Addis Ababa University

College of Business and Economics

Department of Accounting and Finance

The effect of Capital Structure on financial performance of Construction Companies in Addis Ababa, Ethiopia

A Thesis submitted to Department of Accounting and Finance in partial fulfillment of the requirements for the Degree of Master of Science

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June, 2018

Addis Ababa

Addis Ababa University

School of Graduate Studies

This is to certify that Maru Telila has carried out a thesis on the topic entitled "The effect of capital structure on financial performance of construction companies in Addis Ababa, Ethiopia" in partial fulfillment of the requirements of the MSc degree in Accounting and Finance complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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STATEMENT OF DECLARATION

I, Maru Telila, declare that this study entitled "the effect of capital structure on financial performance of construction companies in Addis Ababa, Ethiopia" is my own work. I have carried out the research work independently with the guidance and support of the research advisor. As far as my knowledge, this study has not been submitted to any degree/diploma in Addis Ababa University or any other institutions. It is done in partial requirement of the MSc Degree in Accounting and Finance.

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STATEMENT OF CERTIFICATION

This is to certify that Maru Telila has carried out his research work on the topic entitled with "the effect of capital structure on financial performance of construction companies in Addis Ababa, Ethiopia". This work, to the best of my knowledge, is original in nature and is suitable for submission for the award of MSc in Accounting and Finance.

Advisor:

Name: Gebremedhin Gebrehiwot

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Date: _____

Acknowledgement

This thesis would not have been completed without the huge support I have received from different people and institutions. First I would like to thank to my al-mighty GOD for giving me the potential and patience to accomplish this study. Next I would like also to express my sincere gratitude to my advisor Gebremedhin Gebrehiwot (Assistant Professor) who took time to read and made the necessary criticisms, suggestions and corrections in the course of writing this thesis. I would like to extend my gratitude to ERCA and construction companies of Addis Ababa for providing me with the relevant data for my study.

I thank my friends who in one way or another provided assistance during the time of conducting this research activity.

Finally, I thank my brother Solomon Belete Jijo and my family for the support they gave me during the period of writing this thesis.

I would like to dedicate this thesis to the memory of my late mother, **Fantu Dugda**, who always believed in my ability to be successful in the academic area. She was constant source of inspiration to my life. It was my strong desire to celebrate my graduation with her, but luck is not with me. Rest In peace, Mom.

Abstract

The topic of capital structure has been widely explored as an area of study. Many studies have tried to identify the optimum capital structure that would allow profit maximization for companies. However, with capital structure, there have been many divergent findings due to different sectors exhibiting different behaviors and model that attempt to establish relationship between capital structure and performance. This research therefore, seeks to examine the effect of capital structure on financial performance of 16 grade one general contractors in Addis Ababa in the year 2012 - 2017. The objective of this study is to determine the effect of capital structure on financial performance. The researcher used secondary data from audited financial statements of grade one general contractors. Quantitative methodology using random sampling was employed and the data collected were analyzed using E-views 8 econometric software to come up with descriptive, regression and correlation results. Diagnostics tests such as normality test, correlation, autocorrelation, multicollinearity and heteroscedasticity test were conducted to ensure that the data suits the basic assumptions of classical linear regression model. The regression result show that Short term debt to asset had statistically significant and positive relationship with financial performance (measured by ROA) at 5 % significance level, whereas long term debt to asset had statistically significant positive effect on financial performance of construction companies. Besides, Interest coverage ratio, tangibility and asset size also had statistically significant and positive relationship with financial performance. The findings also showed a negative significant relationship between debts to equity with financial performance. Thus, the study concluded that data from GC1 companies result mostly appear to support Trade-off theories of capital structure. The findings revealed that capital structure has statistically significant effect on financial performance of construction companies. Finally, the study recommended that construction companies in Ethiopia should employ an appropriate mix of capital structure and attention should be given for significant variables in order to increase the financial performance.

***Key words**: Grade one contractors, Capital structure, financial performance, and panel data*

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List of Acronyms & Abbreviations

ERCA – Ethiopian revenue custom Authority

CLRM Classical Linear Regression Model

ROA - Return on Asset

ROE - Return on Equity

ROI - Return on Investment

GC1 - Grade one General contractors

Size – firm size

TANG – Tangibility

SDA – short term debt to asset ratio

ICR – Interest coverage ratio

LDA – long term debt to asset ratio

DE – Debt to Equity ratio

GDP- Gross domestic product

CHAPTER ONE: INTRODUCTION

This chapter gives a brief background of the effect of capital structure on financial performance of construction companies in Ethiopia. It also contains the statement of the problem, general and specific objectives, research questions and hypothesis, scope of the study, the limitations of the study and significance of the study.

1.1Background of the Study

Financing decision is a key decision function of financial management. Capital structure decisions involve deciding the debt level and equity amount to use to attain the optimal capital structure. Many firms require funds to facilitate their expansion or provide working capital for day-to-day operation. This kind of financing need is referred to as capital. In real life, capital can be generated internally or externally. Internally generated funds are usually obtained from retained earnings and don‘t render an obligation in any form. However, for the externally generated capital, entities are faced with a burden of having to reimburse creditors and shareholders through interest payment, dividend payment, value creation and profit maximization (Chechet & Olayiwola, 2014).

Shubita & Alsawalhah (2012) defined capital structure as a combination of equity and debt, which firms employ in order to facilitate their operations. A firm can choose to raise funds by issuing stocks, debt, or other accessing it from sources of financing such as: convertible bonds, warrant, forward contract, overdrafts etc. Since capital structure impact wealth maximization as well as the ability of a firm to sustain in a competitive market, making the right capital mix decision is paramount. Nevertheless, the identification of an effective capital structure has proven to be a difficult task for many firms. The difficulty arises from the challenges encountered in quantifying generating a model which will deliver accurate result for optimum capital structure (Koech, 2013). For this reason, the issue of capital structure has been attracting keen attention from key industrial players such as analysts, investors and company officers. The attraction stems from the fact that capital structure decisions are crucial in financial management. Not only does capital mix affect the profitability of an organization, but also, it‘s vital in sustaining the going concern status of companies, in a period of financial crisis.

Modigliani and Miller (1958) popularly referred to as MM published what has come to be known as the modern theory on capital structure. MM demonstrated under a very restrictive set of assumptions that a firm's value is unaffected by its capital structure. This assertion by MM is based on some assumptions including the absence of taxes; market participants can borrow or lend at risk free rate; there are no brokerage or transaction charges; no bankruptcy cost among others. MM, therefore, by implication point out that in real world, factors such as taxes and interest rate payment affect the debt equity composition of a firm's capital and the value of a firm. Since then, the study of capital structure and its debate has received a lot of attention from academicians, researchers on finance, financial analysts and practitioners; however, most of these studies have occurred in the developed countries or in the developed economies.

Capital structure decisions is a very debatable topic in finance mainly in regard to the optimal capital structure that will result to maximum value of a firm.

In reality, capital structure of a firm is difficult to determine. Financial managers face difficulty to exactly determine the optimal capital structure. A firm has to issue various securities in a countless mixture to come across particular combinations that can maximum its overall value which means optimal capital structure. Optimal capital structure means with a minimum weighted-average cost of capital and thereby maximize the value of firms. Although optimal capital structure is a topic that had widely been done in many researches, we cannot find any formula or theory that decisively provides optimal capital structure for a firm.

Corporate performance can be measured by variables which involve productivity, profitability, growth or, even, customers' satisfaction. These measures are related among each other. Financial measurement is one of the tools which indicate the financial strengths, weaknesses, opportunities and threats. Those measurements are return on investment (ROI), residual income (RI), earning per share (EPS), dividend yield, price earnings ratio, growth in sales, market capitalization etc (Barbosa &Louri, 2005).

One of the major goal of a firm is wealth maximization. Profit is the most commonly used measure of financial performance of any firm. It is determined by matching revenues and costs associated in generating that revenue. In order to achieve the profit maximization goal, firms are affected by various factors which determine their

profitability levels. The management should therefore continuously monitor those factors in order to remove those with negative influences and to enhance those with positive impact on profitability of the firm. Such factors include capital structure, inflation rates, liquidity, growth, size of the firm etc.

In designing the capital structure, it is important to be guided by the goal of maximizing a firm's value as well as the propositions of the various theories on capital structure. A firm in the construction industry here in this study refers to the companies engaged in the activities specified by Ministry of Urban Development and Construction.

Construction sector is a key pillar to the economy of Ethiopia as a developing economy. Government stimulates economic activities through development of infrastructures such as roads, railways, house development, airports, and dams etc.

Expansion of economic infrastructure (railways, roads, telecom, power, irrigation) being critical towards achieving the country's Growth and Transformation Plan (GTP).

Thus, this study examined the effect of capital structure decisions on financial performance of construction companies in Addis Ababa, Ethiopia.

1.2 Statement of the problem

Financial Managers have a responsibility of determining the optimal mix of debt and equity that will ensure maximization of shareholders wealth. This has led to the desire to establish whether there is an optimal capital structure that maximizes firm's value. The study about capital structure is a crucial tool used in maximizing company financial performance which is the best interest of shareholders who expects dividends and capital gains from the company

The idea of relating company's capital structure and its value started from the establishment of irrelevancy theory of capital structure by Modigliani and Miller in 1958. This theory was cited by Toraman (2013) which stated that, "firm value is independent of its capital structure". In recent years, researchers have come up with different perspectives of their studies; some revealed the positive relationship between capital structure and company profit while others revealed the negative relationship between the variables.

Gohar, et al. (2015) have proved that there is no effect of capital structure on profitability. Ebaid (2009); has proved the same conclusion with Gohar, et al. (2015). Those two papers support the MM theorem. Feng and Guo (2015) have proved different conclusion with those papers above that capital structure gives negative effect on profitability. The same conclusion is also proved by Hashim and Hassan (2017); Akeem, Lawal Babatunde, et al. (2014); Khan, A.G. (2012); Shubita and Alsawalhah(2012). The negative effect of capital structure on profitability supports that the pecking order theory is occurred. Kumar and Himani (2014);Mujahid and Akhtar (2014); Nirajini andPriya(2013) have proved that the positive effect of capital structure on profitability. There are also some moderating variables such as firm's size and asset tangibility. Firm's size also gives positive effect on profitability which has been proven by Pouraghajan & Malekian (2012); Twairesh (2014); Zeitun and Tian (2007). Chinaemerem and Anthony (2012) proved that asset tangibility gives negative effect on profitability. Pouraghajan & Malekian (2012) proved the different result with Chinaemerem and Anthony (2012).

These contradictory findings reveal that there is inconsistency among research findings on the effect of capital structure on financial performance.

Studies on the effect of capital structure on firm performance have mostly been carried out in developed economies where capital markets are well developed. In Ethiopia, as far as the knowledge of the researcher is concerned, there are very few research related to the effect of capital structure on financial performance. Aragaw(2015) investigate the effect of capital structure on profitability of commercial banks in Ethiopia, Frezewed (2016) investigate corporate capital structure and its effect on profitability, evidenced from manufacturing firms in Ethiopia, Asrat(2016) investigate capital structure and financial performance, evidence from Ethiopian cement companies, Yohannes(2017) examine the effect of capital structure on financial performance on micro finance institution and Abnet (2013) investigated the effect of capital structure on financial performance of Ethiopia's Metal and Engineering Industry.

Based on the above studies, there is no empirical research done in Ethiopia concerning the effect of capital structure on financial performance of construction companies in Addis Ababa, Ethiopia, which motivates the researcher in filling the gap by putting its own contribution on the effect of capital structure on financial performance of

construction companies in Ethiopian. Esperanca et al. (2003) reported that industry effect is important because risk levels and capital structures significantly differ among industries (cited in Netsanet, 2012).

Therefore, given the unique financial features of construction companies in Ethiopia and the environment in which they operate, there is a strong ground to conduct separate study on the impact of capital structure on profitability of construction companies.

1.3. Objectives of the study

The general objective of this study was to examine the effect of capital structure on financial performance of firms in the construction industries in Addis Ababa, Ethiopia.

The specific objectives of the study are;

- To examine the effect of short term debt to asset on financial performance of grade one general contractors in Addis Ababa, Ethiopia.
- To examine the effect of long term debt to asset on financial performance of grade one general contractors in Addis Ababa, Ethiopia.
- To examine the effect of debt to equity on financial performance of grade one general contractors in Addis Ababa, Ethiopia.
- To examine the effect of interest coverage ratio on financial performance of grade one general contractors in Addis Ababa, Ethiopia.
- To examine the effect of asset tangibility on financial performance of grade one general contractors in Addis Ababa, Ethiopia.
- To examine the effect of firm size on financial performance of grade one general contractors in Addis Ababa, Ethiopia.
- To detect the nature of relationship between capital structure and grade one general contractor's financial performance in Addis Ababa, Ethiopia.
- Determining which giant capital structure theory supported in Ethiopia's construction Industry.

1.4. Research Questions and Hypotheses of the Study

Research Question (RQ)

Based on the above statement of the problems, the research has answered the following research questions.

RQ1 what is the effect of capital structure on financial performance of grade one contractors Addis Ababa, Ethiopian?

RQ2 what are the nature of relationship between capital structure and financial performance?

Hypotheses

Based on theories and empirical studies, develops the following hypothesis to achieve the objectives of this study. Hence, based on the objective, the present study seeks to test the following six hypotheses:

H1: Short term debt to total asset has positive and significance effect on financial performance of grade one contractors in Addis Ababa, Ethiopia.

H2: Long term debt to total asset has negative and significance effect on financial performance of grade one contractors in Addis Ababa, Ethiopia.

H3: Total debt to total equity has negative and significance effect on financial performance of grade one contractors in Addis Ababa, Ethiopia.

H4: Interest coverage ratio has positive and significance effect on financial performance of grade one contractors in Addis Ababa, Ethiopia.

H5: Asset tangibility has positive and significance effect on financial performance of grade one contractors in Addis Ababa, Ethiopia.

H6: Asset size has positive and significance effect on financial performance of grade one contractors in Addis Ababa, Ethiopia.

1.5. Scope and limitation of the study

This study was limited in examining the effect of capital structure on financial performance of grade one general contractors companies in Addis Ababa, Ethiopia over the period 2012 to 2017. This study also identified the most dominant theory for construction sector in Ethiopia. Though there are so many factors that affect construction companies' financial performance, but this study is limited only to factors such as, short

term debt to asset ratio, long term debt to asset ratio, total debt to total equity ratio and interest coverage ratio; firm size and asset tangibility are used as a control variables. The major limitation that hinder the study were no capital market is established in the country, computing market value of dependent variable as well as the proxies of the independent variables is impossible. Hence, the researcher conducts the study using book value of variables.

