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THE INFLUENCE OF CAPITAL STRUCTURE ON THE FINANCIAL PERFORMANCE OF FIRMS:EVIDENCE FROM THE GHANA ALTERNATIVE MARKET (GAX)

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ABSTRACT

This study sought to examine the influence of capital structure on the financial performance of firms listed on the Ghana Alternative Market (GAX), a subsidiary of the Ghana Stock Exchange (GSE).The study adopted the purposive sampling technique in selecting its sample. This technique was employed because it was flexible and met the multiple needs and interests of the researcher. An unbalanced secondary data extracted from the audited and published annual reports of the HORDS, Intravenous Infusions, Meridian-Marshalls Holdings and Samba Foods Ltd for the period 2015 to 2018 was employed for the study. Thus, the statement of comprehensive income, statement of financial position, statement of cash flows, statement of changes in equity and notes to the accounts provided the study's data. In this study, Debt-to-Total Assets (DA) was used to proxy capital structure (explanatory variable) whilst Return on Capital Employed (ROCE), Return on Assets (ROA) and Return on Issued Capital (ROIC) served as proxies for financial performance (explained variable). The descriptive and inferential techniques of data analysis were used for the study. These analysis were conducted through the use of STATA version 15software package at an alpha (α) level of 5%($p \leq 0.05$). From the study's Pearson Product-Moment Correlation Coefficient estimates, capital structure had a significantly negative relationship with the firms' financial performance, whilst the study's Robust Ordinary Least Squares (OLS) regression output provided evidence of capital structure having a significantly adverse influence on the firms 'financial performance as measured by ROCE, ROA and ROIC.Based on the findings, the researchers recommended among others that, since capital structure was a significant determinant of the firms' financial performance, they should operate with a capital structure mix that would minimize costs and maximize their final bottom line

.**Keywords:** Influence, Capital Structure, Financial Performance, Ghana Alternative Market (GAX), Return on Assets (ROA), Return on Capital Employed (ROCE), Return on Issued Capital (ROIC).

1.0 INTRODUCTION

The ability of organizations to meet their stakeholders' requirements is closely related to capital structure. Therefore, the issue of capital structure cannot be underrated in the day-to-day operations of organizations. According to Saad (2010), capital structure is how organizations finance their assets through a mixture of equity, debt or hybrid securities. Akintoye (2008) also viewed capital structure as a mixture of a company's long-term and short- term debts, common equity and preferred equity.

Raising capital to finance operations is an important decision deliberated over in all establishments. The decision is important not only because of the need to maximize returns

to key organisational components, but because of the impact such a decision can have on firms' ability to deal with their competitive environment (Roy &Li, 2002).As explained by Pandey (1999), the resources of firms are financed by their capital and these resources are necessary for their survival and growth. According to the author, the financing of these resources can be done by either increasing owners' claims or the claims of creditors and in some cases both. While the claims of owners rises when establishments acquire capital by issuing shares or by retaining part of their earnings, the creditors' claim increases by borrowing. Hence, the composition of both funds indicates the capital structure of an organisation (Pandey, 1999). This is different from financial structure in that, while the former refers to the proportionate relationship between long term debts and equity capital, the later implies various means used to raise capital (Pandey, 1999).

According to Abor (2008), capital structure issues are important for organisations because they affect corporate financing decisions which in itself are associated with a wide range of policy issues. For instance, at the macro level, they have implications for capital market development, interest rate, security price determination and regulations (Abor, 2008). Whilst at the micro level, Green,Murinde and Suppakitjarak (2002) posited that such decisions affectcorporate governance and firm development. Secondly, Lawal, Edwin, Monica and Adisa (2014) indicated that capital structure is tightly related to the ability of a firm to fulfill the needs of various stakeholders. Such needs according to the authors include employment generation, income in terms of profit, dividends and wages to households, foreign exchange to the government and the discharge of corporate social responsibilities. Lastly, capital structure affectsfirms' performances and have serious implications on their earnings capacities.As such, the determination of an optimal capital structure mix that minimizes risks and maximizes prosperity would be of great significance to corporations (Akintoye, 2008; Taani, 2003; Umar, Taveer, Aslam & Sajid, 2012; and Pandey, 1999).

Studies on capital structure have taken different dimensions after the ground breaking work of Modigliani and Miller (1958) commonly referred to as the **M & M Theory**.A large number of these studies do not have a common consensus. While researchers Dare and Sola (2010), Akintoye (2008), Umar et al. (2012) and Taani (2003)reported positive relationships between capital structure and firms' financial performance,Iorpev and Kwanum (2012), Ebaid (2009), and Erioti,Franguoli and Neokosmides (2002) established converse links between capital structure and the financial performance of firms. Irrespective of the numerous studies on capital structure and its connection with firms' financial performance, there have been limited research (if any) that particularly sought to explore the influence of capital structure on the financial performance of firms that listed and traded their shares on the Ghana Alternative Market (GAX), a subsidiary of the Ghana Stock Exchange (GSE).This study was therefore undertaken to help fill that gap.

1.1 Purpose of the Study

This study generally sought to examine the influence of capital structure on the financial performance of firms listed on the Ghana Alternative Market (GAX). The study also sought to come out with findings that will be of relevance to all students in the academic community because, they will be exposed to the various aspects of capital structure and its impacts on the performance of firms. By so doing, the study adds to the existing pool of literature on the link between capital structure and firms' financial performance,and further serves as a reference material for future studies. As managers, there

are a lot of issues relating to capital structure within the organisation if left unattended to, will jeopardize the intents of the organisation.This study was therefore conducted to serve as an eye opener to all managers. More specifically, the study sought to;

1. Examine the relationship between capital structure and the firms' financial performance.
2. Explore the effect of capital structure on the firms' financial performance.

1.2 Research Hypothesis

The following research hypothesis were formulated to help achieve the study's purpose;

H_{01}: There is no significantrelationship between capital structure and the firms' financial performance.

H_{02}: Capital structure does not significantly affect the firms' financial performance.

