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EFFECTS OF CAPITAL STRUCTURE ON PROFITABILITY OF THE MANUFACTURING INDUSTRY: TESTING THE FIXED AND RANDOM EFFECT MODEL ON SELECTED FIRMS IN GHANA

Philip Arthur
Hubei University of Technology, Wuhan, China.
Email: philipn.arthur@yahoo.com

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ABSTRACT

One of the most complicated fields of financial decision-making is capital structure. Capital structure is the composition of debt and equity capital which involves the funding of a company's assets and can be interpreted as the amount of net value plus preferred stock plus long-term debts. The relationship between capital structure and profitability cannot be underestimated because it is necessary for the company's long-term survivability to improve its profitability. This research sets out to assess the impact of capital structure on the competitiveness of the manufacturing industry in Ghana using some selected firms as the case study for the period between 2005-2012 to provide a critical assessment of the need and value of capital structure. Utilizing a mixed research approach as methodology, thus descriptive statistics and correlation analysis amidst the fixed effect model, the findings revealed that short term debt and long term debt had a negative impact on productivity whilst equity was positively related to profitability. The study recommends that Ghanaian-based manufacturing companies use equity such as retained earnings to expand their business rather than debt financing.

Contribution/ Originality: This study is one of the very few studies which have investigated on capital structure on the profitability of the manufacturing industry.

1. INTRODUCTION

The capital structure has been an enticing theme in the corporate and educational environments since the Industrial Revolution (See Swanson, Srinidhi, and Seetharaman (2003)). Defining an ideal capital structure that integrates all corporate capital, be it equity or debt capital, fosters deep discussions. With regard to this topic, the question by Myers (1984) about "how companies choose their capital structure" is still without a conclusive answer. Famá and Grava (2000) mentioned that the debates continue even after more than 50 years of the publication of seminal articles by Modigliani and Miller (1963); Modigliani and Miller (1958). The following question is open to the present day, "What do we know about capital structure?" (see, Rajan and Zingales (1995)). Advances have been made on the subject, and at the moment some of the conceptual contributions have channeled the debate to debt stratification (Graham & Leary, 2011)

especially financial debt. For Rauh and Sufi (2010) most empirical research on capital structure considers debts as if they were uniform, but debt diversity is a common feature, as several businesses have contrasting characteristics in their Balance Sheets, such as cash flow priorities (payment order) and supply control.

Each company uses capital to do their business. The capital used may consist of equity (contribution to ownership) and debt. Debt is any external debt that can be repaid and has related costs. The expense could be direct, such as interest payment or indirect, such as the cost of the organization. Debt may be short (less than one year) or long (more than one year). Companies may use various forms of debt, such as taking a credit facility directly from a financial institution, issuing (warrants or convertible) bonds, lease financing, or taking a trade credit to fund their business. For instance, using derivative instruments such as futures and forward contracts or using derivatives, the debt can also be more complicated.

It is known that the financial debts must be evaluated along the lines of current research, i.e. inquiries must be carried out into the liabilities that consist of interest-bearing debts (Machado, Medeiros, & Junior, 2010). The arrangement of financial debts must be studied in its various types in an even more specific way such as bank loans, debentures, subsidized credit, leasing, etc. There is thus a void in studying the relationship between the capital structure determinants in relation to the different financial debt instruments of the businesses. Keown, Martin, Petty, and Scott (2005) pointed out, if the firm's cost of capital can be affected by its capital structure then capital structure management is clearly an important subset of business financial management.

In Ghana, manufacturing companies need capital to purchase machinery for their factories and to procure raw materials locally or abroad and transport them to their processing plants. Also, they need storage facilities (both raw materials and finished products), marketing and transportation of their finished products either locally or abroad to their target markets. There is also a need for funds to pay salaries and meet other financial obligations. In order for companies to maintain their operations, become (more) competitive, and optimize the returns on their investment, strategic decisions on choosing the right mix of capital structure are required.

Is there in fact, an optimal capital arrangement? What are the potential factors influencing this optimal structure of capital? Although the above questions are of great importance, the scientific concepts did not provide satisfactory answers to these practical questions. On the contrary, the concepts of the capital structure remain one of the most controversial issues in modern finance. Despite decades of intensive research, there is a disparity between the hypotheses and all current assumptions. Many work has been carried out from the point of view of developed economies. In this regard, it is hard to recognize whether the finishes of hypothetical and experimental research directed in created economies, are likewise pertinent in creating economies. Research discoveries have not concurred on the connection between capital structure and gainfulness. Gatsi and Akoto (2010) and Amidu (2007) in their different investigations, all found a converse connection among productivity and influence of banks in Ghana. Tornyiva (2013) additionally found an unfriendly connection among benefit and influence in the protection business in Ghana. Salawu and Agboola (2008) additionally found a positive connection among gainfulness and capital structure of huge non-money related recorded firms in Nigeria; it makes the investigation of capital structure a fascinating region of research.

This study sets out an ambitious search to investigate the effect of capital structure on Ghana's manufacturing industry competitiveness using selected firms as a case study. As a matter of fact, audited financial statements of selected firms are obtained with permission from the GSE and the individual firms ' websites. The return on equity (ROE) or income after interest and tax was used to reflect profitability, while the capital structure was represented by short-term debt (STD), long-term debt (LTD) and equity (EQ) natural logarithms. In all, fifteen (15) firms were selected from different manufacturing industry sub-sectors, out of which thirteen (13) were firms listed on the Ghana Stock Exchange (GSE) while the other two were private sector firms. Methodologically, the study adopts both qualitative and quantitative research methods in addressing the nexus. In this regards, descriptive statistics amidst correlation analysis were also employed in the study. Furthermore, panel data regression method, using both the fixed effects and the random effects, was used for the data analysis. In terms of organization, ensuing the introduction here in is the literature review in section two. Section three presents an overview of manufacturing firms in

Ghana while section four gives an account on the research materials and methods utilized for the study. Section five presents empirical results and discussion of research findings. Lastly, section concludes the study and gives suggested recommendation.