1.6 Significance of the Study

The appropriate choice of capital structure for a company by its corporate and financial managers is very crucial because capital structure affects the company's profitability and the long term survival of the company depends on its profitability.

The findings and recommendations of this research would go a long way to help financial managers of Ethiopian construction companies to make such an important strategic decision on the debt equity mix for their companies. Moreover, it will also enable managers to know how they have to treat such factors in order to achieve an optimal capital structure decision, thereby enabling to minimize a cost of capital and maximizing their firm's value.

The study will also be useful to investors in the construction industry. It will assist them with information on how various capital structure combinations affect the profitability of the firms they have or intend to invest in.

The results of this study will also have important implications for the government in formulating appropriate policies for the construction industry, as the government has the dual role of being the largest single client of the industry and manager of the economy.

Academically, it would contribute to literature on capital structure in the construction industry and the findings and recommendations would serve as bases for further research.

Finally, this paper can be an eye opener and serve as a stepping stone for further studies by adding literature in developing countries context, particularly in Ethiopia construction industry.

1.7 Organization of the Paper

This paper consists of five parts. The first part of this study introduced the background of the study, the problem statement, research questions to be addressed, general and specific objectives as well as description about the scope of the study. Second part presents a review of literature and relevant theories as well as empirical research. Next, the paper presents the research design and methodology, tools and procedures used for data collection and analysis. The fourth part is analysis of the data and presentation of the results of the study. Finally, it offers the summary of finding, conclusion and recommendations.

CHAPTER TWO: LITERATURE REVIEW & CONCEPTUAL FRAM WORK

In this chapter, main theories concerning capital structure will be explained. It begins with components of capital structure, profitability measures and a short introduction of the "irrelevant" capital structure theory: M&M theory (Modigliani and Miller theory). This theory is the origin of all up-to-date capital structure theories. Even though the main supposition of this theory is a perfect capital market, which is not applicable to realistic economic issues, the M&M theory has an important role in history of the capital structure theories. Then it is followed by the introduction and discussion of other main theories: pecking order theory, signaling theory, agency cost theory, Bankruptcy Cost and trade-off theory. Besides, earlier studies conducted on this subject have been offered. Finally, conclusions on the literature review and knowledge gaps are presented.

2.1 Theoretical Literature Review

2.1.1 Equity Financing

In components of capital structure, equity share capital represents the ownership capital of the company. It is the permanent capital and cannot be withdrawn during the lifetime of the company. Owners are the real risk bearers, but they also enjoy rewards. Their liability is restricted to their capital contributed.

According to Nawaz, et al., (2011), capital consists of two types: (1) Contributed capital, which is the money that was originally invested in the business in exchange for shares of stock or ownership and (2) Retain earnings, which represent profits from past years that have been kept by the company and used to strengthen the balance sheet or fund growth, acquisitions, or expansion.

If a firm doesn't use debt financing, it's referred to as an unlevered firm. This brings about what is referred to as business risk which is defined as the risk a firm's common stockholders would face if the firm had no debt (Ehrhardt & Brigham, 2011). In other words, it is the risk inherent in the firm's operations, which arises from uncertainty about future operating profits and capital requirements. If a firm doesn't use debt then its return on invested capital shall be measured by return on equity. This simply means that the

business risk of a leverage free firm will be measured by the standard deviation of its ROE.

2.1.2 Debt Financing

The debt capital in a company's capital structure refers to borrowed money that is at work in the business. The safest type is generally considered long-term debt because the company has years, if not decades, to come up with the principal, while paying interest only in the meantime according to Nawaz, et al. (2011).When a firm decides to use debt financing for its operations it will face a financial risk and it's referred to as a levered firm. Ehrhardt & Brigham (2011) defined financial risk as the additional risk placed on the common stockholders as a result of the decision to finance with debt. Financial risk is the probability that the earnings of the firm will not be as projected because of the method of financing. Also, the financial risk arises because debt has a fixed financing obligation usually in the form of interest which must be met when the obligation falls due before the shareholders can share in the retained earnings. The level of debt (financial leverage) that is acceptable for one industry or line of business can be highly risky in another, because different industries and lines of business have different operating characteristics (Gitman & Zutter, 2012).

2.1.3 Return on Assets (ROA)

Return on assets measures the amount of profit the company generates as a percentage of the value of its total assets.The simplest way to determine ROA is to take net income reported for a period and divide that by total assets according to Gitman and Zutter (2012) and Ehrhardt & Brigham (2011).Furthermore, Rate of return on Assets (ROA) is the net income generated by all assets, after labor has been compensated but before interest payments. In addition, it is a measure that has been used by many other researchers when evaluating the effect of capital structure on a firm's performance.

2.1.4 Modigliani & Miller (MM)

In 1958 MM wrote the article "The cost of capital, corporate finance and the theory of investment". This article introduced two propositions that had an enormous impact in the

field of finance, and that today can be found in finance textbooks used by universities around the world. The proposition regards a firm's capital structure and its cost of capital in a perfect capital market. The perfect capital market assumes that there are no taxes, no transaction costs and that the borrowing and lending rate is the same for corporations and individuals according to Ehrhardt & Brigham, (2011).

Five years after MM introduced Proposition I & II, in 1963 they published the article "Corporate Income Taxes and the Cost of Capital: A Correction". It was an extension and correction of the Propositions that they had introduced five years earlier, where taxes had been included. The inclusion of taxes had an effect on both of the propositions. Below, an explanation of the two propositions, with and without taxes, have been given.

2.1.4.1 Modigliani and Miller: No Taxes

Modern capital structure theory began in 1958, when MM published what has been called the most influential finance article ever written. MM's study was based on some strong assumptions, which included the following as (Ehrhardt & Brigham, 2011):

1. There are no brokerage costs.

2. There are no taxes.

3. There are no bankruptcy costs.

4. Investors can borrow at the same rate as corporations.

5. Investors have the same information as management.

6. EBIT is not affected by the use of debt.

The perfect markets theory of capital structure contradicts the "real world" approach. The corporation can mix any proportion of debt and equity to build capital structure without any effect on firm value because the value is independent of its capital structure as MM 1958 state and the determinant factor for firm value is future earnings power(future cash inflow).

The proposition of no taxes or irrelevant proposition can be stated as MM Proposition I (no taxes): The value of the levered firm is the same as the value of the unlevered firm. This is the first proposition of the MM theorem in absence of taxation. It simply states

that, in perfect financial markets, the value of a levered company is exactly the same as an unlevered company.

2.1.4.2 Modigliani and Miller II: The Effect of Corporate Taxes

When MM introduced taxes into their proposition in 1963 the result was altered. It was shown that it was beneficial for firms to include debt in their capital structure. Firms that are partly financed by debt can deduct the interest it pays on its debt, from the tax it has to pay on its income as MM 1958. It creates a higher total value for a firm that is financed with debt and equity, a leveraged firm, than for a firm that is financed only with equity, an unleveraged firm.

The Tax Code allows corporations to deduct interest payments as an expense, but dividend payments to stockholders are not deductible. The differential treatment encourages corporations to use debt in their capital structures. This means that interest payments reduce the taxes paid by a corporation, and if a corporation pays less to the government then more of its cash flow is available for its investors. In other words, the tax deductibility of the interest payments shields the firm's pre-tax income. MM also showed that the cost of equity, rs, increases as leverage increases but that it doesn't increase quite as fast as it would if there were no taxes. As a result, under MM with corporate taxes the WACC falls as debt is added. (Ehrhardt & Brigham, 2011)

2.1.4.3 Miller: The Effect of Corporate and Personal Taxes

Merton Miller (this time without Modigliani) later brought in the effects of personal taxes. The income from bonds is generally interest, which is taxed as personal income at rates, while income from stocks generally comes partly from dividends and partly from capital gains.

The personal tax burden on interest income is generally higher than that for equity income. Three reasons are presented by Graham (1999) for why the personal tax rate on interest income is generally higher than that for equity income.1) Long-term capital gains are often taxed at a rate below statutory personal rates, 2) taxes on capital gains can be deferred until the gain is realized, and 3) capital gains taxes can be avoided altogether if equity shares are held until death.

So, on average, returns on stocks are taxed at lower effective rates than returns on debt. Because of the tax situation, Miller argued that investors are willing to accept relatively low before-tax returns on stock relative to the before-tax returns on bonds. Thus, as Miller pointed out, (1) the deductibility of interest favors the use of debt financing, but (2) the more favorable tax treatment of income from stock lowers the required rate of return on stock and thus favors the use of equity financing.

2.1.5 The Signaling, or Asymmetric Information Theory

It was assumed by MM that investors have the same information about a firm's prospects as its managers-this is called symmetric information. However, managers in fact often have better information than outside investors. According to Ehrhardt & Brigham (2011) this is called asymmetric information, and it has an important effect on the optimal capital structure.

The signaling, or asymmetry information theory was proposed by Myers and Majluf(1984) when they contended that equity is a less preferred means to raise capital because when managers (who are assumed to know better about true condition of the firm than investors) issue new equity, investors take it as a signal that the managers think that the firm is overvalued, so they (managers) are taking advantage of this over-valuation. As a result, investors will place a lower value to the new equity issuance. Masulis and Korwar (1986) empirically observed that announcements of new equity issues are greeted by sharp declines in stock prices. This is a major reason why equity issues are comparatively rare among large established corporations. Debt also plays an important role in allowing investors to generate information useful for monitoring management and implementing efficient operating decisions. Ross (1977) model suggests that the value of firms will rise with leverage, since increasing leverage increases the market's perception of value. Ross (1977) argued that, debt and equity give different signals to rational investors as important insider information.

Ross (1977) therefore concludes that investors take larger levels of debt as a signal of higher quality and that profitability and leverage are thus positively related. However when debt goes beyond the optimal leverage level the cost of debt and financial distress threatens the very survival of the firm.

Empirical tests of the signaling theory done by smith (1986) show an average deduction of 3% in the share price of firms that announced equity offerings, compared to an insignificant decline in the share price after a debt issue announcement. In fact, the increases in debt were associated with an increase in share price returns. This support Ross's (1977) conclusions that debt sends a good signal to the market.

2.1.6 The Pecking Order Theory (Asymmetric Information Model)

This model considers the possibility of asymmetric information whereby firm managers are assumed to know more about the characteristics of the firm's return stream or investment opportunities (Harris and Raviv, 1991).The choice of capital structure by management therefore signals to outside investors some insider information. This asymmetry of information influences the choice between internal and external financing and between new issues of debt and equity securities. This choice is based on the "pecking order" hypothesis (Baskin, 1989).

The pecking order theory of capital structure was first presented by Myers and Majluf (1984), and relies heavily on information cost to explain corporate behaviour. They show in their pioneering work that, if investors are less well-informed than current firm insiders about the value of the firm's assets, then equity may be mispriced by the market. If firms are required to finance new projects by issuing equity, underpricing may be so severe that new investors capture more than the NPV of the new project, resulting in a net loss to existing shareholders.

Myers (1984), challenges the notion of an optimal capital structure based purely on the tradeoff of debt-related benefits and costs in a world of information asymmetry between corporate managers and investors. He further observes that corporate financing practice does not conform to a simple trade off model and he suggests the existence of a pecking order among the financing sources used by firm. Firms prefer to finance its investments using retained earnings as an internal source of finance first, debt as the second option then equity as last option when the first two options are unable to meet the fully required funds for investments (Calabrese, 2011).

2.1.7 Trade-off theory

The trade-off theory was advanced by Myers (1984) who intimated that firms choose between the different sources of financing to take advantages of tax benefits of debt and also reduce the costs associated with agency and bankruptcy. This theory indicates that there is an optimum capital structure for a firm where the firm equates the tax benefits of debt with the leverage costs such as financial distress costs. The company therefore mixes the amount of debt in the capital structure with equity to have an optimum mix which would strike an effective balance between the benefits of debt in taxation and the costs associated with leverage risks. Factors which are considered by companies in arriving at the optimum mix of debt and equity include chance of bankruptcy, profitability level of the company and the form and quality of assets that the firm owns.

This theory therefore posits that the capital structure that a firm chooses has an effect on the value and profitability of the company. There is an optimum mix of debt and equity in the capital structure that firms should strive to achieve so as to have a balance between the benefits and the costs of debt. This theory however, indicates that the optimum capital structure depends on the specific type and decision of a particular company (Myers, 2001).This theory indicates that the most important function of the finance manager in a firm is to get the optimum balance between debt and equity in the capital structure. . Debt also has disciplining role because of reduction in free cash flow (Myers, 1984). When a firm adjusts the optimum debt ratio, costs, and therefore lags, which are called as adjustment costs, make optimal capital structure of each firm different (Myers, 1984, p.576).

Graham and Harvey (2001) suggest that firms need to identify their optimal capital structure. As it is understood, there is large deviation in optimal capital structure among firm. Tax shield is also important point of the theory. Firms can deduct interest payment of debt from tax, as a result net incomes of the firms increase. In order to maximize tax shield, firms may choose higher debt levels (Graham, 2000, p. 1906). As it is seen, the theory does not only explain taxes and tax shields but effect of financial distress due to high leverage. It propose that firm's target capital structure is designed by taxes, financial distress (cost of bankruptcy), and the agency conflict (Graham, 2000).

2.1.8 The Agency Theory

Jensen and Meckling (1976) discussed that there are unpreventable agency costs in firms funding, which emerge because of two sorts of conflicts: a conflict between company's administration, and its shareholders and a conflict between debt holders and shareholders. Jensen and Meckling (1976) introduce two types of conflicts:

i) Shareholders-managers conflicts

This kind of conflict stems from the separation of ownership and control. If managers do not completely own the firm, they can only capture a fraction of the gain earned from their value enhancement activities but they need to bear the entire costs of these activities. Jensen (1986) argues that, instead of working under shareholders' interests to maximize firm's value, managers prefer to increase firm's size to enjoy the benefit of control. Managers have incentives to cause their firm to grow beyond the optimal size and accept negative net present value (NPV) projects. The overinvestment problem can be made worse by more free cash flow and less growth opportunities. Issuing debt helps to mitigate agency problems since debt commits firm to pay out cash so prevents managers from investing in negative NPV projects. Jensen refers to the non-discretionary nature of debt as the disciplining role of debt.

ii) Shareholder-bondholder conflicts

The shareholders or their representatives make decisions transferring wealth from bondholders to shareholders. The bondholders are aware of the situations in which this wealth expropriation may occur and will demand a higher return on their bonds or debts to guard against this. The conflicts may be minimized by firms with high growth opportunities having a lower leverage and using a greater amount of long-term debt than firms in more mature industries. The issue of convertible debt or debt with warrants can serve as another way of mitigating the conflicts as shown by Jensen and Meckling (1976) because the convertible debt will have lower agency costs than plain debt.

