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Regina Naa Amua Dodoo, Matilda Kumi, Tinashe Mangudhla

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The effect of capital structure on firm performance: empirical evidence from emerging economy

Regina Naa Amua Dodoo*

Department of Business Administration,
Hohai University,
Nanjing, Jiangsu Province, 211100, China
Email: lx20210613004@hhu.edu.cn

*Corresponding author

Matilda Kumi

Department of International Trade and Economics,
Jiangsu University of Technology,
Changzhou, 213001, China
Email: tillykiss56@gmail.com

Tinashe Mangudhla

School of Management,
University of Science and Technology of China,
Hefei, Anhui, 230026, China
Email: tmangudhla@gmail.com

Abstract: The effect of capital structure on company performance was investigated for a decade (2008–2017) using a panel data sample representing 15 non-financial firms registered on the Ghana stock exchange. Because improved performance is required for the firm's long-term survival, the relationship between capital structure and firm performance cannot be neglected. The empirical studies using two Step System generalized method of moment (GMM) and ordinary least squares (OLSs) regression methods show that capital structure (especially STD and LTD) has a negative impact on company performance as assessed by return on asset (ROA). Capital structure (LTD and DE) has no substantial impact on firm performance as assessed by return on equity (ROE). These findings lead the study to the conclusion that capital structure has little to no impact on the financial performance of Ghana's listed non-financial companies. These results are supported with the robustness check.

Keywords: capital structure; firm performance; non-financial listed firms; Ghana stock exchange; GMM; generalised method of moment.

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Biographical notes: Regina Naa Amua Dodoo is a student in Hohai University, Department of Business Administration. She majors in accounting with research focus on finance, financial inclusion and poverty alleviation.

Matilda Kumi is a student in Jiangsu University of Technology in China. Her field of study is in international economics and trade.

Tinashe Mangudhla is a student in the School of Management at the University of Science and Technology of China. His research interests are within the domains of finance, small-medium enterprises, and regional and agricultural economics.

1 Introduction

For some decades now, researchers have studied the relationship between capital structure and corporate performance. The connection has drawn the interest of many researchers in this area. One of the most important concerns in finance and accounting is the makeup of capital structure, which is made up of debt and equity, and its possible impact on corporate performance. An ideal capital structure, which represents the corporate financing mix, can maximise the market share price and the value of the company, financing options can be referred to key corporate decisions. Choosing a capital structure is one of the most challenging and complex management decisions a company can make (Pouraghajan et al., 2012). This is because the decision could affect the cost of capital and, as a result, the company's value.

Domestic and international firms, particularly those that are underperforming, have been severely impacted by the present financial crisis. Credit supply has significantly dropped, while rising risk and a higher cost of capital have put pressure on enterprises to strike the optimum debt-to-equity ratio. Capital structure has been the subject of numerous studies, with experts concentrating on the link between capital structure and business success. A corporation may benefit from determining and implementing the optimum financial structure. Capital structure influences the cost and availability of money, which in turn influences a company's success.

Modigliani and Miller initially defined capital structure as the mix of debt and equity that a firm employs in its operations. Modigliani and Miller's study was based on a number of restricted assumptions, which was changed five years later in 1963 (Modigliani and Miller, 1963). Followed by Modigliani and Miller, was Jensen and Meckling who discussed the agency cost theory, which refers to the potential conflict between managers and shareholders on one side and stockholders and debtors on the other. The capital structure literature grew throughout time, and researchers discovered several of the factors that affect both financing decisions and financial performance.

In line with Jensen and Meckling (1978), the research such undertaken by Hull and Dawar (2014) documented no significant effect of efficiency on leverage and non-linearities in the relationship between ownership type, capital structure, and company performance.

Margaritis and Psillaki (2007) use a sample of 12,240 New Zealand businesses to find evidence for Jensen and Meckling (1978) agency cost model's theoretical predictions. Leverage over the entire range of observed data is positively related to efficiency as

assessed by the distance from the industry's 'best practice' production frontier. They continued to show that the inverse causal impact of leverage efficiency is favourable at low to mid-leverage levels but negative at high leverage levels. Over the years 1998–2002, Abor (2005) found a positive relationship between capital structure (STD and TD) and performance in Ghanaian enterprises. From 2001 to 2007, Arbabiyan and Safari (2009) explore the influence of capital structure on profitability using 100 Iranian publicly traded companies. They found short-term and total debts positively relates with profitability (ROE) which indicates a negative relation between long-term debts and ROE.

