DETERMINANTS OF CAPITAL STRUCTURE OF CONSTRUCTION COMPANIES IN ADDIS ABABA, ETHIOPIA

A Thesis submitted in partial fulfillment of the requirements for the award of the Degree of Master of Business Administration (Finance)

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Statement of Declaration

I, Asteraye Tsigehymanot, declare that this thesis entitled "Determinants of capital structure of Construction companies in Addis Ababa, Ethiopia" is my original work, which has not been presented for a degree in this or any other universities and that all sources of materials used for the thesis have been properly acknowledged.

Declared by:	Confirmed by Advisor:
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Statement of Certification

This is to certify that Asteraye Tsigehymanot Molla has carried out his research work on the topic entitled "Determinants of Capital Structure of the Construction Companies in Addis Ababa, Ethiopia". The work is original in nature and is suitable for submission for the reward of the MBA Degree in Master of Business Administration (Finance).

Advisor: Habtamu Berhanu (PhD):_____

ABSTRACT

Capital structure has attracted intense debate in the financial management arena for near a half-century. The basic question is whether a unique combination of debt and equity capital maximizes firm value, and if so, what factors determine a firm's optimal capital structure. Several studies have been conducted to examine the factors that can affect the capital structure of companies in various countries. However, few countable studies have been conducted in Ethiopia. Hence, this study examines empirically the determinants of capital structure of Construction Companies in Ethiopia, using secondary panel data and a quantitative research approach for identifying what determines both externally as well as internally their capital structure. And also to understand which capital structure theory is appealing to them. Secondary panel data collected from audited financial statements of 17 randomly selected construction companies (out of the population of 73 Companies), covering the period of 8 years (2013 to 2020). The collected data were analyzed using STATA 14 econometric software to come up with descriptive, regression, and correlation results. Diagnostics tests such as normality, correlation, autocorrelation, multicollinearity, and heteroscedasticity tests were conducted to ensure that the data suits the basic assumptions of the classical linear regression model. The findings from the panel random effect estimation appear to support the Pecking Order Theory of capital structure. This implies that the construction companies in Ethiopia are not in a position to trade off the benefits of debt financing and its cost, and in turn, they may not maintain the optimum debt ratio (leverage ratio), which can increase the value of the firm. Specifically, the result revealed that the variables including Earning Volatility, Growth Opportunity, Firm's Size, and Age of Firms positively affect the variations on the capital structure of construction companies. Profitability, liquidity, Tangibility, and Interest rate, on the other hand, inversely affect their capital structure. Furthermore, among the whole independent variables, which were tested in this study, Profitability, Liquidity, Tangibility, Firm's Size, and Age of the companies were found as significant variables of the capital structure of construction companies in Ethiopia. It is, therefore, recommended that in carrying out their debt financing decision, the financial managers of Construction Companies, should ascertain and properly measure those significant variables to have an optimum financing mix for their firms.

Keywords: *Determinants of Capital structure, Pecking Order theory, Trade-off Theory, Ethiopian Construction Companies, panel Data.*

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Acronyms and Abbreviations

ADF……Augmented Dickey-Fuller test

CPI……Consumer Price Index

CLRM……Classical Linear Regression Model

DW……Durbin-Watson test

EBIT…… Earnings Before Interest and Tax

E.C …….Ethiopian Calendar

FEM ……..Fixed Effect Model

MoR…… Ministry of Revenue

FDRE……..Federal Democratic Republic of Ethiopia

GDP……... Growth domestic product

GLS……... Generalized Least square

HP……..Hypothesis

LM…… Lagrange Multiplier

LTO…… Large Taxpayers Office

MM…….....Modigliani and Miller theory

MoFED…… Ministry of Finance and Economic Development

NAICS…….North America Industry Classification system

NBE……National Bank of Ethiopia

NDTS…….Non-Debt Tax Shield

OLS……... Ordinary Least square

POT…….....Pecking Order Theory

PV……..Present Value

REM ……..Random Effect Model

RQ……..Research Question

SER……..Standard Error of Regression

SME……..Small and Medium Enterprises

TOT…… Trade off Theory

VIF…… Variance Inflation Factor

WACC…….Weighted Average Cost of Capital

CHAPTER ONE

1. INTRODUCTION

This chapter briefly introduces the research subject and outlines the research background, incorporating the problems and results from the past studies. The problem statement is given and research objectives have been clearly described and based on which, hypotheses are formed and the model is specified. Apart from this, it also identifies the significance, scope & limitations of the study.

1.1. Background of the Study

According to Fernández (2009), Under the NAICS (North American Industry Classification System of the US Census Bureau), the construction industry is listed in the service sector of the economy and is broken down into many categories, such as Buildings and Civil. Construction is a basic industry like manufacturing, mining, fishing, and farming. It's easy to think of manufacturing and construction as sibling industries. They both make things such as homes, cars, office buildings, and toys for that they need a large workforce and a lot of equipment to do it. However, Manufacturing and Construction are two different entities. The obvious difference between them is that one makes buildings and the other makes things such as folding chairs, televisions, or guns.

The Construction industry consists of a group of establishments engaged in one or more of the following activities: Site preparation; building of complete constructions or parts thereof, civil engineering; Building installation, Building completion, and Renting of construction or Demolition equipment with operators. The Ethiopian Government, Ministry of Urban Development and Construction, classifies the construction sector by the companies engaged in such an economic activity directed to the creation, renovation, repair, or extension of fixed assets in the form of buildings, land improvements of an engineering nature, and other such engineering constructions as roads, bridges, dams and so forth. Accordingly, the activities covered under the industry are the construction and maintenance activities of (1) Residential buildings in urban and rural areas, (2) Nonresidential buildings, i.e. factory buildings, warehouses, office buildings, garages, hotels, schools, hospitals, clinics, etc., (3) Other construction works, like roads, dams,

dikes, athletic fields, electricity transmission lines, telephone & telegraph lines, etc. [MoFED, report, 2005].

The construction industry plays a vital role in the socio-economic development of the country. Besides its direct contribution to the socio-economic development of the country such as in generating employment and contributing to the GDP growth of the country, the construction sector supports other sectors such as manufacturing, agriculture, and service sectors to be an active participant in the development of the country's economy.

Field and Ofori (1988) (cited in Netsanet (2013)), noted that "the construction industry makes a noticeable contribution to the economic output of a country; it generates employment and incomes for the people and therefore the effects of changes in the construction industry on the economy occur at all levels and in virtually all aspects of life".

Without actively involving the construction sector in expanding the necessary infrastructures such as roads, bridges, and dams for irrigation, housing, and generating employment, the expected contribution of those sectors to the economic development of the country cannot be realized. From these, it can be understood that neglecting the construction sector in general means neglecting all sectors, because the construction sector connects directly or indirectly with other sectors of the country. Therefore, it can be said that the construction industry is the driver of the economic growth of the country.

Construction companies, just like other types of business, have both variable and fixed costs. To finance all of these costs, the construction companies have to generate funds either internally or externally. But the question here is how these companies should finance their business that can enhance the value of the firm.

According to Haipin & Senior (2009) (cited in Tariku (2015)); construction financing is mainly concerned with Project financing and Company financing. Project financing is effectively a short-term activity tied to "line of credit" issues and protocols. Short-term financing, as the name indicates, has to do with loans or credits which must be repaid shortly. Company financing, on the other hand, is handled mainly using commercial bank loans and retained earnings within the firm or organization.

The capital structure of a firm is a mixture of various types of equity and debt capital a firm maintained resulting from the firms' financing decisions. Capital structure has an impact on wealth maximization as well as the ability of a firm to sustain itself in a competitive market. Capital structure decisions involve deciding the debt level and equity amount to use to attain the optimal capital structure.

The factors that affect the capital structure of a firm are classified into two categories: (a) the internal (firm-specific) such as Profitability, Liquidity, Firm's Size, Firm's Age, Growth Opportunity, Asset Size, Tangibility of Assets, Earning volatility, etc. and (b) the external (macroeconomic) factors reflecting macroeconomic conditions such as Inflation Rate, Interest Rate, GDP, etc.

The issue of capital structure has created intense debate in the area of corporate finance since the seminal work of Modigliani and Miller (1958). Whether a unique combination of debt and equity capital maximizes the firm value has been the basic question, and if so, what factors could influence a firm's optimal capital structure has been the subject of frequent debate in the capital structure literature. Although much research has been done, we cannot find any formula or theory that decisively provides an optimal capital structure for a firm. Researchers have found different results with different contexts. Accordingly, there is no specific result, which can be generalized on the extent of the relationship between leverage and firm internal & external factors.

Millers and Modigliani's (1958) theory of capital structure, also called, the irrelevance theory of capital structure, argued that external borrowing does not affect a firm's value. However, five years later (in 1963) they reached a different conclusion that suggests the optimal capital structure can be obtained for firms with 100 percent debt financing. Trade-off theory was completed by the contribution of Jensen & Meckling (1976), who introduced the costs of financial distress. According to this final set, the firm should use leverage to the extent that the marginal benefits of additional debt including tax saving and a lower cost of debt capital are equal to its costs of financial distress, Jensen & Meckling (1976).

The pecking order theory emphasizes the information asymmetry between the firm insiders and the outside investors suggesting that firms use debt only when the internal financing is not

available, Myers & Majluf (1984). Besides, the agency cost theory predicts the capital structure choice based on the existence of agency cost, Jensen and Meckling (1976).

Although this sector is generally seen as a driver of the economic growth of the country, the construction companies in Ethiopia have no clear financing trend, and consequently, it is difficult to predict the prospects of the construction industry in general. To enhance the capacity of the construction companies in Ethiopia, it is necessary to investigate their trend of capital structure choice depending on the theoretical framework and prior empirical findings of capital structure and in turn, the result of the study will contribute its part to increase the value of the construction companies.

Thus, this research study entitled 'Determinants of Capital Structure of Construction Companies in Addis Ababa, Ethiopia', examines the determinants of capital structure of firms in the Ethiopian Construction Industry, examining the relationship between the firm's internal & external factors and leverage. In Ethiopia, no adequate research has been conducted in this area, and also no study is conducted to see the influence of interest rate on leverage of the construction firms in Ethiopia. These reasons have motivated the researcher to put his contribution on what factors determine the capital structure of construction companies in Ethiopia.

Therefore, this paper aims to examine both internal (firm-specific) and external (macroeconomic) determinants of capital structure decisions pertaining to the Ethiopian construction sector. To meet this objective, the researcher used a quantitative research approach by collecting data from secondary sources of data. Panel data combining the features of both time-series and cross-sectional data are collected for 17 No. sample construction companies and used for descriptive statistics and regression analyses. In analyzing the determinants of capital structure of construction companies, a panel random effect estimation technique was used.

The remainder of this paper is divided into five main sections. The next section includes the remaining part of Chapter one which includes a statement of the problem, Objectives of the study, Significance of the Study, Scope and Limitation of the study, and Organization of the Research Report. The second chapter deals with a review of related literature. Furthermore, the third chapter discusses the Methodology and method used for the study. The empirical result and discussions are presented in chapter four and finally, the conclusions and recommendations for future researchers are forwarded in chapter five.

1.2. Statement of the problem

Capital structure refers to several alternatives that could be adopted by a firm to get the necessary funds for its investing activities in a way that is consistent with its priorities, Kibrom (2010). Most of the effort of the financial decision-making process is centered on the determination of the optimal capital structure where the firms' value is maximized and the cost of capital is minimized, Woldemikael (2012).

In Ethiopia, the research study on the financing decisions or capital structure of the firm is not yet extensively investigated. Research in the area of capital structure and its determinants of different industries in Ethiopia have been conducted by Ashenafi (2005), Mintesinot (2010), Kinde (2011), Amanuel (2011), Fisseha and Lavanya (2012), Netsanet (2013), Tariku (2015), Ahmed (2017), Gebreyes (2018), Merkin (2021) and others.

On the other hand, the empirical evidence suggests that there is significant industry influence on capital structure decisions of the companies. Harris and Raviv (1991)(cited in Netsanet (2013)), noted that firms in the same industry have more in common than firms in different industries and thus, the capital structure of firms is highly affected due to industry differences. Esperança (2003) reported that the industry effect is important because risk levels and capital structures significantly differ among industries. So, analyzing a separate industry, in this case, the Ethiopian Construction industry individually may produce better results.

Although the Ethiopian government uses the construction sector as an instrument to eradicate unemployment problems and consecutively reduce poverty and ensure the sustainable economic growth of the country, no attention has been given to this sector to investigate the financing decisions of the firms in the industry.

To the best of the researcher's knowledge, there was a very little empirical investigation in the Ethiopian context that examined both internal (firm-specific) and external (macroeconomic) determinants of capital structure decisions in the Ethiopian construction sector. The previous researchers; namely, Netsanet (2013) & Wendwesen (2017) studied only the impact of firm-specific factors on capital structure; and Tariku (2015) examined the impact of eight firm-specific variables and two macroeconomic variables on the leverage of the sampled construction firms in Ethiopia.

Moreover; there is no clear understanding of how the Ethiopian Construction firms construct their capital structure and what internal and external factors influence their corporate financing decision. And also, there are no clear-cut and mutually accepted conclusions on the theories that best explain the capital structure of Construction firms in Ethiopia. Specifically, the influence of interest rate on the leverage of the capital structure of Ethiopian construction firms has not been studied by any researcher. Thus, the lack of agreement about what would qualify as optimal capital structure and lack of literature in the case of Ethiopia has motivated this study. Therefore, given the unique financial features of construction companies in Ethiopia and the environment in which they operate, there was a strong ground to conduct a separate study on capital structure determinants of the Construction firms in Ethiopia.

This study, therefore, examines determinants of the capital structure of construction firms in Ethiopia by using its internal and external determining factors. Ethiopia differs from other developing countries previously studied in such a way as it doesn't have a secondary capital market which makes things easier for firms to raise funds and choose the best mix of debt and equity sources.

In general, the researcher was fascinated to conduct this study due to the lack of a comprehensive study on the various determining factors of capital structure of Construction firms in the country and all available previous studies conducted in this regard unincorporated influence of Interest rate on leverage in their research work. Hence, this study is filling the research gap by incorporating both internal and external variables; namely, internal variables (profitability, liquidity, tangibility, size, non-debt tax shield, earning volatility, growth, and age) and external variables (GDP Growth, Interest Rate & Inflation Rate) determining the factors that affect Ethiopian Construction firms' capital structure.

Hence, this study aimed to empirically examine the determinants of capital structure decisions of Construction firms in Ethiopia during the period 2013-2020. This will equip financial managers with applied knowledge of determining their capital structure and fill the gap by providing full information about the relationship of leverage with firm internal and external determinants of capital structure decisions.

1.3. Objectives of the study

1.3.1. General Objective of the study

The general objective of this study is to analyze the internal and external factors determining capital structure decisions of Construction firms in Addis Ababa, Ethiopia, and then test the result in line with major capital structure theories.

1.3.2. Specific Objectives of the study

Based on the above main objectives of this study and the problem statement, the researcher addresses the following specific research objectives:-

1. To assess the effect of firm-specific factors i.e. profitability, liquidity, asset tangibility, firm's size, non-debt tax shields, growth opportunity, Earning Volatility (risk), as well as the age of the firm on the debt ratio (leverage) of construction companies in Ethiopia.

2. To investigate the influence of macroeconomic (external factors) i.e. GDP growth rate, Interest rate, and Inflation on the capital structure choice of Construction companies in Ethiopia

3. To identify which capital structure theory can more explain the variations on the capital structure of Ethiopian Construction Companies.

1.4. Research Questions and Hypotheses of the Study

Based on the research objectives, the following research questions and hypotheses were developed.

Research questions (RQ)

RQ1. What are the effects of firm-specific factors on the capital structure of the Ethiopian Construction companies?

RQ2. How the external (Macroeconomic) factors do affect the capital structure of the Ethiopian Construction Companies?

RQ3. Which theory of capital structure best explains the financing decision adopted by Construction companies in Ethiopia?

Hypotheses

To achieve the objective of this study, in addition to the research questions presented above eleven hypotheses concerning the determinants of capital structure choice in the Ethiopian Construction industry are tested.

a- Profitability

Profitability is a strong point of dissent between the two theories of capital structure; i.e. the Pecking order theory and the Static trade-off Theory. For the Static trade-off theory, the higher the profitability of the firm, the more are the reasons it will have to get debt, reducing its tax burden.

On the other hand, the Pecking order theory assumes that larger earnings lead to the increase of the main source of capital firms choose to cover their financial deficit, retained earnings. Therefore, the Static trade-off theory expects a positive relationship between profitability and leverage, whereas the pecking order theory expects exactly the opposite.

Most of the previous studies confirm the negative relationship between leverage and profitability, (example: - Amanuel (2011), Fisseha and Lavanya (2012), Usman (2013), Daniel (2015), Ahmed (2017), Gebreyes (2018), Daniel (2021), and Merkin (2021)). Hence, Profitability is expected to have a negative impact on the leverage ratio.

Hypothesis 1: There is a negative relationship between profitability and leverage ratio.

b- Liquidity

There are two different opinions on the association between liquidity and capital structure. The first view implies a positive significant relationship that is consistent with trade-off theory. Companies with more liquidity (current assets) tend to use more external borrowing because of their ability in paying off the liabilities. The second viewpoint is an existence of a negative significant relationship between leverage and liquidity that is consistent with the pecking order theory, arguing that companies with more liquidity will decrease external financing, relying on their internal funds.

Most of the previous studies confirm the negative relationship between leverage and liquidity (example:-Ahmed (2010), Najjar and Petrov (2011), Netsanet (2013), Cekrezi (2013), and Julkid & Lau (2020). Hence, liquidity is expected to have a negative impact on the leverage ratio.

