

ANALYSIS OF THE CAPITAL STRUCTURE AND PROFITABILITY OF MANUFACTURING COMPANIES LISTED ON THE GHANA STOCK EXCHANGE



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ABSTRACT

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Manufacturing companies play a crucial role in the economies of most developing countries. Decisions on capital structure portend great importance for businesses vis-à-vis the daunting task of coping with competition within the business landscape. This makes capital structure decisions a reality rather than a myth. Coupled with the daily activities of manufacturing businesses, profitability ensures economic growth and increases in taxes. Profitability is also influenced by the ideal combination of debt and equity. Using descriptive and causal research designs, this study assesses the impact of capital structure on profitability for the period from 2005 to 2019 of listed manufacturing companies in Ghana. Results indicate a significant correlation between capital structure and profitability. The independent variables are found to be inversely related to profitability. Based on these findings, companies may need to minimize the debt component of their capital structure in order to increase profitability.

Contribution/Originality: This study uses various models to assess the impact of capital structure on the profitability of manufacturing companies listed on the Ghana Stock Exchange (GSE). It also discusses various theories underpinning capital structure and profitability in order to provide a theoretical perspective. The study contributes to existing literature by segregating the various components of the dependent and independent variables for statistical and econometric analysis. Focusing on listed manufacturing companies, the study spans a 15 year period making it one of the few studies in Ghana which have investigated the issues under consideration for such a period with results which are policy oriented.

1. INTRODUCTION

Capital structure and its effect on firm performance is a core issue in finance and accounting (Chisti, Ali, & Sangmi, 2013). The recent competitiveness and changing aspects in the business world has made financial decisions central to a firm's day-to-day operations and performance. The financial decisions of firms affect almost every aspect and the activities within the company. Capital structure decisions have therefore become progressively important in every business, cutting across all sectors of the economy. As Amidu (2007) contends, the decision relative to the capital structure of a business is one that is herculean. Thus, businesses are saddled with the combination of debt and

equity in order to be successful. This decision appears to be quite imperative because of the need to maximize returns on the various investments stakeholders make in a firm (Kidwell, Blackwell, Sias, & Whidbee, 2016). In addition, because of the impacts such decisions have on a firm's ability to deal with the competitive environment, an organization can choose among many options of capital structure. In general, companies can select from a variety of capital arrangements. Firms can arrange lease financing, utilize warrants, issue convertible bonds, sign forward contracts, or trade bond swaps, for example (Shubita & Alsawalhah, 2012). Firms can also issue dozens of distinct securities in countless combinations to maximize overall market value (Steklá & Gryčová, 2016). Using equity to finance the firm means that the ownership of the firm will be divided among the shareholders. Ownership also comes with control of the business, and most owners of companies do not like to lose control of their business. If they issue more shares (equity financing) of the business to the public in order to raise capital, the shares bought will transfer part ownership of the company to the shareholders. To control this situation of ownership, business owners normally use debt instruments to finance the business to maintain control. According to Kirimi (2017), the use of debt in the capital structure of the firm leads to agency costs that arise as a result of the relationships between shareholders and managers, and those between debt holders and shareholders. To this end, the choice of capital structure becomes a difficult one for businesses since it transcends the choice of only maximizing shareholder wealth (Gill, 2016) as it equally deals with business sustainability and the ability of the firm to satisfy external obligations. Manufacturing companies continue to play a critical role in the economic growth of every country. The GDP of most countries is largely contributed by the service sector and the manufacturing sector. In Ghana, the industries (manufacturing) sector contributed 34.69% to the country's GDP, making it the second largest contributor to GDP after the service sector, which contributed 47.2% in 2019 (Ghana Statistical Service Report, 2019). Thus, the sector witnessed a steady increase in its contribution to GDP after falling from 38.1% in 2014 to 34.6% in 2015. The report further indicated that, in 2016, the contribution of the manufacturing sector fell again to 30.6% but increased to 33.2% in 2017 and 34% in 2018 (Ghana Statistical Service Report, 2019). Manufacturing companies are identified to include those in the food processing, cement, pharmaceuticals, oil and gas exploration, and light manufacturing sectors. It is also worth noting that in an economy with these industries, there is intense competition among firms. This competition calls for optimal decisions to be made in the corporate world. To this end, managers of these companies have to be very particular in making decisions since they have to be wary of the consequences of such decisions. The decisions these firms make regarding the capital structure become critical among all the various types of capital investment decisions (Abor, 2005; Chisti et al., 2013). To be able to increase shareholders' wealth, managers must be very careful and have deep perceptions of finance regarding which of the financing options will be more appropriate. Also, company executives, when faced with the task of choosing a company's capital structure, tend to select a capital structure that aligns with their individual goals and not the goals of the owners. This scenario gives rise to potential conflict between managers and owners. As Hull and Dawar (2014) argue, conflict arises because managers will always wish to maximize their own utility as opposed to increasing firm value. Be that as it may, increases in firm value will maximize shareholder value. To overcome this conflict, many businesses owners align most of the salaries and bonuses of managers with the profitability of the business. In some instances, managers are given share options to make them part-owners of the firm to ensure company growth. The studies by Dawood (2014) and Gatsi (2020) argue that there is no linkage between a company's performance and its capital structure. Abor (2005), on the other hand, evaluated a sample of 22 businesses listed on the Ghana Stock Exchange. He identified a relationship between the short-term debt-to-total-assets ratio and the return on equity. According to the preceding, empirical investigations on the link between capital structure and company performance, as evaluated by ROA and ROE in various studies, show conflicting and contradictory data. As a result, the current study adds to the literature on the influence of capital structure on company performance, with a focus on manufacturing firms in Ghana. Following on from the above, this study examines the linkage between capital structure and the profitability of manufacturing companies listed on the Ghana Stock Exchange (GSE) from 2005 to 2019. Thus, the effect of short-term debt, long-term debt and total debt on