Ebaid (2009) also found that the level of debt has a significant negative affiliation with the firm performance on non-financial Egyptian firms. This was not consistent with the discoveries of numerous studies conducted for Western Economies but reliable with a few of the studies completed for developing nations. One vital reason for this conflicting result can be the high cost of borrowing in developing nations like Ghana in comparison to Western countries.

Whereas the literature analysing the performance implications of capital structure choices is monstrous in developed economies, less is empirically known about such implications in transition economies such as Ghana. In such a nation as Eldomiaty (2007), the contended capital structure is less efficient and incomplete and endures from a higher level of information asymmetry than capital markets in developed countries. This environment of the market may cause financing decisions to be incomplete and subject to a significant degree of irregularity. In this manner, it is fundamental to examine the validity of capital structure on the performance of non-financial firms in Ghana listed on the Ghana Stock Exchange for 10 years.

The most points of this paper are empirically looking at the relationship and impact between capital structure and financial performance of non-financial firms listed on the Ghana Stock Exchange for the 10 year period (2008–2017), utilising two accounting-based measures of firm performance: return on assets (ROAs) and return on equity (ROE). The paper also employs two different estimation methods, thus two-step system generalised method of moment (GMM) and ordinary least squares (OLSs).

The rest of this investigation is as follows: Section 2 outlines the theoretical and empirical basis of the study. Section 3 deals with the sample and data, including the variables description as well as the model and the methods. Section 4 explains the results and analysis of the investigation and finally, Section 5 concludes the study.

2 Literature review

2.1 Theoretical review

The concept of capital structure and its relationship with a firm's performance has been a topic of great concern in corporate finance and accounting literature since the pioneering study of (Modigliani and Miller, 1958). They claim that under certain conditions, such as a perfect capital market, investors' homogeneous expectations, a tax-free economy, and no transaction costs, capital structure is irrelevant in determining corporate value. In any event, one can wonder whether all financial markets are flawless in the real world. Capital structure may be crucial when market imperfections like as transaction and

bankruptcy costs are taken into account. Little adjustment costs, as Strebulaev (2007) points out, can lead to huge differences in capital structure.

Modigliani and Miller (1963) in this way rectified their capital structure irrelevance proposition for taxes. Because the interest on the loan may be tax deductible, the company is able to reduce its tax bill by taking on more debt. The market value of the company increases by the share value of the interest on tax shield as the debt to equity ratio rises. This implies that if leverage is used to excessive levels, the cost of capital will not grow. According to Kim (1978) and Solomon (1963), the capital tax must grow in an exceptional use situation. To keep the weighted average cost of capital low, corporations will keep a strategic distance from a perfect debt position and strive for the best mix of debt and equity. Furthermore, between 1963 and 1970, non-financial enterprises in the United States were financed by one-third of debt.

Baxter (1967) identifies two primary explanations for leveraged firms' low debt ratios. To begin with, the debt interest rate is inextricably linked to the debt-to-equity ratio. As the company borrows more, creditors are likely to demand a higher rate of return on the borrowed funds. Furthermore, higher debt levels may increase the likelihood of defaulting on interest payments, resulting in bankruptcy. For these reasons, businesses will seek a level of financing that maximises the tax savings generated by increasing debt levels while minimising the risk of bankruptcy. Brennan and Schwartz (1978) argue that the possibility of bankruptcy costs increases the vulnerability of future tax savings, and they show that this vulnerability is sufficient to launch an optimal capital structure, even though their model does not include bankruptcy charges.

The capital structure irrelevance argument, according to Miller (1988), was not intended to suggest that "... the debt-equity ratio was unclear..." In light of this, Myers (2001) suggests that the Modigliani and Miller (1958) propositions should be regarded as a benchmark rather than the perfect concluding outcome. There are claims that finance is unimportant, but that certain transaction expenses significant.

2.2 *Empirical review*

There have been various empirical studies that have found a link between capital structure decisions and firm performance. Some have observed a favourable effect, while others have observed either a negative or no effect.

Razak et al. (2008) investigate the impact of a different corporate governance ownership control structure on firm performance among government-linked companies (GLCs) and non-GLCs in Malaysia. The research was conducted on a sample of 210 businesses between 1995 and 2005. After adjusting for firm-specific criteria such as size, non-duality, leverage, and growth, the findings suggest that government ownership has a considerable impact on corporate success. The findings are important for investors and policymakers because they will help them make better investment decisions. Zeitun and Tian (2007) used a panel data sample covering 167 Jordanian enterprises from 1989 to 2003 to explore the impact of capital structure on corporate performance. The research found that a company's capital structure has a considerable negative influence on its performance measurements, both accounting and market measures.