Hypothesis 2: There is a negative relationship between leverage and liquidity.

c- Asset's Tangibility

According to trade-off theory, the asset's tangibility is assumed to have a positive association with the use of debt by the firm to finance its operations. It means that the higher the firm's

tangible assets or fixed assets, the higher the firms are inclined to use debt financing. A firm having a large number of fixed assets can easily raise debt at cheaper rates because of the collateral value of those fixed assets (tangibility). Therefore, a positive relationship between the tangibility of assets and the firm's leverage is expected.

The pecking order theory suggests a negative relationship between tangibility and leverage. It argued that tangible assets do not necessarily help as collateral during financial distress. Titman and Wessels (1988) and Harris and Raviv (1991) argue that tangibility might be the major factor in determining the firm's debt level. If a debt is secured against assets, the borrower is restricted to using loaned funds for a specific project and creditors have an improved guarantee of repayment. Besides, the negative relationship between leverage and asset structure indicates that firms that employ lots of tangible assets seem to rely more on internal funds generated from these assets as predicted by the pecking order theory.

Hypothesis 3: There is a positive relationship between tangibility and leverage ratio.

d- Non-debt tax shields

From the theoretical point of view, the Trade of Theory (TOT) predicts that companies have an incentive to take debt as they can benefit from the tax shield due to interest deductibility. If firms have non-debt tax shields (NDTS) such as depreciation and investment tax credits, they have a lower incentive to use debt from a tax shield point of view and hence use less debt. The Trade of Theory assumes an inverse relationship between non-debt tax shield and leverage.

Hypothesis 4: There is a negative relationship between the Non-debt tax shields and leverage ratio.

e- Earnings Volatility

Earnings volatility is a proxy for the probability of financial distress for that the firm will have to pay a risk premium to outside providers of funds. A firm will first use internally generated funds and then outsider funds in order to reduce the cost of capital. This suggests that earnings volatility is negatively related to leverage. Both the trade-off theory and pecking order theory share the same prediction in this regard.

Hypothesis 5: There is a negative relationship between the Earning Volatility and leverage ratio.

f- Growth Opportunity

Pecking order theory by Myers and Majluf (1984) stated that firms finance their projects from internally generated funds. However, the growing firms may not be capable to finance all their growth by the internally generated funds. Consequentially, firms with relatively high growth will tend to issue securities less subject to information asymmetries, i.e. short-term debt. This should lead to firms with relatively higher growth having more leverage. Therefore, according to the pecking order theory's assumption growing firm requires high capital and internal funds are insufficient to meet requirements, so firms use external borrowing. These result in an increase in the level of leverage.

Trade-Off Theory, on the other hand, argues the existence of a negative relationship between growth opportunities and level of debt. According to this theory, companies with good growth opportunities are encouraged to invest in high-risk projects to maximize shareholders' income to the detriment of creditors (Myers (1977)). This will result in a negative relationship with debt. As noted by Shah & Khan (2007), deeming their investments at risk in the future, bondholders will impose higher costs at lending to growing firms. Due to a higher cost of debt, growing firms will thus use less debt and more equity.

Hypothesis 6: There is a positive relationship between the Growth Opportunity and leverage ratio.

g- Firm's size

A firm's Size is one of the most widely accepted determinants of capital structure in research. The relationship between size and leverage is mixed. As per the Static trade-off approach, the larger firms are more diversified and the probability of bankruptcy for larger firms is less than smaller firms. Hence, according to Titman and Wessels (1988), a Firm's size positively relates to leverage.

Concerning the Pecking order theory, Rajan and Zingales (1995) argued that this relationship could be negative. There is less asymmetrical information about the larger firms by reducing the chances of undervaluation of the new equity issue and encouraging large firms to use equity financing. This means that there is a negative relationship between the size and leverage of the firm.

Most of the previous studies confirm the positive relationship between leverage and size, (example: - Fisseha and Lavanya (2012), Usman (2013), Saddam (2014), Gebreyes (2018), Daniel (2021), and Merkin (2021)). Hence, firm size is expected to have positive impact on the leverage ratio.

Hypothesis 7: There is a positive relationship between the firm's size and its leverage ratio.

h- Age of the Firm

Since the establishment of the business, the number of years in which the business is in operation is considered an important determinant of capital structure. Based on the trade-off theory, it is argued that as a firm operates for a long period, it establishes a reputation and increases its capacity to take more debt from any lenders.

On the other hand, the pecking order theory argues that as the firm matures it builds reputation leading to better access to equity markets that implies the firm's age should be negatively related to leverage.

Hypothesis 8: There is a Positive relationship between the age of the firm and the leverage ratio.

i- GDP Growth Rate

GDP growth rate, as measured by annual real gross domestic product, reflects how much a country's overall economy is growing as compared to its own one-year lagged value. During an economic downturn, due to bad performance and an increase in bankruptcy costs, firms would hesitate to borrow. Reversely, companies would borrow more in the good economic condition given more investment opportunities. As noted in Frank and Goyal (2004), the Trade-off theory predicts a positive impact of the GDP growth rate of a country on the leverage of firms operating within that country. This positive prediction implies that firms will have more debt levels in the period of higher economic growth than did in lower economic growth. According to the trade-off theory, it is expected to observe a positive relationship between GDP and leverage due to high profitability during economic booms. This finding by Booth (2001), Deesomsak (2004), Jong (2008), Mitton (2008), Cekrezi (2013), and Bas (2009), confirmed a positive relationship between GDP growth rate and leverage. Gropp and Heider (2007) also conclude a positive relation but Octavia and Brown (2010) and Saddam (2014) found GDP growth statistically insignificant in determining leverage.

The pecking order theory implies a negative relationship between GDP and debt financing. It suggests that an increase in economic activities may reduce the need for leverage.

Hypothesis 9: GDP growth rate has a statistically significant and positive effect on leverage.

j- Interest Rate

In studies about capital structure determinants, most commonly the interest rate factor is measured by the lending rate of commercial banks within a country. Interchangeably, the lending rate represents a cost that firms incur to raise debt. Under pecking order theory, there is no effect, or else an increase in the interest rate will tend to reduce the debt level, Frank and Goyal (2004). Rationally, firms tend to use a high amount of leverage when the interest rate is low due to the low cost of debt financing.

On the other hand, the trade-off theory predicts a positive relationship between the interest rate and the leverage of firms. Firms prefer more debt during an increase in the interest rate that highly increases the cost of equity, Frank and Goyal (2004). Researchers including Bas (2009), Cekrezi (2013), and Saddam (2014) confirmed such a positive prediction of trade-off theory for the relationship between interest rate and leverage. Thus, in the present study, the interest rate is measured by the cost of borrowing capital for a given period and is expected to have a positive relationship with the debt ratio.

Hypothesis 10: Interest rate has a statistically significant and positive effect on leverage.

k- Inflation rate

Inflation and leverage could have an unclear relationship. When inflation is high, the real value of tax deductions on interest payments is high. Therefore; firms tend to have high leverage so that they can trade off the costs with rising benefits. According to Frank and Goyal (2009), inflation was considered the least reliable factor affecting capital structure choice. Booth (2001) also found almost no significant relation of inflation with leverage in the case of book leverage but on changing the dependent variable to market leverage, a positive relation was found.

Hypothesis 11: There is a positive relationship between inflation and leverage.

1.5. Scope of the study

The scope of this study was limited to the relationship between leverage and determinants of capital structure decision of Construction companies in Ethiopia over the period 2013 to 2020. The study was limited to firm-specific determinants of capital structure; namely, Profitability, Liquidity, Asset's Tangibility, Non-debt tax shields, Earning Volatility (risk), Growth opportunity, the Firm's Size and Age of the firm; and external factors; namely, GDP growth rate, Interest Rate, and Inflation Rate.

1.6. Limitation of the study

The major limitations that hamper the study were resource constraint and unavailability of an active secondary market which forced the researcher to measure the dependent variable, i.e. leverage as well as the proxies of the independent variables in terms of book values rather than market values.

1.7. Significance of the Study

The general objective of this study is to analyze the internal and external factors determining capital structure decisions of Construction companies in Ethiopia and to understand the theories of capital structure that can explain the capital structure of the industry. Therefore, this study is expected to provide empirical evidence on determinants of the capital structure of Construction companies in Ethiopia. Furthermore, many parties would benefit from the result of the study. The management of firms in construction industry would benefit toward policy making on the appropriate financing mix that would improve their performance. Policy makers of various organizations would benefit from the findings which should enhance their ability to plan the capital structure of their organizations so as to maximize the value of their firms. The findings should assist Regulatory authorities; especially, National Bank of Ethiopia (NBE), Ministry of Revenue (MoR) etc., in establishing a code of corporate governance that will eventually reduce the problems associated with debt equity financing. Moreover, it allows to identify the concept and framework of determinants of capital structure decisions in Ethiopian context as well as it provides useful knowledge on factors that might have impact on the capital structure decisions of firms in Ethiopian Construction Industry. Finally, it serves as a stepping stone for further study and detailed investigation of other researchers in this area.

1.8. Organization of the thesis

This study is organized into five chapters. Chapter one presents the research introduction, statement of the problem, objective of the study, research questions and hypotheses, scope and limitation, and significance of the study. Following this, chapter two of the study presents the review of the theoretical and empirical literature on determinants of capital structure. Chapter three presents the research methodology. Then, chapter four presents the results and analysis of the study. And finally, chapter five presents conclusions and possible recommendations.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Theoretical Framework of Capital Structure

Companies can utilize internal or external resources to provide funds for their financial needs. Strategies used by managers to provide the required financial resource of the economic entity will affect the company's value. Therefore, awareness of factors affecting the company‘s financial decision is so critical. To maximize the value of the firm, the attempt has been made by the firm’s finance manager by employing an optimal capital structure for that particular firm. As Song (2005) (cited in Netsanet (2013)) describes the term capital structure “it is the mix of different types of securities (Debt, common stock, preferred stock, etc) issued by a company to finance its assets”. Hence, this decision is called in finance as Capital structure: it means the way a firm finances its assets through the combination of equity, debt, or hybrid securities (Saad, 2010).

Always there is a question: How do firms choose their capital structure? In the last few decades, different theories have been developed to answer this puzzling question in explaining the mix of capital structure of the firm. Therefore, this section primarily focuses on reviewing the major capital structure theories; i.e. Modigliani and Miller (MM) Theory, Pecking Order Theory (POT), Static Trade-off Theory (TOT), and other capital structure theories.

2.1.1. The Modigliani & Miller (MM) Theory

Modigliani and Miller (1958) present the first capital structure theory called “The Irrelevance theory”. This theory is the basis for modern thinking on the capital structure that states in the absence of taxes, bankruptcy costs, and asymmetric information, and in an efficient market, the value of a firm is unaffected by how that firm is financed. When financial managers are trying to find the particular combination that maximizes the market value of the firm, Modigliani and Miller‘s (MM‘s) (1958), famous proposition-1 states that no combination is better than any other in a perfect market. The firm’s value is determined by its real assets, not by the securities it issues. It implies that the financing choices of the firm do not affect the firm‘s investment, borrowing, and operating policies. It also implies the choices of long-term versus short-term debt do not affect the overall value of the firm, Brealey, Myers, & Allen (2008).

Furthermore, MM‘s proposition-2 states that the capital structure does affect the expected rate of return on the common stock. According to the weighted average cost of capital (WACC) developed by MM, return on equity increases in proportion to the debt-equity ratio. But any increase in expected return is exactly offset by an increase in risk and therefore leaves stockholders no better or worse off. The second irrelevance proposition of Miller and Modigliani (1961) concludes that given a firm’s investment policy, the dividend payout it chooses to follow will affect neither the current price of its shares nor the total return to its shareholders, Miller and Modigliani (1961). In other words, neither capital structure choices nor dividend policy decisions matter in perfect markets.

However, in 1963 MM reached a different conclusion after allowing for the inclusion of corporate taxes by setting free the first assumption of no tax. They argued that optimal capital structure can be obtained for firms with 100 percent debt financing by having the tax shield benefits of using debt. With tax introduced, the value of levered firms becomes higher than unlevered firms. This was their correction model that paved the way towards the modern trade-off theory.

Even though, the irrelevance theory states that any capital structure of the firm doesn’t affect the value of the firm, the later researchers find that the assumptions set by MM highly affected the capital structure of the firm and in turn the value of the firm, Miller (1977), Myers (1984), Myers and Majluf (1984). In most of the later studies, researchers accepted the importance of financial leverage in affecting the overall cost of capital, the return to the shareholders, and the value of a firm. In principle, if capital structure is irrelevant in a perfect market then imperfections that exist in the real world must be the cause of its relevance. In reality, a perfect world does not exist. Issues such as taxes, financial distress, asymmetric information, and conflicts between economic agents associated with the firm affect the firm‘s capital structure. Subsequent theoretical works, thus, focus on these factors associated with market imperfections and their effects on the capital structure.

2.1.2. Trade-off theory

One of the most arguable issues in corporate finance in general and capital structure, in particular, is whether firms have a target debt ratio or not. The trade-off theory says that firms have an optimal debt-equity ratio which they determine by trading off the benefits of debt with

the costs, Miller (1977). According to Myers (2001), the trade-off theory justifies moderate debt ratios. It says that the firm will borrow up to the point where the marginal value of tax shields on additional debt is just offset by the increase in the present value of possible costs of financial distress. Financial distress refers to the costs of bankruptcy or reorganization, and also to the agency costs that arise when the firm's creditworthiness is in doubt, Myers (2001). According to this theory, an optimal capital structure can be achieved by equating the present value of tax shields on debt with the present value of financial distress (bankruptcy) costs associated with leverage, Brealey (2008).

The trade-off theory predicts a positive relationship between profitability and leverage, implying that expected bankruptcy costs are lower and interest tax shields are more valuable for highly profitable firms than less profitable firms. Similarly, this theory predicts that firm size, the tangibility of assets, GDP growth rate, interest rate, and inflation have a positive impact on a firm's leverage. Generally, the tradeoff's prediction of a positive relationship between size and leverage is interpreted as large firms will have more debt since larger firms are more diversified as well as more matured and will have lower default risk, Frank and Goyal (2005).

Companies having safe and tangible assets and plenty of taxable income have a high debt ratio. According to Titman and Wessels (1988), tangible assets end up helping companies to accumulate debts, as if the investment proves a failure, the creditor will charge the guarantee offered. The trade-off theory also clarifies that profitable companies take more benefit of the tax shield by debt financing because there is little chance for them to go bankrupt. Thus, profitable companies are capable to raise their debt ratio more than less profitable companies. As noted by Stiglitz (1974 and 1988) (cited in Netsanet (2013)) "a high level of debt may increase the risk of bankruptcy, so there is a trade-off between the potential tax-saving benefits and the potential bankruptcy costs resulting from using debt".

Tradeoff's theoretical prediction of a positive relationship between GDP growth rate and leverage implies that firms will have more debt in the period of high economic growth than did in lower economic growth. On the other hand, the predicted positive relationship between interest rate and debt level can be interpreted as firms will prefer more debt than equity in times of higher interest rates. Because, as interest rate increases; equity has become somewhat more expensive than debt, which leads firms to issue more debt. According to trade-off theory, a

positive relationship between inflation and leverage reflects that firms are more likely to raise a substantial amount of debt in times of an inflationary economy than they do in a less inflationary state of an economy. This is due to that the real value of tax deductions on the debt will be higher when inflation is expected to be high, Frank and Goyal (2005).

The trade-off theory has contributed a lot to finance. It yields an intuitively pleasing interior optimum for firms and gives a rationale for cross-sectional variation in corporate debt ratios i.e. firms with different types of assets will have different bankruptcy and agency costs and different optimal debt ratios. However, the theory has limitations, i.e. debt ratios as produced by this theory are significantly higher than observed. Secondly, in many industries, the most profitable firms often have the lowest debt ratio which is the opposite of what the tradeoff theory predicts, Ssunder & Myers (1999) (cited in Netsanet (2013)). According to Myers (1984), the trade-off theory also fails to predict the wide degree of cross-sectional and time variation of observed debt ratios.

Furthermore, one other major cost factor consists of agency costs. Agency costs stem from conflicts of interest between the different stakeholders of the firm and because of ex-post asymmetric information, Jensen and Meckling (1976) and Jensen (1986). Hence, incorporating agency costs into the static trade-off theory means that a firm determines its capital structure by trading off the tax advantage of debt against the costs of financial distress of too much debt and the agency costs of debt against the agency cost of equity. Therefore, this discussion ends with the assertion that an important prediction of the static trade-off theory is that firms target their capital structure, i.e. if the actual leverage ratio deviates from the optimal one, the firm will adapt its financing behavior in a way that brings the leverage ratio back to the optimal level.