2.0 REVIEW OF RELATED LITERATURE

This aspect of the study reviews literature that supported the topic understudy. Theoretically, reviews on capital structure including the static trade-off theory, agency theory, pecking order theory, net income approach, net operating income approach, traditional approach and the MM-1 and MM-2 propositions by Modigliani and Miller(1958) are presented. Finally, empirical reviews on the relationship between capital structure and the financial performance of firms are outlined.

2.1 Theoretical Reviews

There exists various theoretical frameworks on capital structure with conflicting views by different researchers. As explained in Abor (2005), firms' most favourable capital structure could be determined by the trade-off among the effects of corporate and personal taxes, bankruptcy costs and agency costs. According to Frank and Goyal (2003), the benefits of debt include tax savings brought about by the deductibility of interest expenses from profit-before-tax of organisations and the reduction of agency cost through the threat of liquidation which causes personal losses to managers of salaries and reputation. Therefore more profitable business organisations have higher income to shield and should borrow more to take tax advantages. Thus, according to the trade-off theory, a positive relationship could be expected between debt level and firm's performance (Frank & Goyal, 2003). Studies by Tian and Zeitun (2007) and Tsuji (2011) provide empirical evidence supporting this relationship.

The agency cost theory developed by Berle and Means (1932) tries to resolve the conflict of interest between owners and managers over the control of corporate resources through the use of contracts that seek to allocate decision rights and incentives. According to the theory, there is a separation between ownership and control in larger corporations as a result of dilution in equity position. The agency theory has implications for the conflict relationship between shareholders and debt holders. This conflict arises because the claims of the two vary (Berle & Means, 1932).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 firms' preference with respect to the financing of their investments. 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 the last option (Frank & Goyal, 2003). 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 will be able to finance their investment opportunities with their retained earnings (Frank & Goyal, 2003).

Diverse opinions have also been expressed by researchers on the impact of leverage on cost of capital. Pandey (1999) indicated that, if leverage affects the cost of capital and value of firms, then an optimal capital structure can be obtained at the debt and equity combination that minimizes all weighted average cost of capital. The net income approach and the net operating income approach were the two extreme views identified by Durand (1959). According to the author, the net income approach assumes that, the cost of debt and that of equity are independent of the capital structure. In line with this, Durand(1959) opined that, the weighted average cost of capital declines and the total value of the firm rises with increased use of debt.

Under the net operating income approach, Durand(1959) explained that, the cost of equity is assumed to increase linearly with debt. This makes the weighted average cost of capital to remain constant and that of the total value of the firm remaining constant as well. According to Pandey (1999), if the net income approach is valid, then debt is a significant variable, therefore, financing decisions would affect the value of firms. If this approach is also valid, then financing decisions does not matter in the valuation of firms (Pandey, 1999). Solomon (1963) advocated an intermediate version called the traditional approach which is a mid-way between the income approach and the net operating income approach. This approach assumes that, cost of capital decreases within the reasonable limits of debt and then increases with debt. In other words Solomon (1963) indicated that, as the cost of capital decline, the value of firms' increases with debt up to an optimal point where the cost of capital would increase while the value of firms declines. Modigliani and Miller in 1958 came out with the M & M theory in their seminal paper supporting the net operating income approach by denying the existence of an optimum capital structure. The researchers had two propositions; MM-1proposed in 1958 and MM-2 proposed in 1963.

Modigliani and Miller in 1958 proposed that, in an efficient market world with no taxes or bankruptcy cost, the value of a firm is not affected by the manner in which the firm is financed. According to the MM-1 proposition, the value of a firm and hence, the wealth position of stockholders are not affected by capital structure. In 1963, Modigliani and Miller proposed the MM-2 which recognizes that, firm value is relevant to its capital structure. According to the MM-2 theory, capital structure of firms is optimum with 100 percent debt due to interest and tax shield. In other words, the MM-2 theory is of the view that, firms should use as much debt capital as possible in order to maximize their value by maximizing tax shield. Irrespective of the various theories, approaches or propositions presented by different authors or researchers, Harris and Raviv (1991) and Frank and Goyal (2003) have argued that, there is no universal theory, approach or proposition for capital structure. Therefore, choices are based on the discretion of individuals or organisations.

2.2 Empirical Reviews

Chinamerem and Anthony (2012) examined the impact of capital structure on the financial performance of thirty (30) non-financial firms listed on the Nigerian Stock Exchange. A panel data for the period 2004 to 2010 was used for the study. Through the

Ordinary Least Squares (OLS) regression analysis,it was disclosed that, firms' capital structure surrogated by debt ratio had a significantly negative impact on the firms' financial performance as measured by Return on Assets (ROA) and Return on Equity (ROE). The results further showed a consistency with prior empirical studies and provided evidence in support of the agency cost theory. The findings of Chinamerem and Anthony (2012) agreed with that of Pratheepkanth (2011) who examined the impact of capital structure on the financial performance of firms in Sri Lanka for the period 2005 to 2009, and discovered anadverse link between capital structure and the firms' financial performance.

The findings of Chinamerem and Anthony (2012) were however not in tandem with that of Abor (2005) whose regression output on some selected firms on the Ghana Stock Exchange (GSE) revealed a positive relationship between Debt to Assets (DA) and Return on Equity (ROE).For the period 1997 to 2005, Ebaid (2009) conducted a study to explore the impact of capital structure choice on the financial performance of firms in Egypt. Through the multiple regression analysis, the study found out that capital structure choice decision in general, had a weak-to-no impact on the firms' financial performance as measured by Return on Equity (ROE), Return on Assets (ROA) and Gross Profit Margin (GPM). The findings by Ebaid (2009) was not in line with that of Simon-Oke and Afolabi (2011), Chinamerem and Anthony (2012) and Pratheepkanth (2011) whose studies established vital associations between capital structure and firms' financial performance.

