The Determinants of Financial Pattern: Evidence from Construction Companies in Addis Ababa; Ethiopia

A Thesis Submitted to the Department of Accounting and Finance, College of Business and Economics

Presented in the Partial Fulfillment of the Requirement for Master's Degree in Accounting and Finance

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Abstract

Capital structure has attracted intense debate in the financial management arena for nearly half-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 have been the subject of frequent debate in the capital structure literature. This paper examines empirically the problem of Construction Companies, capital structure decisions using firm-level panel data with the aim of identifying what determines both externally as well as internally the capital structure of Ethiopian construction industry? And to understand which of the capital structure theories are appealing to them? To do this, 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 were taken from the population of 266 companies by using simple random sampling and secondary data (Panel data i.e. which embodies information across both time and space.) was collected through structured record review from audited financial statements of selected companies for the period of six years (2001-2006EC). And the collected data would be analyzed on quantitative basis through multiple regressions by using Eviews6 software packages. The panel random effect estimation result revealed that, debt ratio (leverage) have: a positive relation, with asset tangibility, growth opportunity, and size of the firm. But, have a negative relation, with profitability, liquidity and risk (earning volatility). However, 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. From the view point of the determinants of capital structure, the findings of this study would assist in establishing financial policy guidelines that will mitigate financial risk in the various firms. Therefore, it is recommended that in carrying out their debt financing decision, the financial managers of Construction Companies, should ascertain and properly measure those significant variables in order to have an optimum financing mix for their firms.

Keywords: Capital Structure, Determinants of Capital Structure, Construction Company, pecking order theory, trade of theory, MM theory, and agency cost theory

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Acronyms and Abbreviations

EEA …….Ethiopian Economic Association

ERCA…… Ethiopian Revenue and Custom Authority

FDRE……Federal Democratic Republic of Ethiopia

GDP……... Growth domestic product

ISIC……. International Standards Industrial Classification

JB……. Jargue-Bera

MM……...Modigliani and Miller theory

MoFED…….. Ministry of Finance and Economic Development

POT……....Pecking Order Theory

TOT…… Trade off Theory

UCBP…… University Capacity Building Program

UN…… United Nations

UNEP……United Nations Environmental Program

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Statement of declaration

I, the undersigned, declare that this thesis entitled ―Determinants of financial patterns of Construction companies in Addis Ababa, Ethiopia" is my original work, has not been presented for a degree in any other university and that all sources of materials used for the thesis have been appropriately acknowledged.

Declared by:

Name: *T*ariku *G*erito *D*enbelo

Signature: _____

Date: _____

Certification

This is to certify that *T*ariku *G*erito has carried out this research work on the topic entitled –D~~d~~eterminants of financial patterns of Construction companies in Addis Ababa, Ethiopia" under my supervision. This work is original in nature and it is sufficient for submission for the partial fulfillment for the award of *M*Sc. *D*egree in *A*ccounting and *F*inance.

***A*dvisor:** *V*enkati *P*. (*P*hD):_____

Chapter one

1. Introduction

1.1. Background of the study

This part of the paper presents brief overview of the construction industry, the role of construction industry in an economy and financing of the construction industry in the first section and then goes to the capital structure issues in the second part.

1.1.1. Overview of Construction Industry

According to UN report of (1996), International Standards Industrial Classification (ISIC), Rev. 3, construction is defined generally as 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, etc. The 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 industry includes all activities of construction irrespective of whether they are carried out by private or public construction firms, whether done on a contractual basis or of own account.

In the case of Ethiopia, although the definition adopted by the National Accounts department of MOFED is the same as that of ISIC, the activities actually 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, ware houses, 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]. In principle, activities undertaken by the construction industry which do not fall under the industry such as the quarrying of stone, gravel crushing, and manufacturing of bricks, are not part of the industry‘s production and hence should, if possible, be allocated to separate group of economic activities. This, however, would not be possible in most cases and hence such output is also included in the construction sector [MoFED, report, 2005].