Le and Phan (2017) investigated the effect of capital structure on company performance in Vietnam using unbalanced panel data from all non-financial listed firms between 2007 and 2012. The data was analysed using the OLS, fixed and random effects, and GMM estimation methods. All debt ratios have a strong negative relationship with

firm performance, according to the findings. Also, Ebaid (2009) investigated capital structure decisions using three accounting-based financial performance indicators (i.e., ROE, ROAs, and gross profit margin) with a sample of non-financial Egyptian enterprises from 1997 to 2005. In simplified terms, the findings show that debt has a weak-to-no effect on a firm's performance, and that debt levels have a significant negative relationship with firm performance, which contradicts the findings of numerous studies conducted for Western economies but is consistent with a few studies completed for developing countries. One important cause for this discrepancy could be the high cost of borrowing in emerging economy such as Ghana.

Hull (2014) findings were in line with Jensen and Meckling (1978) agency cost model, and they found no evidence of a major impact of efficiency on leverage. Non-linearities in the link between ownership type, capital structure, and company performance have been observed. Lin and Chang (2009) investigated the relationship between debt ratio and company performance by using the OLS method to determine whether a threshold debt ratio exists for 196 Taiwanese publicly traded companies between 1993 and 2005, and measuring firm performance using Tobin's Q. They claimed that the debt ratio and business performance had two threshold impacts. When the debt ratio is smaller than 9.86%, a 1% rise in the debt ratio results in a 0.0546% increase in Tobin's Q. Tobin's Q increases 0.0057% with a 1% increase in debt ratio when the debt ratio is between 9.86% and 33.33%. There is no correlation between debt ratio and business value when it exceeds 33.33%.

Margaritis and Psillaki (2007) use a sample of 12,240 New Zealand businesses to find evidence for the Jensen and Meckling (1978) agency cost model's theoretical predictions. Leverage over the entire range of observed data is positively related to efficiency as assessed by the distance from the industry's 'best practice' production frontier. They continued to show that the inverse causal impact of leverage efficiency is favourable at low to mid-leverage levels but negative at high leverage levels. (Berger and Di Patti, 2006; Gill et al., 2011) examine the capital structure of 272 American companies and 695 US commercial banks from 2005 to 2007 and 1990 to 1995, respectively. From 2001 to 2007, Arbabiyan and Safari (2009) explore the influence of capital structure on profitability using 100 Iranian publicly traded companies. They discovered that short-term and overall debts are positively associated with profitability (ROE), whereas long-term debts are negatively associated with ROE.

San and Heng (2011) found that there is an association between capital structure and corporate performance in their study of construction businesses listed on the Main Board of Bursa Malaysia between 2005 and 2008. The influence of an alternative ownership control structure of corporate governance on company performance across GLCs and Non-Government-linked firms (NGLCs) in Malaysia was investigated by (Razak et al., 2008). The research was based on a sample of 210 businesses from 1995 to 2005. After adjusting for firm-specific criteria such as size, non-duality, leverage, and growth, the findings suggest that government ownership has a considerable impact on corporate success. Investors and politicians will benefit from the findings, which will help them make better investment decisions.

Using the OLS Regression estimates, they discovered a positive correlation between short-term debt and company performance. Over the years 1998–2002, (Abor, 2005) found a favourable relationship between capital structure (STD and TD) and performance in Ghanaian enterprises. In contrast, results were reported by Abor (2007) who expands

his past studies to small and medium-sized enterprises in Ghana and South Africa and accounts for a negative relationship between long-term debt and performance.

In addition, Amjed (2011) found a negative relationship between a firm's financial structure and its performance for all chemical businesses registered on the Karachi Stock Exchange between 2001 and 2006. According to Elkelish and Marshall (2007), the debt-to-equity ratio has little effect on business value. They also discovered, using multiple regression analysis, that business risk is the most important indicator of debt-to-equity ratio. This could be owing to the lack of any tax benefits from using debt, as well as the low value of witnessing bankruptcy and agency expenses. Chakraborty (2010) used two performance measures: the ratio of profit before interest, taxes, and depreciation to total assets and the ratio of cash flows to total assets, as well as two leverage measures: the ratio of total borrowing to assets and the ratio of liability and equity, to show a negative relationship between these variables.