Chowdhury and Chowdhury (2010) tested the influence of debt-equity structure on the value of shares given different sizes, industries and growth opportunities with companies listed on the Dhaka Stock Exchange (DSE) and Chittagong Stock Exchange (CSE) of Bangladesh. Their findings empirically supported the argument of Modigliani and Miller (1958).Abor (2005) conducted a study on the influence of capital structure on the profitability of listed companies on the Ghana Stock Exchange (GSE). From the study's regression output, a significantly positive relationship between ROE and Short-term Debt to Assets (SDA)was established, whilst an adverse link between ROE and Long-term Debt to Assets (LDA)was also discovered. The study's regression output further revealed a positive association between ROE and Debt to Assets (DA).The findings by Abor (2005) that, there was a positive relationship between ROE and Debt to Assets (DA) was not in tandem with that of Chinamerem and Anthony (2012) and Pratheepkanth (2011) whose studies found out a negative relationship between capital structure and firms' financial performance.

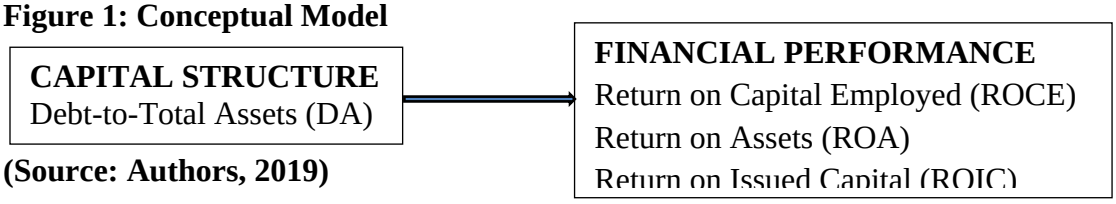
Taani (2003) examined the impact of capital structure on the performance of 12 Jordanian banks listed on Amman Stock Exchange (ASE) for the period 2007 to 2011. From the study's multiple regression analysis, capital structure proxied by Total Debt to Total Funds (TDTF) and Total Debt to Total Equity (TDTE) had a significantly positive association with the banks' performance as measured by Net Profit (NP), Return on Capital Employed (ROCE) and Net Interest Margin (NIM), except Return on Equity (ROE) which had an immaterial connection with the banks' Total Debt to Total Funds (TDTF) and Total Debt to Total Equity (TDTE).The findings by Taani (2003) were not consistent with that of Lawal et al.(2014) and Chinamerem and Anthony (2012) whose studies disclosed a converse relationship between capital structure and firms' financial performance.

Ahmad, Abdullah and Roslan (2012) examined capital structure effects on the performance of 58 firms in the Malaysian Consumer and Industrial sectors for the period 2005 to 2010. The study used Return on Assets (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; whilst controlling for size, asset growth, sales

growth and efficiency. From the study's regression output, only STD and TD had a significant relationship with ROA whilst ROE had significance on each of the debt levels. However, the analysis with lagged values showed no significant relationship between the firms' performance and STD, TD and LTD.

Lawal et al. (2014) delved into the effect of capital structure on the performance of 10 manufacturing firms in Nigeria for the period 2003 to 2012.From the study's findings, capital structure proxied by Debt to total Assets (DA) and Debt to Equity (DE) had an inverse association with the firms' financial performance as measured by Return on Assets (ROA) and Returns on Equity (ROE). A significant connection was however found between Debt to total Assets (DA) and the firms' performance at the 95% confidence interval. The findings by Lawal et al.(2014) supported that of Chinamerem and Anthony (2012) whose study disclosed a significantly negative association between capital structure and firms' financial performance as measured by ROA and ROE. The findings by Lawal et al. (2014) were however in disagreement with that of Abor (2005) and Taani (2003) whose studies discovered positive associations between capital structure and firms' performance. Akintoye (2008) used Earnings before Interest and Taxes (EBIT), Earnings per Share (EPS) and Dividend per Share (DPS) as measures of performance; and Degree of Operating Leverage (DOL) and Degree of Financial Leverage (DFL) as measures of leverage in his study on the relationship between performance and capital structure in some selected companies in Nigeria. From the study's ordinary least squares regression analysis, positive links between debt ratio, firm size and growth were established, whilst asset tangibility, risk, corporate tax and profitability regularly related to debt ratio.

Figure 1: Conceptual Model



(Source: Authors, 2019)

3.0 RESEARCH METHODOLOGY

Howell (2013) defined research methodology as the general research strategy that outlines the way in which research is to be undertaken and, among other things, identifies the methods to be used in it. According to the author, these methods described in the methodology, define the means or modes of data collection or, sometimes, how a specific result is to be calculated. This aspect of the study presents the research methodology. The methodology covers, the research design, population and sampling, sources of data, data analysis and model specification and estimation.

3.1 Research Design

The quantitative research approach was adopted for this study. Given (2008) viewed quantitative research as the systematic empirical investigation of observable phenomena via statistical, mathematical or computational techniques. To the author, the objective of quantitative research is to develop and employ mathematical models, theories and hypotheses pertaining to phenomena. The process of measurement is central to quantitative research because it provides the fundamental connection between empirical observation and mathematical expression of quantitative relationships (Given, 2008).SIS International Research (2018) also defined a quantitative research as a structured way of collecting and analyzing data obtained from different sources. According to

the body, quantitative research is conclusive in its purpose as it tries to quantify the problem and understand how prevalent it is by looking for projectable results to a larger population.

This approach was adopted because it provided the fundamental connection between empirical observation and mathematical expression of quantitative relationships; its results was based on a sample that was representative of the entire population; it could be replicated or repeated due to its high reliability; and it could be used to generalize concepts more widely, predict future results or investigate causal relationships(Babbie, 2009; McNabb, 2008; and Singh, 2007).The study was specifically correlation in nature because, it sought to explore the link or association between variables. The study was also experimental in nature because, it sought to examine what would happen to the response variables, when the explanatory variable was manipulated while other factors were held constant. The study was finally panel in nature because it collected repeated measures from the study's sample at different point in time.