1.1.2. The Role of the Construction Industry in an Economy

Construction industry makes significant contributions to the socio-economic development process of a country. Its importance emanates largely from the direct and indirect impact it has on all economic activities. It contributes to the national output and stimulates the growth of other sectors through a complex system of linkages. Ethiopian Economic Association (EEA) report (2006)

It is noted that about one-tenth of the global economy is dedicated to constructing and operating homes and offices (UNEP, report, 1996). UNEP further observes that the industry consumes one-sixth to one half of the world‘s wood, minerals, water and energy. It contributes to employment and creates income for the population and has multiplier effects on the economy. Friend and Lang (1988) 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”. From this it can be understand that neglecting the construction sector

in general means that neglecting all sectors, because the construction sector connects directly or indirectly with other sectors of the country.

The construction industry has important contributions to the Ethiopian economy as well. For instance, the share of the sector in the total GDP averaged at about 5.2 percent in the period 2002/03- 2006/07 .The sector has registered relatively higher growth as compared to the growth of GDP during this period. Over this period, there has been increased investment on the development and expansion of various infrastructure projects like roads, airports and residential and non-residential housing units. [EEA, report, 2006] Therefore, 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.

1.1.3. Financing of the Construction Industry

According to Ethiopian Economic Association (EEA) 2006 report, Construction activities in Ethiopia are generally financed by government budgets and private equity capital, NGOs and banks. Government budget finances public infrastructures and other public constructions such as schools, clinics, etc. Government budget consists of resources originating from government treasury, domestic borrowing and foreign loans and grants. The private sector, on the other hand, finances buildings for residential and business purposes. Private sector‘s sources of financing originate from own capital and loans from formal and informal money markets. As per, Haipin & Senior (2009) construction financing is mainly concerned with; 1. Project financing, and 2, 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

in the near future .Company financing, on the other hand, is handled mainly using commercial bank loans and retained earnings from within the firm or organization. Therefore, financing decision in construction companies, just like other types of business enterprise, is also crucial decisions that can help them to increase the value of the firm.

1.1.4. 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 value. Therefore, awareness of factors affecting the company‘s financial decision is so critical. Hence, this decision called in finance as Capital structure: it means the way a firm finances their assets through the combination of equity, debt, or hybrid securities (Saad, 2010). In short, capital structure is a mixture of a company's debts (long-term and short-term), common equity and preferred equity. Capital structure is essential on how a firm finances its overall operations and growth by using different sources of funds.

The Modigliani and Miller theory, proposed by Modigliani and Miller (1958 and 1963), forms the basis for modern thinking on capital structure. In their seminal article, Modigliani and Miller (1958 and 1963) demonstrate that, in a frictionless world, financial leverage is unrelated to firm value, but in a world with tax-deductible interest payments, firm value and capital structure are positively related. Miller (1977), added personal taxes to the analysis and demonstrates that optimal debt usage occurs on a macro level, but it does not exist at the firm level. Interest deductibility at the firm level is offset at the investor level. In addition, Modigliani and Miller (1963) made two propositions under a perfect capital market condition. Their first proposition is that the value of a firm is independent of its capital structure. Their second proposition states that

the cost of equity for a leverage firm is equal to the cost of equity for an unleveraged firm plus an added premium for financial risk.

Since then, several theories have been developed suggesting a number of factors that might determine a firm‘s capital structure decision. However, out of these theories of capital structure, two models appear to come across strongly. One of them is the trade-off theory, which assumes that there are benefits and costs associated with the use of debt. In the beginning, the theory was limited to the trade-off between the tax advantages of debt and bankruptcy costs. Then, it was extended to include benefits and costs of debt associated with agency conflicts. The other main theory is the pecking order hypothesis which assumes that, under information asymmetry between insiders and outsider, firms will resort to internally generated funds first to finance their growth, but when external financing is needed, firms prefer to raise debt before equity.

According to Kila and Mahmood, (2008), Capital structure decisions are crucial for the financial well-being of any firm. Financial distress, liquidation and bankruptcy are the ultimate consequences lay ahead if any major misjudgment occurred following financing decision of firms‘. Thus, firms with high leverage need to allocate an efficient mixture of capital that will finally reduce its cost.

