in the total capital structure of the company. As such, Pandey (2004) differentiated between capital structure as represented by the proportionate relationship between long-term and equity, while a company's financial structure involves the various methods the company employs to raise funds for its operations. Hence, Stulz (1988) is of the opinion that debt can have both a positive and negative effect on a company's

market value, hence, Aggarwal and Kyaw (2006) concluded that the optimal debt structure is determined by balancing agency costs and other associated costs of debt as a method of alleviating under or over-investment problems.

Parashantini and Nimalathansan (2013) investigated the relationship between capital mix and market value based on a sample of 14 manufacturing firms listed on the Colombo Stock Exchange using three accounting based measures for market value, which are, earnings per share *(EPS),* price earning *(P/E)* ratio and market price per share *(MPS)*. They concluded that there is positive association between debt and *P/E* ratio and a negative association between debt and *MPS*. Similarly Hoque, Hossain and Hossain (2014) in studying the impact of capital structure policy on the market value of the firms analyzed responses of 80 respondents from 20 manufacturing firms listed on the Dhaka Stock Exchange. The study concluded that capital structure had influence on the market value of the listed firms.

In Nigeria, Adeyemi and Oboh (2011) who studied the empirical effects of capital structure on the market value of a selected number of firms listed on the NSE, found a positive significant relationship. Mutaib (2010) similarly examined the impact of corporate capital structure on firm's market value in Nigeria, the study however indicated that the market value of firms in Nigeria is positively and significantly influenced by their choice of capital mix. Again, Lawal (2014) who also examined the relationship between capital structure and the market value of commercial banks in Nigeria, observed that debt as opposed to equity played a significant role in magnifying the market values of the firms. Also Isaac (2014) in identifying the extent to which non-financial firms in Nigeria attain optimal capital mix, found a significant and positive relationship between market value and debt equity ratio of non-financial firms operating in Nigeria.

**2.2 Theoretical Framework**

Several theories such as the pecking order theory, free cash-flow theory, trade-off theory, agency-cost theory and capital-significant theory had been used to explain the nexus between capital structure and market value of firms (Bokpin and Issaq, 2008). The pecking order theory (Donaldson, 1961) modified by Myers and Majluf (1984) emphasized that companies prioritize there sourcing from internal financing to equity according to the cost of financing, preferring to raise debt. Hence, internal funds are utilized and when that is depleted, debt is issued. Where it is not sensible to issue any more debt, equity is issued. The pecking order theory postulates that the cost of financing increases with asymmetric information.

Financing comes from three sources which comprises internal funds, debt and new equity. The free cash flow theory as propended by Jensen (1993) states that managers endowed with free cash flow will invest in a negative net present value *(MPV*) project rather than pay it out to shareholders, as Jensen (1993) defines free cash-flow as cash-flow left over after the firm had invested in all available positive net present value projects. The trade-off theory refers to the idea that a firm chooses how much debt and/or equity financing it can use by balancing the associated costs and benefits. The theory explains that firms are usually financed with part debt because it allows tax benefits and part equity. Though the marginal benefit of further increases in debt declines as debt increases, marginal cost increases so that a firm that is optimizing its overall value will focus on this trade-off when choosing how much debt and equity for financing. In addition, the agency cost theory looks at conflicts between shareholders and managers as propounded by Jensen and Meckling (1976). The theory states that an optimal capital mix will be determined by minimized the cost arising from conflicts between the parties involved, the study further argued that agency costs plays an important role in financing decisions due to conflicts that may exist between shareholders and debt holders.