3.2 Population and Sampling

All non-financial firms that listed and traded their shares on the Ghana Alternative Market (GAX) formed the study's targeted population. The study employed the purposive sampling technique to choose a sample from the population. As indicated by Black (2010), purposive sampling (also known as judgment, selective or subjective sampling) is a sampling technique in which researchers rely on their own judgments in choosing a sample for a study.Saunders, Lewis and Thornhill (2012) also viewed purposive sampling to be one of the non-probability sampling methods adopted in studies in which researchers believe that they can obtain a representative sample by using a sound judgment, which will result in saving time and money.This technique was employed because it was flexible and met the multiple needs and interests of the researcher. Thus, it was the only viable sampling technique that could help the researcher to obtain information from a very specific group of elements or units that possessed the researcher's traits of interest (Black, 2010; and Saunders, Lewis & Thornhill, 2012).The HORDS, Intraveneous Infusions, Meridian-Marshalls Holdings and Samba Foods Ltd were the firms that were considered for the study because, they were the only non-financial firms that were actively operational during the study period 2015 to 2018.

3.3 Data Collection Procedure

An unbalancedpaneldata sourced from the audited and published annual reports of the firms for the period 2015 to 2018 was used for the study. The firms' annual reports, audited and published on the Ghana Stock Exchange (GSE) comprised of the comprehensive income statement, statement of financial position, statement of cash flows, statement of changes in equity and notes to the accounts. Data on the Ghana Stock Exchange was relied upon because, the GSE contained the most comprehensive and reliable data for all listed firms. This independent data source have been updating and validating the annual reports of its listed firms. It should be noted also that, information from companies' annual reports submitted to the GSE are reliable as they are audited by external auditors, majority of whom are of high international repute.

3.4 Model Specification and Estimation

According to Ford (2009), statistical models are useful in identifying patterns and underlying relationships between data sets. Konishi and Kitagawa (2008) indicated extraction of information, description of stochastic structures and predictions as the three main purposes

for a statistical model. In this study, capital structure proxied by the ratio of Debt-to-Total Assets (DA)servedas the input variable, whilst financial performance proxied by the Return on Capital Employed (ROCE), Return on Assets (ROA) and Return onIssued Capital (ROIC) served as the response variable.The Robust Ordinary Least Squares (OLS) regression estimator was employed for the study. This estimator was selected after taken into consideration the assumptions of the Classical Linear Regression Model (CLRM). The general form of the econometric model adopted for the study was;

$\mathbf{Y_{it} = \alpha + \beta_0 X_{it} + \mu_{it}}$……(1)

Where:

Y_{it} = Response variable of firm (i) in time (t);

α = Intercept;

β_0 = Parameter or slope of predictors;

X_{it} = Vector of predictor variables of firm (i) in time (t); and

μ_{it} = Error term of firm (i) in time (t)

From the above econometric model, the following functions were deduced:

Y_{it} = f(Financial Performance)

But Financial Performance = f(ROCE, ROA and ROIC)

Therefore,

Y_{it} = f(ROCE, ROA and ROIC)……....(2)

Also,

X_{it} = f(Capital Structure)

But Capital Structure = f(DA)

Therefore,

X_{it} = f(DA)……(3)

Substituting equation (2) and equation (3) into equation (1), the following working models were formulated to help direct the study's focus;

$ROCE_{it} = \alpha + \beta_1 DA_{it} + \mu_{it}$……..(4)

$ROA_{it} = \alpha + \beta_1 DA_{it} + \mu_{it}$……....(5)

$ROIC_{it} = \alpha + \beta_1 DA_{it} + \mu_{it}$……..(6)

Where:

α = Intercept;

β_1 = Parameter or partial slope coefficient of the explanatory variable DA_{it};

$ROCE_{it}$= Return on Capital Employed of firm (i) in time (t)calculated as the ratio of net profit after tax to capital employed of firm (i) in time(t);

ROA_{it} = Return on Assets of firm (i) in time (t)calculated as the ratio of net profit after tax to total assets of firm (i) in time (t);

$ROIC_{it}$ = Return on Issued Capital of firm (i) in time (t)calculated as the ratio of net profit after tax to issued capital of firm (i) in time(t);

DA_{it} = Debt-to-Total Assets of firm (i) in time (t) calculated as the ratio of total debt to total assets of firm (i) in time (t); and

μ_{it} = Stochastic error term

3.5 Data Analysis

Descriptive and inferential techniques of data analysis were used for this study. In the descriptive analysis, the mean, standard deviation, variance, minimum and maximum values and range of both the response and predictor variables were analysed. On the other hand, the Pearson Product-Moment Correlation Coefficient technique was adopted to examine the

relationship that existed between capital structure and the firms' financial performance, whilst the Robust Ordinary Least Squares (OLS) regression technique was employed to determine the effect of capital structure on the firms' financial performance. Before the descriptive and inferential analysis of data, tests for data normality, heteroscedasticity and serial or autocorrelation were conducted. Thesetestswere to help choose the appropriate regression estimator for the study. All the data analyses were conducted through the use of STATA version 15 software package with a 5% level of significance ($p \leq 0.05$).

4.0 RESULTS AND DISCUSSIONS

This section presents results and discussions of the study. The section is divided into five parts. The first three parts present results on the tests for data normality, heteroscedasticity and serial or autocorrelation. The fourth part tackles the model specification and estimation, whilst the fifth part presents descriptive analysis on the study's variables. The sixth part of this section brings to light the results and discussions on the association between capital structure and the firms' financial performance as measured by Return on Capital Employed (ROCE), Return on Assets (ROA) and Return on Issued Capital (ROIC), whilst the final part concludes with the results and discussions on the influence of capital structure on the firms' financial performance as measured by ROCE, ROA and ROIC.

4.1 Test for Data Normality

The Shapiro and Wilk (1965) test for data normality was adopted to test the normality of the data. It is a test of normality in frequentist statistics with the null hypothesis that, a sample $X_1 \ldots . X_n$ came from a normally distributed population (Shapiro &Wilk, 1965). The chosen alpha level for this study was 5% ($\alpha=0.05$). Therefore, the Shapiro-Wilk test, tested the null hypothesis that, all the data values of ROCE, ROA, ROIC and DA were normally distributed at the 5% level of significance as against the alternative hypothesis that the data values were not normally distributed.