1.2. Motives for the study

Over the past several decades, theories on a firm‘s capital structure choice have evolved in many directions. But what are the factors that affect the firm‘s financing decisions? Researchers in the corporate finance area have devoted extensive time and effort to ascertain the answer to this important question through theoretical and empirical means. Several researchers have investigated the determinants of the capital structure. However, there is still no unifying theory

regarding capital structure, even after decades of serious research, which leaves the topic open for further research. Furthermore, most of the literature in the capital structure and its determinant has focused on the experience of developed economies (mainly US-based), where they have many institutional similarities. However, emerging markets like Ethiopia, with many institutional differences, have rarely been the subject of research in this field. In addition, as suspected by Rajan and Zingales (1995), a good understanding of the relevant institutional context is required when identifying the fundamental determinants of capital structure and in this context; it is worthwhile to note that Ethiopia has many special features as an emerging market. So, like other developing country, the determinants of capital structure of Ethiopian firms are still in underexplored areas in the literature of financing decision. Moreover, research in the capital structure of construction had received a very limited attention; to the researcher‘s knowledge, there was only one study conducted on determinants of capital structure in Ethiopian construction companies by Netsanet Belay. Furthermore, no study is conducted to see the effect of country-specific factors i.e. GDP and inflation on leverage. This fact reveals a great need for studies to update the existing evidence. Therefore, this empirical study was designed to address these short coming.

1.3. Statement of the problems

To understand how companies finance their operations, it is necessary to examine the determinants of their financing or capital structure decisions. Company financing decisions, which are mostly made by the finance manager of the firm, are highly affected by several factors directly or indirectly. Beside these factors, the financing pattern of the firms, therefore, have to be in a manner that maximizes the value of the firm or minimize the overall cost of capital. However, in reality this is not an easy task because it encompasses the selection of debt and

equity financing in a sensible proportion keeping in view of different costs and benefits joined with these two sources of finance. So, the objective of managing capital structure is to mix the financial sources used by the firm in a way that will maximize the shareholders' wealth and minimize the firm's cost of capital. This proper mix of funds sources is called optimal capital structure. But how a firm should choose its debt to equity ratio? Or, what is the optimal capital structure for a firm? , Whether or not such an optimal capital structure exists? And what are the potential determinants of such optimal capital structure is an issue in corporate finance Myers, (1984).

Moreover, the empirical work undertaken to identify the determinants of capital structure has fallen behind theoretical research, mainly because the relevant attributes advanced by various capital structure theories are quite abstract in nature and not directly observable (Titman and Wessels, 1988).In addition to this, most capital structure studies to date are based on data from developed countries. Only few researches have been carried out on the perspective of developing economies. This makes it uneasy to say whether conclusions from theoretical and empirical research carried out on developed economies are also applicable for developing economies too or whether a different set of determinants work in deciding capital structure in developing economies like Ethiopia. For example, Rajan and Zingales (1995) use data from the developed countries, Bevan and Danbolt (2000 and 2002) utilize data from the UK, Antoniou et al, (2002) analyze data from the UK, Germany, and France and Hall et al, (2004) used data from European small and medium enterprises.

There are few studies that provide evidence from developing countries, for example Booth et al, (2001) analyze data from ten developing countries (Brazil, Mexico, India, South Korea, Jordan, Malaysia, Pakistan, Thailand, Turkey and Zimbabwe), Pandey (2001) uses data from Malaysia,

Chen (2004) utilize data from China and Al-Sakran (2001) analyses data from Saudi Arabia. Of the capital structure studies, some have used cross-country comparisons based on data from particular region. More over Rajan and Zingales (1995) have attempted to find out whether the capital structure choices in other countries are made based on factors that similar to those capital structure influencing ones in U.S firms. Four factors; tangibility of assets, growth, size of the firm and profitability were tested to see their influences on leverage. Singh et al. (1992) and Singh (1995) also used data on the largest companies in selected developing countries. Their results are still contradicting because they find that firms in developing countries made significantly more use of external finance to finance their growth than is typically the case in the industrialized countries. In contrast, the results also show that firms in developing countries depend more on equity finance than debt finance. These findings seems surprising given that stock markets in developing countries are invariably less developed than those in the industrial countries, especially for equities. Based on the above mentioned problems this study would be expected to answer the questions: What determines both externally as well as internally the capital structure of Ethiopian construction industry? Or whether and how closely, do those significant determinants of Ethiopian capital structure support the finance theory?