A comparable study by Saeedi and Mahmoodi (2011) looks at the relationship between capital structure and firm performance. The study utilised a sample of 320 firms listed on the Tehran Stock Exchange over the period 2002–2009 including all of the financial companies and banks. The study employs four performance measures (ROA, ROE, EPS, and Tobin's Q) as the dependent variable and three capital structure measures (long-term debt, short-term debt and total debt ratio) as the independent variable. The investigation demonstrated that firm performances (EPS and Tobin's Q) significantly and positively relates to capital structure, whereas it detailed a negative connection between capital structure and ROA, and no significant relationship between ROE and Capital structure. Pratheepkanth (2011) analysed the capital structure and its effect on financial performance capacity from 2005 to 2009 of Business companies in Sri Lanka. The outcome indicates the relationship between capital structure and financial performance is negative.

The impact of stock returns in studies of corporate financing choices is irrelevant to target leverage, according to Hovakimian et al. (2004). This is likely owing to the relationship between the Pecking order theory and Market timing behaviour theory. Furthermore, profitability has little bearing on target leverage, according to this study. Unprofitable businesses issue stock to offset the overabundance advantage resulting from accumulated losses. This study supports the assumption that firms have a goal capital structure in this way. In any case, the desire for internal financing and the temptation to timing the market by offering fresh equity when the stock price is fairly high interfered with the firm's desire to keep its debt ratio close to its aim.

3 Sample and data

The study uses all publicly traded corporations on the Ghanaian stock exchange from 2008 to 2017. The Ghana Stock Exchange is a database organisation that keeps records of financial statements and market data for all Ghanaian companies that are registered on the Ghanaian stock exchange and are regulated. The study checks the listed companies for a few things: all financial services institutions (banks and insurance companies) are removed from the sample, and the remaining companies are examined for the availability of financial data throughout the test period (2008–2017). This screening provided the final 15-firm sample. The companies in the sample are from 15 different non-financial industries.

4 Variables measurement

Most literary works include a variety of performance measurements, including accounting-based measures such as ROE, ROA, and GMM, which are determined from a company's financial statements (Abor, 2005; Dodoo et al., 2020; Salloum et al., 2016). Stock returns and volatility are examples of market-based measurements. Tobin's Q degree, developed by Welch, (2004), combines market and accounting values (Zeitun and Tian, 2014). Abor (2007) used accounting-based and Tobin's Q measurements, as well as other metrics like profit efficiency (i.e., frontier efficiency calculated using a profit function (Berger and Di Patti, 2006).

To evaluate the firm performance, this study uses two typical accounting-based performance measures: ROE, which is calculated as the ratio of net profit to average total equity, and ROA, which is calculated as the ratio of net profit to average total assets.

Capital structure variables. Related to preceding literature (Abor, 2005, 2007; Salim and Yadav, 2012), the study estimates Capital Structure by the following three ratios:

- 1 long term debt (LTD)
- 2 short term debt (STD)
- 3 debt-equity ratio (DE).

Control variable. According to previous study, a company's size and expansion can affect its performance; larger companies have a wider range of capabilities and can benefit from economies of scale, which can change the outcomes and deductions (Frank and Goyal, 2003; Salim and Yadav, 2012; Salloum et al., 2014). As a result, by integrating the size and growth variable in the model, this study is able to manage the contrasts in a firm's operational environment. To account for the impacts of firm size and growth on the dependent variable, the model includes measures of size and growth (log of total assets, total sales) (i.e., performance). Table 1 describes the variables used in the study.

Table 1 Definition of variables

<i>Variable</i>	<i>Description of calculation</i>
<i>Dependent variable</i>	
Return on asset (ROA)	Net income earned by a company as a percentage of the total assets
Return on equity (ROE)	The rate of return on the owners' equity employed in the business
<i>Independent variables</i>	
Long-term debt (LTD)	Long term debt to total assets
Short-term debt (STD)	Short term debt to total assets
Debt equity ratio (DE)	Total liabilities by its shareholder equity
<i>Control variables</i>	
Size	Log of total assets
Growth (GR)	Total Sales

Source: Authors composition

5 Model and methods

The following regression models test the connection between capital structure and firms performance.

$$ROA_{it} = \alpha + \beta_1LTD_{it} + \beta_2STD_{it} + \beta_3DE_{it} + \beta_4SIZE_{it} + \beta_5GR_{it} + \varepsilon_{it} \quad (1)$$

$$ROE_{it} = \alpha + \beta_1LTD_{it} + \beta_2STD_{it} + \beta_3DE_{it} + \beta_4SIZE_{it} + \beta_5GR_{it} + \varepsilon_{it} \quad (2)$$

LTD_{it} = Long term debt, STD_{it} = Short term debt, DE_{it} = Debt-Equity Ratio, $Size_{it}$ = Size, GR_{it} = Growth, ε_{it} = the error term.