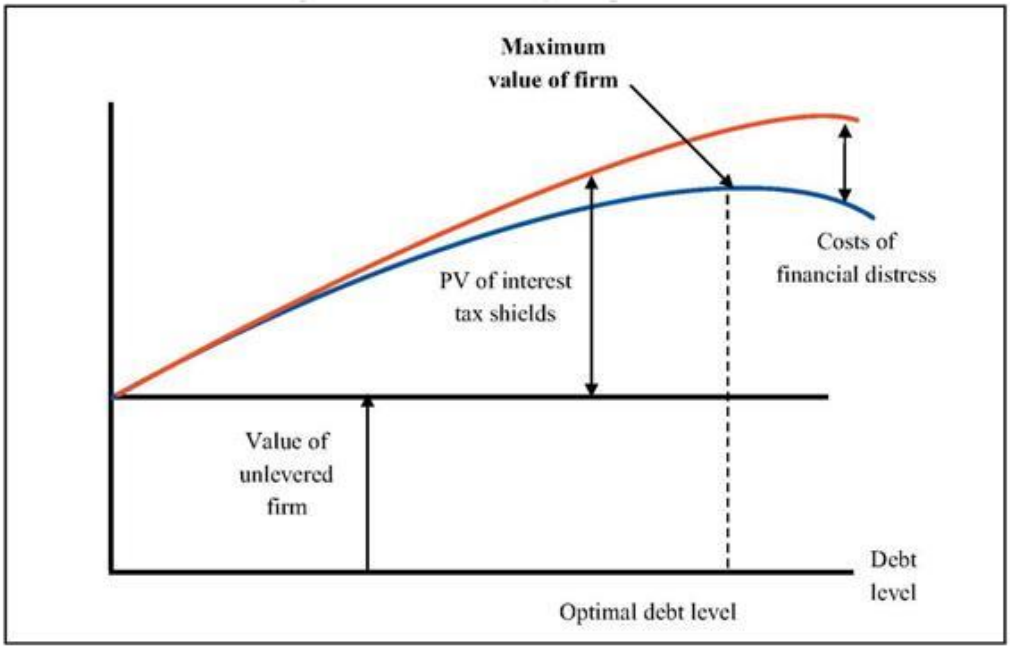

Figure 2.1: The static trade-off theory of Capital structure

Source: Myers (1984)

As figure 2.1 shows, one major cost associated with debt is the cost of financial distress which makes firms reluctant to highly depend on debt as a source of finance. At moderate debt levels, the probability of financial distress is negligible but at a later point in time, the probability of financial distress increases rapidly with additional borrowings.

2.1.3. Pecking order theory

According to Myers and Majluf (1984) and Myers (1984), the pecking order theory of capital structure is designed to minimize the inefficiencies in the firms' investment decisions. Due to asymmetric information cost, firms prefer internal finance to external finance and, when outside financing is necessary, firms prefer debt to equity because of the lower information costs. The pecking order theory states that there is no optimal capital structure since the debt ratio occurs as a result of cumulative external financing requirements. As it is suggested by Myers and Majluf (1984), it starts with the assumption of asymmetric information, indicating that managers know more about their companies' prospects, risks, and values than do outside investors.

Companies want to issue shares when shares are fairly priced or overpriced. Investors understand it and the stock price usually falls when a stock issue is announced. Thus when companies need

external financing, they prefer debt to underpriced external equity. This leads to a pecking order in which investment is financed first with internal funds, reinvested earnings primarily, then by new issues of debt, and finally with new issues of equity; Brealey, Myers, & Allen (2008). This theory has no well-defined optimal target debt ratio because the current leverage of a firm reflects its cumulative requirements of external financing; Morri & Cristanziani (2009). Pecking order theory assumes that the attraction of interest tax shields is the second order. Debt is better than equity when the problem of asymmetric information is considered the most important issue.

According to Hamberg (2001), the pecking order hypothesis is based on three assumptions: The first assumption says the management of the firm prefers internal financing to external financing. The second assumption is that the pecking order theory depends on the dividend policy changes so that cash flow from past investments matches expected future investment needs. And the third assumption is when forced to use external financing, management chooses the safest and least demanding source first. As they are forced to obtain more external financing, they will do so by working their way down the pecking order.

Hence, the pecking order theory is a consequence of information asymmetries that exist between insiders of any firm and outsiders and it assumes that firms meet their capital requirement through internal funds use first, before going for external borrowing and equity issuance.

Myers and Majluf (1984) argue that the higher the profit a firm is the lesser the probability of using more debt due to the availability of internal retained earnings to finance its operations. In a contrary manner with tradeoff and agency cost theories, this theory predicts that less profitable firms will use more debt finance because they do not have sufficient internal funds for their investment programs and due to that debt financing is first on the pecking order of external financing before equity. Highly profitable firms with limited investment opportunities work down to low debt ratios. Firms whose investment opportunities exceed internally generated funds are forced to borrow more; Brealey and Myers (2008). This indicates that unlike trade-off and agency cost theories of capital structure, the pecking order model predicts the existence of a negative relationship between a firm's profitability and its leverage implying that more profitable firms will become less levered over time due to utilization of their internally generated cash flows to finance operations. Besides, it predicts that the tangibility of assets appears to have a negative impact on leverage; Frank and Goyal (2005). The negative relationship between

leverage and asset structure indicates that firms that employ lots of tangible assets seem to rely more on internal funds generated from these assets, which is predicted by the pecking order theory. On the other hand, pecking order theory predicts a positive impact of growth opportunities on leverage.

The pecking order theory, however, has certain limitations. It does not explain the influence of taxes, financial distress, security issuance costs, and agency costs upon the firm‘s capital structure.

2.1.4. Signaling Theory

The signaling theory of capital structure states that information asymmetry between a firm and outsiders lead the former to make certain changes in the firm’s capital structure. Ross (1977) and Myers & Majluf (1984) (as cited by Tariku (2015)) have shown that under asymmetric information, firms may prefer debt to equity financing. The outcome of the prevailed information asymmetry is that outsiders do not know quite enough or accurate information about the firm’s future decisions. This may lead the firm to make certain changes in its capital structure to send certain signals to outsiders concerning the quality of its financial decisions.

Ross (1977) (as cited by Tariku (2015)) in his model, assumes two types of firms (high quality with high leverage and low quality with low leverage) that have different prospects and that these are known by managers but not by investors. Moreover, managers benefit if the company‘s securities are more highly valued by the market but are penalized if the firm goes bankrupt. Under such circumstances, the level of debt the company managers choose serves as a signal about the quality of the company, a signal sent from the managers as possessors of private insider information towards outside investors. Since lower quality firms have higher marginal expected bankruptcy costs for any debt level, managers of low-quality firms do not imitate higher quality firms by issuing more debt. Therefore, higher leverage is a good signal in this model. Therefore in the case of a good company the debt must be large enough to act as an incentive-compatible signal, i.e., it does not pay off for a bad company to mimic it.

2.1.5. Agency Theory

Agency theory initiated by Jensen and Meckling (1976) suggests that agency costs arise from the conflict of interest between debt-holders and equity-holders. Commonly, managers, being part of

the owners, tend to collaborate with equity-holders, thus if the firm is approaching financial distress, equity-holders may encourage managers to pass decisions, which, in effect, extract wealth from debt-holders to equity-holders; Buferna (2005).

The Agency theory states that the owners of the firm or shareholders have to bear the cost of the firm. Shareholders have to provide incentives to the managers or agents for efficient working and increased outputs. Jensen and Meckling (1976) described that if the firm takes loans then the managers have to act as the agent of owners as well as to the debt providers. Therefore, the agency cost theory of capital structure states that the optimal capital structure is that point where the agency cost of all the interested parties is at the minimum level.

To sum up, there is no universal theory of the debt-equity choice, and no reason to expect one. However, there are several useful conditional theories, each of which helps to understand the debt-to-equity structure that firms choose. These theories can be divided into two groups; that predicts the existence of the optimal debt-equity ratio for each firm (so-called static trade-off model) or declares no well-defined target capital structure (pecking order model), Myers (2001).

2.2. Empirical review on the determinants of capital structure

Following the theoretical standpoints, several empirical studies have identified firm-level characteristics that affect the capital structure of firms. However, the capital structure research has been accompanied by some general criticisms and findings. For instance, numerous attempts to explain capital structure have proved to be inconclusive, Harris and Raviv (1991); empirical work in this area has lagged behind the theoretical research, perhaps because the relevant firm attributes are expressed in terms of fairly abstract concepts that are not directly observable, Titman and Wessels (1988); furthermore, capital structure decision-making is even more complicated when it is examined in an international context, particularly in developing countries where markets are characterized by controls and institutional constraints, Boateng (2004).

Among the numerous firm-level characteristics: the size of the firm, asset tangibility, profitability, Earning volatility, Growth opportunity, Non-debt Tax shield, liquidity, and firm's age are discussed in this paper. Apart from the commonly tested firm characteristics, this paper aims to include a few external factors that may rationally influence capital structure decisions, which include the gross domestic product (GDP), inflation, and interest rate. For clarity, this

paper classifies the empirical study of the determinants as studied in developed countries, developing countries, and Ethiopia.

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2.2.1. Empirical review on the determinants of capital structure of developed countries

Most of the literatures seeking an association between the capital structure and the firm-specific or industry characteristics have focused on the experience of developed economies. Here, in this section, certain empirical findings conducted based on developed countries' data are reviewed.

Bradley (1984), Titman and Wessels (1988), Friend and Lang (1988), Harris and Raviv (1991), Mei & Bo (2010), Najjar and Petrov (2011), Cekrezi (2013), and Julkid & Lau (2020) assert that firms that invest heavily on tangible assets have higher financial leverage since they borrow at lower interest rates if their debt is secured with such assets. Their results also suggest that smaller firms are more likely to use equity finance while larger firms are more likely to issue debt rather than stock. Hence there is a positive relationship between size and debt ratio. Kester (1986), Titman and Wessels (1988), found a positive relationship between sales growth and leverage while Rajan and Zingales (1995), Deesomsak. (2004), Mei & Bo (2010), Nelson Vergas, António & Elísio (2015) found a negative relationship between sales growth and leverage. But Najjar and Petrov (2011) argue that sales growth has no significant effect on leverage ratio.

Titman and Wessels (1988) agree that firms with high-profit rates would maintain relatively lower debt ratios since they can generate such funds from internal sources. Hence, negative relation exists between profitability and leverage ratio. Other studies that found a negative relationship between profitability and capital structure in the developed economy includes Friend and Lang (1988), Rajan and Zingales (1995), Bevan and Danbolt (2002), Mei & Bo (2010), Nelson, António & Elísio (2015), Julkid & Lau (2020). But, the study by Najjar and Petrov (2011) indicated that Profitability has no significant effect on leverage ratio.

Deesomsak (2004), Cekrezi (2013), Julkid & Lau (2020), agree that more Liquid firms would use first their internal funds that decrease the level of external financing. Hence there is a negative relationship between Liquidity and leverage ratio. Mei & Bo (2010) agree that firms will use the internally generated fund to reduce their Cost of Capital. They also found that there is a negative relationship between earning volatility and leverage ratio. But Cekrezi (2013)

argues that earning volatility has a positive effect on leverage ratio. Deesomsak (2004), Cekrezi (2013), agree that there is a negative relationship between Non-debt Tax shield and leverage ratio. Julkid & Lau (2020) argue that there is a positive relationship between the Non-debt Tax shield and leverage ratio.

In addition, according to the literature research of developed countries, several authors are investigating the relationship between corporate capital structure and external factors.

One of the most used external determinants of capital structure is Gross Domestic Product, Bastos, Nakamura & Basso (2009), Bokpin (2009), Camara (2012), Julkid & Lau (2020). They found that there is a negative and significant relationship between corporate capital structure and GDP (as well as GDP growth). Nicole (2019) argues that there is a positive and significant relationship between corporate capital structure and GDP growth. Gajurel (2006) argues that the GDP growth rate has a negative relationship with the total debt ratio and short-term debt ratio while it has a positive influence on the long-term debt ratio.

Bastos, Nakamura & Basso (2009) found that inflation does not influence the capital structure. Frank & Goyal (2009) found the relation between inflation and the market leverage, but with no effect on the book leverage. Camara (2012) showed that macroeconomic conditions including inflation rate have significant relation with capital structure. Sett & Sarkhel (2010), Hanousek & Shamshur (2011) found that inflation has a strong positive influence on the capital structure. But, Nicole (2019) argues that inflation has a negative influence on the capital structure. Relying on debt structure, Gajurel (2006) finds that inflation is negatively related to total leverage and the short-term debt ratio, but positively influences the long-term debt ratio.

Bokpin (2009) found that increasing interest rate positively influences firms to substitute long-term debt for short-term debt over equity in the countries investigated. Another study by Mehdi (2012), in the case of Iranian publicly listed firms, assessed the impact of GDP growth rate, inflation rate, interest rate, and exchange rate on total leverage. The result of their regression analysis shows that there was no significant relationship between the perceived macroeconomic variables and the way Iranian firms adjust their capital structure. Furthermore, Mehdi (2012) revealed that GDP growth rate had no significant impact on corporate capital structure according to the results of regression analysis. Sbeiti (2010) suggests that the interest rate factor was

significant for affecting the capital structure of firms in Kuwait negatively; whereas it was found as insignificant to affect the dependent variable in Saudi Arabia and Oman.

Nicole (2019) deals with the impact of profitability, non-debt tax shield, GDP growth rate, and inflation rate on the overall, long-term, and short-term debt of medium and large civil engineering companies on eleven selected countries; namely, the Czech Republic, Slovakia, Poland, Hungary, Austria, Slovenia, Romania, Bulgaria, Estonia, Latvia, and Lithuania. The sample covered a total of 6,524 companies, of which 5,995 are medium-sized enterprises, and 529 are large companies, during the period 2009–2018. The results generally show that profitability and non-debt tax shield have a significant negative relation with debt ratios, GDP growth rate has a strong positive relationship with debt ratios, and the Inflation rate has negative relation with debt ratios.

Julkid & Lau (2020) attempt to analyze the determinants of capital structure decisions among Malaysian firms by considering both the firm-specific (micro-economic) and the macro-economic factors. Using a sample covering 612 listed firms across major business sectors in Bursa Malaysia during a span of ten years (2009-2018), the analysis proposes that both the microeconomic and macro-economic determinants are relevant for decision-makers in understanding the financial leverage of firms. Panel data regression suggested a significant positive relationship of non-debt tax shield, firm size, tangibility, interest rate, and stock market development with the debt ratio of firms. Meanwhile, a significant negative relationship is found for profitability, liquidity, and GDP growth. While the macro-economic variables are proposed to be fundamentally important in this study, they do not affect the roles of commonly proposed firm-specific factors implied by the existing capital structure theories.

2.2.2. Empirical review on the determinants of capital structures of developing countries

Although the capital structure issue has received importance in the developed countries, recently attention is also given to this area in developing economies and some researchers have started conducting a study based on the data from developing countries. Few studies from developing economies in this area are reviewed in this section.

Jorgensen and Terra (2002), Odinga (2003), Abor (2008), Chandrasekharan (2012), Mohamed and Mahmoud (2013), Dung (2015) asserted that asset tangibility and firm's size have a positive

relationship with the financial leverage of firms. In addition, Rataporn (2004) confirmed that there is a positive relationship between size and debt ratio. Jorgensen and Terra (2002), Odinga (2003), Rataporn (2004), Chandrasekharan (2012), found a positive relationship between growth opportunities and leverage while Mohamed and Mahmoud (2013), Dung (2015) found a negative relationship between growth opportunity and leverage.

Jorgensen and Terra (2002), Odinga (2003), Abor (2008), Dung (2015) agreed that negative relation exists between profitability and leverage ratio. But, Chandrasekharan (2012), Mohamed and Mahmoud (2013), argued that Profitability has a positive effect on leverage ratio.

Rataporn (2004), Mohamed and Mahmoud (2013), agreed that there is a negative relationship between Liquidity and leverage ratio. Jorgensen and Terra (2002), Odinga (2003), Dung (2015), argue that there is a positive relationship between earning volatility and leverage ratio. Odinga (2003), Rataporn (2004), Mohamed and Mahmoud (2013), agreed that there is a negative relationship between the Non-debt Tax shield and leverage ratio. Chandrasekharan (2012) agreed that there is a negative relationship between the age of firms and the leverage ratio. But Mohamed and Mahmoud (2013) argued that there is a positive relationship between the age of firms and the leverage ratio.

Jorgensen and Terra (2002) found that there is a negative relation between leverage ratio and GDP (as well as GDP growth). Jorgensen and Terra (2002) confirmed that there is a negative relationship between inflation and leverage ratio while Dung (2015) argued that inflation has a positive influence on the leverage ratio. Dung (2015) indicated that interest rate has an unclear impact on leverage.

Jorgensen and Terra (2002) have investigated firm-specific, macroeconomic, and institutional factors that determine the capital structure in seven Latin American Countries. In their analysis, the effect of tangibility, size, profitability, growth options, tax, and business risk was analyzed in each country. In addition, the effects of macroeconomic and institutional factors (GDP growth, inflation, real interest rate, and real stock returns) were investigated using pooled regression. The result showed that only profitability, real GDP growth, and inflation are found to be negative. The result also shows that the explanatory power of the firm-specific factors out weights the explanatory power of the institutional and macroeconomic factors.

Chandrasekharan (2012) studied the determinants of capital structure in Nigerian firms for a period of ten years from 2007 to 2011. It examines the impact of firms' tangibility, size, growth, profitability, and age on the leverage of the sampled firms. The result reveals that three out of five of the explanatory variables are significant with the dependent variable whereas the remaining two which include profitability and tangibility are not. It can also be observed that the coefficient of two explanatory variables; namely, size and age are negative, and are both significant at 1%. Whereas growth, profitability, and tangibility have a positive coefficient even though it is only growth that is significant at 5% and the other two explanatory variables are not significant.

Dung (2015) studied the factors that potentially affect the financial leverage of listed firms on Vietnamese stock exchanges, and identifies their key determinants of the capital structure. The explanatory variables are business risk, profitability, firm size, growth opportunities, tangibility of assets, uniqueness of assets, taxes, non-debt tax shields, industry condition, stock market condition, debt market condition, and macroeconomic condition. This study identifies that the most reliable and important factors that determine the use of debt by Vietnamese listed firms are firm size (+), inflation rate (+) as a proxy for macroeconomic condition, tangibility of assets (+), business risk (+), stock market return (+) as a proxy for the stock market condition; followed by the moderately influential factors, including profitability (–), growth opportunities (–/+), industry mean leverage (+) as a proxy for industry condition, average lending rate (+/–) as a proxy for debt market condition, and uniqueness of assets (+). This study maintains that industry classification plays an important role in a firm's leverage. There is strong evidence of a higher level of debt for firms belonging to Construction, Construction Materials, Real Estate industries, and Mineral industries, followed by Manufacturing, Steel, Plastics, and Packaging industries.