More specifically:

1. What factors determine the capital structure decisions of Construction Company in Ethiopia? and
2. To what extent can those significant factors of capital structure decisions of Construction Company in Ethiopia support the finance theory?

1.4. Objectives of the study

The main purpose of this study is to identify the factors which influence the capital structure of Construction companies in Addis Ababa; and then testing the result in line with major capital structure theories.

Specifically, the study was designed:

1. To assess the impact of firm specific factors i.e. non-debt tax shields, growth opportunity, profitability, risk, liquidity, size of the company, age of the firm, as well as the asset structure (tangibility) on the debt ratio(leverage) of construction companies
2. To know the effect of macroeconomic (external factors) i.e. Expected Inflation and GDP growth on the capital structure choice And
3. To identify which capital structure theory can more explain the variations on capital structure of Ethiopian Construction Companies.

1.5. Research Hypotheses

In this study, in order to identify which factors best explains capital structure of Ethiopian Construction Company and to know which of the capital structure theories is relevant in the Ethiopian context, the researcher‘s identifies ten key variables based on the available literature and major theories in capital structure. These explanatory variables were: tangibility, non-tax shields, growth, earning volatilities, age, profitability, liquidity, Expected Inflation, GDP and size. Out of these ten variables four explanatory variables (Tangibility, size, profitability and growth) are identified as important factors in the G-7 countries (Rajan and Zingales, 1995), as well as in ten developing countries (Booth et al,. 2001). Based on the above information the following ten hypotheses would be tested throughout the proposed study.

The developed hypotheses and their rationale would be discussed in the separate section in the methodology part.

Hypothesis 1*: There is a positive relationship between leverage ratios and tangibility.*

Hypothesis 2*: There is a positive relationship between leverage ratios and growth.*

Hypothesis 3: *There is a negative relationship between leverage ratios and non-debt tax shields.*

Hypothesis 4: *There is a negative relationship between leverage ratios and earnings volatility.*

Hypothesis 5*: There is a negative relationship between leverage ratios and profitability.*

Hypotheses 6*: There is a positive relationship between leverage ratios and size.*

Hypothesis 7*: There is a positive relationship between leverage ratios and age.*

Hypothesis 8: *There is a negative relationship between leverage ratios and liquidity*

Hypothesis9: *There is a positive relation between leverage and expected inflation.*

Hypothesis10: *There is a negative relation between leverage and GDP growth.*

1.6. Significance of the study

To this end, the study would provide vital information for the concerned bodies: first, the management of firms in construction industry would benefit toward policy making on the appropriate financing mix that would improve their performance. Second, policy makers of various organizations would benefit from the fruits of the findings, which should enhance their ability to plan the capital structure of their organizations so as to maximize the value of their firms. Thirdly, regulatory authorities especially, national bank of Ethiopia (NBE), Ethiopian

revenue and custom authority (ERCA), among others, these findings should assist in establishing a code of corporate governance that will eventually reduce the problems associated with debt equity financing. Fourth, it allows us 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. And finally, it was important for researcher‘s to utilize the pool of available literatures in the subject matter or areas for future investigation.

1.7. Scope and limitation of the study

From broadest and most interesting topics in the capital structure the scope of the study was limited to the determinants of capital structure and assesses their relevance in Ethiopian context specially in case of construction industry. Although analyzing every firm-specific (internal) factors as well as external factors that might explain the Capital Structure decisions of firm is equally important, but this study was more focus on firm level (internal) determinants of capital structure thereby little attention was given to external determinants of capital structure. In Ethiopia since there was no financial market, this unavailability of active secondary market would limit and force the researcher to measure the dependent variable i.e. measures of debt ratio as well as the proxies of the independent variables in terms of book values rather than market values. In addition, Shortage of finance and time for data collection, analysis, and discussion would be mentioned as limitation of this study.