2. CONCEPTUAL LITERATURE

2.1. The Concept of Capital Structure

The idea of capital structure got a lot of consideration after Modigliani and Miller (1958) exhibited in their paper that the decision among obligation and value doesn't have any material consequences for the estimation of the firm. This proposition indeed holds assuming perfect capital markets. A perfect market is one where frictions like transaction costs and restructuring costs are not present. In the real world, however, one might wonder if all the capital markets are fine. Capital structure may well be important when considering market imperfections such as acquisition and restructuring costs. As Strebulaev (2007) points out, small cost of adjustment may result in large variations of capital structure. Subsequently, Modigliani and Miller (1963) revised their argument for tax irrelevance in capital structure. Modigliani and Miller (1963) later relaxed the perfect market proposition and introduced corporate tax into their models. The justification for doing so was to understand that debt is tax-deductible and therefore a corporation that uses debt is entitled to receive a protection from interest tax. In that capacity, as progressively more obligations is utilized, the market estimation of the firm would increment by the present estimation of the premium assessment shield. Nonetheless, they likewise alert that despite the presence of an assessment advantage for debt financing, it doesn't really imply that enterprises ought to consistently look to utilize the greatest conceivable measure of obligation in their capital structures. For one thing, other types of financing, especially retained earnings, may be even cheaper in some circumstances when considering shareholders ' tax status under personal income tax (Modigliani & Miller, 1963).

In the genuine world situation, their suggestions scarcely hold and have in this way been tested by a few researchers. Among the early researchers, Robichek and Myers (1966) contend that, on one hand, without charges, the estimation of the firm won't change for moderate measures of influence, yet will decrease with high degrees of influence, and then again, within the sight of duties an ideal level of influence will exist. Borch (1969) exhibits that the income of a firm can be explained by a discrete stochastic procedure, wherein the terms can take negative qualities. As such, earnings can be added to the firm's working capital, or paid out as dividends. If a firm has debt, part of the earnings must be set aside to service the debt. As a consequence, a firm is ruined and has to cease its operations if the working capital becomes negative. This is in opposition to the M&M unimportance recommendation. Jensen and Meckling (1976) hypothesize that in their financing choices, firms would intend to limit organization costs because of the contention that may exist among investors and obligation holders. They characterize the gatherings to this relationship as the administrators (specialist) and the bondholders just as the investors, being the principals. Besides, they characterize office costs as (1) the monitoring expenditures by the principal, (2) the bonding expenditures by the agent and (3) the residual loss. Jensen and Meckling (1976) demonstrated that an ideal capital structure can be acquired by exchanging off the office cost of obligation against the advantage of obligation. Miller (1977) invalidates the ideal capital structure way of thinking by figuring in close to home annual charges into the Modigliani and Miller unimportance recommendation. He contends that even in a world wherein intrigue installments are completely deductible in registering corporate annual assessments, the estimation of the firm, in balance, will at present be free of its capital structure. The significant constraints of Miller's suggestion would appear to be his impossible suspicions of the nonappearance of capital additions charge and the danger of liquidation. In this manner, Schneller (1980) examined the effect of tax collection on the ideal capital structure of the firm when all speculators have a place with a similar duty sections. He showed that, within the sight of capital additions charge and the probability of chapter 11, for the profit paying firm, inside answers for the capital structure choice are conceivable because of the divergence between the capital increases and profit annual assessment rates and the plausibility of illiquidity. Schneller (1980) battles that Miller's recommendation just holds in circumstances whereby the profit paying firm is constantly liquid.

It is trite to feature that capital structure hypothesis has developed from the Modigliani and Miller (1958) proposed an effective capital structure. Despite being started with the presence of impeccable markets, the suggestions have become the hinders of the structure by which capital structure is tied down. Nonetheless, what observational experiments have disentangled is that the firm value varies with the blend of the duty price. As suggested by Investopedia, Capital Stock is the way a company finances its general operations and growth through the use of different asset wellsprings. Obligation (acquired cash) comes as security issues or long haul notes payable, while value (proprietors' reserve) is named normal stock, favored stock or held income.

The sum of the temporary liabilities of a corporation and its long-term liabilities as a percentage of the assets of the association is referred to as the financial power or equipment of the association. Wright and Snell (1998) placed that, the choice whether to acquire long haul or transient obligation can be recast as the choice whether to cause fixed-rate (long haul) or gliding rate (present moment) obligation. A firm picks the value blend or a mix of various wellsprings of fund in various structures that will best augment the estimation of the firm (Gajurel, 2005). The obligation and value mix that augments the estimation of the firm is the association's ideal capital structure and picking a company's capital structure stays a crucial key decision that corporate supervisors need to make (Gatsi & Akoto, 2010). At the ideal capital structure, the steady tax cut gets from obligation is equivalent to the gradual expenses of budgetary misery (Wright & Snell, 1998).