### 3.1 Methodology and Model Specification

The population of the study consists of all seven (7) quoted pharmaceutical firms listed on the NSE as at 31st December, 2013. However, due to the unavailability of data, one firm was removed and the sample size was reduced to six (6) firms. Secondary data was obtained from the published annual reports and accounts of the quoted pharmaceutical firms for the period *2007-2013*. The study adopted the correlational research design. The ordinary least squares *(OLS)* regression technique was used to analyze data collected, while the variables are measured as follows:

**Table 3.1: Variables Measurement**

| Variables | Measurements |
|---|---|
| Market values | Measured as the market price per share (*MPS)* at year end *i* at time *t* |
| Short-term debt | Measured as the short term debt/equity as a ratio |
| Long-term debt | Measured as long term debt/equity as a ratio |
| Size | Natural log of total assets |

**Source: Parashantini and Nimalathasan (2013)**

The model of the study is mathematically expressed as:

$MPS_{it} = \alpha + \beta_1 STD_{it} + \beta_2 LTD_{it} + \beta_3 SIZE_{it} + \mu_{it}$

Where:

| | | |
|---|---|---|
| $MPS_{it}$ | = | Market value of firm *i* in year *t* |
| $STD_{it}$ | = | Short-term debt of firm *i* in year *t* |
| $LTD_{it}$ | = | Long-term debt of firm *i* in year *t* |
| $SIZE_{it}$ | = | Size of firm *i* in year *t* |
| $\alpha$ | = | Intercept |
| $\mu_{it}$ | = | Residual |
| $\beta_1 - \beta_3$ | = | Coefficients |

**4.1 Results and Discussion of Findings**

This section discusses the results obtained from the data collected. Descriptive statistics, correlation and test of the hypotheses are presented in the following tables:

**Table 4.1: Descriptive Statistics**

| Variables | Mean | Std. Div. | Min | Max | N |
|---|---|---|---|---|---|
| **MPS** | 3.376 | 2.475 | 0.790 | 10.620 | 42 |
| **STD** | 0609 | 0.197 | 0.350 | 0.980 | 42 |
| **LTD** | 0.361 | 0.225 | 0.020 | 0.770 | 42 |
| **SIZE** | 6.754 | 0.323 | 6.100 | 7.420 | 42 |

**Source: SPSS OUTPUT**

The results in table 2 indicates that the average Market Price per Share *(MPS)* of the pharmaceutical companies is N3.376 with standard deviation of 2.475 and minimum and maximum values of N0.79 and N10.62 for the period under study. The table indicates that the short term debt *(STD)* of the companies has a mean value of 60.9% with standard deviation of 0.197 and minimum and maximum values of between 35% and 98%. The standard deviation suggests that the data deviate from the mean by only 19.7%. Similarly, the average long-term debt *(LTD)* during the period is 36.1% with standard deviation of 0.225 and a minimum and maximum value of 2% and 77%. The results from table 2 also show that the average firm size *(SIZE)* is 6.754 with standard deviation of 0.323 with a minimum and maximum value of 6.100 and 7.420 respectively.

The summary of the Pearson Correlation Coefficients of the variables are presented as follows:

**Table 4.2: Correlation Matrix**

| Variables | MPS | STD | LTD | SIZE |
|---|---|---|---|---|
| **MPS** | 1.000 | | | |
| **STD** | 0.638<br>(0.000) | 1.000 | | |
| **LTD** | 0.639<br>(0.000) | 0.607<br>(0.000) | 1.000 | |
| **SIZE** | -0.139<br>(0.385) | -0.505<br>(0.001) | -0.153<br>(0.334) | 1.000 |

**Source: SPSS OUTPUT**
**Note: P-values are in parentheses**

Table 3 presents the Pearson Correlation Coefficients of the variables of firm leverage (short-term debt, and long-term debt) and the control variable of firm size with their relationship to market prices per share of the quoted pharmaceutical companies. The table indicates a significant positive relationship between market price per share *(MPS*) and short-term debt *(STD)* of the sampled companies with a correlation coefficient of 0.628 with a p-value of 0.000, which is statistically significant at 1% level of significant. This result suggests that the market price per share of the quoted pharmaceutical companies increased as short-term debt increased during the period of the study. Similarly, the table showed a positive relationship between *MPS* and long-term debt *(LTD)* from the correlation coefficient of 0.643 and a p-value of 0.000, statistically significant at 1% level of significance. This result again implies that as long-term debt increased, the *MPS* of the companies also increased. However, the table showed a negative relationship between firm size *(SIZE)* and *MPS* of the sampled companies from the correlation coefficient of -0.119 and a p-value of 0.446.