Table 1:Shapiro-Wilk (1965) Test for Data Normality

Variable	W	V	Z	Prob (Z)
ROCE	0.75490	2.827	1.718	0.04289
ROA	0.81425	2.142	1.125	0.13033
ROIC	0.65057	4.030	2.793	0.00261
DA	0.73867	3.014	1.880	0.03008

(Source: STATA Output, 2019)

As depicted in Table 1, ROCE had a W-test coefficient of 0.75490, a V-value of 2.827, a Z-value of 1.718 and a p-value of 0.04289. The test was statistically significant at the 5% level of significance ($p<0.05$). The study therefore rejected the null hypothesis that, all the data values of ROCE were normally distributed and accepted the alternative hypothesis that, the data values of ROCE were not normally distributed at the 5% level of significance. This also applied to the data values of ROIC, which had a W-test coefficient of 0.65057, a V-value of 4.030, a Z-value of 2.793 and a p-value of 0.00261, meaning the test was significant at the 95% confidence interval. The study therefore rejected the null hypothesis that, all the data values of ROIC were normally distributed and accepted the alternative hypothesis that, the data values of ROIC were not normally distributed.

The result for ROIC was synonymous to that of DA which had a W-test coefficient of 0.73867, a Z-value of 1.880, a V-value of 3.014 and a p-value of 0.00690, indicating the

test's significance at α=5%. Hence, the study rejected the null hypothesis that all the data values of DA were normally distributed and accepted the alternative hypothesis that the data values of DA were not normally distributed. Table 1 however revealed a W-test coefficient of 0.81425, a Z-value of 1.125, a V-value of 2.142 and a p-value of 0.13033 for all the data values of ROA. This indicates that, the test for normality was not significant at α=5%. The study therefore accepted the null hypothesis that, all the data values of ROA were normally distributed and rejected the alternative hypothesis that, the data values of ROA were not normally distributed. Apart from the W-test for ROA which was significant at α=5% (p=0.13033), all the other tests were insignificant. Thus, all the data values of ROCE, ROICand DA were not normally distributed. The researchers therefore viewed a more generalized estimator as ideal for the ROCE, ROA and ROIC working models.

4.2 Test for Heteroscedasticity

As explained by Giles (2013) a collection of random variables is said to be heteroscedastic if there are sub-populations that have different variability's from others. According to Gujarati and Porter (2009), one of the assumptions of the Classical Linear Regression Model (CLRM)is that, there is no heteroscedasticity; breaking this assumption therefore means, the Gauss-Markov theorem does not apply, indicating that, the Ordinary Least Squares (OLS) estimators are not the Best Linear Unbiased Estimators (BLUE) and their variances are not the lowest of all other unbiased estimators. Heteroscedasticity causes ordinary least squares estimates of the variance (and thus, standard errors) of the coefficients to be biased, possibly above or below the true or population variance. Biased standard errors too lead to biased inferences, so hypothesis results are possibly wrong (Ginker & Lieberman, 2017; Greene, 2012; and Tofallis, 2008). In short, the presence of heteroscedasticity implies, the usual hypothesis-testing routine is not reliable, raising the possibility of drawing misleading conclusions. The Bleusch and Pagan (1979) and Cook and Weisberg (1983) test was adopted to test for heteroscedasticity in the linear regression models. The test tested the null hypothesis that, there was absence of heteroscedasticity among the fitted values of ROCE, ROA and ROIC working models at the 5% level of significance as against the alternative hypothesis that, there was presence of heteroscedasticity among the fitted values of the working models.

Table 2: Bleusch-Pagan (1979) and Cook-Weisberg (1983) Test for Heteroscedasticity

Variable	Chi2 (1)-Value	Probability-Value
ROCE	0.38	0.5376
ROA	0.39	0.5304
ROIC	0.39	0.5333

(Source: STATA Output, 2019)

From the results shown in Table 2, a hettest Chi2 (1) of 0.38 for all the fitted values of the ROCE working model was not statistically significant at the 95% confidence interval (p=0.5376).The study therefore accepted the null hypothesis that, there was the absence of heteroscedasticity among the fitted values of the ROCE working model and rejected the alternative hypothesis that, there was the presence of heteroscedasticity among the fitted values of the ROCE working model. Similarly, a hettest Chi2 (1) of 0.39 for all the fitted values of the ROA working model was statistically insignificant at α=5% (p=0.5304). The study thereforeaccepted the null hypothesis that, there was the absence of heteroscedasticity among the fitted values of the ROA working model and rejected the alternative hypothesis

that, there was the presence of heteroscedasticity among the fitted values of the ROA working model. Finally, a hettest Chi2 (1) of 0.39 for all the fitted values of the ROIC working model was statistically insignificant at the 5% level of significance (p=0.5333).The study therefore accepted the null hypothesis that, there was the absence of heteroscedasticity among the fitted values of the ROA working model and rejected the alternative hypothesis that, there was the presence of heteroscedasticity among the fitted values of the ROA working model.

4.3 Test for Serial or Autocorrelation

The Durbin-Watson (DW) statistic which tests for serial or autocorrelation in the residuals from a statistical regression analysis, was employed for this study (Kenton, 2019). The DWtest, tests the null hypothesis that, there is no first order autocorrelation in the residuals from a regression analysis, as against the alternative hypothesis that, there is a first order autocorrelation in the residuals from a regression analysis (Durbin & Watson, 1950; and Durbin & Watson, 1951).

Table 3: Durbin-Watson Serial or Autocorrelation Test Results

Model	Durbin-Watson d-statistic
ROCE	2.753639
ROA	2.877465
ROIC	2.156438

(Source: STATA Output, 2019)

The study's Durbin-Watson d-statistic results for the ROCE working model was 2.753639. The study therefore failed to accept the null hypothesis that, there was no first order autocorrelation in the residuals of the ROCE working model and concluded that, there existed first order negative autocorrelation in the residuals of the ROCE working model.The Durbin-Watson test also revealed a d-statistic value of 2.877465 for the ROA working model. The study therefore failed to accept the null hypothesis that, there was no first order autocorrelation in the residuals of the ROA working model and concluded that, there existed first order negative autocorrelation in the residuals of the ROA working model.The Durbin-Watson test finally discovered a d-statistic value of 2.156438for the ROIC working model. The study therefore failed to accept the null hypothesis that, there was no first order autocorrelation in the residuals of the ROIC working model and concluded that, there existed first order negative autocorrelation in the residuals of the ROIC working model.