2.2. Concept of Profitability

Profitability can be described in different ways. Hofstrand (2009) describes profitability as either Accounting Losses (Net Income) or Economic Profits. Accounting Profit offers a short-term view of business profitability, while economic losses provide a longer-term view of revenue. Corporate execution assumes a significant role in deciding association's capital structure. This relationship is clarified by the hierarchy hypothesis, which expresses that organizations favor inner wellsprings of account to outer sources. The classification for inclination is from the one, which is least touchy to the one, which is most delicate that emerge due to deviated data between corporate insiders and less well-educated market members (Myers, 1984). Titman and Wessels (1988) and Barton, Hill, and Sundaram (1989) concur that organizations with high benefit rates, taking everything into account, would keep up moderately lower obligation proportion since they can produce such assets from inner sources. Most examinations found a negative connection among productivity and obligation financing (Booth, Aivazian, Demirguc-Kunt, & Maksimovic, 2001; Friend & Lang, 1988; Kester, 1986; Rajan & Zingales, 1995). Explanation on how capital structure is related to the profitability of a company could be given by using the pecking order theory as previously explained above. The theory states that, when it comes to funding their business ventures or operations, businesses would first use internally generated fund (IGF) rather than funds raised outside the organization. The order of choice is as follows: the organization would utilize the wellspring of assets that is least dangerous to the one that is generally unsafe, this occurs for the way that administrators of a firm are very much educated on the (money related) issues of the firm than different partners outside, so there is data awry, as Myers (1984) puts it, between the directors who are inside partners and the less educated different partners including market members. From the perspective of this statement, accordingly, it is adequate to state that organizations that are increasingly beneficial and which can without much of a stretch get the IGF would rely upon them, as against firms whose hold income are exceptionally constrained and need to rely upon outer sources (obligation). Hold income are in this way, the primary wellspring of money and the most dependable which has the least cost. In this manner, Titman and Wessels (1988) and Barton et al. (1989) agreed that organizations which make exceptionally high benefit, under ordinary conditions, would keep tolerably lower to obligation proportions since they can acquire the required assets for the business activities from interior sources.

2.3. Empirical Literature

2.3.1. Determinants of Capital Structure

A company's capital structure is made up of equity and debt. Such tools are used for corporate funding. Capital structure research's overall objective is to find the optimal capital structure for a

business that provides the highest value (Myers, 2001). There are a few interesting questions related to this subject. For example, what factors are important if a business is going to borrow money? Do businesses with more profitability have debt or equity preference? And is there more free cash flow combined with more debt or equity? These questions focus on specific factors that affect a company's capital structure. Research was also carried out to find out how different factors impact the capital structure from countries and industries. For example, the differences in determinants of the capital structure between Spain and the United States were explored by De Miguel and Pindado (2001). Kayo and Kimura (2011) conducted research to determine which hierarchy influences the capital structure by various factors.

In an examination: "Ideal Capital Structure of Insurance Companies" by Laeven and Perotti (2010) creators intended to research the installment capacity of Holland-based insurance agencies for the period between 2005-2009, especially in the years during which the money related emergencies extended. The study conclusion was that during the years 2007 and 2008, the payment ability of companies during these years fell significantly. The financial crisis caused the insurance sector (as well as other financial intermediaries) to review their capital's infrastructure (Laeven & Perotti, 2010).

Noulas and Genimakis (2011) explore the capital structure assurance of firms recorded on the Athens Stock Exchange, utilizing both cross-sectional and nonparametric measurements. The initial segment of their investigation evaluates the degree to which influence relies on a more extensive arrangement of capital structure determinants, while the last gives proof that capital structure changes essentially over a progression of firm characterizations. Their outcomes archive experimental regularities as for elective proportions of obligation that are predictable with existing speculations. Especially, their outcomes bolster the hierarchy speculation.

Various firm level factors have been distinguished by observational writing as components deciding the capital structure of firms. As indicated by Harris and Raviv (1991) in their review of capital structure speculations, "The models studied have recognized countless potential determinants of capital structure. The observational work so far has not, be that as it may, sifted through which of these are significant in different settings". As per Harris and Raviv (1991) "a few investigations shed light on the particular qualities of firms and businesses that decide influence proportion. These examinations for the most part concur that influence increments with fixed assets, non-tax shields, growth opportunities, and firm size and decreases with volatility, advertising expenditures, research and development expenditures, bankruptcy probability, profitability and uniqueness of the product."

This study attempts to determine how firms choose their capital structure, while taking into account many important factors that might affect it to achieve their primary goal. Given the views of the different theories of capital structure (referred to above), empirical literature has defined various firm-level attributes as factors that determine the capital structure or leverage of the firm. Some of these attributes are profitability age, the size of the organization and the quality of the asset of the company. Others are the company's growth, how risky its business is, and its structure of tax and ownership.

2.3.2. Negative Association between Capital Structure and Company's Profitability

So many academics and authors have carried out empirical studies on the relationship between a firm's capital structure and the financial performance of the firm. Most of them pointed to a negative relationship between productivity and capital structure from these various works carried out by financial and economic researchers. These include (Amidu, 2007) in his dissertation, "determinants of banks ' capital structure in Ghana": Abor (2005) researching the "impact of capital structure on Ghana's listed companies ' profitability". The research by Graham (2003) on big tax and corporate finance. Others are:' Determinants of the capital structure of European small and medium-sized companies' by Hall, Hutchinson, and Michaelas (2004). Fama and French (1998) research on taxation, investment decisions and firm quality and determinants of the option of capital structure by Titman and Wessels (1988). Amidu (2007) work uncovered that there exists a backwards linkage between an organization's momentary liabilities and its budgetary exhibition. Abor (2005) work, in like manner, likewise uncovered a reverse connection between organization gainfulness and its long haul obligation. A Graham (2003) study likewise reached indistinguishable

inferences from Abor (2005) on the connection between all out obligation and gainfulness. He additionally called attention to that large and all the more performing firms have lower influences.

2.3.3. Debt-to-Equity Ratio as a Measure of Capital Structure

On the balance sheet, debt and equity can be found. With this debt and equity, the assets listed in the balance sheet are acquired. Companies that use more debt than equity to fund assets have an aggressive capital structure and a high leverage ratio. A company that pays more equity than debt for property has a low leverage ratio and a conservative structure of capital. Having said that, a high leverage ratio or an aggressive capital structure may also lead to higher growth rates while a moderate capital structure may lead to lower growth rates. It is the goal of company management to find the optimal mix of debt and equity, also referred to as the optimal capital structure. Analysts compare capital structure using the debt-to-equity ratio. Through dividing debt through equity, it is measured. Savvy companies have learned to include both debt and equity in their corporate strategies. Nonetheless, businesses may sometimes rely too heavily, in particular, on external financing and debt. Investors can control the capital structure of a business by measuring and comparing the debt-to-equity ratio to the peers of the company. Debt can be used as a tool to improve investor returns, but it can also reduce returns on investments by investors.