Furthermore, Myers (1977) confirms the underinvestment or debt overhang problem, which means that a company can reject some positive NPV projects. Not financing in such projects is harm for debt holders because they are more advantageous if the company's value increases. Another theory about managers acting in their own interests

was proposed by Harris and Raviv (1988). They explain higher leverage as an antitakeover instrument: – firms with a large amount of debt will be less likely to become a target for acquisition. That is why managers, who are afraid to lose their job after takeover, may be willing to accumulate higher than necessary amount of debt.

To test the validity of the agency theory, Berger and Bonaccorsi di patti (2006) developed a performance indicator to measure firm performance and found that high leverage is positively related to profit efficiency. This is consistent with the predictions of the agency theory that high leverage is positively related to profitability.

2.1.9 Bankruptcy Cost

Bankruptcy cost, or cost of financial distress (Myers 1984), is the costs that a firm has to incur when it neglects to service its debt payments and thus faces the likelihood of being closed down (Titman, 1984).Abor (2008) likewise characterized it as the costs that a firm has to bear when the perception of the likelihood that the firm would not be able to meet its debt obligation is more than zero. Bankruptcy cost may be direct or indirect. The direct costs are those that occur when the firm actually goes bankrupt, such as legal fees and administrative cost, and are usually small compared to the firm's market value. The indirect costs are exceptionally critical. They include moral hazard, evaluating assessing and monitoring and contracting costs which can reduce firm's value even if formal default is avoided (Myers, 1984), loss of goodwill from customers, loss of key and competent employees to competitors and the loss in profits incurred by the firm as a result of the unwillingness of stakeholders to do business with them (Abor, 2008). From the firm's business activities level, it turns out to be obviously clear to stake holders that a firm is getting closer to liquidation, key employees might leave the firm, for the apprehension of losing their employment. Suppliers will either vary their credit terms with the firm, or may be unwilling to extend trade credit at all.

Customers may feel reluctant in purchasing the products for the danger that the company would not be able to honor its guarantee commitments. According to Miglo (2010) large firms are expected to have greater percentage of leverage, since bigger companies have different business segments or income streams in operation and the chances that they may not be able to pay for their debt are very low. The value of tangible assets does not reduce

so much when the company goes into distress; therefore, firms which has majority of its assets being tangible such as airplanes, automobile and airplane manufacturers would have higher leverage as compared to companies whose assets are mostly intangible assets such as research firms.

2.2 Empirical Review

Several empirical studies around the world have been conducted to measure the relationship between capital structure and company profitability. In most cases, researchers came up with mixed results; some revealed a positive relationship between the variables, others revealed the negative relationship while other researchers revealed the contradictory results between study variables. Such kind of results shows that the topic is still debatable hence it's high time to conduct study on the effect of capital structure on financial performance of construction companies in Addis Ababa, Ethiopia. The section summarizes literature of similar studies conducted on the topic both locally and internationally.

2.2.1 International studies

Gill, et al., (2011) seeks to extend Abor's (2005) findings regarding the effect of capital structure on profitability by examining the effect of capital structure on profitability of the American service and manufacturing firms. A sample of 272 American firms listed on New York Stock Exchange for a period of 3 years from 2005 –2007 was selected. The correlations and regression analyses were used to estimate the functions relating to profitability (measured by return on equity) with measures of capital structure. Empirical results show a positive relationship between short-term debt to total assets and profitability and between total debt to total assets and profitability in the service industry. The findings of this paper show also a positive relationship between short-term debt to total assets and profitability, long-term debt to total assets and profitability, and between total debt to total assets and profitability in the manufacturing industry.

Saeed et al. (2013) also investigated the Impact of Capital Structure on Banking Performance within country over the period of five years from 2007 to 2011 by utilizing data of banks listed at Karachi stock exchange. The researchers used ROA, ROE and EPS

as performance indicators, long term debt to capital ratio, short term debt to capital ratio and total debt to capital ratio as indicators of capital structure. Multiple regression models are applied to estimate the relationship between capital structure and banking performance. Assets growth proposed a negative insignificant impact upon return on asset and return on equity, while a negative significant impact on profitability as measured by earnings per share. A positive correlation was found between capital structure and firm performance.

Nirajini and Priya (2013) studied the relationship between capital structure and financial performance during 2006 to 2010 (05 years) financial year of listed trading companies in Sri Lanka. They used correlation and multiple regression method to prove the relationship between debt equity ratio, debt asset ratio and long term debt with different determinant of financial performance and proved that capital structure is positively correlated with firm's financial performance. They found consistent with the findings of Gill, et al., (2011) who indicated that firm's performance is positively related to capital structure.

In contrary with the Abor (2005) findings, Shubita and Alsawalhah (2012) carried out a study that sought to determine the relationship that existed between capital structure and profitability during six years period (2004-2009). The study focused on industrial firms that were quoted in thirty nine companies was used as the study sample and multiple linear regression and correlation analysis were applied to analyze the data. This study used short-term debt to total assets ratio, long-term debt to total assets ratio and total debt to total assets ratio as measures of capital structure. The measure of profitability used was ROE. The study established that there was a significantly negative relationship between profitability and short-term debt to asset ratio. The findings also indicated that there was a significantly negative relationship between long term debt to asset ratio and profitability. Additionally, a significant negative relationship between total debt to asset ratio and profitability was established in the study. The conclusion made in the study was that increase in both short and long term debt in the industrial firms in Jordan would result in lower profitability.

Zeitun and Tian (2007) conducted a study on capital structure and corporate performance on 167 Jordanian firms from 1989-2003. They found a significantly negative relationship between capital structure and corporate performance, in both the accounting and market's measures. Firm size was found to have a positive impact on a firm's performance, as large firms have low bankruptcy costs. Many variables such as return on assets, return on equity, profitability, Tobin's Q were used to measure performance while short-term debt to total asset, long-term debt to total asset, and total debt to total assets were proxies for capital structure. However, others find mixed results regarding the impact of capital structure on firm's performance (Ebaid, 2009).

In contrary with the Gill, et al., (2011) findings, Twairesh (2014) investigate the impact of capital structure on the performance of non-financial firms operating in Saudi Arabia as one of emerging or transition economies. Panel econometric technique called fixed effect regression is used for the period between 2004 - 2012.Sample data includes 74 companies. The study analyzes the relationship between capital structure proxies that include short term debt to total asset, long term debt to total asset and total debt to total asset and the operating performance measured by ROA and ROE. The firm's size was used as a control variable. The study finds that short term debt to asset, long term debt to asset and total debt to asset have significant negative impacts on ROA. While only long term debt to asset has significant negative impacts on ROE. Firm size has significant positive impacts on firm performance when ROA is a dependent variable and no impact on firm performance when ROE is dependent variable.

Furthermore, Akeem, Lawal Babatunde, et al. (2014) Use data from 10 manufacturing firms in Nigeria from 2003-2012 to examines the effect of capital structure on firm's performance. Descriptive and regression research technique was employed to consider the impact of some key variables such as Returns on asset (ROA), Returns on equity(ROE),Total debt to total asset(TD), Total debt to equity ratio(DE) on firm performance. Findings revealed a negative relationship between capital structure measures (total debt and debt to equity ratio) and firm performance. It is hereby recommended that firms should use more of equity than debt in financing their business activities.

Hasan et al. (2014) study the influence of capital structure on firm's performance on 36 Bangladeshi firms listed in Dhaka Stock Exchange during the period 2007–2012. The paper has used four performance measures; (Earning per Share) EPS, ROE, ROA and Tobin's Q; as dependent variables and three capital structure ratios; short term debt to total asset, long term debt total asset and total debt to total asset ratios; as independent variables. Using pooling panel data regression method, the paper found that earning per share is significantly positively related to short term debt to total asset while significantly negatively related to long term debt to total asset. There is significant negative relation between ROA and capital structure. On the other hand, there is no statistically significant relation exists between capital structure and firm's performance as measured by ROE and Tobin's Q. Nonetheless, aside from the positive relation between earning per share and short term debt to asset, we can conclude that capital structure has negative impact on firm's performance which is consistent with the proposition of Pecking Order Theory.

In Pakistan, Khan, A.G. (2012) using 36 engineering sector firms in Pakistani market listed on the Karachi Stock Exchange (KSE) during the period 2003-2009 applied Pooled Ordinary Least Square regression and the results revealed that financial leverage measured by short term debt to total assets (STDTA) and total debt to total assets (TDTA) has a significantly negative relationship with the firm performance measured by Return on Assets, Gross Profit Margin and Tobin's Q. The relationship between financial leverage and firm performance measured by the return on equity is negative but insignificant. Asset size has an insignificant relationship with the firm performance measured by ROA and GM but negative and significant relationship exists with Tobin's Q. Firms in the engineering sector of Pakistan are largely dependent on short term debt but debts are attached with strong covenants which affect the performance of the firm.

Chinaemerem and Anthony (2012) examines the impact of capital structure on financial performance of Nigerian firms using a sample of 30 non-financial firms listed on the Nigerian Stock Exchange during the 7 year period, 2004 – 2010. Panel data for the selected firms were generated and analyzed using ordinary least squares (OLS) as a method of estimation. The result shows that a firm's capital structure has a significantly negative impact on the firm's financial measures ROA and ROE. The relationship between ROA and firm's asset tangibility is negative and significant at 1% level. This

shows that firms with high ratio of tangibility have a lower financial performance ratio. However, the relationship between ROE and asset tangibility is positive but not significant. The study of these findings, indicate consistency with prior empirical studies and provide evidence in support of Agency cost theory.

Gansuwan and Önel (2012) tested the impact of firm's capital structure on its performance for 174 Swedish listed companies. The researchers employed ordinary least squares regression to investigate this study for the period of ten years from 2002 to 2011. Moreover, they used three metrics for performance namely, Return on Investment (ROI), Return on Asset (ROA), Return on Equity (ROE) as a dependent variables and total debt divided by total assets ratio, long term debt ratio and short term debt ratio as independent variables. The empirical findings show that company's capital structure negatively and significantly effects on financial performance on Swedish companies. That means the companies that use more debts to finance its operations, have less financial performance than the firms that take less debt to finance its operations. Two control variables (Size and Growth) are statistically significant but intangibility is not statistically significant.

A study had been done by Abor (2005) on the influence of capital structure on profitability of listed companies on the Ghana Stock Exchange during a five-year period. He found out that there is significant positively interrelated between short term debt to total assets and return on equity and shows that firms which earn a lot use more short-term debt to finance their business. In other words, short-term debt is an essential source of financing in favor of Ghanaian companies, by representing 85 percent of total debt financing. Yet, the results showed the adverse relation between long term debt to total assets and return on equity. The regression output showed that there is positive relationship between total debt to total assets and return on equity which measure the relationship between total debt and profitability.This indicates that firms which earn a lot are depending on debt as their key financing option.

Using a sample of 237 Malaysian companies during 1995-2011, Salim and Yadav (2012) studied the relationship between capital structure and firm performance. The researchers used four performance metrics namely, earning per share, return on equity, Tobin's Q and return on asset as dependent variables and three measures for capital structure as

independent variables namely, short term debt divided by total assets, long term debt divided by total assets and total debt ratios, while Size and growth used as control variables. The findings indicate that company performance ROA, ROE and EPS, adversely influence on long term debt ratio (LTD), short term debt ratio (STD) and total debt ratio (TD), while growth positively affect the financial performance all the sectors. In addition, Tobin's Q has a positive and significant impact on short term debt (STD) and long term debt (LTD).Similar result was observed by Zeitun and Tian(2007) in their study for a sample of 167 Jordanian companies during 1989–2003.

Besides, Pouraghajan & Malekian (2012) investigate the impact of capital structure on the financial performance of companies listed in the Tehran Stock Exchange. For this purpose, they studied a sample of 400 firms in the form of 12 industrial groups during the years 2006 to 2010. In this study, Variables of ROA and ROE used to measure the financial performance of companies. Results suggest that there is a significant negative relationship between debt ratio and financial performance of companies, and a significant positive relationship between asset turnover, firm size, asset tangibility ratio, and growth opportunities with financial performance measures. But the relationship between ROA and ROE measures with the firm age is not significant. In addition, research results shows that by reducing debt ratio, management can increase the company's profitability and thus the amount of the company's financial performance measures and can also increase shareholder wealth.

Another study was done by Tailab (2014) in America used a sample of 30 energy American firms for a period of nine years from 2005 to 2013 to test the effect of capital structure on profitability of energy American firms. To indicate capital structure, short-term debt, long-term debt, total debt, debt to equity ratio, and firm's size were used. Findings also presented that the total debt has a significant negative impact on ROE and ROA, while size in terms of sales has significantly negative effect only on ROE of the American firms. However, a short debt significantly has a positive influence on ROE. An insignificant either negative or positive relationship was observed between long term debt, debt to equity and size in terms of total assets and profitability. However, the notion of short term credit having a positive influence on profitability is refuted by Zeituna and Tianb (2007) who observe that the short maturity of short term debt may

prove expensive to the firm hence increasing its cost of capital. This has an effect of influencing profitability negatively.

On the other hand, Ebaid (2009) examined the capital structure and performance of firms, basically the aim was to check the relationship between debt level and financial performance of companies (listed at Egyptian stock exchange during the period of 1997 to 2005). By using the three accounting based measure of performance (ROA) return on assets (ROE) return on equity and gross profit margin. He found that there is negative significant influence of short term debt to total asset and Total debt to total asset on the financial performance measured by the return on asset (ROA) but no significant relationship found between long term debt to and this measure of financial performance. He also proposed that there is not significant influence of the debt (TD, STD and LTD) on financial performance measured by both of gross profit margin and Return on equity. The results also indicated that control variable firm size has no significant effect on the firm's performance. In this research paper multiple regression analysis is used in the study in estimating the relationship between the leverage level and firm's performance. These results lead the study to conclude that capital structure choice, in general terms, has weak-to-no influence on the financial performance of listed firms in Egypt.

2.2.2 Studies with reference to Ethiopia environment

Aragaw (2015) examine the effect of capital structure on profitability of commercial banks in Ethiopia. The study considered a sample of 8 commercial banks for 12 year (2001/02 – 2012/13). In his study a profitability measure of the core business operation of banks, Net Interest Margin (NIM) was taken as a dependent variable. Whereas, the Total Debt to Asset, Deposit to Asset, Loan to Deposit, Spread, Growth, and Asset size were used as independent variables. The result shows that Capital structure/Leverage as measured by debt to asset ratio had statistically significant negative relationship with profitability. This result also supports the packing order theory and prefers using internal finance before raising debt or equity. On the other hand, deposit to asset ratio had statistically significant positive relationship with profitability; similarly, liquidity (loan to deposit) had a positive and statistically significant relationship with profitability and the

finding of the study suggests that capital structure had significant impact on profitability of core business operations of commercial banks.