The summary of OLS regression results are presented in table 4 below:

**Table 4.3: Summary of OLS Regression Results**

| Variables | Coefficients | P-values |
|---|---|---|
| **STD** | 0.509 | 0.004 |
| **LTD** | 0.356 | 0.018 |
| **SIZE** | 0.174 | 0.196 |
| **CONSTANT** | -7.645 | 0.279 |
| **R** | 0.727 | |
| **R Square** | 0.529 | |
| **Adj. R Square** | 0.491 | |
| **F-Stat** | 14.208 | |
| **DW** | 1.157 | 0.000 |
| **TV** | 0.457 | |
| **VIF** | 2.189 | |

**Source: SPSS OUTPUT**
The results from table 4 indicates that firm leverage (short-term debt, long-term debt and firm size) explained 49.1% of the total variations in the market values of

the quoted pharmaceutical companies in Nigeria during the period of the study. This is confirmed by the coefficient of multiple determinations (*Adj.* $R^2$) value of 0.491. The table also shows that the model is fitted at 99% confidence level as indicated by the *F-statistics* of 14.208 and a p-value of 0.000 which is significant at 1% level of significance. There is also an absence of serial correlation as indicated by the Durbin Watson *(DW)* statistics of 1.157. The table on the other hand indicated the absence of multicolinearity among the explanatory variables as shown by the Variance Inflation Factor *(VIF)* of 2.189 and a Tolerance Value *(TV)* of 0.457.

Table 4 shows that short-term debt *(STD)* with a coefficient of 0.509 and a p-value of 0.004 has a significant positive effect on the market value of the companies, which is statistically significant at 1% level of significant. This suggests that when short-term debt increased by 1%, market value significantly increased by 51%. Therefore, the study rejects hypothesis $HO_1$, which states that short-term debt has no significant impact on the market values of quoted pharmaceutical firms in Nigeria. Similarly, the regression results in Table 4 shows that long-term debt *(LTD)* with a coefficient of 0.356 and a p-value of 0.018 is statistically significant at 5% level of significant and has a positive effect on the market value. This implies that when long-term debt increased by 1% market value increased by 35.6%, as such, the study rejects hypothesis $HO_2$, which states that long-term debt has no significant effect on the market values of quoted pharmaceutical firms in Nigeria. Finally, table 4 indicate that firm size with a coefficient of 0.174 and a p-value of 0.196 is not statistically significant, and had no influence on the market values the companies.

These findings therefore implies that if management of pharmaceutical companies in Nigeria utilize an optimal leverage mix of both short-term and long-term debts, would bring added value to the companies and maximizes the owners' wealth of the quoted pharmaceutical companies.

**5.1 Conclusions and Recommendations**

The study thus concludes after controlling for firm size that firm leverage (short-term debt and long-term debt) has significant positive effect on the market values of quoted pharmaceutical firms operating in Nigeria for the period of the study, and in line with the findings, the study recommends that managements of quoted pharmaceutical firms operating in Nigeria should employ both short and long term use of debt as a mechanism to improve the market values.

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## APPENDIX

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|---|---|
| | Statistic | Statistic | Statistic | Statistic | Statistic | Statistic | Std. Error | Statistic | Std. Error |
| MPS | 42 | .79 | 10.62 | 3.3760 | 2.47475 | 1.392 | .365 | 1.317 | .717 |
| STD | 42 | .35 | .98 | .6090 | .19702 | .464 | .365 | -1.075 | .717 |
| LTD | 42 | .02 | .77 | .3612 | .22482 | .064 | .365 | -1.366 | .717 |
| SIZE | 42 | 6.10 | 7.42 | 6.7543 | .32320 | -.194 | .365 | -.472 | .717 |
| Valid N (listwise) | 42 | | | | | | | | |