2.2.3. Empirical review on the determinants of capital structure in Ethiopia

Even though the capital structure issue has a critical research area in the developed economy, like other emerging economies, research in the area of capital structure and its determinants in Ethiopia is still under-investigated and few countable studies are conducted in Ethiopia. As per the researcher's access and knowledge, the researchers conducted on determinants of capital structure in the Ethiopian case are Ashenafi (2005), Mintesinot (2010), Kinde (2011), Amanuel

(2011), Fisseha and Lavanya (2012), Usman (2013), Saddam (2014), Daniel (2015), Ahmed (2017), Gebreyes (2018), Abebe (2021), Daniel (2021), and Merkin (2021).

Fisseha and Lavanya (2012), Usman (2013) assert that asset tangibility has a positive relationship with the financial leverage of firms. However, Amanuel (2011), Daniel (2015), Gebreyes (2018), Merkin (2021) argue that asset tangibility is inversely related to leverage. Ahmed (2017) and Daniel (2021) found that asset tangibility has an insignificant effect on the leverage ratio. Fisseha and Lavanya (2012), Usman (2013), Saddam (2014), Gebreyes (2018), Daniel (2021), and Merkin (2021) confirm that there is a positive relationship between size and debt ratio while Amanuel (2011) argue that size of a firm is inversely related with leverage. Daniel (2015), Gebreyes (2018), and Daniel (2021) found a positive relationship between growth opportunity and leverage while Amanuel (2011), Fisseha and Lavanya (2012), and Merkin (2021) found a negative relationship between growth opportunity and leverage. Usman (2013) and Saddam (2014) found that Growth opportunity has an insignificant effect on leverage ratio.

Amanuel (2011), Fisseha and Lavanya (2012), Usman (2013), Daniel (2015), Ahmed (2017), Gebreyes (2018), Daniel (2021), and Merkin (2021) agree that negative relation exists between profitability and leverage ratio. But, Saddam (2014) indicated that profitability has an insignificant effect on leverage ratio. Daniel (2015) and Daniel (2021) agree that there is a negative relationship between Liquidity and leverage ratio. Usman (2013) argues that there is a positive relationship between liquidity and leverage ratio. But, Saddam (2014), Gebreyes (2018), and Merkin (2021) indicated that liquidity has an insignificant effect on leverage ratio. Amanuel (2011) agrees that there is a negative relationship between the Non-debt Tax shield and leverage ratio. Fisseha and Lavanya (2012) and Usman (2013) argue that there is a positive relationship between Non-debt Tax shield and leverage ratio.

Amanuel (2011) and Usman (2013) agree that there is a negative relationship between earning volatility and leverage ratio. While Saddam (2014) argues that there is a positive relationship between earning volatility and leverage ratio. But, Daniel (2021) and Merkin (2021) indicated that earning volatility has an insignificant effect on the leverage ratio. Fisseha and Lavanya (2012) and Daniel (2021) found that there is a negative relationship between the age of firms and the leverage ratio. Whereas Amanuel (2011), Usman (2013), and Saddam (2014) agree that there

is a positive relationship between the age of firms and leverage ratio. But, Ahmed (2017) indicated that a firm's age has an insignificant effect on leverage ratio.

Ahmed (2017) found that there is a positive relation between leverage ratio and GDP (as well as GDP growth). But, Saddam (2014) indicated that the GDP growth rate has an insignificant effect on the leverage ratio. According to him, inflation has a positive influence on the leverage ratio. But Gebreyes (2018) and Daniel (2021) indicated that the inflation rate has an insignificant effect on the leverage ratio. Ahmed (2017) found that there is a negative relation between leverage ratio and interest rate. But Saddam (2014) confirmed that interest rate has an insignificant effect on leverage.

Saddam (2014) studied the impact of firm-specific and macroeconomic factors on capital structure decisions in the environment of the Ethiopian insurance sector by using seven years' data (2007-2013). To achieve this aim the researcher regressed profitability, liquidity, business risk, size, growth opportunity, age, GDP growth rate, interest rate, and inflation rate against the dependent variable as measured by total debt ratio. The results of this study suggest that business risk, firm size, age, and inflation rate variables were significant factors affecting leverage of insurance firms in Ethiopia positively; confirming tradeoff and pecking order theories as prominent theories for the sector. On the other hand, profitability, liquidity, growth opportunity, GDP growth rate, and interest rate variables were found as insignificant to affect the dependent variable.

Ahmed (2017) examined the effect of firm-specific & macroeconomic factors on the capital structure of private commercial banks in Ethiopia. To achieve this objective the researcher fully relied on secondary sources of data such as financial reports of private banks and reports of the National Bank of Ethiopia and regressed firm-specific factors (profitability, tangibility, and age) and macroeconomic factors (GDP growth rate and interest rate) against the dependent variable leverage. The researcher utilized a quantitative approach and regressed thirteen years' (2004 – 2016) data for six private commercial banks in Ethiopia. The results of this study suggested that profitability, GDP growth rate, and interest rate variables were found to be significant factors affecting leverage of commercial banks in Ethiopia confirming tradeoff and pecking order theories as prominent theories for the sector. On the other hand, tangibility and age variables were found as insignificant to affect the dependent variable.

Gebreyes (2018) studied to analyze internal and external factors determining capital structure decisions of commercial banks in Ethiopia. In this study, one dependent variable (leverage) and six independent variables, i.e. growth, size of the firm, the tangibility of assets, liquidity, inflation, and profitability were employed. The findings show that profitability, size, the tangibility of assets, and the growth of the banks are important determinants of the capital structure of banks in Ethiopia. However, liquidity and inflation are found to have no statistically significant impact on the capital structure of banks in Ethiopia. In addition, the results of the analysis indicate that pecking order theory is a pertinent theory in the Ethiopian banking industry, whereas there is little evidence to support static trade-off theory and the agency cost theory.

Daniel (2021) investigated the determinants of capital structure decisions in foreign-owned manufacturing companies in Ethiopia. The study used nine variables namely Leverage as its dependent variable and Profitability, Tangibility, Growth, Liquidity, Earnings Volatility, Size, Age, and Inflation Rate as its explanatory variables. The results showed that profitability, growth, liquidity, age, and size were important variables that influence foreign-owned manufacturing companies' capital structure decisions. On the other hand, the result showed tangibility of assets, earnings volatility and the macroeconomic indicator inflation were insignificant. The result of the study also showed that there is a negative relationship between profitability, liquidity, age with companies leverage level, and a positive relationship between growth and size with companies leverage level for foreign-owned manufacturing companies in Ethiopia.

2.2.4. Empirical findings on the capital structure of Construction Companies

So far, the empirical studies on the capital structure of construction companies are rare. Concerning this, most of the prior empirical studies on the capital structure of companies in the construction industry have been conducted based on developed countries' data. In this section, the available empirical studies on the capital structure of construction companies are reviewed.

Muhammad (2017) conducted research to determine factors that affect capital structure for construction companies listed in Malaysia. The result suggested that profitability and growth have a significant negative effect on debt ratio while the size and asset tangibility are positively significant to debt ratio.

Febria (2017) has conducted testing on the Determinants of Capital Structure on the Building Construction Industry in Indonesia; in the period 2008-2015. The results of this empirical study indicate that there is a negative effect of firm size, tangibility, liquidity, and non-debt tax shield on leverage while Profitability has a positive effect.

Nguyen (2020) studied the influence of factors on the capital structure of construction companies listed on the Hanoi Stock Exchange. The results showed that growth and firm size have a positive effect while profitability has the opposite effect on capital structure.

Setiawan (2021) studied determinants of the capital structure of listed construction companies in China considering the independent variables of profitability, asset tangibility, firm size, growth opportunities, non-debt tax shield, interest rate, and inflation rate. Among the independent variables been tested, the result revealed that Profitability, Asset Tangibility, Growth opportunities, the Interest rate have a negative and significant impact on the capital structure while Firm size has a positive and significant impact on the capital structure of China's construction listed companies. On the other hand, the Non-debt tax shield and Inflation rate have a negative and insignificant impact on the capital structure of Chinese construction listed companies.

In Ethiopia, no adequate research has been conducted in this area and to the best of the researcher's knowledge; research on the construction industry in Ethiopia has been conducted by Netsanet (2013), Tariku (2015), and Wendwesen (2017). Hence, Netsanet (2013) who studied "determinants of Capital structure decisions of the construction companies in Addis Ababa, Ethiopia" covering the period from 2006 to 2010, the variables including growth opportunity, tangibility, and non-debt tax shield positively affect the variations on the capital structure of construction companies. Profitability, size, earning volatility, liquidity, and age on the other hand, inversely affect their capital structure.

Tariku (2015) studied the determinants of Capital structure decisions using panel data to identify what determines externally as well as internally the capital structure of the Ethiopian construction industry. The study examines the impact of eight firm-specific variables and two

macroeconomic variables on the leverage of the sampled construction firms. A sample of 30 companies was taken from the population of 266 companies by using simple random sampling and secondary Panel data were collected through structured record review from audited financial statements of selected companies for six years (2001-2006EC). The panel random effect estimation result revealed that debt ratio (leverage) has a positive relationship with asset tangibility, growth opportunity, and size of the firm, but has a negative relation with profitability, liquidity, and risk (earnings volatility). However, the age of a firm, non-debt tax-shield, inflation, and GDP have no statistically significant impact on a firm‘s choice of debt ratio. The results mostly appear to support the pecking order theory of capital structure.

Wendwesen (2017) examined the determinants of capital structure for construction companies in Ethiopia. The factors which were tested are profitability, the tangibility of assets, age of the firm, earning volatility, growth of the firm, size of the firm, liquidity, and non-debt tax shields. The study uses five years (2011 - 2015) data for 13 no. construction firms in Ethiopia. The result reveals that the variables including profitability, the tangibility of assets, age of the firm, earning volatility, growth of the firm, size of the firm, liquidity negatively affect the capital structure of construction companies. Non-debt tax shield on the other hand inversely affects their capital structure. In addition, the results of the analysis indicate that pecking order theory is a pertinent theory in the Ethiopian construction industry, whereas there is little evidence to support static trade-off theory.

Generally, although construction companies have special features that make them an interesting case study for investigating their capital structure choice, no attention has been given to this sector in Ethiopia. Therefore, this study has been conducted to overcome this shortcoming and encourage future researchers to go further for the investigation of the Ethiopian construction sector.

2.3. Conclusions and Research gaps

Although various empirical studies have been conducted regarding determinants of capital structure, almost all were debating each other on the effect of the firm-specific and macroeconomic factors on the capital structure of firms. On the other hand, most of the empirical studies were limited to investigating internal determinants of capital structure, excluding external

determinants of capital structure assessment, which is a potential gap for further study. Such knowledge gap is even wider in the Ethiopian context as compared to other countries.

In a more specific manner, besides the lack of assessment concerning the external factors' impact on capital structure decision, as compared to other countries there was an insufficiency of empirical studies regarding firm-specific (internal) factors' impact on the capital structure of the construction sector and overall in Ethiopia. In addition, even if analyzing the industry effect in determining capital structure is more important, the construction sector is less focused. From the empirical studies reviewed above, the researcher concludes that there are no clear-cut and mutually accepted conclusions on the determinants of capital structure and on the theories that best explain the capital structure of Construction firms in Ethiopia.

As mentioned above, capital structure is determined by both internal (firm-specific) and external (macroeconomic) factors but most of the studies in Ethiopia were focused only on firm-specific variables. Only Tariku (2015) examined the impact of two macroeconomic variables; namely GDP growth and Inflation rate, along with eight firm-specific variables on the leverage of the sampled construction firms in Ethiopia. However, no study is conducted to see the effect of the Interest rates on the leverage of construction firms in Ethiopia.

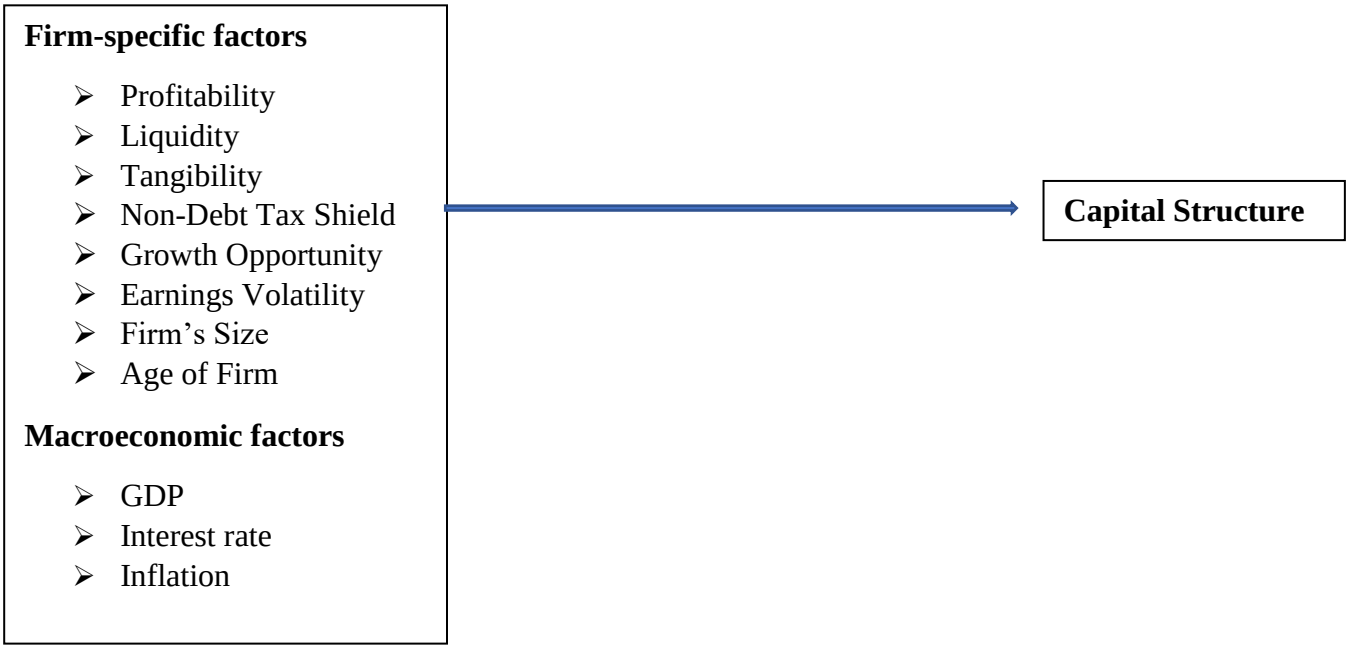
Thus, the researcher in his paper tried to play his role to reduce the literature gap by investigating both firm-specific (size, tangibility, profitability, liquidity, non-debt tax shield, earning volatility, growth, and age) and macroeconomic variables (GDP growth, inflation and Interest rate) of capital structure and investigated theories that best explain determinants of the capital structure taking the case of construction firms in Ethiopia.

Therefore, this empirical study was designed to address these shortcomings and, further, to find out industry-specific determinants of capital structure by taking the Ethiopian Construction Industry as a case.

2.4. Conceptual Framework

The conceptual framework as depicted in figure 2.2 below demonstrates a potential link between independent variables with the dependent variable. In other words, it indicates the cause and effect relationship between selected firm-specific as well as macroeconomic factors with the capital structure of Construction companies in Ethiopia.

Figure 2.2: Conceptual Framework



Source: Researcher's own construction based on his literature review

CHAPTER THREE

3. RESEARCH AND METHODOLOGY

This section provides information on how the study was carried out in terms of data collection, analysis, and presentation.

3.1. Research Approach

According to Creswell (2003), the problem that is going to be investigated in the study is used as a base for determining the research approach. Creswell (2009) stated three basic types of research approaches, i.e. qualitative, quantitative and mixed research approaches. In the quantitative approach, results are based on numbers and statistics that are presented in figures, whereas the qualitative research approach focuses on describing an event with the use of words. The mixed research approach, on the other hand, lies in between. He noted that if the problem is identifying factors that influence an outcome, the utility of an intervention or understanding the best predictors in outcomes then a quantitative approach is best.

A quantitative approach is one in which the investigator primarily uses postpositive claims for developing knowledge (cause and effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, and the test of theories), employs strategies of inquiry such as experiments and surveys, and collect data on predetermined instruments that yield statistics data, Creswell (2009). Therefore to understand and analyze the possible determinants of capital structure decisions of construction companies in Addis Ababa and to know which capital structure theory explains the variations on the capital structure of the companies, the study will adopt a quantitative research approach.

According to Yesigat (2009), the quantitative research approach translated the research problem into specific variables and hypotheses to be tested. Thus, it enables the researcher to get a deep understanding of the area being investigated. Therefore, in such a case a quantitative research approach plays a vital role and Yesigat (2009) noted to support this idea as a "quantitative research approach tests the theoretically established relationship between variables using sample data to statistically generalize for the population under investigation".

Thus, this study would be conducted to test which Capital Structure theory; namely, Trade-off theory (TOT) or Pecking Order Theory (POT) can best explain the variation on the leverage ratio of the companies by taking the construction industry as a case. In examining the capital structure decisions of large construction companies in Ethiopia, one dependent variable i.e. Leverage Ratio of the companies which is measured by the ratio of total debt (short-term liability plus long-term liability) to total Asset was regressed against the stated internal and external independent variables.