Another study Frezewed (2016) was about corporate capital structure and its impact on profitability by using panel data regression analysis. The dataset comprises twenty four large tax payer manufacturing share companies covering a five-year period (2010-2014 G.C.) using firm level accounting data. In his study the researcher used return on capital employed as dependent variable, and six proxy for leverage as independent variables interest coverage ratio, debt ratio, debt to equity ratio, long term debt to capitalization ratio, short term debt to total liability, long term debt to total liability, while size of total asset, sales growth rate and tangibility used as control variable. The results show that all the three variables of capital structure, short-term debt to total liability, long-term debt capitalization ratio and interest coverage ratio showed positive and significant impact on profitability. Other constituted variables i.e. debt ratio and debt to equity ratio found to be insignificant regarding their impact on profitability of sample firms. Therefore, no significant linear dependence was detected for debt ratio and debt to equity ratio versus profitability.

Asrat (2016) also carried out an investigation on capital structure and financial performance of 8 cement companies in Ethiopia during the period 2010-2014.To examine the relationship between capital structures which is measured by long term debt to equity ratio and financial performance measured by the accounting measures of return on asset (ROA) and return on equity (ROE), a random effect multiple regression model was employed. A computer package EVIEWS version 8 was used to solve the multiple regression equation used in this study. From the regression model, he found out that capital structure measured by long term debt to equity ratio (LTDTE) has significant positive relationship with return on asset (ROA) and control variables such as tangibility (TAN) and size has significant positive relationship with return on asset (ROA) and capital adequacy (CA) and growth opportunity (GRO) has insignificant positive relationship with return on asset (ROA),

Furthermore, from micro finance institution of Ethiopia Yohannes (2017) examined the effect of capital structure on financial performance on micro finance institution by using

panel data analysis technique. He carried out a regression analysis on the data of thirteen microfinance institutions, within the period of 2010-2015, which are practicing micro-financing business at present. The result shows that Capital structure as measured by total debt to asset, deposit to asset and loan to deposit have significant and positive relation with financial performance of measured by (profitability) of microfinance institutions in Ethiopia. Control variables such as firm size and firm age has significant relationship with return on asset (ROE) and interest coverage ratio has positive and insignificant relation with profitability. Finally, the finding shows that most of the microfinance institutions had employed high leverage.

On the other hand, Abnet (2013) also investigated the effect of capital structure on financial performance of 10 sampled Ethiopia's Metal and Engineering Industry for a period of six years (2007-2012).Debt to total asset, short term debt to total asset, long term debt to total asset were used as proxies as the independent variables (capital structure) while return on equity used as dependent variable. The multivariate OLS regression result of the study indicates capital structure has a significant and positive effect on financial performance (measured by return on equity) of the Metal and Engineering Industry companies as it is measured by debt ratio; furthermore, short term debt ratio has significant whereas long term debt ratio has insignificant but both positive effect as the study examined if different level maturity of debt has a different effect on financial performance. On the other hand, asset tangibility as a controllable variable was found to have a significant and negative whereas company size and asset turnover were not.

2.2.3. Empirical findings on the capital structure of Construction Companies

San and Heng (2011) examined that the relationship of capital structure and corporate performance of firms before and during 2007 crisis, all 49 construction companies are taken from Malaysia which were listed in Main board of Bursa Malaysia from 2005 to 2008, these forty nine companies are divided in three units like small, medium and large or big size. Always financial crisis are occurred by the poor corporate performance, in the Malaysia construction industries and construction activates are the major source of growth and development in Malaysia, in this research (capital structure)

independent variables are used Long term debt to capital (LDC),debt to capital , debt to asset , debt to equity market value (DEMV), debt to common equity (DCE), long term debt to common equity (LDCE) and (Corporate performance) dependent variables are return on capital , return on equity, return on asset , earnings per share , operating margin and net margin. The result shows that, there is relationship between capital structure and corporate performance; in the interim the results also indicate that there are no relationships between the various variables that are examined in this study. For the big construction companies only return on capital and Earnings per share for large construction companies have significant relationship with capital structure, mean while Return on capital and Debt equity to market value are the most correlated and showing the strongest relationship among all the variables examined. Basically, debt equity to market value , long term debt to capital and debt to capital have direct influence on corporate performance of the large companies and other independent variables don‘t affect the dependent variables. In the interim, only operating margin with long-term debt to common equity has positive relationship in medium firms. Debt to capital has direct impact on corporate performance of small companies and yet other independent variables don‘t affect the dependent variables.

In contrary with the San and Heng (2011) findings, Gohar et al (2015) studied the effect of capital structure on firms' financial performance in Construction and Material (Cement) Sector of Karachi Stock Exchange. The data were collected from the annual reports and accounts of eight listed firms for the period of six years from 2009 to 2014. The balanced panel regression and correlation were used for analysis. The five models were regressed with five dependent and four independent variables. All models are significant but the results explained that the capital structure is not related with firms' financial performance. Also financial performance of the sector is not influenced by the control variable (size of the firm) and concluded that the optimal capital structure may not have such importance in Construction and Material (Cement) Sector of Karachi Stock Exchange.

Kumar and Himani (2014) determined the capital structure of selected construction firms in India between the periods 2009 to 2013. Emphasis has been laid to show the impact of capital structure on the financial performance of Indian construction companies listed in

the Bombay Stock Exchange. Multiple Regression and correlation were used to analyze the data. The variables used for the study were debt equity ratio, long term debt and debt asset ratio as the independent variable and gross profit margin, net profit margin, return on capital employed, return on assets and return on equity as the dependent variables. The result revealed that there is a positive relationship between the capital structure and financial performance of the selected firms.

Another study Feng and Guo (2015) applied factor analysis to analyse the relationship between financial structure and financial performance of real estate listed firms in Shanghai Stock Exchange from 2010 to 2012. The empirical findings suggests that financial structure of real estate listed firms is negatively related to its financial performance.

In consistent with feng and Guo (2015) findings, Hashim and Hassan (2017) investigated the impact of capital structure on financial Performance of 36 public listed construction firms in Malaysia in the year 2011- 2015. Return on asset, return on equity and net profit margin used as dependent variables whereas debt on asset and debt on equity used as independent variables. They used secondary data from audited financial statements of construction firms published in Bursa Malaysia Stock Exchange site. Quantitative methodology using random sampling was employed and the data collected were analyzed using excel and E-views 7 econometric software to come up with descriptive, regression and correlation results. The findings revealed that capital structure impact‘s financial performance of construction firms. Whereby the impact was significant with debt on equity and not significant with debt on asset as per p-value of the coefficient of correlation. The findings also showed a negative relationship between debt on asset and debt on equity with ROE, ROA and NPM.

Youssef and El-Ghonamie (2015) evaluated the factors that affect the financial structure of the Egyptian firms for building materials and construction sector and to analyze financial structures and whether optimal financial structure exists or not. This exploration was performed using panel data procedures for a sample of 18 firms listed on the Egyptian Stock Exchange during the period from 2003 through 2012. The results depicted that profitability is negatively related to debt ratios; whereas firm tangibility is

positively linked to the debt ratios. Similar result was obtained by Baharuddin et al. (2011) who employed debt ratio as independent variable with the research focusing on Malaysia construction firms.

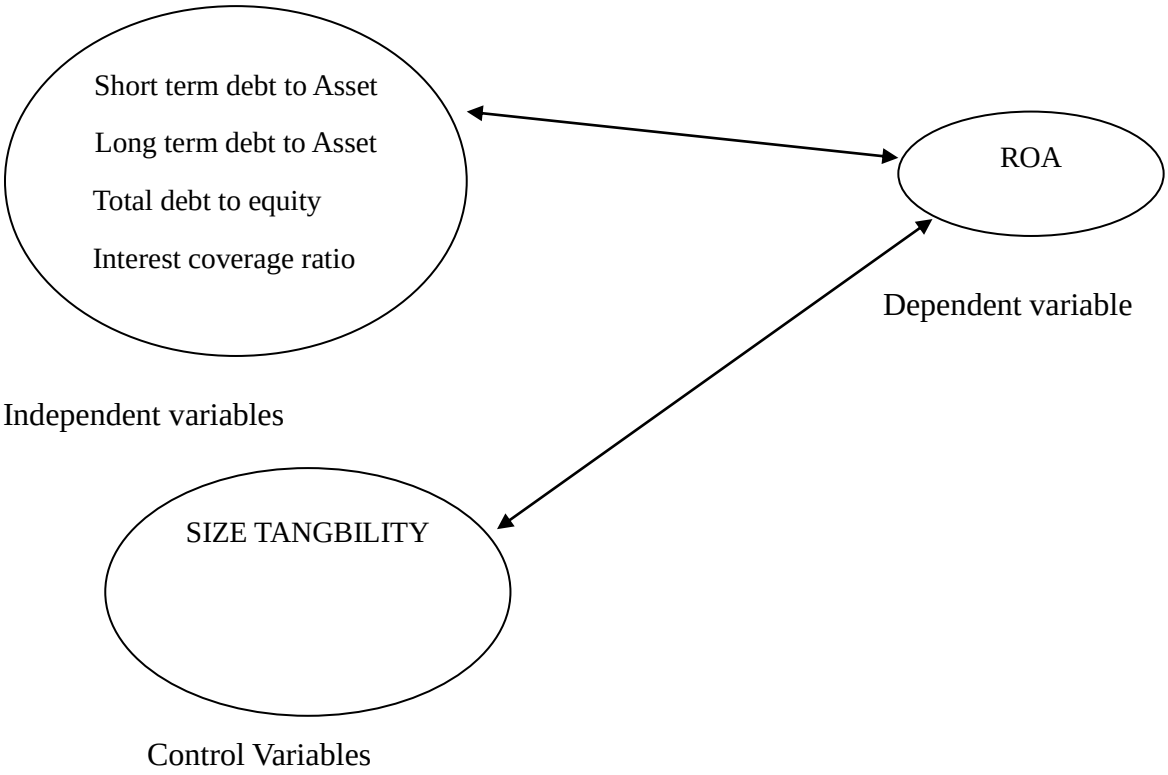
Semuel and Widjojo (2016) examined the effect of capital structure on profitability of 29 property and construction companies in Indonesia for 2009-2013 periods. The study uses four performance measures (including return on equity, return on asset, gross margin and net margin) as dependent variable. The four capital structure measure including long term debt to total asset, short term debt to total asset, total debt to total equity and total debt to total asset as independent variable while firm size and asset tangibility uses as a control variable. The study finds that short term debt to asset, long term debt to asset, total debt to equity and total debt to asset have significant impacts on profitability. It's looked that all hypotheses are positive except the effect of capital structure on asset tangibility and the effect of asset tangibility on profitability. The short term debt is founded positively affect profitability. According to the result, property and construction companies in Indonesia should build more trust to short term debt sources such as property buyers, sub-contractors, and material suppliers.

2.3 Conceptual Framework

This conceptual framework describes the relationship of profitability with short term debt, long term debt, debt to equity, Interest coverage ratio, Size and Tangibility.

Based on different literature, the following conceptual framework of the study is developed by the researcher.

Figure 1: Conceptual framework



(Source: Authors own computation)

2.4 Conclusion and research gap

In this chapter, the theories of capital structure and empirical studies that have been conducted internationally and locally were discussed. Modigliani and Miller 1958's capital structure irrelevant proposition opened the debate on capital structure as it led to the development of many capital structure theories such as the trade-off ,pecking order, agency and signaling theories. Despite the advancement of several theories and their consideration of various complex and dynamic business and economic issues, the puzzle remains unsolved.

Many researchers who tested the relationship between capital structure and firm profitability came up with controversial results; some discovered the negative relationship between the variables, some discovered positive relationship while others revealed no relationship between capital structure and profitability. For instance Shubita

and Alsawalhah (2012), Zeitun and Tian (2007), Khan, A.G. (2012), Akeem, Lawal Babatunde, et al.(2014), Twairesh (2014) and Gansuwan and Önel (2012) found a significantly negative relationship between financial performance and capital structure. Despite the above empirical works some authors have absorbed a different opinion on the relationship between financial performance and capital structure. For example Nirajini and Priya (2013), Gill, et al., (2011), Abnet(2013),Kumar and Himani (2014),Semuel and Widjojo(2016) found profitability or financial performance and capital structure have a positively significant relationship. Apart from the above empirical works, some of authors found that there is a weak or no impact of capital structure on firm‘s financial performance. For instance Ebaid (2009) and Gohar, et al (2015) confirm this assumption.

These contradictory findings reveal that there is inconsistency among research findings on the effect of capital structure on financial performance. In Ethiopia, as far as the knowledge of the researcher is concerned, there is no empirical research done in Ethiopia concerning the effect of capital structure on financial performance of construction companies in Addis Ababa, Ethiopia, which motivates the researcher in filling the gap.

The level of debt that is acceptable for one industry or line of business can be highly risky in another, because different industries and lines of business have different operating characteristics (Gitman & Zutter, 2012). Esperanca et al. (2003) also reported that industry effect is important because risk levels and capital structures significantly differ among industries (cited in Netsanet, 2012).

Therefore, there is a strong ground to conduct separate study on the effect of capital structure on financial performance of construction companies which were not covered in prior studies.

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

The preceding chapter presented both theoretical and empirical studies and it tried to give a brief summary of the chapter and identifies the gap in the existing knowledge. This chapter outlines and explains the methodology that was employed to achieve the research objective. This chapter is presented as follows: section 3.1 presents the research design and approach used for the study then followed by section 3.2 discusses about the data source and collection methods used in this study. Section 3.3 of this chapter focuses on the sampling design whereas section 3.4 presents data analysis techniques employed. Besides, section 3.5 discuss about research hypothesis and variable description issues, and lastly, section 3.6 and 3.7 discusses about Model specification applied in this research and summary of variables, formula and their expected relationship respectively.

3.1. Research Design and Approach

A research design is variously described as the blueprint or roadmap of conducting a research study (Kothari, 2004). A good research design should be able to effectively address the research problem and also the study objectives. As described by Creswell (2009), there are three common approaches to conduct a research project in the area of business and social sciences research namely; quantitative, qualitative, and mixed research approaches. Creswell (2009) defined quantitative research as a formal, objective and systematic process in which numerical data are utilized to obtain information. Well designed and implemented quantitative research has the advantage of making generalizations to a wider population from the sample (Creswell 2003). This method is compatible with the study because it allows the research problem to be conducted in a very specific terms. Besides, it helps to arrive at more objective conclusions and eliminates or minimizes subjectivity of judgments.

According to Saunders, Lewis & Thornhill (2009), explanatory study aims to investigate social phenomena and display relationships between variables.

Thus, in order to achieve the objectives stated in the preceding section, considering the nature of research problem and the research perspective, this study was apply quantitative research approach and explanatory research design.

