Capital Structure and Firm Performance: Evidence from Ghana Stock Exchange

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Abstract
The study examined the relationship between capital structure and firm performance, using secondary data. It covered all the 35 listed companies in accordance with the Ghana Stock Exchange (GSE) Fact Book 2009 over the period 2004 to 2008. Return on equity (ROE), return on assets (ROA) and return on total capital (ROTC) were used as explanatory variables. Capital structure was represented as short term debt (STD), long term debt (LTD) and total equity (TE). Three multiple regression models were utilized; hence series of regression analysis were executed for each model. Observations were that; STD, LTD, and TE respectively account for 8.6% of the variations of return on equity, 0.5% of the variations of return on assets and 3.2% of the variation of return on total capital. Important observed patterns in financing structure were: STD 52%, LTD 9% and EQUITY financing 39%. This has reemphasized the fact that listed companies are highly levered, and also highlights the importance of short-term debts over long-term debts in the financing of companies in Ghana. For every cedi of company financing in Ghana, listed companies employed 0.52pesewas of STD in financing their operations and for every cedi of company financing, listed companies during the study period employed 0.09 pesewas of LTD in their operations, but 0.39 pesewas of equity in financing their operations. This is so because the market for long term debt is not well developed in Ghana. The study observed that STD and TE have a significant positive relationship with ROE, ROA and ROTC but LTD has a significant negative relationship with ROE, ROA and TE.
Keywords: Capital structure; performance; long term debt; short term debt; Ghana Stock Exchange, Sustainable development.

1. Introduction
The term *capital structure* refers to the various means of financing a company. It is the mix of long term sources of funds such as debenture, long term debt, and preference and equity share capitals. It is therefore used to represent the appropriate relationship between debt and equity. One crucial issue confronting managers today is how to choose the combination of debt and equity to achieve optimum capital structure that would minimize the firm's cost of capital and improves return to owners of the business (Dadson et al 2012). The appropriate combination of debt and equity that will minimize the firm's cost of capital and maximize the firm's performance and market value is the optimum capital structure. Finance manager do not have a clear cut guideline to be consulted when taking decisions regarding optimal capital structure. This optimum capital structure combination in practice rest on the availability and cost.

One of the earliest comprehensive researches into capital structure of business firms was conducted by the Nobel Prize winners Modigliani and Miller (M&M) in 1958. They argued in their proposition 1 that, (given their ideal world, where there are no bankruptcy cost and frictionless capital market and a world without taxes) the value of a firm do   not depend on the mix of debt and equity. Accordingly debt policy of a firm does not matter, but the cash flows generated by the operating assets of the firm concerned.

This conclusion in M&M proposition 1is inconsistent with what pertains in the real world of business, where capital structure matters, so firms continue to borrow. As a result, M&M in 1963 (proposition 11) reviewed their earlier proposition to include taxes and other market imperfections such as costs associated with trading in securities and contend that capital structure matters and firms can really maximize value by using more debt in their operations so as to take advantage of tax shield benefits of leverage. Contributing to M&M (1958 & 1963) study on capital structure, other theories of capital structure have emerged.

One of such contributors is the tax shield school of thought. Capital structure of the firm is explained in terms of the tax shield or benefit associated with the use of debt. Green et al (2002) espoused the idea that tax policy has an important effect on the capital structure decisions of firms. Normally the basic tax laws allow firms to deduct interest on debt in computing taxable profits. Tax advantages derived from debt often lead firms to be completely financed through debt. However, this proposition should not entice managers to borrow to the hilt. It is the trade-off that ultimately determines the net effect of taxes on debt usage (Miller, 1977; Myers, 2001). Thus firm that can derive maximum benefit from debt usage are those whose managers can accurately determine the point where the advantages of interest tax shield ends and where the cost of financial distress starts.

Myers (1984) and Myers and Majluf (1984) in pecking order theory, contend that firms will always resort to the cheapest source of funding to stimulate their operations. Myers (1984) argues that companies will

only issue equity as a last resort when their debt capacity has been exhausted. They agreed that, there is a certain hierarchy of firm preferences regarding financing of their investments. Undoubtedly, firms would prefer internal sources of funding to expensive external finance (Myers and Majluf, 1984). They concluded that companies with few investment opportunities and substantial free cash flow will have low (or even negative) debt ratios because the cash will be used to pay down the debt. It also suggests that high-growth firms with lower operating cash flows will have high debt ratios because of their unwillingness to raise new equity.