3.2. Sampling Design

As noted by Cohen (2005), the question of sampling arises directly out of the issue of defining the population on which the research will focus. Factors such as expense, time, and accessibility frequently prevent researchers from gaining information from the whole population. Therefore, they often need to obtain data from a smaller group or subset of the total population in such a way that the knowledge gained is representative of the total population under study, Cohen (2005).

This study was conducted on the Construction companies in Ethiopia, which are generally categorized into three basic categories such as; General Contractors, Building Contractors, and Real estate Contractors. A total of 73 construction companies were currently in operation and classified as large construction companies by the Ethiopian Ministry of Revenues (MoR), large taxpayers Office (LTO). Hence, as noted by Cohen (2005), covering the entire construction firms in the category was both costly as well as time-consuming. Hence, considering sampling technique for studying based on sample was a must.

To give equal chance for each construction company to be included in the sample and to ensure the representativeness of the sample, a simple random sampling technique was used. The criterion for inclusion in the sample is holding 8 years' data from the year 2013 to 2020, inclusive. In other words, companies that are at the pre-implementation stage or companies that are implementing after 2013 are excluded from the sample. All the companies mentioned in the population were listed separately on a piece of paper of the same size, folded, and kept in a basket. Using blindfold; 17 construction companies selected randomly. This accounts 24% of the total 73 construction companies.

3.3. Sources of Data and Data Collection Instruments

To meet the objectives of this study, the researcher highly relied on secondary sources of data. A structured record review has been made to collect panel data, which comprises both time series and cross-sectional elements, i.e. it embodies information across time and space. Annual financial report of 17 construction companies, covering the period from 2013 to 2020 were collected from the Ministry of Revenues (MoR) and eight years GDP, Interest rate as well as inflation data collected from the National Bank of Ethiopia (NBE).

3.4. Variable Descriptions and Model Specifications

3.4.1. Variable Descriptions

The dependent variable in this study is the Leverage ratio. The majority of prior works of literature do not give a clear-cut definition of the leverage ratio and researchers choose its measurement depending on the objective of their study. Rajan and Zingales (1995) apply four alternative definitions of leverage (i) the ratio of total liabilities to total assets (ii) the ratio of debt to total assets (iii) the ratio of total debt to net assets and (iv) the ratio of total debt to capital.

In this study, leverage was measured as the ratio of total Liabilities to the total assets using book values instead of market values because of two reasons. The first reason was the data limitation the forces to measure debt in terms of book value rather than market value, Titman and Wessels (1988). The second reason is the conceptual simplicity and the variables' ability to reflect a firm‘s total reliance on borrowed funds. This is supported by various prior empirical studies such as Rajan and Zingales (1995), Demirguc-Kunt and Maksimovic (1996), Booth (2001), (Netsanet (2013), Wendwesen (2017). Tariku (2015) has measured leverage as the ratio of total debt to Equity.

To identify which of the capital structure theories is relevant in the Ethiopian context, the researcher concentrated only on eleven explanatory variables because of the time constraints. These explanatory variables are tangibility, profitability, liquidity, size, non-debt tax shield, earning volatility, growth, and age, GDP growth, Interest rate, and inflation. Their explanation and proxies of these independent variables are separately examined in the following sub-sections referring to the relevant literature.

a- Profitability

There are conflicting theoretical predictions on the effects of profitability on leverage. In the Trade of Theory (TOT), a positive relationship between a firm's profitability and leverage is expected because taxes, agency costs, and bankruptcy costs push more profitable firms towards higher leverage. Profitable firms should prefer debt to benefit from the tax shield. Moreover, when firms are profitable, all things being equal, they increase their free cash flow and the marginal benefit of using debt to discipline managers to induce them to pay out cash instead of spending money on inefficient projects. Finally, an increase in profitability reduces the likelihood of firm bankruptcy and the cost of financial distress originated by the use of debt. Thus, all these reasons lead the TOT to predict a positive relationship between profitability and debt.

According to the Pecking Order Theory (POT) by Myers and Majluf (1984), the contrary relationship is expected. Firms prefer using internal sources of financing first, then debt, and finally external equity obtained by stock issuing. According to this argument, firms passively accumulate retained earnings, becoming less levered when they are profitable, and accumulate debt, becoming more levered when they are unprofitable. All things being equal, the more profitable the firms are, the more internal financing they will have, and therefore we should expect a negative relationship between leverage and profitability. This negative relationship is one of the most systematic findings in the empirical literature. Harris and Raviv (1991), Rajan and Zingales (1995), and Boot (2001), among others, have highlighted that the debt ratio is inversely related to profitability.

In literature, various measures such as the ratio of operating income over sales and operating income over total assets (Titman and Wessel (1988)), the return on total assets, which is calculated as the ratio of EBIT to total assets (Rajan & Zingals (1995), Ozkan (2001), Netsanet (2013), Tariku (2015), Wendwesen (2017)), were used as a measure of profitability. In this study, profitability was measured by return on assets (defined as earnings before interest and taxes divided by total assets).

b- Liquidity

The trade-off theory and Pecking order theory have two contrasting views about the relationship between liquidity and leverage. According to TOT, the more liquid firm would use external financing due to their ability to pay back liabilities and to get the benefit of tax shields, resulting in a positive relationship between liquidity and leverage. POT, on the other hand, assumes that the more liquid firm would use first its internal funds and would decrease the level of external financing, resulting in a negative relationship between liquidity and leverage. Since most prior empirical studies have found a negative relationship, it is expected that there is a negative relationship between liquidity and leverage.

In this study, Liquidity was measured as a ratio of total current assets to current liabilities.

c- Asset's Tangibility

According to trade-off theory, it is expected that higher levels of collateral contribute to the firm turning more to debt. Concerning this, Scott (1977) (cited in Netsanet (2013)) stated that companies with a higher level of collateral find it easier to access debt, given that companies' fixed assets contribute to reduced information asymmetry between managers/shareholders and creditors, as a consequence of the latter being able to recuperate the capital owed in the form of collateral in the case of company failure. As Booth (2001) states, the more tangible the firm's assets, the greater its ability to issue secured debt and the less information revealed about future profits. As noted by Gaud (2005)(cited in Netsanet (2013)), tangible assets are likely to have an impact on the borrowing decisions of a firm because they are less subject to informational asymmetries and they have a greater value than intangible assets in case of bankruptcy.

The pecking order theory, on the other hand, suggests a negative relationship between tangibility and leverage, Frank and Goyal (2005). It argued that tangible assets do not necessarily help as collateral during financial distress. Titman and Wessels (1988) and Harris and Raviv (1991) argue that tangibility might be the major factor in determining the firm's debt levels. If a debt is secured against assets, the borrower is restricted to using loaned funds for a specific project, and creditors have an improved guarantee of repayment. Besides, the negative relationship between leverage and asset structure indicates that firms that employ lots of tangible assets seem to rely more on internal funds generated from these assets as predicted by the pecking order theory.

In this study, the ratio of total fixed assets to total assets is used as a proxy for the tangibility of assets.

d- Firm's Size

A firm's Size is likely to be positively correlated with leverage since direct bankruptcy costs appear to constitute a larger proportion of a firm's value as that value decreases Titman and Wessels (1988). It is also the case that relatively large firms intend to be more diversified, have greater access to debt markets, and are less prone to bankruptcy. Chung, (1993) and Grinblatt and Titman, (1998)(cited in Netsanet (2013)), justified that smaller firms may find it relatively more costly to resolve informational asymmetries with lenders and financiers, which discourages the use of outside financing and should increase the preference of equity to debt by smaller firms. Therefore there is a tendency of being more leveraged as size increases, according to Trade-off theory.

Concerning the Pecking order theory, Rajan and Zingales (1995) argued that this relationship could be negative. There is less asymmetrical information about the larger firms, reducing the chances of undervaluation of the new equity issue, encouraging large firms to use equity financing. This means that there is a negative relationship between the size and leverage of the firm.

The size of a company can be measured by the natural logarithm of the total annual revenue of the firm. Another possibility is to proxy the size of a company by the natural logarithm of total assets. Most of the prior empirical studies used the natural logarithm of total assets as the proxy of size of the firm (e.g. Tariku (2015) and Gebreyes (2018)). Accordingly, the researcher in this study used Natural Logarithm of the total assets as a proxy for the size of the firm.

e- Non-debt tax shields

The Trade of Theory (TOT) predicts that companies have an incentive to take debt because they can benefit from the tax shield due to interest deductibility. However, according to DeAngelo and Masulis (1980) and Graham (2000), if firms have non-debt tax shields (NDTS) such as depreciation and investment tax credits, they have a lower incentive to use debt from a tax shield point of view and hence use less debt.

Since most of the prior empirical studies used the ratio of annual depreciation expense to total assets (e.g. Netsanet (2013), Tariku (2015), Wendwesen (2017) the researcher in this study used the same as a proxy for the NDTS of the construction companies.

f- Earning Volatility

Earnings volatility as the firm-specific factor is the most important factor that can determine the capital structure of construction firms. Most commonly, the earnings volatility of a firm is used to measure its business risk. Pecking order theory assumes a direct relationship of business risk with leverage, Frank and Goyal (2004). On contrary, trade-off theory predicts an inverse association of business risk and leverage, implying that firms with more volatile cash flows face higher expected costs of financial distress and should use less debt. Several researchers including Nadeem and Zongjun (2011), Amanuel (2011), Lim (2012), and Usman (2013) confirmed such an inverse relationship of business risk with leverage.

In this study, the absolute value of percentage change in earnings before interest and tax (EBIT) has been used as a proxy to the volatility of the company's earnings.

g- Growth Opportunity

Based on the Pecking order theory of capital structure, firms mostly relied on internally generated funds to finance their projects. But, the growing firms may not have sufficient internal funds to finance all of their growth by the internally generated funds and consequentially, firms with relatively higher growth will tend to issue securities less subject to information asymmetries, i.e. short-term debt. This implies that firms with relatively higher growth should have more leverage. Therefore, according to the pecking order theory assumption, growing firms require high capital and internal funds are insufficient to meet their requirements, so firms should seek external borrowing. This increases the level of leverage. Hence, as per the pecking order theory hypothesis, there is a positive relationship between the growth opportunity of the firm and its debt ratio.

Contrary to this, the Trade-Off Theory suggested that companies with good growth opportunities are encouraged to invest in high-risk projects to maximize shareholders' income in detriment to creditors, Myers (1977). This will result in the existence of a negative relationship between growth opportunities and the level of debt. As noted by Shah & Khan (2007), deeming their investments at risk, bondholders will impose higher costs at lending to growing firms. Growing firms, thus, facing a higher cost of debt will use less debt and more equity.

Several measurements have been used by different researchers to measure the growth opportunity of the companies. For example, Titman & Wessel (1988), Netsanet (2013), Tariku (2015), Wendwesen (2017), used the firm's annual growth rate of total assets as a proxy of firm's growth opportunity. The ratio of advertising expense to total sales was used as a proxy of growth opportunity by Graham (2000). Similarly, the ratio of the market value of assets to the book value of assets can be used as a proxy of a firm's growth opportunity, Mayers (1977) and Rajan & Zingals (1995).

In this study, the growth opportunity of the firms was measured by the annual growth rate of total assets.

h- Age of the firm

The trade-off theory argued that as a firm operates for a long period, it establishes a reputation and increases its capacity to take more debt from any lenders and it reveals that the age of the firm is positively correlated with leverage. For example, Petersen and Rajan (1994) suggest that older firms are higher quality firms and should have a higher debt ratio. Likewise, Barton (1989) noted that it is expected that matured firms will experience lower earnings volatility, and hence, they will have a higher debt ratio. These suggested a positive relationship between the age of the firm and leverage is confirmed by many researchers.

On the other hand, it may also be argued that as the firm matures it builds reputation leading to better access to equity markets and it implies that age should be negatively related to leverage, and is consistent with pecking order theory.

In this study, a firm's age is measured by the number of years since the establishment of the company.

i- GDP Growth Rate

During an economic downturn, due to bad performance and an increase in bankruptcy costs, firms would hesitate to borrow. Reversely, companies would borrow more in the good economic condition with more investment opportunities. As noted in Frank and Goyal (2004), the Trade-off theory predicts a positive impact of the GDP growth rate of a country on the leverage of firms operating within that country. This positive prediction implies that firms will have more debt

levels in the period of higher economic growth than did in lower economic growth. The findings by Booth (2001), Deesomsak (2004), Gropp and Heider (2007), Jong (2008), Mitton (2008), Cekrezi (2013), and Bas (2009) confirmed a positive relationship between GDP growth rate and leverage. Octavia and Brown (2010) and Saddam (2014) found GDP growth statistically insignificant in determining leverage.

On contrary, the pecking order theory implies a negative relationship between GDP and debt financing. It suggests that an increase in economic activities may reduce the need for leverage.

GDP growth rate as measured by annual real gross domestic product reflects how much a country's overall economy is growing as compared to its own one-year lagged value.

In this study, GDP growth is measured as the percent change in the annual real GDP.

j- Interest Rate

In studies about capital structure determinants, the interest rate factor is commonly measured by the lending rate of commercial banks within a country. The lending rate represents a cost that firms incur to raise debt. Under pecking order theory, there is no effect, or else an increase in the interest rate will tend to reduce the debt level, Frank and Goyal (2004). On the other hand, the trade-off theory predicts a positive relationship between interest rate and leverage of firms, in that firms will prefer more debt because an increase in interest rate would highly increase the cost of equity, Frank and Goyal (2004). Researchers including Bas (2009), Cekrezi (2013), and Saddam (2014) confirmed such a positive prediction of trade-off theory for the relationship between interest rate and leverage.

In this study, the interest rate is measured by the cost of borrowing capital for a given period.

k- Inflation

According to Taggart (1985) (cited by Tariku (2015)), inflation is positively related to leverage. This may reflect features in the tax code that favor debt when inflation is expected. However, it might also reflect efforts by managers to time the market. It is hard to see why inflation would matter within a pecking order theory. Empirical studies generally find a positive relation between leverage and inflation.

In this study, the percentage change in the annual consumer price index (CPI) would be used as a proxy for expected inflation.

3.4.2. Model Specifications

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 time to determine the true relation between variables. In addition, it supplies greater number of observations and boosts the level of freedom. Thus, Determinants of capital structure of construction companies in Addis Ababa, Ethiopia were assessed by performing panel data regressions.

The model for this study derived on the basis of previous studies made by Netsanet (2013), Tariku (2015), and Wendwesen (2017) and this equation was believed to capture the essence of the subject under study. The following model was specified based on the relationship outlined in the hypothesis.

$$LEV_{it} = \alpha + \beta_1 PROF_{it} + \beta_2 LIQ_{it} + \beta_3 TANG_{it} + \beta_4 SIZE_{it} + \beta_5 NDTS_{it} + \beta_6 EVOL_{it} + \beta_7 GROW_{it} + \beta_8 AGE_{it} + \beta_9 GDP_{it} + \beta_{10} INT_{it} + \beta_{11} INF_{it} \ldots\ldots\ldots + \varepsilon_{it}$$

Where LEV_{it} is the dependent variable and it is the leverage of company (i) to the period t, which starts from the year 2013 to 2020. α is the intercept of the equation. β is the slope coefficient for X_{it} independent variables. X_{it} represents the independent variables. Where i = 1, 2, 3,….17 no. sampled companies and ε represent the error term.

3.5. Method of Data Analysis

To test the hypotheses and the relationship between the level of debt and the explanatory variables, multiple regression analysis was used for the study. In analyzing the data, the researcher used STATA software packages. The diagnostic tests and estimating the result for the study were conducted through STATA software package because the researcher believes that STATA software package is relatively simple to understand for the diagnostic tests, estimating, and interpretation of the result.

3.6. Expected outcome of the paper

Table: 3.1, Expected outcome of the paper

Determinants	**Definitions of variables**	**Predicted signs by theories**	**The Expected outcome of the paper**
Profitability	EBIT/total asset	+ (trade-off theory) -(pecking order theory)	-
Liquidity	Current asset/current liability	+ (trade-off theory) -(pecking order theory)	-
Asset's Tangibility	Fixed asset/total asset	+ (trade-off theory) -(pecking order theory)	+
Size	ln(total asset)	+ (trade-off theory) - (pecking order theory)	+
Non-debt tax shield	Annual depreciation expense/ Total asset	- (trade-off theory) _ (pecking order theory)	-
Earning volatility	Absolute value of change of EBIT	+ (pecking order theory - (Trade-off theory)	-
Growth Opportunity	Percentage change in total asset	+ (pecking order theory) - (Trade-off theory)	+
Firm's age	No. of years in operation	+ (trade-off theory) -(pecking order theory)	+
GDP growth	Percentage change in real GDP	+ (trade-off theory) -(pecking order theory)	+
Interest Rate	Percentage of interest rate	+ (trade-off theory) -(pecking order theory)	+
inflation	Percentage change in CPI	+ (trade-off theory) _ (pecking order theory)	+

The positive sign (+) specifies a positive relationship between the variable and firms' leverage, while a negative sign (-) indicates a negative relationship between the variable and leverage, as well as the blank (_)means no suggestion by theories.

CHAPTER FOUR:

4. DATA ANALYSIS, RESULTS, AND DISCUSSIONS

This chapter presents the results of data analysis and findings from the study with the research objectives and consistency with the literature reviewed in chapter two. The chapter mainly deals with descriptive statistics, correlation Analysis, Classical Linear Regression Model assumptions tests, results of regression analysis, and the summary of findings.

4.1. Statistical data analysis

4.1.1. Descriptive statistics

Here in this section, results of various descriptive measures of the Leverage Ratio of the companies as well as internal and external independent variables are discussed. The descriptive statistics are presented for 136 total observations of Construction firms found in Addis Ababa for eight years. Table 4.1 below depicts the mean, minimum, maximum, and standard deviation values of the dependent and independent variables.