profitability is examined. The next section discusses literature focusing on the theories and empirical works bordering on capital structure and profitability. This is followed by the methods used to achieve the research objectives. The findings of the study are then presented, followed by the conclusion and recommendations for future studies.

2. LITERATURE REVIEW

This section reviews extant literature and theories in relation to capital structure and profitability.

2.1. Capital Structure and Theories of Capital Structure

The capital structure of a business focuses on how a corporation's operations are financed using a combination of debt and equity to maximize the organization's value (Oino & Ukaegbu, 2015), i.e., the combination of the firm's multiple sources of finance. According to Shim and Siegel (2009), the basic goal of capital structure decisions is to maximize the firm's market value through the employment of an optimal mix of long-term sources of funding. As a result, a firm's capital structure is a mash-up of many instruments. Huang (2006) defines capital structure as the total of payable long-term mutual debt and equity securities. According to Irvine and Rosenfeld (2000), capital structure is a type of long-term finance employed by businesses. Long-term debt, preferred stock, and equity are all examples of long-term finance. It is critical to emphasize that capital structure is a key component of the balance sheet and consists of a mix of debt, equity, and preference shares. Firms' capital structures are probably influenced by concerns of potential bankruptcy costs, agency costs, and even pecking order. Bankruptcy expenses are the direct costs when the anticipated chance of the corporation defaulting on funding is greater than zero. The expenses of bankruptcy might be both direct and indirect. According to Salim and Yadav (2012), the direct bankruptcy costs are the legal and administrative expenditures associated with the bankruptcy process, while the indirect bankruptcy costs are the earnings lost by the firm as a consequence of stakeholders' refusal to do business with them. The use of debt in the firm's capital structure also results in agency charges. Agency expenses develop as a result of shareholder–manager connections, as well as debt-holder–shareholder relationships. The need to balance gains and costs of debt financing emerged from the static trade-off theory developed by Myers (1984). These factors are arguably the reasons for which a number of theories have been propounded to underpin the study of capital structure.

2.2. Theories of Capital Structure

In this section, the irrelevance theory, trade-off theory, pecking order theory, and the market timing theory of capital structure are discussed.

2.2.1. Irrelevance Theory of Capital Structure by Modigliani and Miller (MM)

The theories of capital structure began with the publication of the "Irrelevance Theory of Capital Structure" by Modigliani and Miller (1958). The pioneering study on capital structure by Modigliani and Miller (1958) offered a significant boost in the development of the theoretical framework from which numerous theories arose. Modigliani and Miller began by assuming that a company has a certain set of predicted cash flows. When a company decides to finance its assets with a given combination of debt and equity, it distributes the cash flows among investors. The assumption is that investors and enterprises have equal access to financial markets, allowing for home-grown leverage. Their idea, however, was founded on highly limited assumptions that do not hold true in reality. These assumptions include ideal capital markets, homogeneous expectations, no taxes, and no transaction costs. Other significant capital structure theories that have arisen differ from the premise of ideal capital markets under which the "irrelevance model" operates.