The study initially modelled the prompt effect of capital structure and firm performance, which adjusts and compresses time fixed effects, to investigate the relationship between capital structure and firm performance. The result is defined in the study by using a standard dynamic panel regression as shown below:

$$\Delta Y_{it} = \alpha + \delta Y_{i, t-1} + \beta_1 X_{it} + \gamma_t + \varepsilon_{it} \dots \quad (3)$$

For $i = 1 \dots N$ and $t = 1 \dots T$.

where ΔY_{it} , is ROA, ROE named as firm performance, i as firms with t showing time point t . (t_{-1}) is the level of performance within the past period. X_{it} as an independent variable in a firm i at a time point t . In this circumstance, this variable captures long-term debt (LTD), short term debt (STD), and debt-equity ratio (DE). γ_t are the time fixed effects dispersed over firms, ε_t is the error term. Coefficient δ measures the social condition upon the explanatory variable. From the above, the study develops the following equations:

$$\begin{aligned} \Delta ROA = & \alpha + \beta_0 ROA_{i, t-1} + \beta_1 LTD_{it} + \beta_2 STD_{it} + \beta_3 DE_{it} + \beta_4 SIZE_{it} \\ & + \beta_5 GR_{it} + \gamma_t + \varepsilon_t \end{aligned} \quad (4)$$

$$\begin{aligned} \Delta ROE = & \alpha + \beta_0 ROE_{i, t-1} + \beta_1 LTD_{it} + \beta_2 STD_{it} + \beta_3 DE_{it} + \beta_4 SIZE_{it} \\ & + \beta_5 GR_{it} + \gamma_t + \varepsilon_t \end{aligned} \quad (5)$$

With ROA and ROE signifying the level of firm performance, LTD as long-term debt, STD as short-term debt, DE as Debt-Equity Ratio, Size, and GR (Growth) as control variables, ε is an individual error term. The projected coefficient verifies the importance of the given model because the main hypothesis is to investigate the effects of capital structure on firm performance.

The study linked the OLS technique to the two-step system GMM model in evaluating equations (4) and (5). The generalised-method for moments (GMM) estimators of Arellano and Bond (1991) and Arellano and Bover (1995) are far superior to other panel data estimators for models with dynamic panel regression. Controls for both time and firm-specific effects are included in the GMM panel estimators, and suitable lags of the regressors are used as instruments to address the endogeneity issue.

The study connected SYS-GMM estimator since it is more capable of controlling the difficulties of the weak instrument (Arellano and Bover, 1995; Blundell and Bond, 1998). It incorporates both the equations in levels and the first difference as a system once more, but this time with a broader number of instruments. The lagged differences of the regressors are the instruments for the level equations, in addition to the reasons stated above. The validity of the extra instruments in expansion necessitates the incorporation of additional moment criteria. The firm-specific effects are unrelated to the first differences

of the regressors inside the equation. The lagged values of independent variables as instruments within the model, concurring to Reed (2015) are fitting instruments on the off chance that both criteria hold – independent variables are weakly exogenous and no autocorrelation of the error term exists.

The GMM model's application is accompanied with diagnostic tests. To begin, the research investigates the instrument validity to see if it has any bearing on the residual. The Hansen J-statistic test can be used to do this. The Arellano-Bond test is also used to evaluate second-order autocorrelation connections.

The study continues to test the robustness of the results by utilising the 3SLS methods of estimation. The robustness test is to ascertain the validity and reliability of the outcomes within the study.

6 Results and analysis

Table 2 reports the descriptive statistics of the sample of non-financial companies concerning the dependent and independent variables from 2008 to 2017. The outcomes from the firm performance indicate that the level of average firm performance in terms of ROAs and ROE within the sample is 0.0052693 and 0.167214%. The highest profitability accomplished by a firm is 0.7656% and 12.8951% and the lowest is – 5.6487% and –4.5277% with a standard deviation of 0.4849762 and 1.184918% separately. The average long-term debt (LTD) and short-term debt (STD) is 0.075856 and 0.6961607% with minimum of 0.0446 for short-term debt (STD). The maximum values of both the long (LTD) and short-term debts (STD) are 0.5437 and 21.1263%. The mean of the debt-equity ratio (DE) is 2.7978% with a standard deviation of 11.78329%. The average Size is 4.600553% with minimum and maximum of 2.5093% and 5.9545% individually. The mean growth (GR) is 0.0175123% with a standard deviation of 0.0550848%.