Table 4.1 Summary of descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
LEV	136	0.7176	0.2170	0.2628	0.9816
PROF	136	0.1244	0.1166	-0.0366	0.5575
LIQ	136	1.3606	0.6248	0.3908	3.9614
TANG	136	0.3587	0.2273	0.0170	1.2048
NDTS	136	0.0299	0.0259	0.0000	0.1035
EVOL	136	0.6391	0.8737	0.0014	6.2730
GROW	136	0.2813	0.3405	-0.5432	2.1008
SIZE	136	20.7933	1.4416	16.7919	24.1741
AGE	136	15.18	1.34	13	17
GDP	136	0.0895	0.0146	0.0613	0.1041
INT	136	0.1280	0.0084	0.1188	0.1425
INF	136	0.1197	0.0494	0.0739	0.2150

Source: Regression output of STATA 14.1

As shown in Table 4.1, the Leverage ratio has a mean value of 0.7176. This indicates that large construction companies in Ethiopia have financed their total assets through debt to the extent of 71.76% and only 28.24% of the total asset is financed through equity capital. The minimum and the maximum values of leverage are 0.2628 and 0.9816, respectively. This implies that to the minimum, 26.28% of the total asset invested by Construction Companies in Ethiopia

is financed from debt and the maximum debt finance goes up to 98.16% of the total asset invested. This provides evidence of how Construction Companies highly depend on debt financing to cover their huge financial need. The standard deviation of 0.217 indicates a little variation in leverage ratio among sampled Construction companies. Construction companies generally need huge capital to invest in construction machinery and other necessary equipment used in their operation. Thus, the result shows that the percentage of debt is high as compared to equity in financing the assets of construction companies in Ethiopia. This highest average leverage ratio of construction companies or excessive use of debt financing may adversely affect the value of the firms due to the possible financial distress and failure for bankruptcy.

The profitability of the companies, on the other hand, has shown a mean value of 0.1244, indicating that the construction companies earn around 12.44% profit before interest and tax on their total assets. This means that each birr invested in assets generate 0.1244 birr of return. The maximum attainable average profit is 55.75% whereas the lowest observed average profitability rate is -3.66%. The highest average leverage ratio of construction companies shown above or excessive use of debt financing may adversely affect the profitability of construction companies.

As shown in table 4.1, the average liquidity ratio of the sampled firms was 1.36 with the minimum and maximum liquidity of 0.39 and 3.96, respectively. This means the construction companies have current assets (liquid assets) that are 1.36 times their short-term liabilities. This result suggested that there is a problem of liquidity or insufficiency of funds to pay creditors. As a Rule of thumb or arbitrary standard, the liquidity ratio should be greater than 2.

Tangibility shows a mean value of 0.3587 that indicates, out of the total assets owned by large construction companies, 35.87% is categorized as tangible or fixed assets. Regarding the non-debt tax shield, the average tax shields enjoyed by Construction Companies in Ethiopia from depreciation without considering interest were found to be 3.0% of the total assets invested.

The mean value of risk (earnings volatility) is measured as the standard deviation of return on the asset was 63.91% with minimum and maximum values being 0.14% and 627.3% respectively. This indicates that there is high volatility of earnings in construction companies or the sector is riskier. And also standard deviation of 87.37% points out the existence of wide variation in the risk level among the sampled firms. This high volatility of earnings for construction companies

may become a barrier to getting debt financing from lending institutions. Banks and other lending institutions need to see stable earnings over time to provide debt for the companies.

The descriptive analysis showed that the average growth opportunity of the construction firms in Addis Ababa during the eight years was 28.13%. The result indicated that the annual revenue of construction companies is increased by 28.13%. The reason for the growth of revenue of construction companies is highly related with the rapid growth of construction in the country. This is because the FDRE government massively promotes the sector and they continually announces that domestic construction companies are given priority than foreign companies in construction of dams, building, road, bridge and others infrastructure development. The maximum and minimum growth rates were 210% and -54.3%, respectively; the standard deviation of 34.05% pointed out the existence of wide variation in the growth rate among the sampled firms.

In terms of size which was measured as the natural logarithm of total assets; the descriptive statistics result also revealed that the average size of the sampled firms is 20.79 which was around birr 1,072,544,822.03 with the maximum and minimum asset value of birr 31,526,679,734.66 and 19,616,860.81, respectively. This indicates the existence of a very wide variation in the asset value among the sampled firms. Firms included in the study have an age distribution between 13 and 17 years' time span and the average age was approximated as 15 years. This implies that the largest observed operating experience of the sampled firm is 17 years while the smallest is 13 years of operating experience.

As shown in Table 4.1, descriptive statistics result also revealed the average GDP growth rate of 8.95% while the maximum and minimum rates were 10.41% and 6.13%, respectively. The average Interest rate during the sampled period was 12.8% while the maximum and minimum rates were 14.25% and 11.88%, respectively. The average inflation rate during the sample period was 11.97%. The highest inflation rate was 21.5% which was recorded in 2020 while the lowest is 7.39%. This implies there was high inflation during the selected sample period.

Finally, as it is presented in Table 4.1, the Growth opportunity and earnings volatility of the construction companies showed some volatile behavior. This is because their standard deviation is above their mean.

4.1.2. Correlation Analysis

As noted in Brooks (2008), Correlation between two variables measures the degree of linear association between them. Values of the correlation coefficients always range between +1 and -1. A correlation coefficient of +1 indicates a perfect positive association while a correlation coefficient of -1 indicates 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.

a- Correlation between Dependent Variable and Independent Variables

The table below shows the correlation matrix among dependent and independent variables.

Table 4.2 Correlation Analysis of Variables

	LEV	PROF	LIQ	TANG	NDTS	EVOL	GROW	SIZE	AGE	INT	GDP	INF
LEV	1.0000											
PROF	-0.6779	1.0000										
LIQ	-0.6565	0.4588	1.0000									
TANG	-0.3516	0.0321	-0.0106	1.0000								
NDTS	-0.2044	0.1040	-0.1874	0.7933	1.0000							
EVOL	-0.0286	0.0961	0.0347	-0.0261	-0.0061	1.0000						
GROW	-0.0401	0.1651	-0.0553	-0.1482	-0.0295	0.1014	1.0000					
SIZE	0.4286	-0.4747	-0.2238	-0.1567	-0.1861	-0.0233	-0.0733	1.0000				
AGE	0.3587	-0.1909	-0.0769	-0.2895	-0.2655	-0.1523	-0.0894	-0.0883	1.0000			
INT	0.0739	-0.2410	0.0832	0.0071	-0.2252	0.0237	-0.2024	0.3067	0.0000	1.0000		
GDP	-0.0500	0.1786	-0.0208	-0.0172	0.1334	0.0002	0.2326	-0.2236	0.0000	-0.8638	1.0000	
INF	0.0931	-0.2466	0.0423	0.0038	-0.2166	0.0768	-0.1771	0.2672	0.0000	0.8714	-0.7704	1.0000

The correlation result in Table 4.2 shows that Size, Age, Interest rate, and Inflation rate are positively correlated with Leverage. It refers that when these variables increase, the Leverage of construction companies will go up. But, Profitability, Liquidity, Tangibility, Non-Debt tax shield, Earning Volatility, Growth Opportunity, and GDP growth rate have a negative correlation with leverage which shows that while these variables increase, the Leverage of construction companies will go down.

There was a significant negative correlation between leverage ratio and profitability with a coefficient of -0.6779. This shows that as the profitability of the construction companies falls down their leverage ratio increases. This finding is consistent with the argument of the pecking order theory (POT). According to this theory of capital structure, there must be a negative relationship between leverage ratio and profitability. This is because as the firm becomes more profitable, they are more inclined to finance their operation from internally generated funds. Therefore, the negative relationship between profitability and leverage ratio obtained in this study is supported by the Pecking Order Theory.

There was a significant negative correlation between the leverage ratio and liquidity position of the construction companies with a coefficient of -0.6565. That indicates as the liquidity position of the construction companies increases; they decrease their reliance on external financing and concentrate on internally available funds. This finding is supported by the Pecking Order Theory. The POT assumes that the liquid firms use first their internal funds and decrease the level of external financing, which results in a negative relationship between liquidity and leverage.

The correlation coefficient between leverage ratio and tangibility of assets is -0.3516, indicating that there is a negative correlation between asset tangibility and leverage ratio. This finding is supported by the Pecking Order Theory that suggests a negative relationship between tangibility and leverage. It is argued that tangible assets do not necessarily help as collateral during financial distress. If a debt is secured against assets, the borrower is restricted to using loaned funds for a specific project, and creditors have an improved guarantee of repayment. Besides, the negative relationship between leverage and asset tangibility indicates that firms that employ lots of tangible assets seem to rely more on internal funds generated from these assets, which is predicted by the pecking order theory.

The correlation coefficient of -0.2044 between leverage ratio and non-debt tax shield revealed the existence of a negative correlation between leverage ratio and non-debt tax shield. The earnings volatility of the firms with a correlation coefficient of -0.0286 also showed a negative correlation with the leverage ratio. These are consistent with TOT.

The correlation between leverage ratio and growth opportunity was -0.0401. This indicates that as the increment of the total revenue of construction companies increases, their level of leverage ratio decreases. Consistent with this finding; Titman and Wessels (1988), Barclay (1995) and Rajan and Zingales (1995) (cited in Shah& Khan (2007)) all found a negative relationship between growth opportunities and leverage.

There was a positive relationship between the size of the firm and the leverage ratio with a correlation coefficient of 0.4286. This shows that the larger, in terms of total assets, of the construction companies, the higher they were relying on debt financing. This positive relationship between the size of the firm and leverage ratio was also supported by the Trade-off theory.

There was a positive correlation between leverage ratio and the age of the companies with a correlation coefficient of 0.3587. The age of the companies has a positive effect on the leverage ratio of the companies. As the age of the company increases, the cost of borrowing funds for construction companies decreases because as the age of the company increases, they build a reputation and can raise funds at the least cost from any lending institution.

There was a positive correlation between leverage ratio and lending interest rates of commercial banks to the construction companies with a correlation coefficient of 0.0739. This is consistent with the Tradeoff Theory that predicts a positive relationship between interest rate and leverage of firms, in that firms will prefer more debt because an increase in interest rate would highly increase the cost of equity. Similarly, the correlation coefficient between leverage ratio and the Inflation rate is 0.0931 revealing the existence of a positive correlation between leverage ratio and Inflation rate.

The correlation between leverage ratio and GDP growth rate was -0.0500. This indicates that an increment in the economic growth decreases the level of the leverage ratio of the Construction

firms in Ethiopia. This result is consistent with the Pecking Order Theory that suggests an increase in economic activities may reduce the need for leverage.

b- Correlation among Independent Variables

The correlation matrix presented in Table 4.2 shows high correlations between some of the explanatory variables. Among these, the correlation between Non-debt Tax Shields and Tangibility of assets is 0.7933. The reason for this high correlation between non-debt tax shield and tangibility of assets arises due to common use of the total asset in measuring those variables. Non-debt tax shield was measured as a ratio of annual depreciation expense to total assets. Similarly, the Tangibility of Assets was measured as a ratio of total fixed assets to total assets. Therefore, using total assets in measuring both Non-debt tax shield and Tangibility resulted in a high correlation between these two explanatory variables. The other high correlations exist between GDP growth rate and Interest rate, GDP growth rate and Inflation, and Interest rate and Inflation rate with a correlation coefficient of -0.8638, -0.7704, and 0.8714, respectively.

These high correlations indicate that multicollinearity may be a potential problem. Therefore, since multicollinearity is a data problem, the researcher decided to treat it by removing the variables that are found to be strongly correlated. Accordingly, the researcher dropped out the Non-Debt Tax Shield from the independent variables. Moreover, as indicated in the research gap of this paper, no study was conducted to see the effect of Interest rate on leverage of construction firms in Ethiopia. To retain the Interest Rate as an independent variable of the regression, the researcher dropped out both the GDP growth and Inflation rates which were already examined by Tariku (2015) along with eight firm-specific variables to check their impact on the Leverage of construction firms in Ethiopia.

4.1.3. Data Stationery and Unit Root Testing

According to Brooks (2008), a stationary series can be defined as one with a constant mean, constant variance, and constant autocovariance for each given lag. Testing for data stationery or not is essential because if the variables employed in a regression model are non-stationary, then it can be proved that the standard assumptions for asymptotic analysis will not be valid. In other words, the usual t-ratios will not follow a t-distribution, and the F-statistic will not follow an F-distribution, and so on.

In addition, if two stationary variables are generated as independent random series, when one of those variables is regressed on the other, the t-ratio on the slope coefficient would be expected not to be significantly different from zero, and the value of R^2 would be expected to be very low. This seems obvious, for the variables are not related to one another. However, if two variables are trending over time, a regression of one on the other could have a high R^2 even if the two are unrelated. So, if standard regression techniques are applied to non-stationary data, the result could be a regression that looks good under standard measures (significant coefficient estimates and a high R^2), but which is valueless. Such a model would be termed a spurious regression, Brooks (2008).

Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) are used to decide the optimal number of lags in the model. As a Rule-of Thumb, the model with the lowest values of these criteria is the better. As per the table 4.3, the model with 1-lag has the lowest AIC and BIC values so that the optimal lag for the model is 1.

Table: 4.3, Selection Order Criteria

Selection-order criteria
Sample: 3 - 0136, but with gaps Number of obs = 101

lag	df	FPE	AIC	HQIC	BIC
1	144	4.e-127*	-256.952*	-255.317*	-252.913*

Endogenous: LEV PROF LIQ TANG EVOL GROW SIZE AGE INT lagLEV DumID1 DumID17
Exogenous: _cons

Source: Regression output of STATA 14.1

Levin, Lin, and Chu (LLC) (2002) have shown that the use of a unit root test for pooled time-series and cross-sectional (panel) data can significantly increase the power of the test. They developed their method from a multivariate generalization of the ADF test and provided a statistical foundation for panel unit root tests. The following table reports the LLC unit root test result summary for each variable.

Based on the LLC unit root test method the hypothesis is:

H0: panel data has unit root (non-stationary)

H1: panel data has no unit root (stationary)

Table: 4.4, Unit Root Test Results

Variables	T-Statistic	Prob.**	Decision
LEV	-4.7246	0.0000	H0: is rejected at level. Hence, it is stationary
PROF	-6.8273	0.0000	H0: is rejected at level Hence, it is stationary
LIQ	-14.8186	0.0000	H0: is rejected at level. Hence, it is stationary
TANG	-6.6916	0.0000	H0: is rejected at level. Hence, it is stationary
EVOL	-3.5817	0.0002	H0: is rejected at level. Hence, it is stationary
GROW	-9.3552	0.0000	H0: is rejected at level. Hence, it is stationary
SIZE	-4.6459	0.0000	H0: is rejected at level. Hence, it is stationary
AGE		1.0000	H0: is not rejected at level. Hence, it is Non-stationary
INT	-81.1479	0.0000	H0: is rejected at 1st difference. Hence, it is stationary

"** Significant at 1% level except for the age of firm."

(Source: Regression output of STATA 14)

As shown in Table 4.4; the data of seven variables including the dependent variable are stationary at level; the data of one variable has become stationary after 1st difference, and the data for a variable, i.e. Age is non-stationary at all. This is because a single calculated Firm's age for each company is applied for eight consecutive years. It is, therefore, possible to validly undertake hypothesis tests about the regression parameters of this study by using this data, because, the data were stationary except for the age variable because of the above-stated reason.

4.2. Tests for the Classical Linear Regression Model (CLRM) assumptions

The model used in this study is a Classical Linear Regression Model (CLRM) on the basis of previous studies made by Netsanet (2013), Tariku (2015), and Wendwesen (2017) and this equation was believed to capture the essence of the subject under study. Accordingly, diagnostic tests were carried out to ensure that the data fits the basic assumptions of the classical linear regression model. Consequently, the results for model specification tests were presented as follows:

4.2.1. Assumption one:- the errors have zero mean (E (ε) = 0)

The first assumption is the average value of the errors is zero, Brooks (2008). If a constant term is included in the regression equation, this assumption will never be violated. In our case, the

model has a constant term that proves the line did not pass through the origin and the first assumption of CLRM is not violated.

4.2.2. Assumption two:- homoscedasticity (variance of the errors is constant ($Var(u_t) = \sigma^2 < \infty$)

It has been assumed that variance of the errors is constant; this is known as the assumption of homoscedasticity. If the errors do not have a constant variance, they are said to be heteroscedastic. The presence of heteroskedasticity makes ordinary least square estimators inefficient because the estimated variances and covariance of the coefficients (β_i) are biased and inconsistent. Thus, the tests of hypotheses are no longer valid, Brooks (2008).

There are many methods used to test the existence of heteroskedasticity. To test whether there is a presence of heteroscedasticity the researcher used a white test for this study. To do that, the residual square for each observation has been calculated and it was regressed against the explanatory variables. The result finally obtained from the regression is shown below. Table (4.4) presents the White test statistics.

Table 4.5:- White test regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the estimate
1	0.376[a]	0.1415	0.0647	1.6966

a. Predictors:- (Constant), PROF, LIQ, TANG, EVOL, GROW, SIZE, AGE, INT, lagLEV, DumID1, DumID17
b. Dependent variable: - sqr

Source: Regression output of STATA 14.1

Table 4.6:- Chi-Square calculated and tabulated

Test	t-statistic X^2 calculated= nR^2	Chi-square (5% significant level) X2α(P), where p=xi+1
White's test	19.10	21.03

The hypothesis to be tested under the white test of heteroscedasticity is:

H0: Homoscedasticity

H1: Heteroscedasticity

According to the white test, if the Chi-square value obtained in the white test (i.e.X^2 calculated) exceeds the value obtained from the Chi-square table at a 5% significant level (i.e. X^2 tabulated), then we have to reject the null hypothesis of no heteroscedasticity, otherwise, we fail to reject the null hypothesis.