2.2.2. The Trade-Off Theory

According to the trade-off theory, companies trade off the advantages and costs of debt and equity financing to establish an "optimal" capital structure after accounting for market imperfections such as taxes, bankruptcy costs, and agency costs (Luigi & Sorin, 2009). Various writers use the term trade-off theory to designate a set of related ideas. A firm's management assesses the different costs and advantages of potential leverage strategies and attempts to find a trade-off between them. It is frequently believed that an internal solution is achieved in order to balance marginal costs and marginal gains. Thus, according to trade-off theory, a company's capital structure decision comprises a trade-off between the tax benefits of debt financing and the costs of financial crisis (Shah & Khan, 2007). When enterprises change their capital structure, they tend to move toward a target debt ratio that is compatible with theories based on debt trade-offs. There are two types of trade-off theories: static trade-off theory and dynamic trade-off theory. According to the static trade-off hypothesis, the ideal capital structure for a firm is determined by the trade-off between tax advantages from debt use and bankruptcy-related expenditures. Based on the foregoing, Cheng (2015) contends that in a static trade-off paradigm, the organization is considered as creating a desired debt-to-value proportion and is progressively approaching it. Every company has a debt-to-equity ratio that maximizes its worth. According to this, companies have an ideal capital structure that they choose by weighing the costs and benefits of employing debt and equity. Thus, the benefits of the debt tax shield are balanced against the cost of financial difficulty (Muritala, 2012). In the view of Myers (2001), an optimal target financial debt ratio optimizes a firm's worth. When the marginal value of the benefits connected with debt issues exactly compensates the increase in the present value of the expenses associated with issuing additional debt, the optimum point is reached. The dynamic trade-off theory, on the other hand, clearly stresses the concept that companies have a goal that maximizes their value and that departure from those goals are expensive. As a result, deviations will be steadily eliminated over time (Myers, 2003). According to Haron and Ibrahim (2012), with the dynamic trade-off theory, enterprises may depart from their intended capital structure, but they will adapt back to that aim. The optimal financing decision in a dynamic model often depends on the financing margin that the business predicts over a period. Some companies intend to pay out cash in the coming period, while others aim to raise funds.

2.2.3. The Pecking Order Theory

Based on asymmetric information and adverse selection, the pecking order hypothesis proposes that enterprises' apparent debt-to-equity balance merely reflects their cumulative financing decisions over time, with internal finance favored over external finance and debt preferred over equity (Myers, 1984; Myers & Majluf, 1984). According to the pecking order hypothesis, corporations use a funding hierarchy to reduce the problem of knowledge asymmetry between the firm's managers (insiders) and the shareholders (outsiders). Where there is no information asymmetry, the theory argues that enterprises first rely on internally generated money (e.g., retained earnings). Firms next resort to debt for more funding, and ultimately to equity for any residual capital requirements. The pecking order arose as an alternate hypothesis to the trade-off theory. The main premise of the pecking order theory is asymmetric information, rather than adding corporate taxation and financial distress into the MM framework. Asymmetric information captures the fact that managers know more than investors, and their actions thus convey a signal to investors regarding the firm's prospects. According to the pecking order concept, corporations are eager to sell stock when the market overvalues it (Chittenden, Hall, and Hutchinson, 1996). This is presumptively predicated on the idea that management work in the best interests of current shareholders (Gill, 2016). As a result, corporations prefer to issue debt since it allows them to raise capital without sending negative signals to the stock market. Furthermore, if the likelihood of default is high, debt issuance may cause information difficulties because a pessimistic manager would issue debt before bad news spreads.

2.2.4. The Market Timing Theory of Capital Structure

Baker and Wurgler (2002) proposed the "market timing theory of capital structure" as a novel theory of capital structure. According to this view, the existing capital structure is the result of previous attempts to time the equities market. Market timing suggests that corporations issue new shares when they believe they are overpriced and repurchase their shares when they believe they are underpriced. As a result, present capital structure is inextricably linked to prior market values. According to the thesis, capital structure is the cumulative result of previous attempts to time the equity market. The two assumptions are that asymmetric information may fluctuate in the capital market, thus management would be hesitant to make any changes to the goal leverage, and that management is confident in applying "timing" to the stock market. Baker and Wurgler (2002) were able to derive an empirical model of the market timing theory. While some researchers agree with this theory (Huang & Ritter, 2009; Kayhan & Titman, 2007; Welch, 2004), others disagree (Alti, 2006; Leary & Roberts, 2005). Alti (2006) showed skepticism regarding the definition of "market timing" of Baker and Wurgler (2002). Behavioral theorists, such as Miglo (2011), contend that the reasons for or against the market timing theory is due to a firm's internal conditions and external factors such as capital market scenarios. Those who favor the market timing theory maintain that the capital market creates an investor sentiment, whereas the internal condition of a company affects the management's financial decisions.