Table 2 Descriptive statistics

	<i>OBS</i>	<i>Mean</i>	<i>Std. dev</i>	<i>MIN</i>	<i>MAX</i>
ROA	150	0.0052693	0.4849762	–5.6487	0.7656
ROE	150	0.167214	1.184918	–4.5277	12.8951
LTD	150	0.075856	0.1067866	0	0.5437
STD	150	0.6961607	1.725538	0.0446	21.1263
DE	150	2.7978	11.78329	–64.6981	119.1717
SIZE	150	4.600553	0.8196015	2.5093	5.9545
GR	150	0.0175123	0.0550848	–0.2074	0.5214

Source: Authors computation

Tables 3 and 4 display the correlations among the variables. Table 2 shows that ROAs is negatively connected with both long (LTD) and short-term debts (STD). The rest of the variables including debt to equity ratio (DE), size, and growth (GR) are positively associated with ROAs. The results in Table 3 also indicate that ROE positively connects with short-term debt (STD) and growth (GR) but adversely relates to long-term debt (LTD), debt to equity ratio (DE) and size.

Table 3 Correlation results on return on assets (ROA)

<i>Variable</i>	<i>ROA</i>	<i>LTD</i>	<i>STD</i>	<i>DE</i>	<i>SIZE</i>	<i>GR</i>
LTD	-0.0048	1.0000				
STD	-0.9582	-0.1114	1.0000			
DE	0.0258	0.0675	-0.0121	1.0000		
SIZE	0.2750	0.1420	-0.2547	0.1673	1.0000	
GR	0.3222	-0.0318	-0.3369	-0.0035	0.0540	1.0000

Source: Authors Computation**Table 4** Correlation results on return on equity (ROE)

<i>Variable</i>	<i>ROE</i>	<i>LTD</i>	<i>STD</i>	<i>DE</i>	<i>SIZE</i>	<i>GR</i>
LTD	-0.1277	1.0000				
STD	0.0232	-0.1114	1.0000			
DE	-0.6917	0.0675	-0.0121	1.0000		
SIZE	-0.1387	0.1420	-0.2547	0.1673	1.0000	
GR	0.0129	-0.0318	-0.3369	-0.0035	0.0540	1.0000

Source: Authors Computation

The study utilised two methods of estimations to investigate the effects of capital structure on firm performance. The methods applied include the two-step system GMM and the OLS methods of estimations. This section gives the key outcomes of the study by employing the two methods of estimations. This study divides the results into three sections thus the effects of independent variables (Capital Structure) on the dependent variables (ROA, ROE), the effects of the control variables (GR, Size) on the dependent variables (ROA, ROE) and finally the diagnostic tests.

6.1 *Effects of capital structure on firm performance*

Based on Table 4, it indicates that out of three capital structure variables (independent variables), both long and short term debt exerts negative effects on firm performance and significant when performance is measured as ROA with debt-equity ratio (DE) having a positive influence on firm performance. It explains that a percentage increase in both the long and short-term debts results in 56.5% and 26.9% decrease in firm performance respectively. The findings are in line with previous research (Ebaid, 2009; Hull, 2014). Using the fixed effect methodology (FEM) and multiple regression analysis, both authors demonstrate that long and short debts have a negative impact on company performance. In the same way, a unit increase in the debt-equity ratio leads to a 0.1% rise in firm performance. On the other way, using ROE as firm performance presents that long-term debt and debt to equity ratio exercise colossal negative effects on firm performance. Abor (2007) expands his past studies to small and medium-sized enterprises in Ghana and South Africa and reports a negative relationship between long-term debt and performance. When Zeitun and Tian (2014) look at the relationship between capital structure and performance of a group of Jordanian companies, they find that debt has a negative relationship with both accounting and market performance metrics. It claims that

increasing the long-term debt and debt to equity ratios by a percentage affects business performance by 86.5% and 4.5%, respectively. In this pattern, short-term debt has a positive correlation with company performance. (Abor, 2005) examines the relationship between capital structure and profitability of companies listed on the Ghana Stock Exchange over a five-year period and finds a positive association in the case of short-term debt. Furthermore, it can be demonstrated that when short-term debt is increased by a percentage, company performance improves by 3%.