Following closely are the bankruptcy cost school of thought. Bankruptcy costs refer to the cost that occurs when a firm fails to honor its debt obligations and stand the possibility of being closed down (Titman et al 1984). The potential costs of bankruptcy may be direct and indirect, Abor (2008). Firms that have high distress cost would have incentives to decrease outside financing so as to lower these costs. Hence, the optimal capital structure represents a level of leverage that balances bankruptcy costs and benefits of debt finance.

In Ghana, few studies have been conducted to examine the determinants of capital structure and profitability, Dadson et al (2012). None of them have fully been directed at listed companies on the GSE. Abor (2007) compared the capital structure of quoted firms, large unquoted firms, and small and medium enterprises (SMEs) in Ghana using panel data regression. The study observed that quoted and large unquoted firms exhibit significant higher debt ratios than do SMEs.

Abor (2008) studied the link between corporate governance and the capital structure decision of SMEs in Ghana. The study sought to assess how the adoption of corporate governance structures among SMEs influence their financing decisions by examining the relationship between corporate governance characteristics and capital structure using regression model. The results suggested that SMEs pursue lower debt policy with larger board size. However, SMEs with higher percentage of outside directors, highly qualified board members and one-tier board system were observed to employ more debt. His study made it that corporate governance structures influence the financing decisions of Ghanaian SMEs.

Amidu (2007) devised a study to investigate the determinants of capital structure of banks in Ghana and found a significantly negative relation between total debt and profitability

Dadson and Badu (2012) investigated the relationship between capital structure and performance of listed banks in Ghana, using panel data, the result revealed that banks listed on the Ghana Stock Exchange are highly geared and this is negatively related to the banks performance in terms of return on equity and Tobin's q. From the foregoing discussions based on the available empirical literature, none of the studies conducted in Ghana employed all the listed firms for empirical analysis, to the extent that results from investigations into the relationship between capital structure and performance are also inconclusive, and requires more empirical work, given the fact that research, technology and innovation are the bedrock for sustainable development, this study aimed at contributing to the debate on capital structure and performance of listed firms in an era where the private sector has been earmarked as the engine of growth. It is expected that the findings of this study will have important policy implications for Ghanaian listed firms.

2. Methodology

The study analyzed companies from the six different dominant sectors of Ghana's capital market including: Finance and Insurance, paper converters and information Technology, Manufacturing and Trading, Agriculture and Agro processing, Metal and oil, and Pharmaceuticals and Beverages spanning from 2004 to 2008. Secondary data was used and were collected from audited financial statements as well as the fact book of Ghana stock Exchange. The study used time series data. Time series analysis identifies the nature of phenomenon represented by the sequence of observation and forecast the future and observes a trend. The time series data were analyzed using both qualitative and quantitative approach. Using qualitative approach, a pattern in the data set were ascertained. According to (Gujarati, 2004) every statistics to describe a data usually summarizes the content and display the mean indicators of the variables used in the study. For quantitative analysis, the study therefore conceptualized capital structure as a three dimensional construct and for empirical purposes; the linear regression model in estimating relationship between variables was used. Linear regression is the least squares estimator with explanatory variable(s). The basic regression equation was as shown below:

$$Y_{it} = \alpha_i + \beta_1 X_{it} + u_{it} \qquad (1)$$

Where:

Y_{it} is the value of the dependent variable (Y is what is being predicted or explained i.e. the performance variables)

α_i or alpha, a constant (equals the value of Y when the value of X=0), that is time invariant–specific effects

β_1 or Beta, the coefficient of X (the slope of the regression line; how much Y changes for each one-unit change in X).

X_{it} is the value of the independent variable (X) (what is predicting or explaining the value of Y, that is capital structure variables)

U_{it} is the error term; the error in predicting the value of Y, given the value of X, or it's a random disturbance (it is not displayed in most regression equations).