3. OVERVIEW OF MANUFACTURING FIRMS IN GHANA

Ghana's manufacturing dates back to the early days of independence from Ghana. Just after independence, the then government under the leadership of the Republic of Ghana's first president, Dr. Nkrumah, embarked on nationwide industrialization drive and established factories for food and agro production, aluminum smelting, saw milling and wood processing, mineral processing, oil refinery, textiles and glass manufacturing among others. The mission's goals, among others, were for the factories to use the country's readily available raw materials; to add value to the raw materials before they were exported; to produce goods and services for local consumption (and probably with some surplus for export) in a bid to reduce their imports; to provide jobs for Ghanaians, particularly young people, and to open up the country and ensure rapid development of infrastructure in all parts of the country. Under this plan, the accompanying creation plants were set up in Bolegatanga in the northern pieces of Ghana by the administration, Pwalugu Tomato Factory and Meat Factory. The Kumasi Jute Factory, the Kumasi Shoe Factory and the Wenchi Tomato Factory in the mid Ghana were additionally manufactured. In the western area, there were the BonsaTyre Manufacturing Company at Bonsaso, the Aboso Glass Factory, the Preatea Gold Processing Factory and the Takoradi Paper Mill. There were additionally the Kade Match Factory and the Nsawam Cannery in the Eastern Region, the Central Region had the Komenda Sugar Factory and the Saltpond Ceramics Limited. The twin urban communities of Accra and Tema were the center of this industrialization strategy. A large portion of the ventures were situated there because of their closeness to the then recently constructed Akosombo Dam to Provide Hydroelectric capacity to control the businesses; the nearness of the Tema harbor which encouraged development of apparatus and different materials from abroad for the manufacturing plants and furthermore the fare of merchandise and different materials abroad; and the accessibility of the fundamental human capital, around then, to work and deal with the industrial facilities. The greater parts of these state-claimed organizations were given insurance by the legislature to endure.

After the overthrow of the Nkrumah system, progressive governments couldn't give enough supervision and security to the organizations. Debasement, poor administration, political impacts (particularly during the military systems) in the state division and other monetary reasons prompted stagnation for the development of these organizations from 1970 to 1977 and afterward to a decrease from 1977 to 1982. From there on, the assembling and handling industry in the nation couldn't recover their liveliness, and execution stayed powerless into the 1990s. The majority of these organizations likewise endured underutilization regarding their modern limit during the 1960s, which expanded alarmingly during the 1970s. Under the Economic Recovery Program (ERP) during the 1980s, government planned to restore a portion of these state-claimed producing organizations with the goal that the explanations behind which they were set up could be figured it out. Numerous difficulties looked by the organizations made their restoration

troublesome, government, under the sponsorship of Divestiture Implementation Committee (DIC), either completely or incompletely occupied the vast majority of the organizations and referred to different explanations behind that.

Despite the fact that the advancement of the assembling part was initiated by the State, other worldwide organizations, for example, UAC, P Z Cussons Plc, Lever Brother, and somewhere in the range of hardly any individual Lebanese, Indian and Ghanaian industrialists likewise set up assembling organizations.

3.1. Current View of Manufacturing in Ghana

According to the study on Ghana from the Commonwealth of Nations, there are currently about 25,000 enlisted companies working together in agro handling, mining and mineral preparation, light assembly, aluminum purification, food preparation, bond making and small business pontoon construction. Others are also engaged in the production of alcohol and beverages. Chemicals, drugs and other pharmaceutical textiles, wood and wood processing, furniture manufacturing, iron and steel, clothing and textiles are also produced. Ceramics and glass manufacturers are also found in relatively small quantities. More than eighty percent (80 percent) of these companies are small to medium-sized enterprises (with fewer than 50 employees) and about fifty-five percent (55 percent) of them can be found in the Accra / Tema metropolis industrial hub. There are about 1200 members (including service providers) of the Association of Ghana Industries (AGI), the parent association seeking benefits for manufacturing companies.

Manufacturing contributed about 6% (6%) to Ghana's GDP (2011)) and offered jobs to over 250,000 people (2009). As indicated by the Commonwealth of Nations report, on the worldwide economies of 185 nations, Ghana is appraised 67th by the World Bank for relative simplicity of working a business in Ghana a positioning dependent on how simple the administrative condition in the nation regarding the opening and activity of a neighborhood firm. By and large manufacturing firms in Ghana utilize straightforward and unsophisticated advances in their generation forms. On a size of 1-7, with 7.0 speaking to a nation in which the world's ideal and most effective procedure innovation wins and 1 being the least. This implies Ghana is considered as a real part of the world economies where advancements for assembling and preparing are least created.

3.2. Challenges in Manufacturing in Ghana

Ghana's manufacturing industry faces many obstacles that threaten the industry's firms ' survival. The manufacturing industry continues to undergo size reduction, and Ghana is likely to lose its manufacturing factory base if Ghana's government policies do not resolve these issues quickly to resuscitate the manufacturing subsector. Below are some of these issues discussed.

Probably the most challenging aspect for the factories is not enough power supply. Ghana's energy crisis, known locally as the "Dumsor," has reached its crescendo, forcing major generators and distributors, the Volta River Authority (VRA) and the Ghana Electricity Company, respectively, to ration electricity to such an extent that the power available is not adequate to feed the industries. In order to support what they get from the national grid, the industries must produce their own electricity. High fuel prices to Ghana, however, have made the use of generators to generate very expensive electricity so that most of these companies are producing at a loss. Another defies confronting these organizations are the expense of credit in Ghana. In Ghana loan fees are high; in reality, the Bank of Ghana's Treasury charge rate is over 20%. Most business banks have their base rate between 22.5%-25%. In this way, the danger of getting cash to work together is high because of the significant expense of capital. Identifying with the significant expense of credit is access to credit. On account of high financing costs charge by the business banks, firms are not ready to get to the required money to help their business, since reimbursement of the advance in addition to the premium turns into a weight to firms and extraordinarily influence their productivity and the danger of default additionally turns out to be high. Not just that, the pace of swelling is likewise extremely high. Ghana has, for an extremely prolonged stretch of time, being encountering a twofold digit swelling figure which implies that costs of products and ventures are not steady yet increment quickly. As expansion builds the expense of working together, it lessens the obtaining intensity of shoppers (particularly for fixed pay workers,

for example, compensation laborers), thus the total interest for merchandise and enterprises diminishes with the end goal that producers in an aggressive market can't move all the expense to buyers however need to assimilate part, which likewise contrarily influence their gainfulness.