3. PROFITABILITY AND THE FREE CASH FLOW THEORY OF PROFITABILITY

Profitability is defined as a company's capacity to produce a profit and is commonly measured using return on assets (ROA) and return on equity (ROE). There appears to be a fine line between profit and profitability in accounting and other business-related professions. Profit, according to Pervan, Pelivan, and Arnerić (2015), is calculated by subtracting from the revenue of a company the full amount spent in obtaining that income, whereas profitability is defined as the capacity of a particular investment to produce a return from its usage. Muritala (2012) defines ROE as a measure of a company's profitability in relation to its equity. These measurements advise financial statement consumers about how successfully a firm leverages its investments to achieve earnings growth. They are also used to compare the performance of businesses in the same industry. ROA, on the other hand, denotes the percentage of a company's assets that are lucrative in terms of revenue generation, and it demonstrates a company's capital intensity.

3.1. Free Cash Flow Theory of Profitability

This theory is also framed for mature firms that are likely to over invest. It posits that high debt levels will increase value despite the threat of financial distress when a firm's operating cash flow significantly exceeds its profitable investment opportunities (Myers, 2001). Thus, the profit earning capacity increases the value of the firm despite the threat of financial distress. Firms with a positive free cash flow use this cash flow to lower their debt ratio. Firms with a negative free cash flow increase their debt ratio to respond to the lack of internal funds. The percentage adjustment is smaller for firms with relatively more debt than for firms with relatively low debt.

4. EMPIRICAL REVIEW: CAPITAL STRUCTURE AND PROFITABILITY

Kinsman and Newman (1999) argue that it is critical to investigate the link between capital structure and profitability. They contend that it is critical to investigate the link between capital structure selection and company performance. For example, interest payments on debt are tax deductible, therefore adding debt to the capital structure (depending on relevant levels) will increase the firm's profitability. This makes it critical to examine the link between capital structure and profitability in order to make effective capital structure decisions. Roden and Lewellen (1995) collected data on corporate capital structure choices from 107 leveraged buyout businesses in the United States during a ten-year period from 1981 to 1990. In their study on leveraged buyouts, they discovered a positive association between profitability and overall debt as a proportion of the total buyout-financing package using a regression analysis. Using mainstream data, Hung, Albert, and Eddie (2002) collected data related to 18 developers and 17

contractors from Hong Kong using DataStream (an electronic financial database). The study, based on the analysis of 35 companies, indicates a relationship between capital structure and profitability through a regression analysis. Equally, [Raheman, Zulfiqar, and Mustafa \(2007\)](#) found a significant capital structure effect on the profitability of non-financial firms listed on the Islamabad Stock Exchange. [Mendell, Sydor, and Mishra \(2006\)](#) studied the link between debt and taxes postulated in finance theory to explore financing methods among enterprises in the forest products industry. From 1994 to 2003, the study evaluated the theoretical link between taxes and capital structure for 20 publicly listed forest sector enterprises. The findings show that there is a negative association between profitability and debt, a positive relationship between non-debt tax shielding and debt, and a negative relationship between business size and debt. [Abor \(2005\)](#) studied 22 companies listed on the Ghana Stock Exchange during a five-year period (1998–2002). The results show a positive relationship between the short-term debt-to-total-assets ratio and return on equity, a negative relationship between the long-term debt-to-total-assets ratio and return on equity, and a positive relationship between the total debt-to-total-assets ratio and return on equity.

The study conducted by [Yegon, Cheruiyot, Sang, and Cheruiyot \(2014\)](#) examined the relationship between capital structure and firm profitability. Sample data was collected for banks listed on the Nairobi Stock Exchange from 2004 to 2012. The research results show a negative relationship between long-term debt and profitability and a positive relationship between short-term debt and profitability. [Rafique \(2011\)](#) investigated the impact of profitability and financial leverage on the capital structure of Pakistan's car sector. Over a five-year period, the capital structure of 11 publicly traded corporations was analyzed using an econometric approach. The study discovered a substantial inverse link between profitability and capital structure. [Onaolapo and Kajola \(2010\)](#) used the agency cost theory to undertake a seven-year study on the influence of capital structure on the performance of Nigerian enterprises, focusing solely on non-financial firms. The study found that capital structure, as measured by the debt ratio, had a considerable negative influence on firm financial indicators, such as ROA and ROE.