The Modigliani and Miller (MM) model was adopted to serve as framework for the model development. They argued that capital structure was irrelevant in determining the firm's value and its future performance. Modigliani and Miller (1963) showed that their model is no more effective if tax was taken into consideration since tax subsidies on debt interest payments will cause a rise in firm value when equity is traded for debt. Modigliani and Miller (1963) argued that the capital structure of a firm should compose entirely of debt due to tax deductions on interest payments. To this end the market value of a firm is given by: *Equity + Debt = Value (i.e. E + D = V)*. The objective of the managers is the maximization of the firm's value i.e. of its share price. Debt finance is cheaper than equity finance ($r_d < r_e$), because equity is more risky than debt. Traditional theory postulated that if a firm substitute's debt for equity, it will reduce its cost of capital so increasing the firm's value is given by equation 2.

$$r_a = r_d \frac{D}{D+E} + r_e \frac{E}{D+E} = r_e - (r_e - r_d)\frac{D}{D+E} \qquad (2)$$

Where: r_a = value of the firm; r_d = cost of debt; r_e = cost of equity, D = total debt; E = total equity

But, when the *D/E* ratio is considered too high, both equity-holders and debt-holders will start demanding higher returns so that the cost of capital of the firm will rise. Hence, there exists an optimal, cost minimizing value of the *D/E* ratio. Modigliani- Miller (M-M) proposed that the value of a firm is the same regardless of whether it finances itself with debt or equity. The weighted average cost of capital: r_a is constant. In the light of this, M-M assumed perfect and frictionless markets, no transaction costs, no default risk, no taxation; both firms and investors can borrow at the same r_d interest rate. Base on M-M proposition 2, *the rate of return on equity grows linearly with the debt ratio*.

This given by equation 3. From: $r_a = \frac{X}{E+D}$ and $r_e = \frac{X-r_d D}{E}$ (3)

It follows that: $r_e E = r_a (E + D) - r_d D$ (4)

Hence: $r_e = r_a + (r_a - r_d)\frac{D}{E}$ (5)

M-M indicated that the distribution of dividends does not change the firm's market value; it only changes the mix of *E* and *D* in the financing of the firm. To this end, for a firm to decide an investment, a firm should expect a rate of return at least equal to **r_a**, no matter where the finance would come from. This means that the marginal cost of capital should be equal to the average one. The constant r_a is sometimes called the *"hurdle rate"* (the rate required for capital investment).

It can be infused that the M-M propositions are benchmarks, not end results; in this respect financing does not matter except for market imperfections or for costs (i.e. taxes) not explicitly consider. A hint that financing can matter comes from the continuous introduction of financial innovations. If the new financial products never increased the firms' value, then there would be no incentive to innovate. Non-uniqueness of r_a: perhaps it is not very important. Since interests are considered as costs, a leveraged firm has a fiscal benefit. Its operating earnings net of taxes are given by equation 6:

$$X_n = (1-t_c)(X - r_d D + rd\ D = (1-t_c)X + t_c\ r_d\ D \qquad (6)$$

While for an unleveraged firm they are: $X_n = (1-t_c)X$ = net profits.

The difference: $t_c\ r_d\ D$, once capitalized at r_a, makes the value of the leveraged firm greater than that of the unleveraged by the amount: $\frac{t_c\ r_d D}{r_a}$ At the limit: "the optimal capital structure might be all debt" (Miller). But it is necessary to consider the personal taxation of capital gains, dividends and interests that can (partially) offset the firms' tax advantages. In the absence of offsetting, nothing would stop firms from increasing debt in order to decrease taxation. There must be some costs to prevent aggressive borrowing.

In view of this, the single explanatory variable linear equation was modified and transformed into multiple regressions to analyze the study. The full model used for testing firm's performance in relations to its capital structure is as follows:

$$Y_{(1,2,3),i,t} = \alpha_i + \beta_1 X_{1,i,t} + \beta_2 X_{2,i,t} + \beta_3 X_{3,i,t} + u_i \qquad (7)$$

Gujarati (2004) argued that the main strength of using multiple regression is its ability to measure the joint effect of any number of independent variables upon one dependent variable. Multiple regression model is a model in which a dependent variable depends on two or more variables. For empirical purposes, the following operationalization of Equation 7 is used.