Identifying with inflation is the high pace of deterioration of the cedi. The national money, the cedi, has endured gigantic devaluation against all the significant monetary standards (the US dollar, Pound Sterling, Euro and so on.), along these lines the expense of material sources of info imported from abroad for the organizations continues rising which additionally builds generation cost. It could be contended that as the cedi deteriorates, firms which send out their items are in an ideal situation, notwithstanding, since moderately, the expense of every single other contribution for generation additionally increments as the cedi devalues the net impact is somewhat negative on the firm. Another test which is likewise of much concern is absence of fitting innovation for the organizations. The vast majority of these assembling firms (particularly the little to medium size organizations) still utilize old and outdated apparatus in their generation procedure. This is on the grounds that they either come up short on the underlying funding to procure present day apparatus and innovation or the expense of working and keeping up these cutting edge hardware and advances are unreasonably high for their sizes and limit. The outcome is that creation proficiency in the greater part of these organizations is extremely low with a ton of waste items. Ghana is enriched with a ton of normal assets and horticultural items, so if government could give the empowering smaller scale monetary condition, and other specialized and innovative help for the assembling and handling organizations, their commitment to the financial improvement of the nation would be incredible.

4. RESEARCH MATERIALS AND METHODS

The study population consists of (large) Ghana-based manufacturing firms. Due to the ease of data access, I used manufacturing companies on the Ghana Stock Exchange (GSE). Two unlisted firms were chosen in the wood processing industry because none of the firms in the wood processing industry were listed on the (GSE). From the following manufacturing and production subsectors, agro processing, pharmaceuticals, aluminum and iron manufacturing are chosen from all 15 firms. Others are Food and Beverages, Household consumables, Paper and Printing and the Wood processing industries. In all the chosen firms, the following conditions are assumed to exist. First, in the last 20 years, all the selected companies have been in an active business, so if a huge credit was taken during the company's acquisition or establishment, it could have been paid off. Second none of them were reserved for sale, which could influence the value of their assets. Second, all the accounts in Ghana are cedis. Where the presentation currency of a company is not the cedis of Ghana, the figures are converted into the cedis of Ghana using the World Bank's annual average exchange rate.

The research covered the 2005-2012 period. The reason for limiting this period stems from the fact that the latest investigation data for this period was available. The data extracted included sales (thus the total revenue the firms receive from the sale of its manufactured or processed products (less value added tax where applicable), Income/earnings after tax (thus the profit the firm made for the year after interest or finance cost and tax has been deducted), Total Assets (the combination of both non- current and current assets, or the total of both equity and liabilities, employed by the firm to do business), Debt/Liability (thus any fund that has been used by the firm to do business, which is repayable and at a cost, Short term debt/liability Debt/Liability that crystallizes (due for repayment) within one year, Long term debt/Liability (thus Debt/liability that is due for payment after one year and Shareholders" equity representing the total of stated capital, capital surplus accounts and reserves as well as the surplus/deficit from the income statement for the period.

The study was carried out using secondary data. The listed companies ' audited financial statements have been downloaded from the GSE website. Where the financial statements of a particular period were not available on the GSE website for a specified entity, they were obtained from the company's websites. Assessment of their financial statements has been given with approval for the non-listed companies. Nonetheless, since the statistics from different firms are not the same in terms of proportions, their figures cannot be compared explicitly, so the normal logarithms of the figures were used for the study of regression.

5. EMPIRICAL RESULTS AND DISCUSSION

5.1. Descriptive Summary and Correlation Analysis

5.1.1. Descriptive Analysis

Descriptive statistics have been used to illustrate explicitly the distribution and actions of all variables. Table 1 and Table 2 provide the concise description of the measured variables and the proportional contribution to the total assets determined as the total amount of total liabilities and equity. The descriptive statistics are carried out in two ways. First, to observe general patterns among the surveyed companies, the descriptive statistics were conducted on the overall data (combined) see Table 1. Second, the firms were categorized and evaluated in terms of business. The goal was to observe the characteristics of the industry. From the overview analysis, some interesting findings are made.

Table-1. Summary statistics – combined. All figures in thousands of Ghana cedis.

Variables	N	Mean	Std. dev	Median	Max	Min
Short-term debt (in GHc)	120	19068.84	32098.3	6411.5	180534	231
Long-term debt (in GHc)	106	8657.896	21441.13	1431.5	125051	0
Equity (in GHc)	120	16000.38	20420.61	7633.5	138957	-2198
ROE	119	-0.14857	2.076143	0.047628	3.716418	-20.5893
Ratios						
Equity/Total assets (EOA)	120	0.429813	0.35856	0.475693	0.955285	-1.45563
Short-term debt/ Total assets (SDA)	120	0.423289	0.241397	0.397393	1.394027	0.044715
Long-term debt/Total assets (LDA)	106	0.167052	0.269091	0.062393	1.661095	0