[San and Heng \(2011\)](#) evaluated the capital structure and firm performance of Malaysian construction enterprises over a four-year period (2005–2008). Long-term debt to capital, debt to capital, debt to assets, debt to equity market value, debt to common equity, and long-term debt to common equity were used to operationalize capital structure (independent variable). Return on capital, ROE, earnings per share (EPS), operating margin, and net margin were used as proxies for company performance (dependent variable). In general, the findings indicate that there is a link between capital structure and company success. [Ahmad \(2014\)](#) performed a study on the influence of capital structure on profitability, concentrating on enterprises in Pakistan's cement sector. From 2005–2010, a panel data was used with 16 enterprises listed on the Karachi Stock Exchange. According to the findings, profitability is inversely connected to long-term debt and is favorably related to short-term debt. According to [De Mesquita and Lara \(2003\)](#), there is a negative association between capital structure and profitability ratios. The findings also demonstrate that organizations that use long-term debt have lower profitability, whereas firms that use short-term debt have higher shareholder and market values. The study by [Shah and Khan \(2007\)](#) on the drivers of capital structure using data from 1994 to 2002 of non-financial enterprises registered on the Karachi Stock Exchange in Pakistan shows that debt ratio is highly connected to growth, tangibility, and profitability.

5. METHODOLOGY

This study spans 15 years, from 2005 to 2019, which is regarded as appropriate to confirm the study's credibility. The analysis relied on secondary data gathered from the audited financial statements issued by the manufacturing companies listed on the GSE. In order to conduct a statistical analysis, the obtained data was evaluated for completeness and consistency. Panel data was employed to meet the study's goal during a fifteen-year period (2005–2019). Panel data is more meaningful since it includes both cross-sectional information that captures individual variability and time-series information that represents the data's dynamic nature. As a result, more diversity, a higher degree of freedom, improved efficiency, and lower collinearity among the variables are ensured. The acquired panel

data was analyzed using descriptive statistics and multiple regressions using the SPSS statistical program. The mean, standard deviation, maximum, and minimum values were utilized in the descriptive statistics to examine the data trends. To analyze the relationship between capital structure and profitability, the following multiple regression models were employed:

$$ROE_{it} = \beta_1 + \beta_2 STDA_{it} + \beta_3 FIRMSIZE_{it} + \beta_4 SG_{it} + \varepsilon_{it} \quad (1)$$

$$ROE_{it} = \beta_1 + \beta_2 LTDA_{it} + \beta_3 FIRMSIZE_{it} + \beta_4 SG_{it} + \varepsilon_{it} \quad (2)$$

$$ROE_{it} = \beta_1 + \beta_2 TDA_{it} + \beta_3 FIRMSIZE_{it} + \beta_4 SG_{it} + \varepsilon_{it} \quad (3)$$

$$ROA_{it} = \beta_1 + \beta_2 STDA_{it} + \beta_3 FIRMSIZE_{it} + \beta_4 SG_{it} + \varepsilon_{it} \quad (4)$$

$$ROA_{it} = \beta_1 + \beta_2 LTDA_{it} + \beta_3 FIRMSIZE_{it} + \beta_4 SG_{it} + \varepsilon_{it} \quad (5)$$

$$ROA_{it} = \beta_1 + \beta_2 TDA_{it} + \beta_3 FIRMSIZE_{it} + \beta_4 SG_{it} + \varepsilon_{it} \quad (6)$$

Where:

ROE_{it} is the return on the company's equity at time t.

ROA_{it} is the return on the company's assets i at time t.

β_1 is the constant for each company, and $\beta_2, \beta_3, \beta_4$ and β_5 are the regression coefficient values.

$STDA_{it}$ is the short-term debt of company i at time t.

$LTDA_{it}$ is the long-term debt of company i at time t.

TDA_{it} is the total debt of company i at time t.

$FIRMSIZE_{it}$ is the firm size of company i at time t.

SG_{it} is the sales growth of company i at time t.

ε_{it} is the error term.

6. ANALYSIS

This section provides the descriptive statistics, correlation analysis and regression results of the models employed for this study.

6.1. Descriptive Statistics

The descriptive statistics for both the dependent and independent variables are presented in [Table 1](#) below. The ROE measures a company's profitability based on data collected from yearly audited financial reports. In this research, ROE is defined as the ratio of earnings before interest and tax (EBIT) divided by equity, while ROA is the ratio of EBIT divided by total assets. From 2005 through 2019, the average ROA was 7.6%, while the average ROE was 65.2%. The maximum values for ROA and ROE were 67% and 97%, while the minimum values for ROA and ROE were -14.4% and -80.69%. This implies that listed companies did poorly during the time period under review. The findings also show that there was a huge discrepancy in corporate performance, such that although some organizations made significant profits, others recorded losses. Profitability disparities may be explained by variances in industry performance. A cursory examination of the capital structure measures (in [Table 1](#)) indicate that short-term debt to total assets has a mean value of 37.4%, a minimum of 0.8%, and a maximum of 94%, showing that the majority of manufacturing companies in Ghana rely on short-term debt financing. This might be because Ghana's bond market is weak, making it harder for businesses to acquire long-term financing. This is supported by a long-term debt-to-total-assets (LTD/A) ratio of 14%, with a minimum of 0.00% and a maximum of 85.4%. The total debt-to-assets (TD/A) ratio averages at 50.7%, validating the notion that Ghanaian manufacturing firms rely on debt to fund their assets. The average size of the organizations investigated is 17.67 employees. The sales growth of manufacturing companies shows a minimum of -8.96% and a maximum of 114.4%. On average, the sales growth for manufacturing companies was 7.7% for the period of this study. This appears to portend well for the industry indicating the possibility of a suitable business environment.