Besides, Panel data of sixteen construction companies for six years (2012 to 2017) was used. Panel data involves the pooling of observations on a cross-section of units over several time periods. Panel data approach is more useful than either cross-section or time series data alone. The panel data methodology used has certain benefits like more variability, less co-linearity between variables, more informative data, more degree of freedom and more efficiency (Baltagi, 2005).

3.2 Source of data and collection instrument

The research was done based on secondary data to meet the objectives of the study. The financial statements of selected grade one general contractors were obtained from Ethiopian revenue and customs authority large tax payers' branch office and individual companies. In order to avoid the risk of distortion in the quality of data, audited balance sheet and profit and loss accounts was used. Consistent and reliable research indicates that research conducted by using appropriate data collection instruments increase the credibility and value of research findings (Koul 2006).This study also used panel data of sixteen construction companies for covering the period from 2012 to 2017.

3.3 Population of the Study and Sample

The target population for the study consists of sixty construction companies which are active and listed as grade one general contractors by Ethiopian construction Ministry.

This study was conducted on Addis Ababa Construction companies, which is generally categorized in to three basic categories such as, grade one general contractors, building contractors, and road contractors. This study only focuses on the first category, in which a total of 60 construction companies are active and operating in Addis Ababa.

Due to time and fund constraint, and accessibility problem, it is difficult to conduct the study by using the whole population. Cohen (2005) also noted that these factors (expense, time and accessibility constraints) as frequent hindrances which prevent researchers from gaining information as a whole population; so Cohen (2005) advices researchers to obtain data from a smaller group or subset of total population in such a way that the knowledge gained is representative of the study population under study (cited in Netsanet, 2012).

In order to conduct this research, 16 constructions companies were selected from the total population. The above selected sample size is appropriate, as it represent 26% of the total firms listed within grade one general contractors. In addition, 16 firms are enough to offer rich and viable information, that can be provide reliable information fit for the entire population. To avoid biasness, random sampling technique was used. Therefore, construction companies were selected randomly from the population of 60 grade one general contractors. Through this technique, each construction companies have equal opportunities of being included in the sample.

3.4 Data analysis method

This study used a panel data of sixteen listed grade one general contractors using a period from 2012 to 2017 to measure the relationship between capital structure and company profitability.

Panel data involves the pooling of observations on a cross-section of units over several time periods. Panel data approach is more useful than either cross-section or time series data alone. One advantage of using panel data set is that, because of the several data points, degrees of freedom are increased and collinearity among the exploratory variable is reduced. Thus the efficiency of the economic estimates is improved (Baltagi, 2005).

Based on the regression result, diagnostics tests such as Normality, Muliticollinearity, Hetroskadasticity and autocorrelation tests were conducted to ensure that the data suits the basic assumptions of classical linear regression model.

The panel data was analyzed using descriptive statistics and multiple linear regression analysis through E-views econometric software. These descriptive measures include mean, minimum, standard deviation and maximum values of each independent variables as well as the dependent variable of profitability.

Since this study used a panel data, there are two types of panel estimator approaches that can be employed, namely: fixed effects models (FEM) and random effects models (REM) (Brooks, 2008). To examine whether individual effects are fixed or random, a Hausman specification test was conducted

3.5 Variables description and research hypothesis

3.5.1 Variables description

In this study, one dependent variables, namely, return on asset (ROA), four independent variables, namely, short- term debt to asset ratio, long-term debt to asset ratio, total debt to total equity ratio, interest coverage ratio and two control variables firm size and asset tangibility were considered for this study. The definitions and hypotheses of each variable are discussed below,

Dependent Variable: Return on Asset (ROA)

Return on Asset (ROA)

ROA is a measure of profitability per unit of assets (net income / total assets). It reflects financial performance of a firm by measuring how efficiently a firm creates profits using its assets during a year. It shows the ability of the firm's management to produce profit from the company's assets (Aissa and Goaied, 2016).In the previous studies, Zeitun and Tian (2007),Twairesh (2014),and Abdul (2010) used ROA as a proxy for company profitability. Since ROA gauge in total assets, which includes the operating assets, it can be used to measure the overall profitability of a company. For the purposes of this research, ROA was designated as the dependent variable.

The formula was as follows:

$$\text{Return on assets} = \frac{\text{Net profits}}{\text{Total assets}}$$

3.5 Independent Variables

Short term debt ratio (SDA)

A part of a company's balance sheet within the current liabilities section. Short-term debt is usually due within one year. The debt in this liabilities account is usually made up of short-term bank loans taken out by a company, or of commercial paper, among other types. Short term financing or current liability ratio uses how much percentage of the total assets of a company is financed using short term debt. Gill, et al., (2011), Tailab (2014) and Semuel and Widjojo (2016) have found positive relationship between short

term debt to total assets and profitability. As a result, in line with empirical evidences, short term debt was expected to have a positive relationship with profitability in this study.

The formula to calculate the Short term debt was:

$$\textbf{Short term debt ratio} = \frac{\textbf{short term debt}}{\textbf{Total asset}}$$

H1: Short term debt to total asset has positive and significance effect on financial performance of grade one contractors in Addis Ababa, Ethiopia.

Long term debt ratio

Amount owed for a period exceeding 12 months from the date of the balance sheet. It could be in the form of a bank loan, mortgage bonds, debenture, or other obligations not due for one year. A company can build assets by raising debt or equity capital. The ratio of long-term debt to total assets provides a sense of what percentage of the total assets is financed via long-term debt. A higher percentage ratio means that the company is more leveraged. This ratio provides a sense of financial stability and overall riskiness of a company. Investors are wary of a high ratio, as it signifies management has less free cash flow and less ability to finance new operations. Management typically uses this financial metric to determine the amount of debt the company can sustain and manage the overall capital structure of the firm. Empirical evidences reviewed by the researcher including Zeitun and Tian (2007), Shubita and Alsawalhah (2012), Hasan et al. (2014) found such a negative relation of long term debt and profitability. Thus, in the present study, long term debt was expected to have a negative relation with the dependent variable.

Long-term debt ratio formula was calculated as follows:

$$\text{Long Term debt to Total Assets Ratio} = \frac{\text{Long Term Debt}}{\text{Total Assets}}$$

H2: Long term debt to total asset has negative and significance effect on financial performance of grade one contractors in Addis Ababa, Ethiopia.

Debt to equity ratio (DE):

Debt/Equity Ratio is a debt ratio used to measure a company's financial leverage. Debt to equity ratio is a financial ratio that compares a company's total debt to total equity. The debt to equity ratio shows the percentage of company financing that comes from creditors and investors. A higher debt to equity ratio indicates that more creditor financing (bank and moneylenders' loans) is used than investor financing (shareholders). A lower debt to equity ratio usually implies a more financially stable business, firms with a higher debt to equity ratio are considered more risky to creditors and investors than firms with a lower ratio. Unlike equity financing, debt must be repaid to the lender. Since debt financing also requires debt servicing or regular interest payments, debt can be a far more expensive form of financing than equity financing. Previous studies, such as Akim, Lawal Babatunde, et al. (2014), Hashim and Hassan (2017) showed a negative relationship between debt to equity ratio and profitability. So, in this study as well an inverse relation was expected between profitability and Debt to equity ratio.

The formula for Leverage ratio was;

$$\text{Leverage ratio} = \frac{\text{Total Debt}}{\text{Total equity}}$$

H3: Total debt to total equity has negative and significance effect on financial performance of grade one contractors in Addis Ababa, Ethiopia.

Interest coverage ratio

The interest coverage ratio is a financial ratio that measures a company’s ability to make interest payments on its debt in a timely manner. Creditors and investors use this computation to understand the profitability and risk of a company. If a company can’t afford to pay the interest on its debt, it certainly won’t be able to afford to pay the principle payments. Failure to meet this obligation can bring legal action by the firm’s creditors, possibly resulting in bankruptcy. (Brighamm, 2011). Previous studies, such as Frezewed (2016) proposed positive relationship between Interest coverage ratio and profitability. Therefore, it was expected that there is positive relationship between interest coverage ratio and profitability. The times-interest-earned (TIE) ratio, also called the

interest coverage ratio, is determined by dividing earnings before interest and taxes by the interest expense:

$$ICR = \frac{EBIT}{\text{Interest expense}}$$

H4: Interest coverage ratio has positive and significance effect on financial performance of grade one contractors in Addis Ababa, Ethiopia.

Tangibility

Asset Tangibility: This is considered to be the major determinant of a firm's performance. The most common argument in the literature favours a positive relationship between asset tangibility and performance.

Akintoye (2008) argues that firms retaining large investments in tangible assets will have smaller costs of financial distress that lead to better performance than companies that relies on intangible assets (as cited in Adekunle and Sunday, 2010). Pouraghajan & Malekian (2012) and Asrat (2016) found Positive relationship between tangibility and profitability. Based on the nature of empirical evidences and construction companies operation, the relationship between asset tangibility and firm performance was expected to be positive. For the purpose of this study was calculated as:

$$\text{Asset tangibility} = \frac{\text{Fixed Asset}}{\text{Total asset}}$$

H5: Asset tangibility has positive and significance effect on financial performance of grade one contractors in Addis Ababa, Ethiopia.

Firm Size

Size will be measured by the company's total asset. It is assumed that huge companies with bigger assets optimize operations to create more profit. According to the studies of Pouraghajan & Malekian (2012), Zeitun and Tian (2007) and Twairesh (2014) the relationship between company size and profitability is positive, which means that the bigger the company, the higher profitability the company has than smaller firms. Titman and Wessel (1988) argued that as business size increased, companies would benefit from

economies of scale in liability issuing costs. Based on this argument, the present study was expected firm size to be positively related with profitability. For this study, the firm size was measured by natural logarithm of total assets.

Firm size = natural logarithm (total assets)

H6: Asset size has positive and significance effect on financial performance of grade one contractors in Addis Ababa, Ethiopia.

3.6 Model specification

Panel data controls company heterogeneity and decreases the co- linearity between the variables employed in the model (Baltagi, 2005).There are many advantages of using the panel data and panel data takes into account both: time series and cross section which means that panel data considers numerous variables for numerous periods of times to determine the true relation between variables. In addition, it supplies greater number of observations and boosts the level of freedom. Thus, the effect of capital structure on financial performance of construction companies in Addis Ababa Ethiopia was assessed by performing panel data regressions.

The models for this study derived on the basis of previous studies such as Semuel and Widjojo (2016), Zeitun and Tian (2007), and Frezewed (2016) and this equation was believed to capture the essence of the subject under study.

Aforementioned, the researcher tries to employed four various proxies for leverage namely, short- term debt to asset ratio, long-term debt to asset ratio, total debt to total equity ratio, interest coverage ratio. In addition, this study employed one dependent variable specifically, return on assets ratio was used as proxies for financial performance. Finally, size and asset tangibility were utilized as control variables.

The general forms of the model is:

$yi\ t = \alpha + \beta xi\ t + ui\ t$

Where

Yit = dependent variable

$\beta\ o$ = Constant term

β 1-β 6= Coefficients for independent variables.

X it = is the explanatory variable

μ it = are the error terms.

With subscript i denote the cross-section and t representing the time-series dimension.

Specifically, the above general model is converted into specified variables it becomes:

ROAit = β0 + β1 (SDAit) + β2 (LDA it) + β3 (DEit) + β4 (ICR it) + β5 Log (SIZE) it + β6 (TANG) it+ ε

Where:

ROA: Net profit after tax/Total Asset

SDA: Short-term debt/Total assets for firm i in year t

LDA: Long-term debt/Total assets for firm i in year t

DE : Total Debt / Total Equity for firm i in year t

ICR : Income before Interest & Tax / Interest Expense for firm i in year t

Log (SIZE) it: Logarithm of Total Assets for firm i in year t

TANG: = Total fixed assets / total assets for firm i in year t

3.7 Summary of variables, formula and their expected relationship

Table 3.1: Summary of variables and their expected impact on the dependent variables

Types of variable	Name of variable	Formula	Expected sign
Dependent Variable	Return on Asset	ROA =Net Income / Total Asset	
Independent Variables	Short term debt to Asset(SDA)	SDA = short term debt / Total Asset	+
	Long term debt to Assets(LDA)	LDA =Long term debt / Total asset	-
	Total debt to equity(DE)	DE = Total debt / Equity	-
	Interest coverage ratio(ICR)	ICR =EBIT / Interest expense	+
Control variables	Firm size	FSIZE=Log(Total assets)	+
	Asset Tangibility	TANG = Fixed Asset /Total Asset	+

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSIONS

This chapter presents the results of the data analysis and the findings from the study in relation to the research objectives and in consistence with the literature reviewed in chapter two. The chapter is divided into four main sections. The first section deals with the descriptive statistics of the variables as shown in Table 4.1.Then section 4.2 presents correlation Analysis. This is followed by section 4.3 which discusses the Classical Linear Regression Model assumptions tests. Then section 4.4 focuses on the results of regression analysis whereas section 4.5 presented summary of finding.

4.1 Summary of statistics

Here in this section, results pertaining to various descriptive measures of return on asset ratio as well as for the firm specific variables were discussed. The descriptive statistics are presented for 96 total observations of grade one general contractors found in Addis Ababa for the period of six years. Table 4.1 below depicts mean, minimum, maximum and standard deviation values of return on asset, short term debt to asset, long term debt to asset, total debt to equity, interest coverage ratio, firm size and tangibility.

Table 4.1 Summary of descriptive statistics

	ROA	DE	ICR	LDA	SDA	SIZE	TANG
Mean	0.031475	1.932195	0.149858	0.050319	0.089381	1.302107	0.187079
Maximum	0.095364	13.63522	1.491950	0.393103	0.725626	1.412483	0.556077
Minimum	0.000411	0.000000	0.000000	0.000000	0.000000	1.237556	0.045554
Std. Dev.	0.019496	2.649921	0.272791	0.060324	0.122628	0.029635	0.090928
Observations	96	96	96	96	96	96	96

Source: Regression output of Eview

Researcher analyzed the company profitability using one performance indicator of return on asset (ROA). As indicated in the table above, the average return on asset for the sample as a whole was 3.14%, which means that each birr invested in assets generate 0.031 cents of return. The standard deviation of return on asset (ROA) was 1.9 %, this statistical measurement implies that, the volatility of return on asset (ROA) from the mean value is 0.019.The minimum observed value indicated by return on asset was 0.04

% while the maximum value was 9.5%, positive return on asset means that grade one general contractors were generating profit (ROA).

The average value of short term debt which is measured by short term debt divided by total asset was 8.9 %. These figures shows that on average a grade one general contractors financed 8.9 % of its assets through short term debt financing. This suggests that companies use short term debt as their major source of financing as compared to long term debt. Furthermore, the highest short term debt to asset ratio for a company in a particular year was 72.5 % and in the same way the minimum ratio for a company in a year was 0 %. This implies that there are companies that restrict themselves from borrowing debt in financing their operating activities. The value of short term debt to asset ratio can deviate from its mean to both sides by 12 %.