The first line of quantitative research was carried out on all the companies together, as suggested. Results as shown in Table 1 show that short-term debt is higher than long-term debt. Mean statistics indicate that on the average the sampled firms acquired about 220% (mean of short-term debt/ mean of long-term debt = 19068.84 / 8657.896) of short-term liabilities than long-term liabilities to run their business activities. Mean equity is also lower than the average of all firms ' short-term liabilities; this indicates that business operations among the surveyed companies are on the average funded by short-term loans and debts. Further examinations using ratios show that short-term debt, long-term debt and equity ratios to total assets were about 42.3%, 16.7% and 42.9% respectively. This indicates that firms are generating as many short-term liabilities as overall capital to fund their properties. We thus worked at rates that were more risky than their equity could permit. It is therefore not surprising to observe that the average profitability (ROE) of all the firms was negative; about -14.8%. This suggests that the average investor in the manufacturing and processing industry in Ghana lost about 14.8pesewas for every cedi invested. These results, however, contradict that of Abor (2005) on listed firms in Ghana, with an average ROE of 37%, Shubita and Alsawalhah (2012) finding 9% ROE in Jordanian firms (although not significant). The standard deviations, minimum and maximum values of all variables often show high distribution and significant variations between businesses. Therefore, while profitability may be average poor, it is anticipated that some companies and/or sectors may actually operate at positive returns.

In order to observe market features, concise review was given again. Table 2 shows that, with the exception of the agro-processing sector, which finances their operations on average with long-term loans; in almost all industries, companies fund their operations mainly through short-term loans. The mean liability-asset ratio shows that the ratio of short-term debt to total assets is high for such industries, including Timber and Wood (64%), Iron and Molding (60%), Household products (41%) and Paper and Print (41%). While, food and beverages, household products and agro-processing are among the sectors with a high mean size of short-term liabilities. Agro processing, household products, and Timber and Wood in that order are sectors with relatively large estimated long-term liabilities. Ironically, firms in the pharmaceutical and paper and print

sectors have been found to be the group of companies with small amounts of both short-term and long-term debts.

Table-2. Descriptive summaries – industry analysis.

Industry	Variables	N	Mean	Std. dev.	Median	Max	Min
1	Short term	24	24183.96	47013.24	1887	180534	296
	Long term	16	34583.06	44255.85	11898.5	125051	97
	Equity	24	13451.17	14292.25	14614.5	50518	-2198
	ROE	24	-1.06234	4.456124	0.045114	2.765101	-20.5893
	EOA	24	0.322409	0.625334	0.297805	0.955285	-1.45563
	SDA	24	0.312257	0.261195	0.279584	1.085431	0.044715
	LDA	16	0.551905	0.453118	0.392686	1.661095	0.063028
2	Short-term	16	1399.25	539.2327	1377	2335	246
	Long term	16	100.6875	131.0016	40	402	0
	Equity	16	6582.063	6002.003	2766.5	19224	1781
	ROE	15	0.117682	0.106067	0.160055	0.253677	-0.08647
	EOA	16	0.735072	0.157862	0.757892	0.922678	0.476458
	SDA	16	0.240804	0.137306	0.222275	0.498395	0.077322
	LDA	16	0.240804	0.137306	0.222275	0.498395	0.077322
3	Short-term	16	12675.44	12641.93	9170.5	35538	959
	Long term	16	5563	8212.837	368.5	28833	9
	Equity	16	8917	9793.27	4070.5	26445	-830
	ROE	16	-0.01532	1.123019	-0.24935	3.716418	-1.72802
	EOA	16	0.299118	0.251578	0.348372	0.624477	-0.39981
	SDA	16	0.602855	0.28296	0.5485	1.394027	0.318235
	LDA	16	0.099104	0.122692	0.018351	0.391838	0.005685
4	Short-term	16	46140.31	44384.42	28864	139502	6398
	Long term	16	12113.31	15409.76	3854	52277	501
	Equity	16	47750.94	30519.3	47179	138957	8624
	ROE	16	0.248009	0.150675	0.284674	0.440946	-0.10274
	EOA	16	0.528136	0.173326	0.557578	0.762176	0.223794
	SDA	16	0.386162	0.141443	0.339543	0.699718	0.212455
	LDA	16	0.085701	0.081413	0.038273	0.265256	0.024591
5	Short-term	16	32708.38	29583.85	24159	115329	231
	Long term	16	2712.625	2137.889	1695	6614	201
	Equity	16	28550.19	13395.26	29695.5	48893	3114
	ROE	16	28550.19	13395.26	29695.5	48893	3114
	EOA	16	0.536745	0.163508	0.527346	0.878173	0.206674
	SDA	16	0.419082	0.171457	0.439233	0.750298	0.065144
	LDA	16	0.044173	0.015922	0.04232	0.082017	0.010598
6	Short-term	16	11043.25	4649.945	11236.5	17785	3913
	Long term	14	1580.643	1742.81	1225.5	7146	224
	Equity	16	4488.188	2786.569	4881	7984	-1840
	ROE	16	-0.11635	0.571139	-0.18804	1.77337	-0.81177
	EOA	16	0.28262	0.194073	0.276099	0.536572	-0.13438
	SDA	16	0.640948	0.208789	0.644421	1.134375	0.36553
	LDA	14	0.08735	0.068863	0.081258	0.278141	0.010713
7	Short-term	16	2773.75	2679.046	2361	11441	447
	Long term	12	1203.75	790.8707	1222	2581	258
	Equity	16	3537.688	5963.721	1732	24473	247
	ROE	16	0.033393	0.178572	0.025948	0.295154	-0.29745
	EOA	16	0.35829	0.224841	0.297089	0.701233	0.085114
	SDA	16	0.416429	0.155108	0.375789	0.700998	0.178352
	LDA	12	0.300375	0.25103	0.136155	0.722456	0.067048

Note: 1. Agro-processing, 2. Pharmaceuticals, 3. Iron and Moulding, 4. Food and Beverage, 5. Household products, 6. Timber and Wood. 7. Paper and Print.