**Correlations**

| | | MPS | STD | LTD | SIZE |
|---|---|---|---|---|---|
| MPS | Pearson Correlation | 1 | .638** | .639** | -.138 |
| | Sig. (2-tailed) | | .000 | .000 | .385 |
| | N | 42 | 42 | 42 | 42 |
| STD | Pearson Correlation | .638** | 1 | .607** | -.505** |
| | Sig. (2-tailed) | .000 | | .000 | .001 |
| | N | 42 | 42 | 42 | 42 |
| LTD | Pearson Correlation | .639** | .607** | 1 | -.153 |
| | Sig. (2-tailed) | .000 | .000 | | .334 |
| | N | 42 | 42 | 42 | 42 |
| SIZE | Pearson Correlation | -.138 | -.505** | -.153 | 1 |
| | Sig. (2-tailed) | .385 | .001 | .334 | |
| | N | 42 | 42 | 42 | 42 |

**. Correlation is significant at the 0.01 level (2-tailed).

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
| 1 | .727[a] | .529 | .491 | 1.76479 | .529 | 14.208 | 3 | 38 | .000 | 1.157 |

a. Predictors: (Constant), SIZE, LTD, STD

b. Dependent Variable: MPS

**ANOVA[b]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 132.750 | 3 | 44.250 | 14.208 | .000[a] |
| | Residual | 118.350 | 38 | 3.114 | | |
| | Total | 251.101 | 41 | | | |

a. Predictors: (Constant), SIZE, LTD, STD

b. Dependent Variable: MPS

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | | 95% Confidence Interval for B | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | t | Sig. | Lower Bound | Upper Bound | Tolerance | VIF |
| 1 | (Constant) | -7.645 | 6.962 | | -1.098 | .279 | -21.739 | 6.450 | | |
| | STD | .825 | .267 | .509 | 3.090 | .004 | .285 | 1.365 | .457 | 2.188 |
| | LTD | 1.888 | .762 | .356 | 2.477 | .018 | .345 | 3.431 | .599 | 1.669 |
| | SIZE | 1.333 | 1.014 | .174 | 1.315 | .196 | -.720 | 3.387 | .707 | 1.414 |

a. Dependent Variable: MPS

**Coefficient Correlations[a]**

| Model | | | SIZE | LTD | STD |
|---|---|---|---|---|---|
| 1 | Correlations | SIZE | 1.000 | -.225 | .525 |
| | | LTD | -.225 | 1.000 | -.622 |
| | | STD | .525 | -.622 | 1.000 |
| | Covariances | SIZE | 1.029 | -.174 | .142 |
| | | LTD | -.174 | .581 | -.127 |
| | | STD | .142 | -.127 | .071 |

a. Dependent Variable: MPS

**Collinearity Diagnostics[a]**

| Model | Dimension | Eigenvalue | Condition Index | Variance Proportions | | | |
|---|---|---|---|---|---|---|---|
| | | | | (Constant) | STD | LTD | SIZE |
| 1 | 1 | 3.275 | 1.000 | .00 | .02 | .02 | .00 |
| | 2 | .527 | 2.493 | .00 | .19 | .08 | .00 |
| | 3 | .198 | 4.070 | .00 | .51 | .85 | .00 |
| | 4 | .001 | 64.944 | 1.00 | .28 | .05 | 1.00 |

a. Dependent Variable: MPS

**Residuals Statistics[a]**

| | Minimum | Maximum | Mean | Std. Deviation | N |
|---|---|---|---|---|---|
| Predicted Value | 1.3509 | 9.5815 | 3.3760 | 1.79939 | 42 |
| Residual | -3.00665 | 4.02569 | .00000 | 1.69900 | 42 |
| Std. Predicted Value | -1.125 | 3.449 | .000 | 1.000 | 42 |
| Std. Residual | -1.704 | 2.281 | .000 | .963 | 42 |

a. Dependent Variable: MPS