4.4 Model Specification and Estimation

The study had wanted to choose between the fixed effects model and the random effects model, by using the residuals of thefixed and random-effects GLS regressions for the fitted values of the ROCE, ROA and the ROIC working models to conduct the Durbin-Wu-Hausman fixed-random specification test. However, due to the constraint of limited number of observations, such a test could not be undertaken. The Robust Ordinary Least Squares (OLS) regression estimator was therefore viewed as the most ideal estimator for all the fitted values of the ROCE, ROA and the ROIC working models. The estimator was viewed as more ideal for the study because it had the qualities of remedying the issues of data abnormality and serial correlation that were detected in the study's diagnostic tests. The estimator was also viewed as more appropriate because it provided much better regression coefficient estimates than the OLS regression estimator. Put simply, the Robust Ordinary Least Squares

(OLS)regression estimator was viewed as the Best Linear Unbiased Estimator (BLUE) for all the working models of the study.

4.5 Descriptive Analysis

According to Trochim (2006), Babbie (2009) and Nick (2007), a descriptive statistic is a summary statistic that quantitatively describes or summarizes features of a collection of information. Descriptive statistics are distinguished from inferential statistics, in that,they are not developed on the basis of probability theory, and are frequently nonparametric in nature (Dodge, 2003).Table 4presents the descriptive statistics on the study's variables, and from the results, the mean values of -0.109925, -0.790325 and -0.1335 for ROA, ROIC and ROCE respectively implies, on the average, the firms' were able to use their resources to generate -0.109925, -0.790325 and -0.1335 on their assets, issued capital and capital employed for the period 2015 to 2018 respectively.The minimum values of ROA, ROIC and ROCE were respectively-0.2513, -2.8574 and -0.3339,with -0.0391, -0.0681 and -0.0454 being their maximum values respectively. The ROA, ROIC and ROCE data values had range values of 0.2122, 2.7893 and 0.2885 respectively.The negative mean values implies management of the firms were not efficient enough in using resources to generate earnings. This gives investors a negative perception about the firms.

Investors are always interested in ROA, ROIC and ROCE ratios because, it helps them to assess the efficiency of management in terms of resource utilization. Management of the sampled firms therefore need to re-evaluate the business strategies of the firms to improve upon these ratios.ROA, ROIC and ROCE also had 0.0965138, 1.378416 and 0.1349701 respectively as their standard deviation values and 0.0093149, 1.90003 and 0.0182169 respectively as their variances. These figures show how the data values of the variables were dispersed or deviated from their means. Comparing the standard deviations of the three performance proxies, ROIC had the widest disparity from its mean with a standard deviation of 1.3784. The variance figures also show the variability (volatility) of the variables from their means, and volatility is a measure of risk, therefore, the variance statistics can help investors to determine the risk they might face when investing in the firms.

Table 4: Descriptive Statistics on ROCE, ROA, ROIC and DA

Variable	Mean	Std. Dev.	Variance	Minimum	Maximum	Range
ROCE	-0.1335	0.1349701	0.0182169	-0.3339	-0.0454	0.2885
ROA	-0.109925	0.0965138	0.0093149	-0.2513	-0.0391	0.2122
ROIC	-0.790325	1.378416	1.90003	-2.8574	-0.0681	2.7893
DA	0.090525	0.0874295	0.0076439	0.0358	0.2206	0.1848

(Source: STATA Output, 2019)

The sampled firms also had 0.090525 as mean, 0.0874295 as standard deviation and 0.0076439 as variance for the capital structure proxy DA.This implies, data values of DA deviated from the average by 0.0874295. In other words, dispersions around the mean DA ratio was 0.0874295. The DA ratio had a maximum value of 0.2206 and a minimum value of 0.0358, resulting in a range of 0.1848. The average debt ratio of 0.090525 for the firms indicates that, 9.05% of the assets of the firms were being financed by debt. The ratio also shows that, the firms had more assets than debt and could easily pay off their debt from the

sale of their assets. Essentially, 9.05% of the assets of the firms were owned by creditors, and shareholders of the firms owned the remaining 90.95% of the assets. The ratio being so low further implies, the firms were not leveraged or riskier for investors. It is also an indication that, the firms were more stable with the potential of longevity because, the lower the debt ratio, the lower the overall debt of the firms.

4.6 Correlational Analysis

As explained by Steven (2018), correlation coefficient is a measure that determines the degree to which the movement of two variables are associated. The Pearson Product-Moment Correlation Coefficient technique of data analysis was used to measure the relationship between capital structure and the firms' financial performance as measured by ROCE, ROA and ROIC.From Table 5, there was a significantly strong and inverse relationship between DA and ROCE at the 5% level of significance [r= -0.9712, (p=0.0288)<0.05]. The negative association between DA and ROCE implies, an increase in DA led to a decrease in ROCE and vice versa. The degree of association that existed between DA and ROCE is evidenced by the coefficient of determination (r^2 =0.9432) which indicates that 94.32% of the variations in ROCE was accounted for by DA and 94.32% of the variations in DA was explained by ROCE.