$$ROTC_{1,,i,t} = \alpha_i + \beta_1 STD_{,i,t} + \beta_2 LTD_{,i,t} + \beta_3 TE_{,i,t} + u_i \qquad (8)$$

Where: ROTC = return on total capital; STD = short term debt; LTD = long term debt; TE=Total equity; u_i = error term

$$ROE_{2,i,t} = \alpha_i + \beta_1 STD_{,i,t} + \beta_2 LTD_{,i,t} + \beta_3 TE_{,i,} + u_i \qquad (9)$$

In equation 9 and 10 the same independent variables are maintained except the dependent variable which are ROE (return on equity) and ROA (return on asset).

$$ROA_{3,i,t} = \alpha_i + \beta_1 LTD_{,i,t} + \beta_2 LTD_{,i,t} + \beta_3 TE_{,i,t} + u_i, \qquad (10)$$

2.1 Research Questions and Hypotheses
This study addressed two research questions. The first describes the irrelevancy of capital structure and firm performance, i.e. do capital structure decisions matters in firm's performances in Ghana? A descriptive method was used to answer this first research question.

The second research question determines the extent to which the increase or decrease in capital structure affect firm's performance, i.e. to what extent does the increase or decrease in capital structure affect firm's performance? To answer this second research question, two hypotheses were tested.
Thus, Hypothesis 1 is stated in the null and alternative forms as follows:
H_0: There is no significant relationship between a firm's performance and capital structure as measured by return on assets, return on equity and return on total capital.
H_a: There is a significant relationship between a firm's performance and capital structure as measured by return on assets, return on equity and return on total capital.
To investigate whether there has been significant change in firm's performance as a result of decrease or increase in capital structure. Hypothesis 2 is stated in the null and alternative forms as follows:
H_2: There is no significant change in firm's performance as a result of increase or decrease in capital structure.
H_{2a}: There is a significant change in firm's performance as a result of increase or decrease in capital structure.

3. Results and Discussions
3.1 Descriptive Statistics
Table 4.1 and 4.2, shows the mean value and standard deviations of the variables under study, return on equity was averaged 18% (Std dev = 0.33) as compared to ROA which is 6% (std dev =0.14) and ROTC of 5% (std dev = 0.11). This was the average profitability in respect of ROE, ROA and ROTC measures. The high standard deviations means that profitability was not stable and companies operated under severe risky business environment. The performance indicators also means that as listed firms employ debt into its capital structure the return to equity will increase. The higher performance level of ROE might have been contributed by tax shield of interest and disciplinary role imposed by high short term debts. This implies that management of firms can use short term debt decisions to increase the return on the firm. This study has observed that companies that employ short term debt into their capital structure maximized their equity shareholders wealth, but will be operating under severe unstable condition depicted by the standard deviations of the various profitability measures.

Furtherance to the above, from table 4.1 listed companies' use of STD averaged 52% in financing their operations. However, some variations in the levels of STD were eminent as indicated by the high Standard deviation of 0.26. This shows the level of reliance listed entities place on short term debt finance. However, the use of LTD averaged 9% which was not astronomically deviated as in STD (i.e. 0.12). An important point that was also noted is that 39% of the capital structure of listed firms was equity with a standard deviation of 0.23. In the choice of their capital structure, the study also noted some instability as shown by the high standard deviations. This study has shown that listed entities do not rely much on LTD, but on STD. This is so because the market for long term debt is not well developed in Ghana, but it is easy to raise money in the money market in the short term because of the unstable nature of the macroeconomic environment. Why ROA is not performing well is probably due to the fact that, listed companies are hugely financed by STD, it will be very difficult for them to invest in viable long term projects using STD, therefore listed firms will be unable to invest in profitable long term projects that would increase their net assets with the resultant multiplier effect on ROA, hence listed firms which rely on STD will always be under investing. This confirms Myers (1977) argument. This observed trend in capital structure presents some interesting results and will direct the extent at which listed companies can take opportunities as they are presented by the environment, given the fact that most of them are finance by short term debts.