With the use of the OLS regression method, the results are just the same as delivered from the two-step system GMM method. The results reveal that the long and short-term debt significantly and negatively relates to firm performance (ROA) as stipulated by Abor (2007) with debt to equity having a positive influence on firm performance which confirms the results of Margaritis and Psillaki (2007) and Sadeghian et al. (2012). In the same vein, a percentage increase in the debt to equity ratio leads to a 0.06% increase in firm performance. The outcomes state that firm performance (ROA) decreases by a wide margin of 54.4% and 27.1% when there is an increase of 1% of long and short-term debts (Onaolapo and Kajola, 2010). In applying ROE as firm performance, long-term debt and debt to equity indicate negative effects on firm performance. The outcomes details that when long-term debt as recorded by Amjed (2011) and debt to equity as revealed by (Arbabiyan and Safari, 2009; Elkelish and Marshall, 2007) upsurges by a percentage, firm performance diminishes by 87.3% and 6%. Short-term debt in this design depicts a positive relationship with firm performance. Additionally, this result records that there is an increment in firm performance of 3% when short-term debt grows by a percentage. (Berger and Di Patti, 2006; Gill et al., 2011) found a positive linkage between short-term debt and firm performance by employing a simultaneous-equations model and OLS Regression estimates individually.

6.2 Effects of the control variables on firm performance

Looking at the impact of the control variables (Size, GR) on firm performance (ROA) in Table 5 the results posit a positive relationship between size and growth (GR) and firm performance (ROA) demonstrating that a unit increase in firm size and total sales (growth) equally results in a percentage increase in firm performance by a margin of 2% and 9% individually. (Allen and Liu, 2007; Baral, 2004) discovered in their various studies that company and firm size impose a positive impact on firm performance. Besides, studies from (Chadha and Sharma, 2015; Muritala, 2012) argues that firm with high growth rate tends to finance their firm and pronounce that growth opportunities functions as significant bases of firm performance. At the same time utilising ROE as firm performance, both the Size and growth of companies and organisations increase performance. There is a magnitude upswing in firm performance of 58.2% and 69.1% when size and growth increased by a percentage.

In the OLS estimation results, the outcome reveals a positive relationship between size and firm performance (ROA) as revealed by Allen and Liu (2007) and Muritala (2012) as well as depicting a negative connection between growth and firm performance (ROA) as founded by Dada and Ghazali (2016) and Ganiyu et al. (2019). The consequences prove that a unit increase in the size of companies brings about an increase in performance of about 2% at the same time there is a decrease in firm performance of 7% when growth increase by 1%. On the other side, there is a decrease in firm

performance (ROE) when companies increase in size but produce positive relations when there is an increase in the growth of companies.

Table 5 Regression results

	<i>2 STEP GMM Results</i>		<i>OLS Results</i>	
	<i>ROA</i>	<i>ROE</i>	<i>ROA</i>	<i>ROE</i>
L1	0.0042 (0.0730)	0.1511 (0.1376)		
LTD	-0.5650 (0.0680)***	-0.8650 (0.6237)	-0.5439 (0.0995)***	-0.8730 (0.6747)
STD	-0.2690 (0.0108) ***	0.0366 (0.0199)*	-0.2706 (0.0067)***	0.0047 (0.0453)
DE	0.0015 (0.0014)	-0.0451 (0.0240)*	0.0006 (0.0009)	-0.0688 (0.0061)***
SIZE	0.0211 (0.0243)	0.1330 (0.2505)	0.0265 (0.0135)*	-0.0172 (0.0913)
GR	0.0904 (0.7607)	0.5823 (0.6905)	-0.0737 (0.2020)	0.2357205 (1.3701)
AR (1)	0.078	0.199		
AR (2)	0.866	0.952		
Sargan Test	0.000	0.745		
Hansen Test	0.188	0.222		
No. of insts.	13	13		
Prob > <i>F</i>	0.000	0.000	0.000	0.000
No. of groups	15	15		
Obs/Group: Min	9	9		
Obs/Group: Avg	9	9		
Obs/Group: Max	9	9		

NB: *, **, and *** explains 10%, 5% and 1% significance level.

Source: Authors Computation

7 Model diagnostics

The Arellano-Bond test for autocorrelation errors and the Hansen J test for over-identification are the major diagnostic tests recommended by Arellano and Bond (1991) to assess the validity of the GMM model. Despite the fact that the serial correlation between the residuals in AR (1) is normal, the residuals in AR (2) cannot be correlated. The null hypothesis is that there is no correlation between the residuals. Because all of the p values are more than 0.1, the AR (2) test reveals that we cannot reject the null hypothesis, implying that there is no serial connection. Furthermore, in GMM, over-identification limits must be valid. Furthermore, the instrument variables appear to be valid according to the Hansen J test results. When the instrument variables are not exogenous or are incorrectly omitted from the model, the null hypothesis, which asserts that the over-identifying limitations are valid, is rejected (Fosu, 2013). The results show

that we cannot reject the null hypothesis because the Hansen J-statistics p values for all GMM models are more than 0.1, indicating that the instruments are valid.