With this result, three possibilities are demonstrated; first, both the agro-processing and household product industries may be more profitable for credit financiers and investors than the paper and print and pharmaceutical companies. Second, the high mean sizes of liabilities for the agro-processing industry could be the result of government policies and subsidies for those firms that have led to a high level of credit availability in the country for agro-based firms. Therefore, while support for household product may be attributable to commercial viability, it is likely that government policy and interest may primarily drive agro-based businesses. Second, companies in the pharmaceutical and paper and print industries may also be able to finance their assets with equity so much that they are less compelled to go for loans or operate on credit. Consequent examination of their equity-asset ratio shows that that EOA (73% and 35% respectively) is among the highest and therefore gives ample support for this inference.

Focusing on the rate of productivity, output across industries is found not to be homogeneous. The mean results for ROE show that the pharmaceutical (11%), food and beverages (24%), household products (22%) and paper and print (3%) industries have positive returns to equity; whilst agro-processing (-106%), timber and wood (-11%) and iron and moulding (-1.5%) attained negative average profitability. While the food and beverage industry may be more lucrative, this means that the agro-processing industry is more vulnerable to risk.

5.1.2. Correlation Analysis

Analysis of correlation is then carried out to analyze the relationship between the independent variables (STD, LTD, and EQ) and the dependent variable (ROE); and also to evaluate the relationship between the independent variables to test for the presence of multicollinearity between the independent variables. Results are shown in Table 3.

Table-3. Correlation results.

Number	Variables	1.	2.	3.	4.
1.	Short-term debts	1.00			
2.	Long-term debts	.504**	1.00		
3.	Equity	.470**	.228*	1.00	
4.	ROE	-.475**	-.384**	0.079	1.00

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Note: 1=Short-term debt; 2=Long-term debt; 3=Equity and 4=ROE.

Table 3 show that there is a significant negative relationship between short term liabilities (r = -0.475), long term debts (r = -0.384) and returns on equity. This implies that increases in long term and short-term liabilities may lead to a resultant fall in profitability by 38.4% and 47.5% respectively. Meanwhile there was no significant relationship between equity and ROE; though the correlation coefficient was positive (r=0.079). It is also shown that the association between the independent variables was mild and always below 0.504; indicating that there was no issue with multicollinearity. Having observed the trends in terms of overall company and industry characteristics and relationships between the explanatory variables and ROE, an attempt is now being made at this crucial junction to perform the regression analysis to estimate the individual impact on profitability of the independent variables.

5.2. Regression Results

The panel data regression models (fixed effect and random effect) were estimated based on the nature of the study and the data set to observe the impact on profitability of the explanatory variables. The first section of the regression analysis involved specifying a fixed-effect model to examine temporarily constant effects at the individual level. In the second inquiry, the variance across entities is presumed to be random and uncorrelated with the predictors, thus defining a random model of consequence. The purpose was to determine whether or not the impact of the predictors would vary based on the assumptions adopted, while checking the model that fits the dataset best.

5.2.1. Fixed Effect Model Results

In order to explore the relationship between the independent variables and ROE within an individual, fixed effect models are calculated as described above. For approximate these models, it is presumed that the predictor or outcome variables can be influenced or skewed by individual differences or effects within a company or industry and must therefore be monitored. Furthermore, it is believed that these individual features are unique to the organization and should not be associated with other individual features. The results of fixed-effect models were shown in Table 4. The significance of the F- test, F (3,16) = 19.15, at less than 1% significance level shows that the model is robust and fits the data well. Again, the adjusted R-squared coefficients show that independent variables explain about 43.05% of the total variance in ROE in model. Focusing on the individual effect of the explanatory variables, it is shown that both short-term debt and long-term debt affect productivity negatively. Results show that any unit increase in long-term debts that reduce profitability by approximately 0.001 percent; although not statistically significant. Meanwhile, for short term liabilities, results indicate that any unit per cent age increase will reduce ROE by 0.010%, though the figure looks insignificant, it is statistically significant even at the 1 % level. Evidence also shows a positive impact of the size of equity on profitability. Estimated results show that any increase in equity of 1% will lead to a significant increase in profit ability of 0.019%. In other words, when equity is doubled, profitability will also be increased by approximately a fifth.

Table-4. Results of fixed effect model.

Explanatory variable	Coefficients (t-ratios)
ln long-term liability	-.0955818 (0.40)
ln short-term liability	-1.014608 (-3.93) ***
ln equity	1.91654 (7.16)***
Constant	-7.407014 (-2.53)**
Nos. of observations	93
Nos. of firms	14
Rho	0.51584758
R^2 within	0.4305
F test: u_i=0	F(13, 76) = 2.68***
F test: model fitness	F(3, 16) = 19.15*** Prob>F- 0.0038

Notes: t-ratios in parentheses; *, ** and *** denote significance at the 10%, 5% and 1% levels respectively.

The estimated amount of the interclass correlation coefficient, rho, and the significance of its F-test shows that differences in entities accounts for 51.584% in total variance at Prob> F = 0.0038. Therefore, believing that disparities between organizations can have some effect on profitability would not be incorrect. Therefore, under the assumption of random and normal distribution, a random-effect model is calculated as a completely efficient specification of the individual effects.

5.2.2. Random Effect Model Results

Statistics from Table 5 indicate that even if the results are believed to be unpredictable, both short-term and long-term liabilities have a negative impact on profitability. Results show that increases in long term debts reduce ROE by 0.001%; albeit insignificant. For short term debts, it is shown that any unit increase will negatively and significantly impact on ROE by 0.011%. For equity size, it is revealed that for the random model, increases in equity also insignificantly lead to a 0.013% incremental change in profitability. The chi-square results (chi2(3) = 48.50, p <1%) shows the strength of the model to capture for heterogeneities in the dataset.

Due to the different coefficients of the independent variables between the fixed and random effect models, the analysis tried to check which model fits the datasets best. The path and effect of the explanatory variables are in fact parallel; however, choosing one model for further analysis is important for parsimony purposes. Conventional analysis of the differences within the units and the high level of correlation between the independent variable and the results of the unit suggest that

the template of fixed effect must be chosen. Nonetheless, since this may not be a necessary and sufficient condition for the random effect model to be dismissed, the Hausman test is carried out. The Hausman test basically tests whether the unique errors (u_i) are correlated with the regressors; the null hypothesis is they are not. Where they are correlated, the model of fixed effect is preferred; otherwise a model of random effect is chosen.