The t-statistic (Chi-square Calculated) from table 4.6 is 19.10 which is less than Chi-square tabulated at the 5% significant level, 21.03 (i.e. 19.10<21.03). Thus, we fail to reject the null hypothesis of no heteroscedasticity. This result indicates that there is no evidence for the presence of heteroskedasticity.

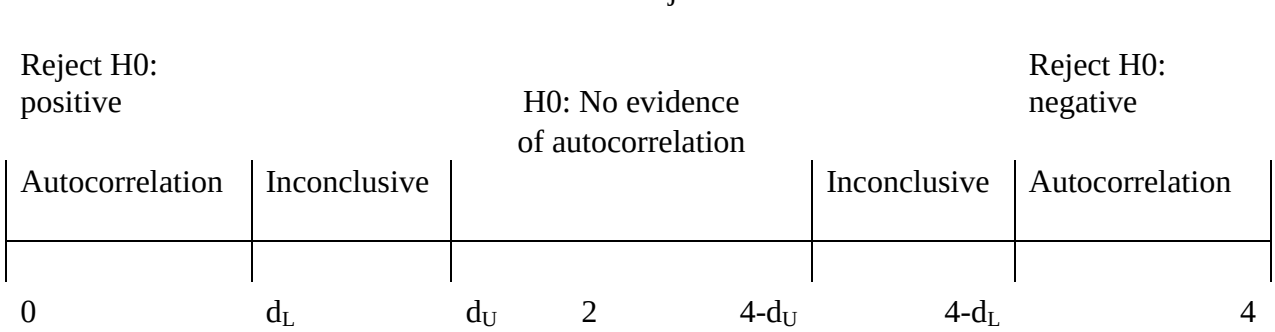
4.2.3. Assumption three: - covariance between the error terms over time is zero (cov $(u_t, u_j) = 0$)

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 autocorrelated or serially correlated. The Durbin-Watson test for serial correlation assumes that errors are stationary and normally distributed with a 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 (lagLEV) is used in this research to adjust the autocorrelation.

If this null hypothesis is rejected, it would be concluded that there is evidence of a relationship between successive residuals, which implies the least-squares estimate suboptimal, standard confidence intervals for betas are incorrect, and the error term is expectable. According to Brooks (2008), DW has two critical values: an upper critical value (d_U) and a lower critical value

(d_L), and there is also an intermediate region where the null hypothesis of no autocorrelation cannot be rejected. The rejection, non-rejection, and inconclusive regions are shown on the number line in figure 4.1 below.

Figure 4.1 Rejection and Non-Rejection Regions for DW Test



Source: Brooks (2008)

The study used the d_L and d_U values for 135 observations as an approximation of 100 observations. As per the Durbin-Watson test (DW) table for 135 observations with 11 explanatory variables at the 1% level of significance, the d_L and d_U values are 1.314 and 1.790, respectively. The DW value for the model and 135 observations is 2.011. The relevant critical values for the test are d_L= 1.314, d_U = 1.790, and 4 - d_U = 4 - 1.790 = 2.210; 4 - d_L = 4 - 1.314 = 2.686. Accordingly, the Durbin-Watson test value 2.010 is clearly between 1.816 and 2.210 and the DW value lies in the non-rejection region. Hence, the above figure shows that the DW is between D_U and 4 - D_U, which implies do not reject Ho since there is no evidence of autocorrelation and errors are independent of each other.

In addition, another test called the Serial Correlation LM Test also managed to validate the result of the DW test result. The 1-lag Breusch-Godfrey Serial Correlation LM Test results as indicated in Table 4.6 shows that the P-values of F-statistic and Obs*R-squared are greater than 0.05. Hence, the null hypothesis is not rejected and no significant residual autocorrelation is presumed.

Table 4.7:- Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.782	Prob. F(1,132)	0.1845
Obs*R-squared	2.841	Prob. Chi-Square(1)	0.0919

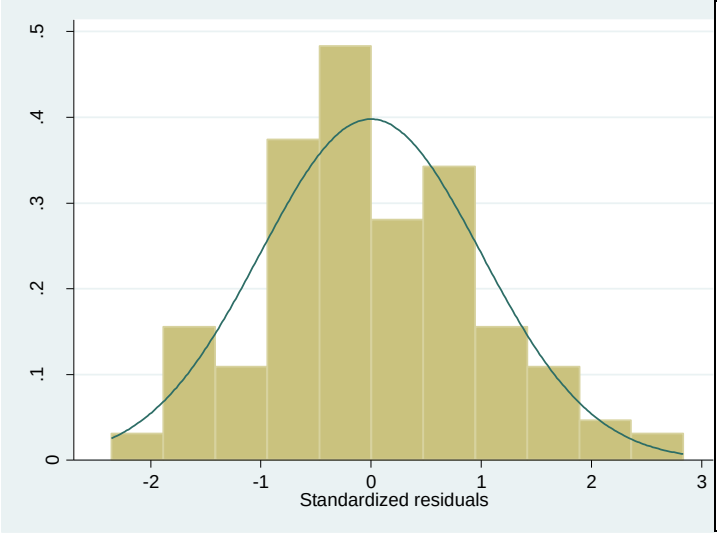
Source; computed from STATA 14 result

In the above table, the output of STATA 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 there is no autocorrelation. This is because p-values of F-statistic and Obs*Rsquared are greater than 5%.

4.2.4. Assumption Four:- Normality (Errors Are Normally distributed ($T \sim N(0, \infty 2)$)

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 3 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 to reject the null of normality hypothesis at the 5% level. Observations 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 (DumID1 and DumID17) to adjust the normality distribution. It tests the null hypothesis Ho that the error terms are normally distributed against the alternative hypothesis H1 that the error terms are not normally distributed.

Figure 4.2 Normality Test



Series:	**standardized residuals**
Sample:	2013 - 2020
Observations:	136
Mean	-0.0026225
Median	-0.1241012
Maximum	2.834642
Minimum	-2.357293
Std. Dev.	1.002731
Skewness	0.2804258
Kurtosis	2.933322
Jarque-Bera	1.808
Probability	0.405

From the Figure 4.2, we can conclude that the data is normally distributed. That is, the coefficient of kurtosis is close to 3, skewness is zero, and the Bera-Jarque statistic has a P-value of 0.405 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 the 5% significance level.

4.2.5. Assumption five:- Multicollinearity Test

The fifth important diagnostic test conducted in this study is the multicollinearity test and it is used to identify the correlation between explanatory variables and to avoid the 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 is no relationship between the explanatory variables, they would be said to be orthogonal to one another. If the explanatory variables are 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 exist.

As it is indicated in Table 4.2, there is a high correlation between independent variables such as Tangibility with Non-debt Tax shield with a coefficient of 0.80; and also between GDP growth

rate and Interest rate, as well as the Interest rate and Inflation rate with a correlation coefficient of -0.8638 and 0.8714, respectively.

These high correlations indicated that multicollinearity may be a potential problem. Hence, an alternative method should be employed to rectify the presence of multicollinearity among independent variables. According to Shiu (2004), dropping one of the two highly correlated variables is a possible remedy for multicollinearity in the model.

Therefore, since multicollinearity is a data problem, the researcher decided to make the treatment by removing the variables that are found to be strongly correlated. Accordingly, the researcher dropped the Non-Debt Tax Shield from the independent variables. Moreover, as indicated in the research gap of this paper, no study was conducted to see the effect of Interest rate on leverage of construction firms in Ethiopia. To retain the Interest Rate as an independent variable of the regression, the researcher dropped both the GDP growth and Inflation rates which were already examined by Tariku (2015) along with eight firm-specific variables to check their impact on the Leverage of construction firms in Ethiopia. Hence, after dropping the Non-debt Tax Shield, GDP growth rate, and Inflation rate, the result is as shown below.

Table 4.8:- Correlation Matrix between independent variables

	PROF	LIQ	TANG	EVOL	GROW	SIZE	AGE	INT
PROF	1.0000							
LIQ	0.4588	1.0000						
TANG	0.0321	-0.0106	1.0000					
EVOL	0.0961	0.0347	-0.0261	1.0000				
GROW	0.1651	-0.0553	-0.1482	0.1014	1.0000			
SIZE	-0.4747	-0.2238	-0.1567	-0.0233	-0.0733	1.0000		
AGE	-0.1909	-0.0769	-0.2895	-0.1523	-0.0894	-0.0883	1.0000	
INT	-0.2410	0.0832	0.0071	0.0237	-0.2024	0.3067	0.0000	1.0000

The researcher also measured the presence of multicollinearity by checking the Tolerance and Variance Inflation Factor (VIF) of the independent variables. The tolerance value is the amount of an independent variable‘s predictive ability that is not predicted by the other independent variables in the equation, Hair (2006). A variance with a very low Tolerance contributes little information to a model, and also causes a computational problem. Variance Inflation Factor (VIF) is the other indicator of multicollinearity and it is the reciprocal of the Tolerance. If the

VIF is low, there is no evidence for the presence of multicollinearity. But as the VIF increase, the variance of the regression coefficient is high and making it an unstable estimate. If there is a high VIF value, it is an indication of multicollinearity and therefore, it needs further investigation.

As a conventional rule, a small value of tolerance is an indication that a predictor is redundant. Accordingly, a variable whose tolerance value is less than 0.10 and VIF value greater than 10 may need further investigation.

Table 4.9:- Multicolliniarity statistics

Variable	VIF	Tolerance = 1/VIF
PROF	1.77	0.564
SIZE	1.51	0.661
LIQ	1.36	0.734
AGE	1.26	0.791
INT	1.21	0.823
TANG	1.21	0.827
GROW	1.12	0.890
EVOL	1.04	0.958
Mean VIF	1.31	

As shown in Table 4.9; there is no variable with a value of tolerance less than 0.10 and whose VIF value is greater than 10. This means that after dropping the above-listed variables, there is no more evidence for the presence of multicollinearity among independent variables.

4.3. Regression analysis and discussion on the results

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

The results so far indicated that all CLRM assumptions aren't violated. So, the ordinary least square regression can be safely applied.

In panel data, there are three models; namely, pooled OLS regression model, random effect model (RE) and fixed effect (FE) or LSDV model. Under the pooled OLS regression model all observations are put together and OLS regressions were run by neglecting the cross-section and time serious nature of the data. The major problem of this model is that it does not distinguish between various companies included in the study. In other word, by pooling all the observations it denies the heterogeneity or individuality that may exists among companies.

Whereas fixed effect model allows the heterogeneity or individuality that may exist among companies by allowing each company to have its own intercept value which is time invariant, Wooldridge (2010).

To determine the kind of estimation (model) in panel data, different tests are used. In this study to know which model (random effect, fixed effect and pooled), is suitable for the given data, the researcher used Haussmann test and Breusch-Pagan-Godfrey LM test. A classical application of the Haussmann test for panel data is to compare the fixed and the random effects models whereas Breusch-pagan LM test is used to compare random effect to pooled regression models.

Based on Haussmann test: the hypothesis is;

H0: Random effect model is appropriate

H1: Fixed effect model is appropriate

Table: 4.10 Haussmann test

Test Summary	Chi-Sq. statistic	Chi-Sq. d.f.	Prob.
Cross-section random	70.4	8	0.0000

Source: Regression output of STATA 14.1

Based on the test result the p-value is very small (0%) therefore, we can reject null hypothesis which states Radom effect model is appropriate.

However, Brooks (2008) mentioned the distinctive features of RE and FE models. According to him, the random effect model is more appropriate when the entities (in this case construction companies) in the sample can be thought of as having been randomly selected from the population but a fixed effect model is more plausible when the entities in the sample effectively constitute the entire population. Additionally, Brook (2008) stated two basic importance of panel random effect estimation. The first one is the transformation involved in the GLS procedure under the random effect approach will not remove the explanatory variables that do not vary over time; i.e. the firm's age in our case, and hence their impact on y_{it} can be enumerated. And the other one is since there are fewer parameters to be estimated with the random effect model and therefore degrees of freedom are saved, the random effect model should produce a more efficient

estimation than the fixed effect approach. Moreover, random effects model is appropriate if number of cross sections is larger than the time period observations. If the assumptions underlying random effects model hold, random effect estimators are more efficient than fixed effect estimators (Gujarati, 2004). In this study the cross section is larger, i.e. 17 than the time period, i.e. 8. Therefore, because of the sampling procedure adopted for the study and the aforementioned importance, panel random estimation has been used for this study in contrary to the Haussmann test result.

Again to know whether this random effect model is appropriate or not, it is necessary to double-check against the pooled regression model by using the Breusch-Pagan-Godfrey LM test. The test result is presented in table (4.11) below:

Under the Breusch-Pagan-Godfrey LM tests, the hypothesis to be tested is:

H0: Pooled regression model is appropriate

H1: Random effect model is appropriate

Table: 4.11:- Breusch-Pagan-Godfrey LM tests

Breusch- Pagan LM Test for random effect model

$chibar^2(01)$	33.24	Prob> $chibar^2$	0.0000

Source: Regression output of STATA 14.1

The result in Table (4.11) revealed that we can reject the null hypothesis because the p-value is very small i.e. 0%. This suggested that the random effect model is appropriate. Thus, both Brooks and Breusch-Pagan's tests are telling that the random effect model is the best model to represent this data. Therefore, the final estimation method used in this research is Random effect Panel Regression.

4.3.2. Regression analysis

Summary of the regression results from the STATA output is presented in Table (4.12) below, from that the detailed analysis and discussion of the results are given.

Table: 4.12:- Random effect panel regression model result

LEV	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
PROF	-0.6002565	0.0936641	-6.41	0.0000*	-0.7838347	-0.4166783
LIQ	-0.0780503	0.0161254	-4.84	0.0000*	-0.1096555	-0.0464451
TANG	-0.1873851	0.0495349	-3.78	0.0000*	-0.2844717	-0.0902985
EVOL	0.0029428	0.007438	0.4	0.6920	-0.0116353	0.0175209
GROW	0.0143309	0.0196092	0.73	0.4650	-0.0241024	0.0527643
SIZE	0.0168645	0.0099867	1.69	0.0910***	-0.0027092	0.0364382
AGE	0.0246309	0.0113085	2.18	0.0290**	0.0024667	0.0467952
INT	-0.4755315	0.9002751	-0.53	0.5970	-2.240038	1.288975
lagLEV	0.2563719	0.0442998	5.79	0.0000	0.1695459	0.3431978
DumID1	-0.0414613	0.0567834	-0.73	0.4650	-0.1527547	0.0698321
DumID17	-0.0151823	0.0606975	-0.25	0.8020	-0.1341473	0.1037827
cons	0.1148745	0.2795974	0.41	0.6810	-0.4331264	0.6628754

Effects of Specification

R-squared	0.8572	Mean of Dependent var.	0.7176
Adj. R-squared	0.8444	S.D. Dependent var.	0.2170
S.E. of regression	0.08585	Akaike Info. Criterion (AIC)	-256.952
Sum Squared resid.	0.90663565	Hannan-Quinn Criterion	-255.317
F-statistic	67.1	Bayesian Info. Criterion (BIC)	-252.913
Prob.(F-Statistic)	0.000	Durbin-Watson stat	2.010105

***, **and * indicate that significant at 10%, 5% and 1% significance level respectively.

Source: Regression output of STATA 14.1

According to Table 4.12, Profitability, Liquidity and Tangibility were found to be statistically significant at 1% level with p-value of 0.0000 and negatively associated with Leverage. The result also showed that a Firm's Age had a significantly positive relationship at 5% level having a p-value of 0.0290 with Leverage. In addition, the Firm's Size had a positive and statistically significant influence on the Leverage of Construction firms in Addis Ababa, Ethiopia at 10% significance level.

On the other hand, the regression result showed that Earning Volatility, Growth Opportunity, and Interest rate were not statistically significant variables on the Leverage of Construction firms in Addis Ababa, Ethiopia. This implies that variations in these variables do not affect the Leverage as per the model.

From the above regression result of the Random effect model, it would be observed that the coefficients of determination, i.e. R-squared and Adjusted R-squared were 85.7% and 84.4%, respectively. This implies that more than 84% of the change in leverage is successfully explained by the selected firm-specific factors (Profitability, liquidity, tangibility, growth opportunity, earnings volatility, size, and age) and the macroeconomic factor (Interest rate) or independent variables included in the model. However, the remaining 15.6% changes in leverage were caused by other factors that were not included in the model. Moreover, the overall test of F statistics showed that the model was fit enough and statistically significant at 1% level (i.e. p-value = 0.0000).

Regarding the adequacy of the model which is measured by the standard error of the model, the result revealed that the Standard Error of Regression (SER) is 8.6% which is considered good enough to confirm the predictive power of the model. Furthermore, the observed value of DW = 2.010 which is approximately 2.00, revealed that there is no serial correlation in the regression results. Therefore, the model is the best model for policy-making purposes.