Similarly, the results of descriptive statistics show that the average long term debt ratio for the sample of grade one general contractors was 5 percent with a standard deviation of 6 percent. The maximum long term debt financing used by a company is 39.3 percent. But, we can observe simply that there are companies that restrict themselves from borrowing debt in financing their operating activities; this can be explained by looking at the minimum value of long term debt ratio of 0 %.

Besides, the average value of debt equity ratio measured by total debt over total equity was 193 percent. The ratios imply most of the firms' assets are financed by debt financing. The maximum and minimum values were 136 % and 0 % respectively for the study period. With regard to standard deviation, the value of debt equity deviate from its mean by 2.64. Furthermore, one of the major debt ratios constituted in this study is interest coverage ratio (ICR). According to data findings, the average value of interest coverage ratio was 14.9 %. The maximum interest coverage ratio for the GC1 in a particular year was 149 % and the minimum was 0%.

Moreover, the amount of mean and standard deviation of tangibility of asset of grade one general contractors had the value 18.7 % and 9% respectively. This result could be described in other words as 81.3 % of the total assets are current assets, in most situations are not used as collateral to get loan from Banks. This implies the sample period of grade

one general contractors generate revenue from fixed asset 18.7%. While the maximum and minimum tangibility of asset were 0.556 and 0.045 respectively.

Finally, to check the size of the firm and its relationship with profitability, natural logarithm of total asset is used as a control variable. From table 4.1 above one can see that the mean value of log of total asset is 1.3 and standard deviation of 2.9 %. The maximum value of log of total asset for a company in a year is 1.41 while the minimum value is 1.23.

4.2 Correlation Analysis

As noted in Brooks (2008), Correlation between two variables measures the degree of linear association between them. Values of the correlation coefficient are always ranged between positive one and negative one. A correlation coefficient of positive one indicates that a perfect positive association between the two variables; while a correlation coefficient of negative one indicates that a perfect negative association between the two variables. A correlation coefficient of zero, on the other hand, indicates that there is no linear relationship between the two variables. The table below shows the correlation matrix among dependent and independent variables.

Table 4.2 Correlation Analysis of Variables

	ROA	DE	ICR	LDA	SDA	SIZE	TANG
ROA	1.000000						
DE	-0.218153	1.000000					
ICR	0.367813	-0.231756	1.000000				
LDA	0.046044	0.631590	-0.257686	1.000000			
SDA	0.031907	0.537115	-0.216477	0.194506	1.000000		
SIZE	0.173277	0.309543	0.100114	0.311733	0.191498	1.000000	
TANG	0.055077	0.014504	0.047866	-0.120906	-0.053339	-0.002651	1.000000

The correlation result in Table 4.2 shows that short term debt, long term debt, interest coverage ratio, size and tangibility are positively correlated to return on asset. It refers that when these variables increases, profitability of construction companies will be go up. But, debt equity have negative correlation with return on asset which shows that while debt equity increases, the profitability of construction companies will be go down. .

4.3 Tests for the Classical Linear Regression Model (CLRM) assumptions

In this study as mentioned in chapter three diagnostic tests were carried out to ensure that the data fits the basic assumptions of classical linear regression model. Consequently, the results for model specification tests were presented as follows:

4.3.1 Assumption one: the errors have zero mean (E (ε) = 0)

The first assumption required is that the average value of the errors is zero. In fact, if a constant term is included in the regression equation, this assumption will never be violated. In our case the model have constant term which is proved that the line did not pass through the origin and the first assumption of CLRM is not violated. The average value of the error term in this study was expected to be zero (Brooks 2008).

4.3.2 Assumption two: homoscedasticity (variance of the errors is constant (Var (ut) = σ2 < ∞)

In this study as shown in table 4.3, both the F-statistic and Chi-Square versions of the test statistic gave the same conclusion that there is no evidence for the presence of heteroscedasticity, since the p-values were in excess of 0.05. The third version of the test statistic, "Scaled explained SS", also gave the same conclusion that there is no evidence for the presence of heteroscedasticity problem, since the p-value was considerably in excess of 0.05.

Table 4.3 Heteroskedasticity Test: White

Heteroskedasticity Test: White

F-statistic	0.140869	Prob. F(9,85)	0.9983
Obs*R-squared	1.396149	Prob. Chi-Square(9)	0.9978
Scaled explained SS	15.77970	Prob. Chi-Square(9)	0.0716

Source: financial statements of sample GC1 companies and own computation

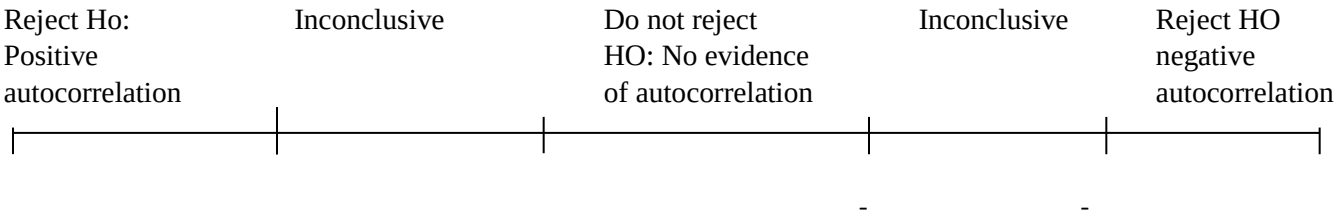
4.3.3 Assumption three: covariance between the error terms over time is zero (cov (ut, uj) = 0)

Assumption 3 stated that the covariance between the error terms over time is zero. In other words, it is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are auto correlated or that they are serially correlated‘. The Durbin-Watson Test for serial correlation assumes that errors are stationary and normally distributed with mean zero. It tests the null hypothesis HO that the errors are uncorrelated against the alternative hypothesis H1 that is errors are correlated. In addition, lagged value of a variable (ROA (-1) is used in this research in order to adjust the autocorrelation.

If this null hypothesis was rejected, it would be concluded that there was evidence of a relationship between successive residuals, which implies the least-squares estimates sub-optimal, standard confidence intervals for betas are incorrect, and the error term is expectable. In fact, test statistic can be calculated using quantities that are already available after the fixed effect regression has been run.

According to Brooks (2008), DW has two critical values: an upper critical value (dU) and a lower critical value (dL), and there is also an intermediate region where the null hypothesis of no autocorrelation cannot rejected. The rejection, non-rejection, and inconclusive regions are shown on the number line in figure 4.1 bellow.

Figure 4.1 Rejection and Non-Rejection Regions for DW Test



The study used the dL and dU values for 96 observations as approximation of 95 observation. As per the Durbin-Watson test (DW) table for 96 observations with 6 explanatory variables at 1% level of significance, the dL and dU values are 1.403 and 1.666, respectively. The DW values for model and for 96 observations were 2.210225. The relevant critical values for the test are dL= 1.403, dU = 1.666, and 4 - dU = 4-1.666

= 2.334; 4 - dL = 4-1.403 = 2.597. Accordingly, Durbin-Watson test value is clearly between 1.666 and 2.334 which is 2.210225 and the DW value is lies in the non-rejection region. Hence, the above figure shows that the DW is between DU and 4-DU, which implies do not reject Ho since there is no evidence of autocorrelation and errors are independent of each other.

This test can be made through Breusch-Godfrey (BG) Serial Correlation LM Test, which is a more general test for autocorrelation up to the first order. In this case we have tried to make first order autocorrelation test.

Table 4.4 Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.202728	Prob. F(1,84)	0.6537
Obs*R-squared	0.228724	Prob. Chi-Square(1)	0.6325

Source; computed from Eveiws result

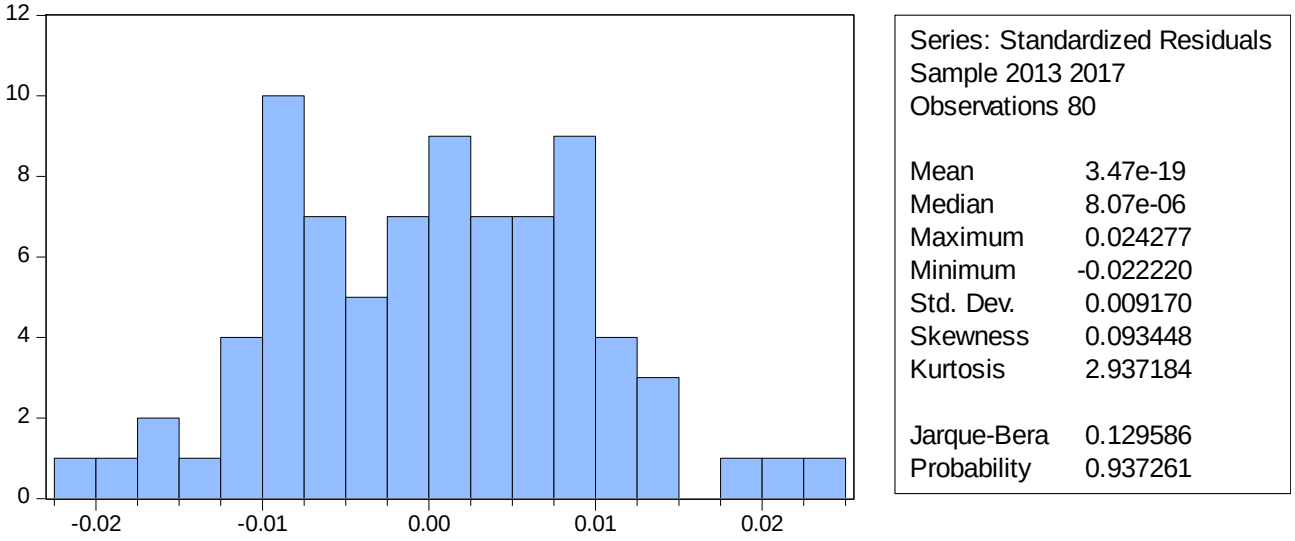
In the above table the output of Eviews offers two versions of the test; an F-version and a $\chi 2$ version from the Breusch-Godfrey Serial Correlation LM Test. From the table one can understand that no autocorrelation. This is because p-value is F-statistic and Obs*R-squared are greater than 5%.

4.3.4 Assumption Four: Normality (Errors Are Normally distributed (T ~ N (0, ∞2))

According to Brooks (2008), if the residuals are normally distributed, the histogram should be bell-shaped, the kurtosis must be no by far large from three and the Bera--Jarque statistic would not be significant. This means that the p-value given at the bottom of the normality test screen should be greater than 0.05 not reject the null of normality hypothesis at the 5% level. Observation that do not fit in with the pattern of the remainder of the data are known as outliers. If this is the case, one way to improve the chances of error normality is to use dummy variables (brooks, 2008). In line with this, the study included two dummy variables (Dum714 and Dum715) to adjust the normality

distribution. It tests the null hypothesis Ho that the errors terms are normally distributed against the alternative hypothesis H1 that the errors terms are not normally distributed.

Figure 4.2 Normality Test



From the above figure 4.2 we can conclude that the data is normally distributed. That is, the coefficient of kurtosis was close to 3, skewness was zero, and the Bera-Jarque statistic has a P-value of 0.937 implying that the data were consistent with a normal distribution assumption. Based on the statistical result, the study failed to reject the null hypothesis of normality at 5% significance level.

4.3.5 Assumption five: Multicollinearity Test

The fifth important diagnostic test conducted in this study is multicollinearity test and it is used to identify the correlation between explanatory variables and to avoid double effect of independent variables from the model (Brooks, 2008).

An implicit assumption that is made when using the OLS estimation method is that the explanatory variables are not correlated with one another. If there were no relationship between the explanatory variables, they would be said to be orthogonal to one another. If the explanatory variables were orthogonal to one another, adding or removing a variable from a regression equation would not cause the values of the coefficients on the other variables to change (Brooks, 2008).

Brooks (2008) mentioned that if the correlation coefficient along with the independent variables is 0.8 and above, multicollinearity problems will be existed.

As it is indicated below the correlations between independent variables show correlation among independent variables such as: short term debt is highly correlated with Total debt as indicated below in the table it is nearly 0.915.

Table 4.5 Correlation Matrix between independent variables

	DE	ICR	LDA	SDA	SIZE	TANG	DA
DE	1.000000						
ICR	-0.231756	1.000000					
LDA	0.631590	-0.257686	1.000000				
SDA	0.537115	-0.216477	0.194506	1.000000			
SIZE	0.309543	0.100114	0.311733	0.191498	1.000000		
TANG	0.014504	0.047866	-0.120906	-0.053339	-0.002651	1.000000	
DA	0.709821	-0.281187	0.572958	0.915264	0.290313	-0.094088	1.000000

This correlation indicates that multicollinearity may be a potential problem. Hence, further an alternative method should be employed to check the presence of multicollinearity among independent variables. Shiu (2004) Dropping one of the two highly correlated variables is a possible remedy for multicollinearity in the model.

Therefore, since multicollineariity is a data problem, the researcher decided to start the treatment by removing the variable that are found to be strongly correlated. Hence, after dropping total debt to asset, the result is as follows

Table 4.6. Correlation Matrix between independent variables

	DE	ICR	LDA	SDA	SIZE	TANG
DE	1.000000					
ICR	-0.231756	1.000000				
LDA	0.631590	-0.257686	1.000000			
SDA	0.537115	-0.216477	0.194506	1.000000		
SIZE	0.309543	0.100114	0.311733	0.191498	1.000000	
TANG	0.014504	0.047866	-0.120906	-0.053339	-0.002651	1.000000

In general, the model, which is set after treating the problem of multicollinearity, shows that there is no more multicolionearity problem. Therefore, it can be concluded that the model is the best model after the researcher drop the total debt to asset variable.

4.4 Choosing Random effect (RE) vs. fixed effect (FE) models

The results so far indicate that all CLRM assumptions are not violated, so the ordinary least square regression can be safely applied. However, since this study used a panel data, there are two types of panel estimator approaches that can be employed, namely: fixed effects models (FEM) and random effects models (REM) Brooks, (2008). To examine whether individual effects are fixed or random, a Hausman specification test was conducted.

The Hausman test hypothesis is:

H0= Random effect model is appropriate H1= Fixed effect model is appropriate

Table 4.7 Hausman test

Correlated Random Effects - Hausman Test

Equation: EQ01

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	114.031385	9	0.0000

Source: financial statements of sample GC1 companies and own computation

Table 4.7 above shows Hausman specification test, the P-value of a models is 0.0000, which is less than 5% level of significance. Hence, the null hypothesis of the random effect model is rejected. This implying that, fixed effect model is more appropriate than random effect model and thus, the analysis is based on the fixed effects estimates.