Table-5. Results of random effect model.

Explanatory variable	Coefficients (t-ratios)
ln long-term liability	-.1092621 (0.49)
ln short-term liability	-1.054635 (-4.52) ***
ln equity	1.287889 (6.53)***
Constant	-1.423033 (0.360)
Nos. of observations	93
Nos. of firms	14
Rho	0.11331559
R^2	0.3999
F test: u_i=0	F(13, 76) = 2.68***
Wald Chi square	$X^2(3)$ = 48.50***

Notes: t-ratios in parentheses; *, ** and *** denote significance at the 10%, 5% and 1% levels respectively.

Table-6. Hausman test results.

Variables	Fixed (b)	Random (B)	Difference (b-B)
ln long-term	-0.0955818	-0.1092621	0.0136802
Liability	-0.4	-0.49	
ln short-term	-1.014608	-1.054635	0.0400275
Liability	(-3.93) ***	(-4.52) ***	
ln equity	1.91654	1.287889	0.182832
	(7.16)***	(6.53)***	
Chi square test	chi2(3) = 13.78		
Prob>chi2	0.0032		

The results of the Hausman test with a chi square value of [chi2 (3) = 13.78; p < 5%] in Table 6 supported the choice of the fixed effect model. The study therefore selects the coefficients of the fixed effect model for further discussions.

5.3. Discussion of Results

The results show that the surveyed companies do not finance their capital on average according to the scale of their equity. Generally surveyed businesses across sectors use short-term loans to finance their operations. An exception can be made to this principle for companies in the agro-processing and household products sectors Table 2. Descriptive analysis shows that their working capital's long-term debt components are relatively high to the other.

It is conceivable that the financing elements and speculators might be offering more momentary credit than long haul facilities because of the potential dangers engaged with the last mentioned. In addition, since cost of account is high in Ghana, firms would prefer to lean toward transient credit so it tends to be paid off promptly when their income circumstance improves. It is additionally conceivable that financial managers in these organizations deal with their working capital to such an extent that while giving borrowers shorter days to settle their commitments to the organizations, they likewise moderately delay in settling their monetary obligations, for example, making installment to staffs annuity commitments, installment of service bills, and for crude materials among others. However, this in total expands their short term liabilities, it makes money accessible for tasks. All things considered, because of conversion standard misfortunes and macroeconomic stuns, organizations are not boosted to get or potentially offer long haul offices among themselves. These could represent the high level of short term liabilities among the watched units. With that notwithstanding, it can be concluded that once firms generally incubate a

lot of short-term liabilities in their business, they are operating at a risk. Indeed, the evidence shows that whilst firms operating in the agro-processing and household industries are more liable to go for debts instruments; firms in the pharmaceutical and paper and print industries are less likely to do same. Ironically, the profitability of the companies in the agro-processing sector is the worst, while the profitability of the pharmaceutical companies is the highest among the group of companies. It gives the impression that what matters is not the degree or availability of debt instruments, but sound financial management. While it can not be said that the volume of debt instruments acquired is mismanaged by agro-processing companies; what can be said is that pharmaceutical firms are able to manage their shares average and comparatively better. Differences in the industrial environment and disruptions can also have a major impact on the efficiency of the facilities of these debts. Results of regression showed that while equity increases improve profitability, short-term debt and long-term debt increases were detrimental to profitability; although the effect of long-term debt is negligible. This finding confirms (Duyen, 2012) and Tian and Zeitun (2007) findings, which found that debt increases decrease profitability. Duyen (2012) noted that, although it is negative, the effect of short-term debt on profitability is not negligible. Ebaid (2009) also suggests that there is no significant impact on ROE on long-term debts; an argument strongly supported by the results of this study. While this result agrees with Duyen (2012) on the negative impact of productivity short-term debt, its negative impact on profitability, as Duyen (2012) noted, contrasts with the findings of this study. It can be inferred that the influence of equity size improves productivity more than any of the debt instruments ' injurious impacts, equity presents as a parameter for offsetting. This might also clarify why businesses may still go for the liabilities even though they have a negative impact. It could be that the manufacturing companies are going for the liabilities, in particular the short-term liabilities to fund their ventures with the hope that the resulting rise in capital will ultimately compensate for such foreseen losses. It is also possible that they are unable to monitor the losses due to increase in liabilities because the automatic increase in equity serves to swallow these losses.

6. CONCLUSION AND SUGGESTED RECOMMENDATIONS

This research investigated the effect of capital structure on manufacturing firms ' competitiveness in Ghana, using annual financial data from 15 manufacturing firms operating in different industries from 2005–2012. A review of the current manufacturing firms literature revealed a lack of empirical research on the profitability capital structure in the sub-region of Africa, especially in Ghana. Although several initiatives and attempts have been made to provide the requisite credit support and macroeconomic environment to ensure that manufacturing firms prosper and boost operating capacity, performance, and productivity, there are very few or very limited studies assessing how their capital structure affects their profitability. Following the study findings, it proposed that managers use long-term debt as opposed to short-term debt facilities because the effect is not significant, although the long-term debt has a negative impact on profitability. Additionally, in the extreme case where a short-term borrower facility is unavoidable and has to be purchased, administrators are advised to insure that the cumulative intake of these short-term obligations (current liabilities) as a proportion of the capital structure is less than amounts of non-current liabilities and equity in total assets. Because it could be balanced by the positive effect of the capital on profitability due to the negative effect of short-term liability on profitability while important. Ultimately, it is also advised that corporate financial managers ensure that working capital is handled efficiently and prudently to ensure that adequate cash is available for the day-to-day operation of the company.

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