Table 4.1: Descriptive Statistics Summary

	STD	LTD	TE	ROE	ROA	ROTC
Mean	0.52	0.09	0.39	0.18	0.06	0.05
Max	0.92	0.57	0.94	1.14	1.2	0.38
Min	0.00	0.00	0.00	-.95	-0.54	-0.43

Source: Constructed from GSE Fact book 2009

Table 4.2: Descriptive Statistics for Models 1, 2 & 3

Model	Variable	Mean	Std. Dev.
1	ROE	0.1776	0.32866
	STD	0.5207	0.26268
	LTD	0.0891	0.12358
	TE	0.3871	0.23854
2	ROA	0.0547	0.14257
	STD	0.5207	0.26268
	LTD	0.0891	0.12358
	TE	0.3871	0.23854
3	ROTC	0.0515	0.10538
	STD	0.5207	0.26268
	LTD	0.0891	0.12358
	TE	0.3871	0.23854

Source: Constructed from GSE Fact book 2009

3.2 Correlation Analysis

Pearson correlation analysis showed the results as in Table 4.3. Correlation is a single number that described the degree of relationship between two variables. A Pearson correlation indicates the direction, strength and significance of the relationships for all variables in the study, however, it does not imply causality. Theoretically, there could be a perfect positive correlation between two variables, which is represented by 1.0 or a perfect negative correlation, which is represented by -1.0. The dependent variables, ROE, ROA and ROTC are significant and positively correlated with each other, as highlighted in Table 4.3 below.

The correlation analysis provide early sign that STD, LTD and TE are significantly related to ROE (corr. = 0.307, p-value 0.000, corr. = -0.207, p-value= 0.003, corr.= -0.222, p-value= 0.002), and to ROA (corr.= -0.025, p-value= 0.373, corr.-0.119, p-value= 0.058, corr.= 0.094, p-value = 0.108) and to ROTC (corr.= -0.090, p-value=0.118, corr.= -0.138 p-value=0.035, and corr. 0.177, p-value= 0.009). As evident here, the dependent variables exhibited a weak correlation with the explanatory variables. Noticeably, low values are reported in comparing to +1 or -1. These therefore suggests the possibility of finding close to zero or a non-significant relationships in the next step of the analysis devoted to the estimation of the econometrics models l to 3 presented in table 4.4.

Table 4.3:   Pearson Correlation Matrix

	ROE	ROA	ROTC
STD	0.307	-0.025	-0.090
	(0.000)	(0.373)	(0.118)
LTD	-0.207	-0.119	-0.138
	(0.003)	(0.058)	(0.035)
TE	-0.222	0.094	0.177
	(0.002)	(0.108)	(0.009)

Source: Constructed from GSE Fact book 2009

3.3 Regression Results

A series of regression analyses were executed and the results and finding of which are summarized and presented in table 4.4 below. Variance Inflation factor (VIF) of the variables in the regression models were examined to check for the presence of multi-co-linearity problem. The Durbin Watson statistics that is shown in Table 4.4 indicates that no serious serial correlation problem exists.

F-test is used to test the hypothesis that the variation in the independent variable explained a significant proportion of the variation in the dependent variable in the model. The F-test as shown in table 4.4 indicates that all the models are significant in explaining the firms' performance. However, the explanatory power of the models as shown by the adjusted R^2 is very low comprising of 8.6%, 0.5% and 3.2%. R-square

measures the proportion of the total variation or dispersion in the dependent variable that is explained by the variation of the independent variable. Therefore R^2 informs us how good the line is best fit and also measures the percentage of change in the dependent variable that is caused by the change in the independent variable.

It follows therefore from Table 4.4 that; the results indicate that the explanatory variables (the capital structure ratios in this case) only explains 8.6% of the variations in ROE of listed companies in Ghana. The reported coefficient for STD to ROE was 0.337 and not significant at p=0.28>5%, LTD to ROE was -0.256 and not significant at p=0.469>5%, and TE to ROE was 0.004 and not significant at p=0.990>5%,. The sign agreed with the direction hypothesized except with LTD. The implication to the capital structure coefficient for example, that of STD is that, the STD is significant in varying ROE by a change of 0.337 per cedi of STD, and LTD (-0.256) and TE (0.004).

On the other hand 0.5% of the variations in ROA is explained by the variations in capital structure.