Table 4.8: Fixed effect model estimates

Dependent Variable: ROA

Method: Panel Least Squares

Date: 05/25/18 Time: 08:48

Sample (adjusted): 2013 2017

Periods included: 5

Cross-sections included: 16

Total panel (balanced) observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.439288	0.149441	-2.939531	0.0048
DE	-0.002342	0.001125	-2.080896	0.0421**
ICR	0.026427	0.007205	3.667628	0.0006*
LDA	0.078946	0.037300	2.116536	0.0388**
SDA	0.029452	0.014508	2.030055	0.0472**
SIZE	0.349523	0.115027	3.038620	0.0036*
TANG	0.098609	0.022864	4.312808	0.0001*
ROA(-1)	-0.337181	0.093211	-3.617383	0.0006
DUM714	0.050582	0.012959	3.903314	0.0003
DUM715	0.056171	0.013249	4.239777	0.0001

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.771635	Mean dependent var	0.031533
Adjusted R-squared	0.671984	S.D. dependent var	0.019189
S.E. of regression	0.010990	Akaike info criterion	-5.933330
Sum squared resid	0.006643	Schwarz criterion	-5.188947
Log likelihood	262.3332	Hannan-Quinn criter.	-5.634886
F-statistic	7.743427	Durbin-Watson stat	2.210225
Prob(F-statistic)	0.000000		

and * indicate that significant at 5% and 1% significance level respectively.

4.5 Results of the regression analysis

From Table 4.8, short- term debt with p- value of 0.0472 was found to be statistically significant at 5% level and positively associated with returns on asset. The result also shows that long term debt with a p-value of 0.0388 recorded a significantly positive relationship with return on asset at 5% level. And total debt to equity had negative and statistically significant influence on grade one general contractor's profitability in Addis Ababa, Ethiopia at 5% significance level.

Firm size had positive and statistically significant effect on profitability at 1% level whereas; Interest coverage ratio and tangibility had positive and statistically significant effect on profitability at 1% level.

The regression Analysis result (Table 4.8) shows R-squared statistics and adjusted R squared statistics value of 77.16 % and 67.19 % respectively. The result indicates that the change in the independent variable explain 67.19 % of the change in the dependent variable. That is Short term debt to Total asset, long term debt to total asset, Total debt to equity, Interest coverage ratio, size and Tangibility collectively explains 67.19 % of ROA. The remaining 32.81 % of change was explained by other factors which are not included in the model. Also, the overall test of significant F statistics shows that the model was good enough fitted and statistically significant at 1% level (i.e. p-value = 0.0000).

4.6. Discussion on Regression Results

The previous sub-section highlighted the regression analysis results of the study, and this section discusses the general result of each explanatory variables based on fixed effect regression results indicated in the table 4.8 above. In addition, the discussions analyzed the statistical findings of the study in relation to the previous empirical evidences. Hence, the following discussions present the relationship between explanatory variables and profitability.

Short term Debt to Asset Ratio:

As indicated in the fixed effect model tables above, the coefficient of short term debt is positive and the study found out a positive and statistically significant relationship between short term debt (SDA) and profitability of construction, as measured by return on asset, at 5 percent level of significance and the result was in accordance with the expected sign. This implies that every 1 birr change (increase or decrease) in construction companies' short debt to asset ratio keeping other things constant had a resultant change of 3 cents on the profitability in the same direction. Therefore, the null hypothesis which states that short term debt to total asset has positive and significance effect on financial performance of grade one general contractors in Addis Ababa failed to reject. This suggests that short-term debt tends to be less expensive; therefore increasing short- term debt with a relatively low cost will lead to an increase in profit levels. The results also dictate that profitable construction companies use short term debt as their paramount choice of financing. This finding of the study is consistent to the trade-off theory which argues that the inclusion of debt in capital structure has a positive effect as a result of the advantage tax is deductible for interest payments but is not consistent with the pecking order theory which says companies prefer internal fund to finance their operation. This finding was consistent with the findings of Gill, et al., (2011), Tailab (2014) and Semuel and Widjojo (2016).

Long Term Debt Ratio:

Regression results suggest that long term debt ratio is statistically significant positive association with return on asset (ROA) with P-value 0.0388 at 5% significance level. This implies that every 1 birr change (increase or decrease) in construction companies' long term debt to asset ratio keeping other things constant had a resultant change of 8 cents on the profitability in the same direction. Therefore, the null hypothesis which states that long term debt to total asset has negative and significance effect on financial performance of grade one general contractors in Addis Ababa failed to reject. But, the result was contradicted with the expected sign. This result implies that as a construction companies long term debt level increases its return on asset is expected to increases. The results tend to refute the pecking order theory rather support the trade-off theory.

In addition, a positive relationship between long term debt to asset ratio and profitability was observed in following empirical studies, such as Gill, et al., (2011), Kumar and Himani (2014) were some of them. But contradicted with Zeitun and Tian (2007),Shubita and Alsawalhah (2012),Hasan et al. (2014).

Debt to Equity ratio:

The co-efficient of debt-equity ratio had a negative effect and it is statistically significant at 5% level of significance. This means that there is a negative but statistically significant relationship between ROA (Return on Assets) and DER (Debt-Equity Ratio). This indicate that, holding other independent variables constant, a unit increase in DER (Debt-Equity Ratio) will result to 0.002342 decreases in ROA. This is in agreement with a priori expectation. This negative relationship between debt equity ratio of the firm and profitability is also supported by pecking order theory. As a result, the null hypothesis which states that Total debt to total equity has negative and significance effect on financial performance of grade one general contractors in Addis Ababa failed to reject.

Increased debt may adversely affect firm performance to the extent that such debt is used to finance unproductive investment rather than investment in firm expansion which will consequently result in a boost to firm performance. High levels of debt require the firm to re-pay creditors the amounts borrowed when due with interest but to the extent that the firm invests borrowed funds in unproductive firm investment the debt will have to be re-paid out of firm revenues from its activities and this reduces the funds available to the firm to finance firm operations as they pursue increased performance. This result also implies that as a construction company's debt to equity ratio level increases its return on asset is expected to decline because the excessive use of the leverage might impose high interest costs.

In consistence with this finding, the finding of Akeem,Lawal Babatunde, et al. (2014), Hashim and Hassan (2017) shows a significant negative relationship between debt to equity ratio and profitability of a grade one general contractors.

Interest Coverage Ratio

The panel fixed effect estimation regression result shows significant positive relationship between interest coverage ratio of sampled grade one general contractors and financial performance (ROA) with a regression coefficient of 0.026427 and P- value of 0.0006 in agreement with prior expectation.

Therefore, the null hypothesis which states that interest coverage ratio has positive and significance effect on financial performance of grade one general contractors in Addis Ababa failed to reject. Furthermore, the result implies that an increase in interest coverage ratio keeping other things constant had a resultant change of 0.026427 on profitability.

A higher ratio is desirable, but too high a ratio indicates that the firm is very conservative in using debt and that it is not using credit to the best advantage of shareholders. A lower ratio indicates excessive use of debt or inefficient operations. This, positive relation between interest coverage ratio and profitability found in this study confirms the findings of Frezewed (2016).

Tangibility

As can be presented in the above table 4.8, the panel fixed effect regression result reveled that, there is a significant positive relationship between asset tangibility and profitability of sampled grade one general contractors at 1% significance level and the result was in accordance with the expected sign and its coefficient is 0.098609. This means, holding other independent variables constant at their average value, when tangibility (TAN) ratio increased by one unit, return on asset (ROA) would be increased by 0.098609 unit. Therefore, the null hypothesis which states that Asset tangibility has positive and significance effect on financial performance of grade one general contractors in Addis Ababa failed to reject. The logical explanation for this finding is that, a fixed asset serves as collateral for loans, since, the greater the proportion of tangible assets on the balance sheet, the more willingness of lenders to supply loans, consequently, leverage should become high. In other words, firms with more tangible assets have a greater ability to secure debt and lenders suffer a smaller loss of value when firms go into distress; Because, these assets are insurance for the lenders in the event of winding up.

Consistent with the result of this study a number of prior empirical evidence found positive relationship between Tangibility and profitability; (e.g Pouraghajan & Malekian (2012) and Asrat (2016))

Firm Size

The firm size which measures log of total asset had positive and significantly affects the profitability of construction companies at 1% significant level in agreement with a prior expectation. This indicate, holding other independent variables constant, a one percent increase in size will result to 0.349523 increase on the profitability. Hence, the null hypothesis which states Asset size has positive and significance effect on financial performance of grade one contractors in Addis Ababa failed to reject. The significance of firm size on firm's financial performance indicates that bigger size firms have more profitability compared to firms of small size with the coefficient and p- value of 0.349523 and 0.0036 respectively, most probably as a result of diversification of investment and economies of scale.

The outcome is consistent with the findings of previous writers such as Pouraghajan & Malekian (2012), Zeitun and Tian (2007) and Twairesh (2014) but contradicted with Ebaid (2009)

Table 4.9: Comparison of expected sign/impact and actual result

Type of variable	Name of variable	Formula	Expected sign	Actual result sign
Dependent Variable	Return on Asset	ROA =Net Income / Total Asset		
Independent Variables	Short term debt to Asset(SDA)	SDA = short term debt / Total Asset	+	+
	Long term debt to Assets(LDA)	LDA =Long term debt / Total asset	-	+
	Total debt to equity(DE)	DE = Total debt / Equity	-	-
	Interest coverage ratio(ICR)	ICR =EBIT / Interset expense	+	+
Control variables	Firm size	FSIZE=Ln(Total assets)	+	+
	Asset Tangibility	TANG = Fixed Asset /Total Asset	+	+

CHAPTER FIVE

5. Summary of finding, Conclusion and recommendation

In this section the researcher presents the summary of finding, conclusions and recommendations based on the findings of the study.

5.1 Summary of finding

In this study, the empirical analysis of investigating the effect of capital structure on financial performance of GC1 companies was conducted using a panel data set consisting of financial data of sixteen companies over the period of 2012 to 2017.

The overall result obtained from the regression model indicates that capital structure has an effect on financial performance of construction companies in Addis Ababa. The independent variable short term debt to asset , long term debt to asset , debt to equity, interest coverage ratio, size and tangibility were used to achieve the objective of the study and the dependent variable return on asset were used as to measure construction firm‘s performance.

The results of a balanced panel regression model using OLS regression analysis revealed that short term debt had positive and statistically significant effect on financial performance of GC1 companies in Addis Ababa. The possible reason is short term debt tends to be less expensive; therefore increasing short debt with a relatively low cost will lead to an increase in profit levels. Similarly, long term debt had positive and statistically significant effect on financial performance. This result implies that as a construction companies long term debt level increases its return on asset is expected to increases. The results tend to refute the pecking order theory rather support the trade-off theory. Furthermore, debt equity had negative and statistically significant effect on financial performance of GC1 companies in Addis Ababa. The possible reason for the result is the excessive use of the leverage might impose high interest costs. Interest coverage ratio had positive and statistically significant effect on financial performance of GC1 companies in Addis Ababa. The result implies that an increase in interest coverage ratio keeping other things constant had a resultant change of 0.026427 on profitability.

On the other hand, firm size had positive and statistically significant effect on financial performance of GC1 companies in Addis Ababa. The possible reason is as a result of diversification of investment and economics of scale. Finally, asset tangibility had positive and significant effect on financial performance of GC1 companies in Addis Ababa. The possible cause of the result is firms with more tangible assets have a great ability to secure debt and most probably it affect the profitability of firms positively. Thus, the study concluded that data from GC1 companies result mostly appear to support Trade-off theories of capital structure.

5.2 Conclusion

Many researchers who tested the relationship between capital structure and firm profitability came up with controversial results; some discovered the negative relationship between the variables, some discovered positive relationship while others revealed no relationship between capital structure and profitability. These contradictory findings reveal that there is inconsistency among research findings on the impact of capital structure on financial performance. In Ethiopia, as far as the knowledge of the researcher is concerned, there is no empirical research done concerning the effect of capital structure on financial performance of GC1 companies in Addis Ababa, which motivates the researcher in filling the gap.

The objective of this study was to examine the effect of capital structure on financial performance of GC1 companies in Addis Ababa. To achieve the intended objectives the study used quantitative approaches panel data analysis methodology. The study used panel data for the period of 6 years ranging from 2012 to 2017 and 16 construction companies operating in Addis Ababa. The study used fixed effect regression model to estimate the relationship between the capital structure and firm profitability measured by ROA.

The research used income statement and profit and loss statement which was obtained from Ethiopian revenue and customs authority large tax payers' branch office and individual companies. For the data analysis, Eviews 8 econometric software was used to analyze the data collected.

The results of the fixed effect estimation model showed the existence of the following relationship between profitability and six independent variables.

In relation to ROA, there was significant positive effect of short term debt to asset ratio on financial performance in agreement with a priori expectation. Similarly, the long term debt had significant positive effect on financial performance and also contradicted with a prior expectation. Besides, Debt equity of the firm had significant negative effect on profitability, which was in line with prior expectation.

On the other hand, significant positive relationships was obtained between interest coverage ratio and ROA in agreement with a prior expectation. Size of the firm, a control variable to the study, had significant positive effect on financial performance in agreement to a prior expectation. Similarly, asset tangibility showed positive significance with companies' financial performance, which was in agreement with a prior expectation.

5.3 Recommendations

Based on the findings obtained from the result of the study, the researcher forwards these recommendations.

Construction companies play crucial role in the overall development of Ethiopia and a contributor of Gross domestic product (GDP). Hence, it is prudent that the industry generates enough income to enhance the country's GDP. Among the factors that affect performance of a company is the capital structure decision. Therefore, it is important that construction firms maintain an appropriate debt and equity capital mix that would guarantee great performance.

Findings revealed that debt to equity ratio is negatively correlated to profitability of listed construction companies in Addis Ababa. As such in the case of higher debt, profitability will tend to decline. The reason behind this may be due to the high interest expense. Therefore, construction companies should minimize debt financing from its capital structure and try to use other financing options that can minimize too much interest payment.

The finding of the research showed that except debt equity all capital structure variables had positive impact on profitability. The study therefore recommend that the managers of

the grade one general contractors should give attention for significant variables in order to increase the financial performance.

Finally, the study found that firm size had a positive relationship with financial performance of construction companies. The study therefore recommends that to improve the financial performance, managers of the listed GC1 should focus on growing their firms to ensure that they enjoy the economies of scale associated with large firms.

5.3.1 For Future Researchers

This study paper had put some ground work to explore the effect of capital structure on financial performance of construction companies in Addis Ababa, Ethiopia, by using short term debt to asset ratio, long term debt to asset ratio, debt to equity, interest coverage ratio, firm size, and tangibility, to measure their effect on firm's performance. This study focuses only on the relation between capital structure and financial performance measured as ROA. There are also other measures of profitability, ROI and ROE to consider for further study.