Table 5: Correlational Matrix for ROCE, ROA, ROIC and DA

Variable	ROCE	ROA	ROE	DA
ROCE	1			
ROA	0.9972*	1		
	(0.0028)			
ROIC	0.9929*	0.9812*	1	
	(0.0071)	(0.0188)		
DA	-0.9712*	-0.9518*	-0.9900*	1
	(0.0288)	(0.0482)	(0.0100)	

Note: * implies significance at 5% and values in parenthesis ( ) represent probabilities.
(Source: STATA Output, 2019)

Additionally, a significantly strong and converse relationshipwas found between DA and ROA at the 95% confidence interval [r= -0.9518, (p=0.0482)<0.05].The inverse relationship that existed between DA and ROA means, an increase in DA led to a decrease in ROA and vice-versa.The strength of association between DA and ROA is supported by the coefficient of determination (r^2 =0.9059) which shows that 90.59% of the variations in ROA was accounted for by DA and 90.59% of the variations in DA was explained by ROA.Finally,a significantly strong and adverse relationship between DA andROIC was established atα=5% [r = -0.9900, (p=0.0100)<0.05]. The negative connection between DA and ROIC is an indication that an increase in DA led to a decrease in ROIC and vice-versa. The degree of association that existed between DA and ROIC can also be justified by the coefficient of determination (r^2 =0.9801) which indicates that 98.01% of the variations in DA was accounted for by ROIC and 98.01% of the variations in ROIC was explained by DA.

Test of Hypothesis One: Significantlyinverse relationshipswere found betweenthe capital structure proxy (DA) and the proxies for financial performance (ROCE,ROA and

ROIC)at the 95% confidence interval ($p<0.05$).Therefore, the null hypothesis (H_{01}) that, there was no significant relationship between capital structure and the firms' financial performance is rejected. The alternative hypothesis (H_1) that, there was a significant relationship between capital structure and the firms' financial performance is accepted.These findings were in line with Pratheepkanth (2011) who conducted a study on the impact of capital structure on the financial performance of business organisations in Sri Lanka during the period 2005 to 2009 and established a negative relationship between capital structure and financial performance of the firms.The findings did not however support that of Taani (2003) who examined the impact of capital structure on the performance of 12 Jordanian banks listed on the Amman Stock Exchange (ASE) for the period 2007 to 2011 and found out a significantly positive association between Total Debt-to-Total Fund (TDTF)and the performance of the banks. The study's findings did not finally agree with that of Abor (2005) whose study on some listed firms on the Ghana Stock Exchange (GSE) disclosed a positive relationship between Debt to Assets (DA) and Return on Equity (ROE).

4.7 Regression Analysis

According to the Necessary Condition Analysis (2018), regression analysis helps one to understand how the typical value of the response variable changes when any one of the predictor variables is varied, while other factors are held fixed.This aspect of the study presents results and discussions on the effect of capital structure on the financial performance of the firms as measured by ROCE, ROA and ROIC. As displayed in Table 6, DA had a significantly inverse effect on ROCE at the 5% level of significance [absolute t =11.57, (p=0.007) <0.05]. The beta (β) value of -1.499367 implies, on the average, a unit increase in DA led to a 1.4994 decrease in ROCE when all other factors were held constant.

Table 6: Effect of Capital Structure on the Firms' Financial Performance (ROCE)

Variable	Coefficient (β)	Robust Std. Err	t-Statistic	Probability(t)
DA	-1.499367	0.1296347	-11.57	0.007
Cons.	0.0022302	0.0304727	0.07	0.948
R-Squared (R^2)	0.9433			
F-Statistic	133.77	AIC	-13.30178	
Probability (F)	0.0074	BIC	-14.52919.	

(Source: STATA Output, 2019)

The coefficient of determination (R^2=0.9433) indicates that, 94.33% ofthe variations in ROCE were accounted for by the predictor variable, DA.Further, the F-statisticvalue of 133.77was statistically significant at the 95% confidence interval (p=0.0074). On the basis of this, it can be concluded that, DA significantly accounted for 94.33% of the variations in ROCE. The other 5.67% (100-94.33%) of the variations in ROCE may be attributed to unknown variables or inherent variabilities.**ROCE=0.0022302-1.499367DA** was finally obtained after fitting the coefficients into the ROCE working model.

Table 7: Effect of Capital Structure on the firms' Financial Performance (ROA)

Variable	Coefficient (β)	Robust Std. Err.	t-Statistic	Probability(t)
DA	-1.05075	0.1199547	-8.76	0.013
Cons.	-0.0148059	0.0282412	-0.53	0.652
R-Squared (R^2)	0.9060			
F-Statistic	76.73	AIC	-13.9623	
Probability (F)	0.0128	BIC	-15.18971	

(Source: STATA Output, 2019)

As depicted in Table 7, DA significantly negatively affected ROA at the 95% confidence interval [absolute t=8.76, (p=0.013)<0.05].The beta (β)value of DA was -1.05075. As the coefficient carried a negative weight, it means, on the average, a unit increase in DA, led to a 1.05075 decrease in ROA when all other factors were held constant.The coefficient of determination (R^2 =0.9060) also shows that, 90.60% ofthe variations in ROA were accounted for byDA. Further, the F-statistic value of 76.73was statistically significant at α=5% (p=0.0128). On the basis of this, it can be concluded that, DA significantly explained 90.60% of the variations in ROA.The remaining 9.40% (100-90.60) of the variations in ROA may be accounted for by other factors not included in the study.**ROA= -0.0148059-1.05075DA** was finally obtained after fitting thecoefficients into the ROA working model.

Table 8: Effect of Capital Structure on the Firms' Financial Performance (ROIC)

Variable	Coefficient (β)	Robust Std. Err.	t-Statistic	Probability(t)
DA	-15.60915	0.818693	-19.07	0.003
Cons.	0.6226937	0.1856424	3.35	0.079
R-Squared (R^2)	0.9802			
F-Statistic	363.51	AIC	1.080255	
Probability (F)	0.0027	BIC	-0.1471562	

(Source: STATA, Output, 2019)

From Table 8, DA was a significant predictor of the firm's financial performance atα=5% [absolute t=19.07, (p=0.003)<0.05]. The negative beta (β) value of -15.60915 is an indication that, on the average, a unit increase in DA, significantly decreased ROIC by 15.60915when all other factors were held constant.The coefficient of determination (R^2=0.9802)shows that, 98.02% ofthe variances in ROICwere attributed to the explanatory variable DA. In other words, 98.02% of the variations in ROICwere accounted for by the influencing variableDA. Further, the F-statistic value of 363.51 was significant at the 95% confidence interval (p<0.05). Based on this, the study concludes that, DA significantly explained98.02% of the variations in ROIC. The remaining 1.98% (100-98.02) of the variances in ROIC may be attributed to other factors or inherent variabilities which formed no part of the study.**ROIC=0.6226937-15.60915DA** was finally derived after fitting the values intothe ROIC working model.