To test the robustness of the outcomes in Table 6, the study uses the 3SLS method to test for the consistency of the results. The result shows a negative connection between long and short-term debt and firm performance (ROA). The estimated result produced a coefficient of -0.5206 and -0.2728 and significant at a 1% significance level respectively. In the same vein, long-term debt and debt-equity ratio also produce an adverse on firm performance (ROE). When ROA and Equity are treated as firm performance with the use of the two Step System GMM and OLS regression methods, these results are consistent with the study's major findings.

Table 6 Robustness check

Variables	3SLS Regression	
	ROA	ROE
LTD	-0.5206 (0.09667)***	-0.8953 (0.6554)
STD	-0.2728 (0.0060)***	0.0041 (0.0405)
DE	0.0009 (0.0009)	-0.0690 (0.0059)***
SIZE	0.0007 (0.0022)	-7.9800 (0.0019)
GR	-0.0020 (0.0327)	0.0001 (0.0289)

NB: *, **, and *** explains 10%, 5% and 1% significance level.

Source: Authors Computation

8 Summary

8.1 Theoretical and managerial implications

Theoretical Implications: For possible stakeholders, this research has implications. The worth of a company and its stock price are impacted by capital structure in a tax environment where interest can be deducted. The corporation may be able to lower its tax liability by taking on additional debt because the interest on the loan may be tax deductible. As the debt to equity ratio rises, the market value of the corporation rises by the interest on tax shield share value. This suggests that even if leverage is employed excessively, the cost of capital will not increase (Modigliani and Miller, 1963). Thus, there is a perfect option to finance the business. Even if the theory's various presumptions are incorrect, the capital structure theory still has value. A firm's decision about its capital structure is influenced by the environment that is characterised by changes in economic variables, such as interest rates, the cost of taking on risk, institutional change, recessions, etc.

Managerial Implications: Empirical findings show that capital structure significantly affects corporate performance. Therefore, before modifying the debt levels, business managers should take the effect of leverage on performance into account. Lenders should

also kindly enforce the debt agreements in light of their effect on business performance. Finally, before making investment decisions, investors should take the firm's debt level into account. Investors may choose to invest in companies with greater performance goals if they believe that those companies with lower leverage ratios would perform better. Therefore, managers should work to improve performance in order to satisfy shareholders' and investors' needs. This analysis can also assist managers in understanding how performance is impacted by the type of capital structure they utilise in running their operations. As a result, they can create an ideal amount of leverage that enhances the firm's performance while simultaneously lowering associated costs.

9 Conclusion

The main goal of this research is to provide new empirical evidence on the effect of capital structure on firm performance in Ghana. Since the fundamental work of, previous research on capital structure and company performance has demonstrated that the relationship between the two is ambiguous (Modigliani and Miller, 1958). The majority of these research look at these ideas in developed countries, with very few empirical findings in developing or transitional economies like Ghana.

The study examines the effect of capital structure on firm performance of listed non-financial firms in Ghana as one of emerging or transition economies. Based on a test on Ghanaian listed non-financial firms and utilising two accounting-based measures of financial performance (ROA and ROE) with the application of 2 Step System GMM and OLS regression methods, the empirical tests demonstrate that capital structure (particularly, STD and LTD) adversely impacts the firm's performance measured by ROAs. On the other hand, capital structure (LTD and DE) has no significant and positive effect on firms' performance measured by ROE. These results lead the study to conclude that capital structure, in common terms, has a weak-to-no impact on the financial performance of listed non-financial firms in Ghana. These outcomes are consistent with those of the robustness check.

In any event, capital structure concerns continue to be contentious and perplexing, particularly in emerging and transition economies like Ghana. Additional research is needed to examine the factors of Ghanaian enterprises' capital structure, such as size, growth, business risk, and so on, and compare the results to those of developed markets. The relationship between financial leverage and the value of Ghanaian enterprises should also be investigated scientifically. The study's findings revealed that LTD and STD had a negative impact on firm performance as evaluated by ROA and ROE, implying that further research into the relationship between the structure of a corporation's debt and its performance is warranted. Finally, more research into the combined influence of capital structure and ownership structure on the performance of a large number of Ghanaian enterprises may be conducted.

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