Table 1. Descriptive statistics.

Variables	N.	Min.	Max.	Mean	S. D.
ROA	115	-0.144	0.674	0.076	0.145
ROE	115	-80.692	0.973	0.653	7.547
STD/A	115	0.008	0.940	0.375	0.231
LTD/A	115	0.000	0.854	0.144	0.170
TD/A	115	0.049	1.273	0.507	0.293
FIRM SIZE	115	9.823	20.863	17.668	2.453
SG	115	-0.896	1.144	0.077	0.373

6.2. Correlation Analysis

Table 2 below presents the correlation matrix, illustrating that ROE and ROA are adversely linked with STD/A, albeit weakly. Although the association is weak, ROE is positively connected with ROA. The ROA is also shown to be adversely connected to the STD/A, LTD/A and TD/A ratios and FIRM SIZE, although the association is minimal. Sales growth (SG), on the other hand, has a modest but positive correlation with ROA. The LTD/A and TD/A ratios, FIRM SIZE, and SG are all inversely associated to ROE, although the connection is weak. Again, the STD/A ratio is positively connected to ROE, but the association appears weak. Furthermore, STD/A shows a favorable but weak relationship with LTD/A, FIRM SIZE, and SG, but a robust relationship with TD/A. Also, LTD/A, FIRM SIZE, and SG have a weak and positive association, whereas the LTD/A and TD/A ratios have a high positive link. The table also reveals a weak and negative association between the TD/A ratio and SG, but a weak positive relationship between the TD/A ratio and FIRM SIZE.

Table 2. Correlation matrix.

		ROA	ROE	STD/A	LTD/A	TD/A	FIRM SIZE	SG
ROA	Pearson Correlation	1	0.133	-0.121	-0.500**	-0.368**	-0.296**	0.181
	Sig. (2-tailed)		0.155	0.199	0.000	0.000	0.001	0.055
	N	115	115	115	115	115	115	115
ROE	Pearson Correlation	0.133	1	0.005	-0.308**	-0.179	-0.064	-0.184
	Sig. (2-tailed)	0.155		0.960	0.001	0.056	0.496	0.050
	N	115	115	115	115	115	115	115
STD/A	Pearson Correlation	-0.121	0.005	1	0.071	0.803**	0.154	0.106
	Sig. (2-tailed)	0.199	0.960		0.449	0.000	0.099	0.263
	N	115	115	115	115	115	115	115
LTD/A	Pearson Correlation	-0.500**	-0.308**	0.071	1	0.621**	0.234*	0.001
	Sig. (2-tailed)	0.000	0.001	0.449		0.000	0.012	0.995
	N	115	115	115	115	115	115	115
TD/A	Pearson Correlation	-0.368**	-0.179	0.803**	0.621**	1	0.267**	-0.087
	Sig. (2-tailed)	0.000	0.056	0.000	0.000		0.004	0.360
	N	115	115	115	115	115	115	115
FIRM SIZE	Pearson Correlation	-0.296**	-0.064	0.154	0.234*	0.267**	1	0.082
	Sig. (2-tailed)	0.001	0.496	0.099	0.012	0.004		0.390
	N	115	115	115	115	115	115	115
SG	Pearson Correlation	0.181	-0.184	-0.106	0.001	-0.087	0.082	1
	Sig. (2-tailed)	0.055	0.050	0.263	0.995	0.360	0.390	
	N	115	115	115	115	115	115	115

Note: ** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed).