Test of Hypothesis Two: Debt-to-Total Assets (DA) significantly explained 94.33% of the variations in ROCE (R^2=0.9433). Debt-to-Total Assets (DA) also accounted significantly for 90.60% of the variations in ROA (R^2=0.9060). Finally,DA accounted significantly for 98.02% of the variances in ROIC (R^2=0.9802). Therefore, the null

hypothesis (H_{02}) that, capital structure had no significant effect on the firms' financial performance is rejected.The alternative hypothesis (H_2)that, capital structure significantly affectedthe firms' financial performance is accepted.These findings were consistent with that of Chinamerem and Anthony (2012) who examined the impact of capital structure on the financial performance of thirty (30) non-financial firms listed on the Nigerian Stock Exchange from 2004 to 2010 and disclosed that, firms' capital structure surrogated by debt ratio had a significantly negative impact on the firms' financial measures Return On Assets (ROA) and Return On Equity (ROE).

The findings were also in line with Abor (2005) who conducted a study on the influence of capital structure on the profitability of listed companies on the Ghana Stock Exchange (GSE) during a five-year period and found a significantrelationship between Short-term Debt to Assets (SDA) ratio and Return on Equity (ROE).The findings again supported that of Taani (2003) who examined the impact of capital structure on the performance of 12 Jordanian banks listed on Amman Stock Exchange (ASE) for the period 2007-2011 and disclosed that, performance of the banks was significantly associated with total debt.Findings of the study also supported that of Lawal et al. (2014) whosestudy on 10 manufacturing firms in Nigeria for the period 2003 to 2012 revealed a significant relationship between DA and the performance of the firms.The study's findingsdid not however agree with that of Ibrahim (2009) whosestudy on the impact of capital structure choice on firms' performance in Egypt for the period 1997 to 2005 found a weak-to-no impact of capital structure choices on the firms' financial performance.

Table 9: Summary of the Test of Hypothesis

Hypothesis	Analytical Tool	Result
H_{01}: There is no significant relationship between capital structure and the firms' financial performance	Correlation	Rejected
H_{02}: Capital structure does not significantly affect the firms' financialperformance	Regression	Rejected

(Source: Authors, 2019)

5.0 CONCLUSION AND RECOMMENDATIONS

This study sought to examine the influence of capital structure on the financial performance of firms listed on the Ghana Alternative Market (GAX). An unbalanced panel data sourced from the audited and published annual reports of the HORDS, Intraveneous Infusions, Meridian-Marshalls Holdings and Samba Foods Ltd for the period 2015 to 2018 was used for the study. In the study, capital structure was surrogated by the ratio of Debt-to-Total Assets (DA), whilst the Return on Capital Employed (ROCE), Return on Assets (ROA) and Return on Issued Capital (ROIC) were used to proxy the firms' financial performance. From the study's Pearson Product-Moment Correlation Coefficient estimates, capital structure proxied by the Debt-to-Total Assets (DA) ratio had a significantly negative relationship with the firms' financial performance as measured by ROCE, ROA and ROIC; whilst the study's Robust Ordinary Least Squares (OLS) regression output provided evidence of capital structure having a significant influence on the firms' financial performance as measured by ROCE, ROA and ROIC.

After taking into consideration the various findings, the researchers recommend that, since capital structure is a significant determinant of the firms' financial performance, the

sampled firms should operate with a capital structure mix that would minimize costs and maximize their profitability. The firms should also use more equity than debt to finance their operations. This is because, in as much as the value of the firms could be enhanced using debt capital, it will get to a point where it will become detrimental to the value of the firms. Therefore, the firms should establish a point at which their weighted average cost of capital will be minimal, and they should maintain this gearing ratio so that, their performances will not be eroded. This point is raised because, firms that are highly geared are more prone to lower performances than lowly geared ones. Finally, authorities of the sampled firms should strive to retain some of their net profits (if any) as part of their long-term financing decisions. This would discourage excessive borrowing with its associated costs.

6.0 STUDY LIMITATIONS

This study sought to examine the effect of capital structure on the financial performance of firms listed on the Ghana Alternative Market (GAX). The study therefore depended solely on the firms' published annual reports on the Ghana Stock Exchange (GSE). Hence, all limitations that are inherent in published financial statements are bored by the study. While the data used for the study was also verifiable because it came from publications on the GSE, it nonetheless could still be prone to the shortcoming of time because, the study was limited to the period 2015 to 2018. A longer duration of the study could have captured periods of various economic importance, thereby given broader dimensions of the research problem. However, the only available data on the Ghana Stock Exchange (GSE) was from the period 2015 to 2018 which the researchers deemed as credible and reliable to be used for the study.

The study was again limited to only the HORDS, Intraveneous Infusions, Meridian-Marshalls Holdings and Samba Foods Ltd. Findings of the study can therefore not be generalized to include all listed and non-listed firms in the nation. The study finally used ROCE, ROA and ROIC as measures of financial performance and DA as a measure of capital structure. Therefore, all inherent limitations on the selected measures of performance and capital structure may have an impact on the conclusions drawn from the study.

7.0 SUGGESTIONS FOR FURTHER RESEARCH

Since this study explored the effect of capital structure on the financial performance of firms listed on the Ghana Alternative Market (GAX), the researchers suggests that, similar studies should be conducted for other firms listed on the Ghana Stock Exchange for the purposes of comparison and to allow for generalization of findings. The study was also limited to the Ghana Alternative Market (GAX). The researchers suggeststhat, studies on firms not listed on GAX should be conducted so as to confirm if indeed, capital structure have an effect on firms' financial performance. The study finally used DA to proxy capital structure and ROCE, ROA and ROIC as proxies for financial performance. The researchers therefore suggests that, further studies should consider more proxies for both financial performance and capital structure.

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