In this researching area, the future researcher shall conduct research on the same issue by including other variables which wasn't included under this study. For example, by including total debt to asset ratio and growth.

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Annex I: Hausman Test

Correlated Random Effects - Hausman Test
Equation: EQ01
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	114.031385	9	0.0000

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
DE	-0.002342	-0.002648	0.000001	0.6721
ICR	0.026427	0.016471	0.000028	0.0608
LDA	0.078946	0.078643	0.000506	0.9893
SDA	0.029452	0.026070	0.000045	0.6151
SIZE	0.349523	0.069155	0.011137	0.0079
TANG	0.098609	-0.007011	0.000320	0.0000

Cross-section random effects test equation:
Dependent Variable: ROA
Method: Panel Least Squares
Date: 05/25/18 Time: 11:12
Sample (adjusted): 2013 2017
Periods included: 5
Cross-sections included: 16
Total panel (balanced) observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.439288	0.149441	-2.939531	0.0048
DE	-0.002342	0.001125	-2.080896	0.0421
ICR	0.026427	0.007205	3.667628	0.0006
LDA	0.078946	0.037300	2.116536	0.0388
SDA	0.029452	0.014508	2.030055	0.0472
SIZE	0.349523	0.115027	3.038620	0.0036
TANG	0.098609	0.022864	4.312808	0.0001

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.771635	Mean dependent var	0.031533
Adjusted R-squared	0.671984	S.D. dependent var	0.019189
S.E. of regression	0.010990	Akaike info criterion	-5.933330
Sum squared resid	0.006643	Schwarz criterion	-5.188947
Log likelihood	262.3332	Hannan-Quinn criter.	-5.634886
F-statistic	7.743427	Durbin-Watson stat	2.210225
Prob(F-statistic)	0.000000		

Annex II. Panel data

COMPANY	YEAR	SIZE	DE	ICR	LDA	ROA	SDA	TANG
1	2012	1.31751	2.272811	0.014811	0.117782	0.006703	0.108753	0.150835
1	2013	1.316572	1.757394	0.019175	0.072321	0.012571	0.128353	0.143937
1	2014	1.314926	1.528749	0.018392	0.089381	0.016828	0.125148	0.130618
1	2015	1.319985	1.917761	0.015426	0.099898	0.006317	0.123497	0.106842
1	2016	1.321275	2.001394	0.014898	0.139906	0.010788	0.100774	0.132865
1	2017	1.327526	3.406187	0.069346	0.174491	0.014931	0.083181	0.153717
2	2012	1.325888	13.63522	0.011652	0.132697	0.001613	0.082828	0.35624
2	2013	1.328647	7.327631	0.022831	0.067284	0.016566	0.071125	0.363755
2	2014	1.328292	2.952694	0.026842	0.04488	0.017484	0.063497	0.361044
2	2015	1.32502	1.199178	0.017085	0.027038	0.007084	0.033102	0.353949
2	2016	1.321816	1.379858	0.022543	0.04186	0.006906	0.043583	0.334973
2	2017	1.323141	2.035796	0.013622	0.073769	0.000411	0.043692	0.254914
3	2012	1.29566	2.047269	0.031453	0.046363	0.036268	0.175165	0.12892
3	2013	1.302318	5.081463	0.027874	0.080836	0.023983	0.086632	0.131927
3	2014	1.30688	3.568685	0.046597	0.145702	0.051743	0.064868	0.177262
3	2015	1.314205	4.240605	0.032791	0.097097	0.042267	0.103954	0.165661
3	2016	1.323112	3.050449	0.03891	0.123469	0.046891	0.089565	0.154501
3	2017	1.332449	2.720705	0.042774	0.113575	0.05603	0.127419	0.115625
4	2012	1.304692	0.085004	0.076327	0.007741	0.044732	0.001292	0.098831
4	2013	1.306663	0.045384	0.070813	0.006605	0.048318	0	0.119924
4	2014	1.304633	0.018182	0.214101	0	0.030851	0.002413	0.138881
4	2015	1.306852	0.484182	0.115386	0.022367	0.050219	0.053729	0.137456
4	2016	1.312468	0.153622	0.164201	0.003211	0.042773	0.015651	0.13021
4	2017	1.316065	0.711023	0.173564	0.008366	0.031799	0.091828	0.154996
5	2012	1.237556	0	0	0	0.02467	0	0.14912
5	2013	1.241893	0	0	0	0.014889	0	0.120328
5	2014	1.250219	0	0	0	0.023701	0	0.159025
5	2015	1.265389	0.066759	0.459477	0.013173	0.047528	0	0.105828
5	2016	1.262137	0.263156	0.684011	0.035508	0.032454	0.037479	0.199099
5	2017	1.261296	0.129599	0.372554	0	0.032509	0.053138	0.219686
6	2012	1.27536	0.235491	0.169337	0	0.041027	0.095743	0.269395
6	2013	1.284833	0.201914	0.521067	0	0.017769	0.086947	0.274779
6	2014	1.291212	0.058237	0.15689	0	0.020343	0.036913	0.238282

6	2015	1.296237	0.100048	1.00879	0	0.060135	0.060643	0.228333
6	2016	1.299182	0.013832	1.49195	0	0.0589	0.009878	0.222916
6	2017	1.30673	0.088594	0.40006	0	0.031484	0.057082	0.180175
7	2012	1.292777	0.277123	-0.01806	0	0.018445	0.087507	0.379741
7	2013	1.289952	0.25651	0.014879	0	0.008774	0.113648	0.377485
7	2014	1.296664	0.144822	0.141857	0	0.061939	0.076127	0.307854
7	2015	1.294007	0.286462	0.129611	0	0.051874	0.118513	0.334297
7	2016	1.293046	0.159896	0.020732	0	0.007631	0.055083	0.356818
7	2017	1.297409	1.044777	0.003583	0.121671	0.009836	0.172686	0.317112
8	2012	1.260284	0.408741	0.027373	0	0.011398	0.058579	0.180793
8	2013	1.262327	0.134099	0.292174	0	0.027403	0.019022	0.242004
8	2014	1.26207	1.159969	0.055322	0	0.037653	0.194693	0.247971
8	2015	1.264973	1.220626	0.021491	0	0.027196	0.197759	0.186686
8	2016	1.283382	2.676408	0.030577	0	0.02192	0.199181	0.132477
8	2017	1.297619	4.436307	0.036913	0	0.023507	0.227774	0.138882
9	2012	1.306051	1.362448	0.02457	0.108895	0.028661	0.07467	0.281759
9	2013	1.309612	10.12736	0.014247	0.105439	0.002735	0.725626	0.174936
9	2014	1.309166	4.101683	0.01229	0.070501	0.002468	0.081414	0.17476
9	2015	1.311542	2.620488	0.015776	0.062314	0.007662	0.054166	0.155964
9	2016	1.310797	5.102177	0.039009	0.097834	0.021984	0.057533	0.131275
9	2017	1.324424	3.616429	0.025567	0.038671	0.033414	0.03791	0.556077
10	2012	1.306877	1.110067	0.064115	0.019093	0.046519	0.114572	0.067396
10	2013	1.412483	1.58532	0.078841	0.093544	0.080468	0.177801	0.167962
10	2014	1.32129	2.65333	0.029428	0.110861	0.027218	0.196909	0.148809
10	2015	1.334964	4.164398	0.095892	0.085896	0.066222	0.195773	0.119964
10	2016	1.342202	2.093779	0.046039	0.103985	0.050598	0.164892	0.134991
10	2017	1.344184	2.450061	0.049696	0.114556	0.041282	0.149112	0.102011
11	2012	1.310007	0.139853	0.26277	0	0.028737	0.010609	0.087961
11	2013	1.315495	0.566063	0.071946	0	0.032126	0.04843	0.079982
11	2014	1.317691	0.693965	0.083735	0.025715	0.051495	0.039454	0.102573
11	2015	1.326586	1.755763	0.099329	0.155711	0.062607	0	0.131899
11	2016	1.335216	5.440661	0.075791	0.076888	0.06154	0.7102	0.139736
11	2017	1.339876	6.376585	0.025567	0.084261	0.04349	0.117235	0.156198
12	2012	1.324878	0.084197	0.991057	0.018135	0.095364	0.01209	0.20406
12	2013	1.383059	0.04795	0.021495	0	0.021195	0.015191	0.240948
12	2014	1.339342	0.122903	0.775515	0.026871	0.074837	0.00193	0.211939

12	2015	1.343626	3.717634	1.269818	0.008539	0.017	0.015119	0.20243
12	2016	1.350332	0.136555	0.62687	0.049195	0.054752	0.006921	0.170387
12	2017	1.350588	0.197284	0.742324	0.034824	0.03121	0.005989	0.182173
13	2012	1.265939	1.225282	0.040288	0.16	0.037498	0	0.184342
13	2013	1.274493	1.086297	0.085804	0.036031	0.010797	0.059407	0.118339
13	2014	1.284429	0.605844	0.017658	0	0.010571	0.03168	0.079196
13	2015	1.28426	1.019009	0.026972	0.025528	0.026969	0.050349	0.073038
13	2016	1.287542	0.741101	0.045483	0.023168	0.029504	0.031558	0.055727
13	2017	1.288664	2.372244	0.029674	0.016535	0.019486	0.065341	0.045554
14	2012	1.299258	6.06083	0.019182	0.066961	0.015898	0.347108	0.198447
14	2013	1.308901	8.323363	0.019177	0.069	0.017138	0.377601	0.126678
14	2014	1.306582	2.339707	0.056987	0.112	0.026924	0.025034	0.204235
14	2015	1.304746	6.870259	0.025835	0.09903	0.035406	0.435697	0.153475
14	2016	1.304954	1.505554	0.088746	0	0.031176	0.094678	0.135135
14	2017	1.310805	12.7933	0.023549	0.393103	0.025806	0.062406	0.102433
15	2012	1.276851	0.142974	0.144864	0.035727	0.030159	0	0.243217
15	2013	1.279573	0.083998	0.155841	0.019478	0.035792	0.003603	0.212118
15	2014	1.281138	0.063813	0.073042	0.023456	0.033668	0	0.165795
15	2015	1.28278	0.125172	0.074025	0.027867	0.03552	0.023438	0.131483
15	2016	1.282446	0.082074	0.141168	0.012876	0.02553	0.021679	0.103443
15	2017	1.28408	0.052104	0.058492	0.004313	0.000449	0.01818	0.095841
16	2012	1.257757	0.49687	0.105131	0.043271	0.031248	0	0.166206
16	2013	1.259227	0.357579	0.115418	0	0.035252	0.026577	0.194858
16	2014	1.255197	0.49715	0.073715	0	0.082518	0.114232	0.409304
16	2015	1.259516	0.720851	0.043187	0.119381	0.047327	0	0.286381
16	2016	1.268429	0.187184	0.026134	0.035149	0.027479	0	0.133853
16	2017	1.261245	0.486612	0.032267	0.109077	0.028832	0	0.147297

Annex III. Test for heteroskedasticity assumption(var(ut) = σ2 <∞)

Heteroskedasticity Test: White

F-statistic	0.140869	Prob. F(9,85)	0.9983
Obs*R-squared	1.396149	Prob. Chi-Square(9)	0.9978
Scaled explained SS	15.77970	Prob. Chi-Square(9)	0.0716

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/25/18 Time: 11:15
Sample: 2 96
Included observations: 95

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.005660	0.006360	0.890026	0.3760
DE^2	1.73E-07	1.42E-05	0.012127	0.9904
ICR^2	0.000163	0.000896	0.181533	0.8564
LDA^2	-0.005801	0.022845	-0.253942	0.8002
SDA^2	-0.000592	0.004143	-0.142937	0.8867
SIZE^2	-0.002937	0.003778	-0.777391	0.4391
TANG^2	-0.003417	0.006722	-0.508348	0.6125
ROA(-1)^2	-0.002643	0.072789	-0.036308	0.9711
DUM714^2	-0.000398	0.002798	-0.142390	0.8871
DUM715^2	-0.000345	0.002816	-0.122625	0.9027

R-squared	0.014696	Mean dependent var	0.000494
Adjusted R-squared	-0.089630	S.D. dependent var	0.002637
S.E. of regression	0.002753	Akaike info criterion	-8.853305
Sum squared resid	0.000644	Schwarz criterion	-8.584476
Log likelihood	430.5320	Hannan-Quinn criter.	-8.744678
F-statistic	0.140869	Durbin-Watson stat	2.050709
Prob(F-statistic)	0.998328		

Annex IV. Test for autocorrelation assumption (cov(ui, uj) = 0 for i ≠

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.202728	Prob. F(1,84)	0.6537
Obs*R-squared	0.228724	Prob. Chi-Square(1)	0.6325

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 05/25/18 Time: 11:16
Sample: 2 96
Included observations: 95
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002810	0.116375	-0.024150	0.9808
DE	-0.000105	0.001488	-0.070818	0.9437
ICR	0.000936	0.009935	0.094221	0.9252
LDA	0.001734	0.057170	0.030326	0.9759
SDA	3.42E-05	0.024821	0.001378	0.9989
SIZE	0.005171	0.091425	0.056560	0.9550
TANG	-0.003509	0.029906	-0.117336	0.9069
ROA(-1)	-0.102090	0.248744	-0.410424	0.6825
DUM714	-0.001002	0.024339	-0.041185	0.9672
DUM715	0.003520	0.025699	0.136987	0.8914
RESID(-1)	0.121231	0.269250	0.450253	0.6537

R-squared	0.002408	Mean dependent var	1.75E-17
Adjusted R-squared	-0.116353	S.D. dependent var	0.022335
S.E. of regression	0.023599	Akaike info criterion	-4.546708
Sum squared resid	0.046781	Schwarz criterion	-4.250996
Log likelihood	226.9687	Hannan-Quinn criter.	-4.427219
F-statistic	0.020273	Durbin-Watson stat	1.997813
Prob(F-statistic)	1.000000		

These sampled companies include;

1) SUNSHINE CONSTRUCTION PLC
2) SATCON CONSTRUCTION PLC
3) YOTEK CONSTRUCTION PLC
4) ZAMRA CONSTRUCTION PLC
5) WEGERET CONSTRUCTION PLC
6) ELMI OLINDO CONSTRUCTION PLC
7) DMC CONSTRUCTIO PLC
8) ASMELASH AND SONS' CONSTRUCTION PLC
9) AKIR CONSTRUCTION PLC
10) TEKLEBERHAN CONSTRUCTION PLC
11) AFRO-TSION CONSTRUCTION PLC
12) SUR CONSTRUCTION PLC
13) 3M CONSTRUCTION PLC
14) RAMA CONSTRUCTION PLC
15) NASEW CONSTRUCTION PLC
16) SINA CONSTRUCTION PLC