6.3. Regression Analysis

6.3.1. Short-term Debt on ROE – Model 1

From Table 3 below, the first model depicts the link between STD/A and ROE, with sales growth and firm size acting as control variables. The R-squared of 0.036, which quantifies the coefficient of determination, reveals that the independent variables of short-term debt-to-assets ratio, sales growth, and company size explain roughly 3.6% of the ROE, and this combined association is significant at 1%. In this model, sales growth (-3.699, $p = 0.059$) and company

size (-0.147, $p = 0.619$) had a negative and non-significant impact on ROE. It also demonstrates that there is a negative and statistically insignificant association between STD/A and ROE. This indirect link demonstrates that as the STD/A ratio increases by one unit, ROE falls by 0.209 units. This finding is similar with the findings of Hasan, Ahsan, Rahaman, and Alam (2014) and Salim and Yadav (2012), who found that the STD/A variable had a negative influence on ROE. Explaining this, Hosea, Sulistyadi, and Ispriyahadi (2017) concluded that a rise in debt has a lower influence on corporate profitability. Furthermore, the interest expenses incurred as a result of a company's use of external funding sources are not proportional to its earnings. This is because these financial sources are more frequently used to meet operational demands and banking responsibilities, therefore a rise in debt has a negative impact. The findings of Abor (2005) and Yegon et al. (2014) oppose those of this study. They both contend that short-term debt is less expensive, and hence a rise in short-term debt with a low interest rate will result in an increase in profit levels.

6.3.2. Long-term Debt on ROE – Model 2

In Table 3 below, Model 2 shows an R-squared of 0.361, which is significant at 1% and illustrates the association between LTD/A and ROE with firm size and sales growth as control variables. The coefficient of determination (R-squared) demonstrates that the LTD/A ratio and the other control variables collectively explain 36.1% of the ROE. In this model, sales growth (-3.803, $p = 0.040$) has a negative and significant effect on ROE, while firm size (0.078, $p = 0.786$) shows a favorable but insignificant effect on ROE. At a 1% level of significance, Model 2 reveals that the LTD/A ratio has a negative association with ROE. This demonstrates that as the LTD/A ratio increases by one unit, the ROE decreases by -14.040 units and vice versa. This finding is consistent with Yegon et al. (2014) and Abor (2005), who found a strongly negative association between the LTD/A ratio and profitability, implying that an increase in LTD/A levels is associated with a decline in company profitability. This inverse link implies that the cost of LTD/A is higher, thus employing more LTD/A might reduce profitability. Previous studies, such as Miller (1977); Fama and French (1998); Graham (2000) and Booth, Aivazian, Demirguc-Kunt, and Maksimovic (2001) support the findings of this study.

6.3.3. Total Debt on ROE – Model 3

From Table 4 below, Model 3 depicts the association between the TD/A ratio and ROE using sales growth and firm size as control variables.

Table 3. Regression output.

ROE	MODEL 1	MODEL 2	MODEL 3
STD/A	-0.209 (0.947)		
LTD/A		-14.040 (0.001)	
TD/A			-5.131 (0.04)
FIRM SIZE	-0.147 (0.619)	0.078 (0.786)	0.011 (0.969)
SG	-3.699 (0.059)	-3.803 (0.040)	-4.121 (0.032)
Con.	2.309 (0.660)	0.286 (0.954)	2.074 (0.686)
R-squared	0.036	0.361	0.269
Adj. R-squared	0.010	0.106	0.047

The R-squared (0.269), which quantifies the coefficient of determination, reveals that the independent variables of TD/A, sales growth, and company size together explain roughly 26.9% of the ROE, which is significant at 5%. The table also shows the impact of TD on ROE. The findings indicate that there is a negative association between ROE and TD/A. The association is significant at 5%, indicating that if TD/A increases by one unit, the company's ROE decreases by 5.131 units. This suggests that organizations that are more profitable take on more debt, or that more profitable firms rely on debt financing as their principal source of finance. This discovery supports the conclusions of [Abor \(2005\)](#) as well as [Hadlock and James \(2002\)](#).

6.3.4. Short-term Debt and ROA – Model 4

[Table 4](#) below shows that there is a negative and statistically insignificant link between STD/A and ROA as shown in the results for Model 4. This demonstrates that the STD/A ratio has no effect on ROA. This result contradicts the findings of [Goyal \(2013\)](#), who found a positive and statistically significant association between the STD/A ratio and ROA. Regardless, the control variables of company size (0.019, $p = 0.001$) and sales growth (0.078, $p = 0.028$) were significant predictors of ROA. This demonstrates that as sales and company size expand so does the ROA. This implies that the larger the ROA of a business, the higher their sales and size of assets. Furthermore, the model has a substantial R-squared of 0.144 at 1%. Significantly, this suggests that the independent variables of STD/A, size, and sales growth together explain around 14% of the dependent variable of ROA.