The reported coefficient for STD to ROA was 0.023 and not significant at p=0.871>5%, LTD to ROA was -0.112 and not significant at p=0.484>5%, and TE to ROA was 0.075 and not significant at 0.596 (i.e p>5%). The sign do agree with the direction hypothesized except with LTD. The implication to the capital structure coefficient for example, that of LTD is that, LTD is significant in varying ROA by a change of negative 0.256 per cedi of LTD, and STD (0.023) and TE (0.075).

Similarly, 3.2% of the variations in ROTC was accounted for by the variations in capital structure.

Furthermore, the reported coefficient for STD to ROTC was 0.011 and not significant at the p=0.912>5%, LTD to ROTC was -0.101 and not significant at p=0.387>5%, and TE to ROA was 0.087 and not significant at p=0.403>5%. The sign do agree with the direction hypothesized except with LTD. The implication of the capital structure coefficient for example, that of LTD is that, a unit change in LTD will reduce ROTC by 0.101 per cedi, controlling for other factors and that a unit change in STD will increase ROTC by 0.011 per cedi and finally a unit change in TE will also increase ROTC by 0.087 per cedi.

From Table 4.4 below, it can be concluded that STD and TE have a significant positive relationship with ROE, ROA and ROTC but LTD has a significant negative relationship with ROE, ROA and TE. In the case of STD the result is consistent with the findings of Abor, (2007) which concluded in the case of South Africa; "the result exhibited a statistically significant positive relationship between STD and ROA" Based on the above findings, I do not reject the null hypothesis. This finding is also supported by Grossman and Hart (1982) who argued that higher levels of debt in the firm's capital structure will be directly associated with higher performance. In the case of LTD, it is consistent with Mesquita and Lara (2003) who found that LTD is not significant with ROE, which agrees with Fama and French (1998) and Miller (1997) but this has further been extended by this study to ROA and ROTC.

The above results means that returns to a company must be well planned in line with capital structure.

Table 4.4   Regression results

Dependent Var.	ROE	ROA	ROTC
Independent Var.	Model 1 Coefficient (P-Value)	Model 2 Coefficient (P-Value)	Model 3 Coefficient (P-Value)
Constant	0.023	0.023	0.21
STD	0.337 (0.281)	0.023 (0.871)	0.011 (0.912)
LTD	-0.256 (0.469)	-0.112 (0.484)	-0.101 (0.387)
TE	0.004 (0.990)	0.075 (0.596)	0.087 (0.403)
R^2	0.086	0.005	0.032
DW STATS	1.838	1.940	1.855
F-STATS	6.472 (0.01)	1.306 (0.274)	2.913 (0.036)
N	175	175	175

Significant at 0.05 level. Source: Constructed from GSE Fact book 2009

4. Conclusion

An important observation from the study was that 61% of the total capital of listed companies is made up of debt. Of this, 52% constitute short-term debts while 9% is made up of long-term debts with equity accounting for 39%. This means that listed companies are highly levered and showed over reliance on short term debts.

The next observation was that STD and TE have a significant positive relationship with ROE, ROA and ROTC but LTD has a significant negative relationship with ROE, ROA and TE. It follows therefore that, the

explanatory variables (the capital structure ratios in this case) partially explain 8.6% of the variations in ROE of listed companies in Ghana. On the other hand 0.5% of the variations in capital structure, explains the variations in ROA. Similarly, 3.2% of the variations in capital structure accounted for the variations in ROTC.

The result from the descriptive statistics also showed that over the period under study, the performance of listed companies measured by ROE, ROA and ROTC were 18%, 6% and 5% respectively. The higher performance levels of ROE might have been contributed by tax shield of interest and disciplinary role imposed by high short term debts. This implies that management of firms can use short term debt decisions to increase the return on the firm. The study therefore shows that all the models tested have a very low explanatory power on firm performance. The models were all free of multi-co-linearity problem based on Variance Inflation Factor, and serial correlation based on Durbin-Watson statistics.

It should therefore be the burning desire of top management of every firm to make prudent financing decision in order to remain profitable and competitive in sustaining development, in this new economic paradigm. The government of Ghana must assist to develop the debt market so that companies can raise a lot of debt which they need to meet their short to medium term loan obligations as a bedrock for sustainable development in Ghana.

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