4.3.3. 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 variable based on the Random effect regression results indicated in Table 4.12. In addition, the discussion analyzes the statistical findings of the study in comparison with the previous empirical evidence. Hence, the following discussion presents the relationship between explanatory variables and Leverage.

a- Profitability

The regression result in Table 4.12 exhibited that profitability is negatively and strongly related to debt ratio (leverage). This is in line with Pecking Order Theory; in that profitable firms initially rely on internally generated funds and subsequently look for external sources if additional funds are needed. According to the result, one birr change (increase or decrease) in construction companies' Profitability keeping other things constant had a change of 0.60 birr on the Debt ratio in the opposite direction. The result is consistent with the hypothesis of the study. This suggests that profitable firms have a preference for inside financing over outside debt financing. This negative relation between Profitability and Leverage found in this study confirmed the findings of Amanuel (2011), Fisseha and Lavanya (2012), Netsanet (2013),

Usman (2013), Tariku (2015), Daniel (2015), Wendwesen (2017), Ahmed (2017), Gebreyes (2018), Daniel (2021), and Merkin (2021).

b- Liquidity

A significantly negative relationship was found between liquidity and leverage in this study which is in line with the Pecking Order Theory that implies more liquid firms tend to use less debt in their financing. According to the analysis, one birr change (increase or decrease) in construction companies' Liquidity keeping other things constant had a change of 0.08birr on the Debt ratio in the opposite direction. The result is consistent with the hypothesis of the study. This suggests that firms with more liquidity required less debt finance. Moreover, liquid firms have relatively more internal funds and the pecking-order theory assumes that these internal funds are used first when financing is needed. This means firms that have accumulated high capital reserves seem to be willing to employ the same to fund new investments before going to external financing. This is consistent with the work of Netsanet (2013), Tariku (2015), Daniel (2015), Wendwesen (2017), and Daniel (2021).

c- Asset Tangibility

In contrary to the research hypothesis, the regression result in Table 4.12 exhibited a strong negative relationship between tangibility and leverage of the firm. This is again in line with Pecking Order Theory; in that fixed assets do not necessarily help as collateral during financial distress. Firms with a high composition of non-current assets are less likely to issue debt because high tangible assets serve as a buffer to asymmetric information problems. Besides, the negative relationship between leverage and asset structure indicates that firms that employ lots of tangible assets seem to rely more on internal funds generated from these assets.

The panel random effect estimation result, in this study, implies that every 1 birr change (increase or decrease) in construction companies' fixed asset keeping other things constant had a change of 0.19birr on the Debt ratio in the opposite direction. This means that a construction company with a high ratio of fixed assets to the total asset has a low leverage ratio. This negative relation between Tangibility and Leverage confirmed the findings of Amanuel (2011), Daniel (2015), Wendwesen (2017), Gebreyes (2018), and Merkin (2021).

d- Earning Volatility

Initially, Earning Volatility variable represented with the absolute value of change in earnings before interest and tax (EBIT) were expected to influence the Leverage of firms in the Ethiopian

construction sector, negatively. However, the random effect regression result as presented in Table 4.12 showed oppositely that Earning Volatility variable was found to have an insignificant positive impact on the dependent variable with a regression coefficient of 0.003, t- statistic 0.4, and P-value 0.692. So; the result is not consistent with the hypothesis which states that earning volatility has a negative and significant effect on the Leverage of Construction firms in Addis Ababa.

Although it is statistically insignificant, it can be concluded from the result that large construction companies with the high volatility of earnings have a high leverage ratio and this finding is consistent with the Pecking Order Theory. This implies that firms with more earning volatility were more leveraged than firms with less volatility in the Ethiopian Construction sector. This means, the Ethiopian construction firms with volatile earnings tend to rely more on debt than equity. From an empirical perspective, this finding is similar to the findings of previous studies of Saddam (2014), Daniel (2021, and Merkin (2021).

e- Growth Opportunity

Based on the theoretical views as well as previous empirical studies, the researcher predicted and hypothesized the growth opportunity variable to have a significant positive relationship with the dependent variable, leverage. As shown in Table 4.12, the random effect regression model predicted the existence of a positive relationship between the growth opportunity and leverage as expected but insignificant with a regression coefficient of 0.014, t-statistic 0.73, and P-value 0.465. In other words, the growth opportunity had no significant influence on the capital structure decision of construction firms in Ethiopia. The positive coefficient of growth opportunity was consistent with Pecking Order Theory but not statistically significant. This finding is consistent with prior empirical findings of Netsanet (2013), Saddam (2014), Tariku (2015), Daniel (2015), Gebreyes (2018), and Daniel (2021).

f- Firm’s Size

As shown in Table 4.12, the random effect regression model predicted a positive relationship between the firm's size and leverage. The coefficient of size was 0.0169 at 10% significant level with a p-value of 0.0910, as expected and hypothesized in the study. Thus, larger construction firms were more leveraged than those smaller size firms in Ethiopia under the study period. This indicated that the larger size construction firms use more debt as a source of finance than equity.

This is consistent with the trade-off theory, in that large firms will have more debt than small firms since larger firms are more diversified and have a lower risk of default, Frank and Goyal (2005). Besides the theoretical support, this finding is in line with previous empirical studies by Fisseha and Lavanya (2012), Usman (2013), Saddam (2014), Tariku (2015), Gebreyes (2018), Daniel (2021), and Merkin (2021).

g- Age of the Firm

According to the hypothesis, it was expected that the firm's age and leverage of the Ethiopian Construction firms have a significant positive relationship. In line with the hypothesis and Tradeoff Theory, the random effect regression result shown in table 4.12 indicated that the firm's age variable had a significant positive impact on leverage at 5% level with a coefficient of 0.0246 and a p-value of 0.0290. This finding can be interpreted as more firms stay in business, more likely they become known and mature thus they can easily raise more debt. During the study period, older firms in the Ethiopian construction sector utilized more debt as a source of finance than equity as compared to their younger counterparts. This finding is consistent with empirical research by Amanuel (2011), Usman (2013), Saddam (2014), and Tariku (2015).

h- Interest Rate

According to the hypothesis, it was expected that the interest rate variable as measured by the Nominal lending rate of commercial banks and leverage of the Ethiopian Construction firms have a significant positive relationship. However, as it is shown in table 4.12, the random effect estimation result predicted an insignificant negative relationship of interest rate with leverage having a regression coefficient of -0.4755, t- statistic -0.53, and P-value 0.5970. The result is not consistent with the hypothesis of the study. The negative insignificant coefficient of interest rate is in line with Pecking Order Theory's prediction of an inverse relationship with leverage but with no effect. This finding is consistent with the previous study by Ahmed (2017). And also, Saddam (2014) confirmed that interest rate has an insignificant effect on leverage even though their relationship was positive.

4.4. Comparison of the regression results with expectations

Table 4.13 presents the comparison of the regression results for the Ethiopian construction companies with the expected sign of the study and prediction of the theory.

Table: 4.13:- Comparison of the test result and expected sign of the study

Determinants	**Predicted signs by theories**	**The Expected outcome of the paper**	**Actual Test Result for Ethiopian Construction firms**
Profitability	+(TOT) -(POT)	-	- significant (POT)
Liquidity	+ (TOT) -(POT)	-	- significant (POT)
Asset's Tangibility	+ (TOT) -(POT)	+	- significant (POT)
Firm's Size	+ (TOT) -(POT)	+	+ significant (TOT)
Earning volatility	+ (POT) - (TOT)	-	+ Insignificant (POT)
Growth Opportunity	+ (POT) - (TOT)	+	+ insignificant (POT)
Firm's age	+ (TOT) -(POT)	+	+ significant (TOT)
Interest Rate	+ (TOT) -(POT)	+	- Insignificant (POT)

Hence, as shown in Table 4.13, the expected results of the study were the same as the actual test results of the regression output except for the three variables: namely, Asset's Tangibility, Earning Volatility, and Interest rate. Moreover, the estimated model showed that the Pecking Order theory explains more the variations in the capital structure of the Ethiopian construction industry.

So, the estimated model is as written below.

$LEV_{it} = 0.115 - 0.600\ PROF_{it} - 0.078\ LIQ_{it} - 0.187\ TANG_{it} + 0.003\ EVOL_{it} + 0.014\ GROW_{it} + 0.017\ SIZE_{it} + 0.025\ AGE_{it} - 0.476\ INT_{it}$

CHAPTER FIVE

5. CONCLUSIONS AND RECOMMENDATIONS

The preceding chapter analyzed and discussed the major findings of the study. Consequently, conclusions are presented in this final chapter of the paper, based on the results found and suggested possible recommendations for the concerned bodies.

5.1. Conclusions

The capital structure of a firm is a mixture of various types of equity and debt capital a firm maintained resulting from the firm financing decisions. Capital structure has an impact on wealth maximization as well as the ability of a firm to sustain itself in a competitive market. Capital structure decisions involve deciding the debt level and equity amount to use to attain the optimal capital structure.

Capital structure has attracted intense debate in the financial management arena for nearly half a century. The basic question of whether a unique combination of debt and equity capital maximizes firm value, and if so, what factors determine a firm‘s optimal capital structure has been the subject of frequent debate in the capital structure literature. Following the stepping stonework of Modigliani and Miller (1958), plenty of theoretical and empirical works have been conducted about capital structure in general and regarding its determinant factors in particular. However, those theoretical and empirical works were almost contrary to each other. Most of the literature seeks the nature of relations between the capital structure and the firm-specific characteristics as well as country-specific factors in developed economies and developing countries. Unfortunately, Ethiopia, as an emerging market, has rarely been the subject of research in this field.

Concerning the theoretical works, the researcher reviewed Capital Structure Irrelevancy Theory (Modigliani-Miller Theorem), the tradeoff theory, the pecking order theory, and the agency cost theory. More specifically, among the theories of capital structure reviewed, the tradeoff and pecking order theories are the most powerful contenders with the tremendous support of empirical literature. Consequently, explanatory variables (including their signs) of this study were selected based on tradeoff and pecking order theories as well as the findings from the majority of previous empirical studies on capital structure determinants.

The general objective of this study was to examine firm-specific (i.e. Profitability, Liquidity, Asset's Tangibility, Firm's size, Non-debt tax shield, Earning Volatility, Growth Opportunity, Age of the Firm) and macroeconomic (i.e. GDP growth rate, interest rate, and Inflation) factors' impact on financing decision of construction firms in Ethiopia thereby to identify prominent theory for construction sector of the country. To achieve such objectives, the researcher used a quantitative research approach selecting 17 No. construction firms as a sample. The nature of data used by this study was panel data mainly composed of financial statements of sample construction firms as collected from the Ministry of Revenue (MoR) and macroeconomic data collected from the National Bank of Ethiopia over the period between 2013 – 2020, inclusive.

For analysis purposes, descriptive statistics and random effect multiple regression were used. The researcher regressed firm-specific variables (i.e. Profitability, Liquidity, Asset's Tangibility, Firm size, Earning Volatility, Growth Opportunity, and Age of the Firm) and macroeconomic (i.e. Interest rate) against the dependent variable as measured by total debt ratio.

To examine this relationship and thereby to find out significant factors that affect the capital structure decision of Ethiopian construction firms, the researcher employed the Random effect model of panel estimation with the help of STATA 14 software package. So, based on Random effect model estimation, the researcher found out the following relationship of firm-specific plus macroeconomic factors on the dependent variable.

- Profitability, as represented by return on asset (i.e. EBIT/total asset), was found to have a negative and statistically significant at 1% level relationship with leverage of the Ethiopian construction firms. In other words, the Ethiopian construction firms having more profit preferred to finance their business through internal sources of finance rather than debt. The result of this study is consistent with the Pecking Order Theory that suggests profitable firms prefer internal financing to external financing.

- Liquidity as represented by the ratio of the current asset to current liability was found to have a negative and statistically significant at 1% level relationship with leverage of the Ethiopian construction firms. In other words, the more liquid firms in the Ethiopian construction industry preferred to finance their business through internal sources of finance rather than debt. The result of this study is consistent with the Pecking Order Theory that suggests more liquid firms prefer internal financing than external financing.

- Asset Tangibility as represented by the ratio of fixed asset to total asset was found to have a negative and statistically significant at 1% level relationship with leverage of the Ethiopian construction firms. In other words, Firms with a high composition of non-current assets are less likely to issue debt because high tangible assets serve as a buffer to asymmetric information problems. The result of this study is consistent with the Pecking Order Theory that suggests tangible assets do not necessarily help as collateral during financial distress. Besides, the negative relationship between leverage and asset structure indicates that firms that employ lots of tangible assets seem to rely more on internal funds generated from these assets.

- Size of the construction companies as represented by the natural logarithm of their total asset has a positive and statistically significant at 10% level relationship with their leverage. The result indicates that large-sized construction companies need more debt financing than small-sized construction companies. The result of this study is consistent with the Tradeoff Theory that suggests larger construction firms are more diversified, have greater access to debt markets, and are less prone to bankruptcy than smaller firms. So, larger firms are highly relied on external funds to finance their operation.

- Age of the construction companies as measured by the number of years since its establishment has a positive and statistically significant at 5% level relationship with the leverage of the Ethiopian construction firms. The result indicates that the more firms stay in business, the more likely they become known and mature thus they can easily raise more debt. The result of this study is consistent with the Tradeoff Theory that suggests as a firm operates for a longer period; it establishes a reputation and increases its capacity to take more debt from any lender. So, older firms are highly relied on external funds to finance their operation.

- The rest three variables; namely, Earning Volatility, Growth Opportunity, and Interest rate were found to have an insignificant relationship with the dependent variable. In a more specific manner, Earning Volatility and Growth Opportunity were found to have a positive but insignificant relationship with the leverage of construction firms in Ethiopia. On the other hand, the macroeconomic variable, i.e. Interest rate was found to relate negatively and insignificantly with the debt level of the Ethiopian construction firms. This implies that when a higher interest rate exists in the country, the Ethiopian construction firms prefer to finance their firm through internal financing rather than debt, which is consistent with the pecking order theory.

- The three out of five statistically significant firm-specific determinants; namely, profitability, liquidity, and Tangibility supported the prediction of the Pecking Order Theory while the other two significant firm-specific determinants; namely, the Firm's Size and Age supported the prediction of Trade-off theory. All the insignificant variables including the two firm-specific (i.e. Earning Volatility and Growth Opportunity) and the macroeconomic factor, i.e. Interest rate support the prediction of Pecking Order theory. These imply that the Pecking Order Theory appears to be dominant in the Ethiopian construction industry capital structure decision. Thus, the findings of the study suggested that some of the insights from the modern finance theory were portable to Ethiopia in that certain firm-specific factors that were relevant for explaining capital structure in the developed countries were also relevant in the Ethiopian context.

This study also found out that firm-specific factors are significant factors influencing the capital structure decision of construction companies in Ethiopia, as compared to the macroeconomic condition which was insignificantly associated with firm leverage.

To conclude, based on the regression results; profitability, Liquidity, Asset Tangibility, firm's size, and age variables were found to be significant factors that have affected capital structure decision (as represented by leverage) of the Ethiopian construction firms. It is confirmed that the Pecking order theory is found to be the most influential prominent theory for the firms than Trade-off theory in the context of the Ethiopian construction sector. Hence, knowing these factors could help a financial manager to predict the financial pattern of a firm.

5.2. Recommendations

The results of this study have brought some insights into the capital structure of the Ethiopian construction firms. From the viewpoint of the determinants of capital structure, the findings of this study would assist in establishing financial policy guidelines that will mitigate financial risks in various firms. Similarly, given the outcome of this study, the model used in this study could be used as a basis in formulating debt-equity policy in Ethiopia that will maximize the wealth of shareholders and increase the value of firms. As per the study results and conclusions presented in the preceding sections, the researcher made the following recommendations.

- Among the explanatory variables that were used for this study; profitability, Liquidity, Asset's Tangibility, Firm Size, and Age were the significant factors that can influence firms' financing decisions in the Ethiopian construction sector. Accordingly; managers,

shareholders, and investors of the construction industry in Ethiopia are recommended to carefully ascertain and properly measure the impact of those significant variables on the leverage in order to set the best possible mix of debt and equity that maximums their value and achieve an optimal capital structure.

- Based on the regression results found, among the major theories of capital structure, the Pecking order theory appeared as a prominent and most influential theory for the Ethiopian construction sector. It is therefore important for the company‘s policy to be directed at improving the information environment. This is why; the theory is designed to minimize the inefficiencies in the firms' financing decisions due to the asymmetry of information. Simultaneously firms, especially construction companies, were expected to maintain accurate and proper records which disclose their true status to the public.
- The Trade-off theory suggested that firms have an optimal debt ratio, which is determined by trading off the benefit of debt financing with its cost and expected to maximize the value of the firm. But most of the results of this study are consistent with what Pecking Order theory suggests. Therefore, from this, it can be concluded that construction companies in Ethiopia are not in a position to trade off the benefits of debt financing and its cost, and in turn, they may not maintain the optimum debt ratio (leverage ratio), which can increase the value of the firm. Thus, to minimize the possible financial distress and failure for bankruptcy and in turn, maximize the value of the firm, construction companies in Ethiopia should finance their operation based on Trading off the benefits of debt financing with its cost.
- As per the results of descriptive statistics, Construction Companies are highly dependent on debt financing to cover their huge financial need. In reality, tangible assets are important determinants of capital structure to collateralize debt financing and are commonly assumed to be positively correlated with leverage. However, the results of this research showed that tangible assets are negatively correlated with the total leverage ratio. Hence, for detailed investigation and to get better results, future researchers may study the impact of tangibility on different measures of leverage, i.e. long-term debt and short-term debt ratios of the construction firms in Ethiopia.
- Large construction companies obtained from the Ministry of Revenue (MoR) registered as large taxpayers are selected for this study. Although this study mainly focuses on

those of large construction companies, it cannot represent the entire population, i.e. small, medium and large construction companies in Addis Ababa. Therefore, for comprehensive investigation and to get better results, future researchers may cover the entire population (small, medium, and large construction companies) and increase the sample size.

- In addition, the period covered under this study is only 8 years ranging from 2013 to 2020, due to the unavailability of organized data for a longer period. Thus, future researchers could extend this period in examining the determinants of capital structure decisions of construction companies over a longer time and can produce more reliable and better results.

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