6.3.5. Long-term Debt on ROA – Model 5

In [Table 4](#) below, Model 5 has an R-squared of 0.334, which is significant at 1% and illustrates the association between the LTD/A ratio and ROA with firm size and sales growth as control variables. The R-squared demonstrates that LTD/A and the other control variables collectively explain 33% of ROA. In this model, sales growth (0.078, $p = 0.012$) and firm size (0.013, $p = 0.007$) have a positive and substantial effect on ROA. This demonstrates that as the firm grows in size, so does its ROA. This demonstrates that larger businesses listed on the GSE have a better ROA than smaller listed firms. Furthermore, the data shows that the LTD/A ratio has a negative connection with ROA at a 1% significance level. This demonstrates that while the LTD/A ratio increases by one unit, the ROA decreases by 0.388 units and vice versa. This finding is in tandem with the findings of [Khalaf, Ghassan, Talal, and Yaseen \(2015\)](#), who discovered a negative connection between the LTD/A ratio and ROA.

Table 4. Regression output.

ROA	MODEL 4	MODEL 5	MODEL 6
STD/A	-0.045 (0.436)		
LTD/A		-0.388 (0.000)	
TD/A			-0.152 (0.001)
FIRM SIZE	0.019 (0.001)	0.013 (0.007)	0.015 (0.006)
SG	0.078 (0.028)	0.078 (0.012)	0.068 (0.043)
Con.	0.422 (0.000)	0.360 (0.000)	0.409 (0.000)
R-squared	0.144	0.334	0.225
Adj. R-squared	0.120	0.316	0.204

6.3.6. Total Debt on ROA – Model 6

In Table 4, Model 6 depicts the association between the TD/A ratio and ROA using sales growth and firm size as control variables. The coefficient of determination, R-squared (0.225, $p = 0.000$), reveals that the independent variables of TD/A, sales growth, and company size collectively explain roughly 22.5% of the ROA, which is significant at 1%. In this model, company size (0.015, $p = 0.006$) and sales growth (0.068, $p = 0.043$) have a positive and substantial impact on ROA. The table once again demonstrates a negative link between ROA and TD/A. The link is significant at the 1% level, indicating that if the TD/A ratio increases by one unit, the company's ROA decreases by 0.152 units. The findings of this study are congruent with those of Hosea et al. (2017) and Habib, Khan, and Wazir (2016), who concluded that STD/A has a detrimental impact on profitability. The findings of this study indicate that STD/A is one of the elements that might affect a company's profitability, but are contrary to Hasan et al. (2014), who submit that total debt to total assets has a significant positive relationship with ROA.

7. CONCLUSION

As previously stated, each organization's capital structure decision is critical to its survival and success. Because of the requirement to optimize profits for multiple organizational owners particularly, and stakeholders in general, the decision is critical. The choice is also important since it affects a company's capacity to deal with its competitive environment. Over a 15-year period, this study examined the link between the capital structure and profitability of industrial businesses listed on the GSE (2005–2019). Previous empirical studies have found that a company's capital structure has a significant influence on its profitability. However, the findings of these analyses do not precisely indicate the direction and magnitude of this influence. Abor (2005); Salawu and Awolowo (2009); Margaritis and Psillaki (2010); and Gill, Biger, and Mathur (2011) observed a positive relationship, i.e., as debt increased, so did the profitability of the enterprises that were used in those studies. In this study, short-term debt (STD) was found to have a detrimental impact on corporate profitability. Thus, a company's profitability might shrink due to the level of STD. This explains why the lower a company's STD, the higher its profitability, and the higher a company's STD, the lower its profitability. The inverse relationship between LTD/A and ROE and ROA suggests that the use of long-term debt (LTD) financing in Ghana significantly reduces the performance of companies within the manufacturing sector. This problem might be attributed to the high cost of LTD, as well as the difficulty of meeting financial institutions' various collateral requirements. Only 14% of assets may be attributed to long-term financial sources. This also indicates that Ghanaian businesses are unable to value LTD, confirming the market's weakness. In addition, there is a negative association between TD/A and ROA and ROE, implying that prosperous enterprises rely on loans to support their operations. This is consistent with Champion (1999), who asserted that the use of leverage was a means to increase an organization's performance. Abor (2015) confirms this stance by stating that enterprises that do better in terms of ROE rely more on debt funding. From the above, industry players as well as government and its related agencies in Ghana might have to arrange alternative sources for long-term financing for businesses. More importantly, manufacturing, as well as other companies, may have to focus on raising funds outside the Ghanaian capital market with the assistance of the government. A number of initiatives by the government have targeted local manufacturing businesses. The establishment of the Export–Import (EXIM) Bank is one such initiative alongside the One District One Factory (1D1F) initiative. Future studies may want to focus on the effect of capital structure on profitability for periods before and after the establishment of the EXIM Bank. Similarly, a study on the same subject matter for factories under the 1D1F initiative is recommended with a focus on those who might have been able to meet the requirements of listing on the GSE since their inception and the inception of the government flagship project.

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