1.8. Organization of the paper

The remaining chapters of this paper would be organized as follows: the next chapter reviews some of the theoretical and empirical literatures; chapter three presents the research methodology, chapter four reports the data analysis and discussion, and finally, the fifth chapter presents the conclusions and recommendations that derives from the findings.

Chapter Two

2. Literature Review

This chapter presents a literature review on the theories of capital structure in the first section, Factors Determining Capital Structure in the second section, then an empirical review on the determinants of capital structure is presented and finally summary of the chapter and subsequent research gap is then outlined.

2.1. Theoretical literature review

2.1.1. Capital structure theory

Since Modigliani and Miller published their seminal paper in 1958, the issue of capital structure has generated unforeseen interest among financial researchers. Hence it has fulfillment with new elements over the years, such as taxes [Modigliani and Miller, 1963; Miller, 1977], bankruptcy costs [Stiglitz, 1972; Titman, 1984), agency costs [Jensen and Meckling, 1976; Myers, 1977] and the information asymmetry [Myers and Majluf, 1984]. Sanders (1998) adopted a different approach and classified capital structure theories based on whether particular theory presumes the existence of optimal financial policy and how the theory describes it. According to his classification, there are theories in support of the existence of an optimal debt-equity mix (that is, the trade-off theory), the existence of optimal financial hierarchy (the pecking order theory) and the Modigliani and Miller irrelevance theory of capital structure in relation to a firm‘s value. Therefore, this section mainly focuses on reviewing the major capital structure theories; i.e. Modigliani and Miller Theory, Pecking Order Theory (POT), Static Trade-off Theory (TOT), signaling theory and Agency theory.

2.1.1.1. Modigliani Miller propositions

The literature on corporate finance has seen huge progress since the seminal works of Modigliani and Miller (1958). Modigliani and Miller (1958) present the first capital structure theory called "The Irrelevance theory". This theory was the basis for modern thinking on capital structure and the theory states that, 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 should have no effect on the overall value of the firm (Brealey, Myers, & Allen, 2008). Furthermore, the 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 leaving stockholders no better or worse off.

However, in reality, a perfect world clearly does not exist. Issues such as taxes, financial distress, asymmetric information, and conflicts between economic agents associated with the firm have an effect on the firm's capital structure. Subsequent theoretical works, thus, focus on these factors associated with market imperfections and their effects on the capital structure.

2.1.1.2. Trade-off theory

Trade-Off theory, imply that company‘s capital structure decisions involve a trade-off between the tax benefits of debt financing and the costs of financial distress. Cost of financial distress depends on the likelihood of distress and cost of bankruptcy. The implication is that there is no an optimum amount of debt for any individual company. Thus, optimal debt ratio (debt capacity) varies from company to company.

Company having safe and tangible assets and plenty of taxable income have 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 clarify that profitable companies take more benefit of the tax shield by debt financing because there is fewer chance for them to go bankrupt. Thus, profitable companies are capable to raise their debt ratio more than a less profitable companies. 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).

The trade-off theory has contributed a lot in 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 ratios, which is the opposite of what the trade off theory predicts

(sunder & Myers, 1999). According to Myers (1984) the trade-off theory also fails to predict the wide degree of cross-sectional and time variation of observed debt rations.

In general, the static trade-off theory states that firms have optimal capital structures, which they determine by trading off the costs against the benefits of the use of debt and equity.

2.1.1.3. Pecking order theory

Although the trade-off theory has dominated corporate finance circles for a long time, interest is also being paid to the pecking-order theory. Pecking order theory is proposed by Myers and Majluf [1984], by explaining the effects of the information asymmetries between insiders and outsiders of company. According to this theory, companies follow a preferential order of financing sources, and that before seeking debts, they would use internal funds.

Thus, the more profitable companies would tend to have fewer debts and conversely low profitable companies use debt financing due to insufficient resources generated internally. According to Myers and Majluf (1984) and Myers (1984) 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. This theory states that there is no optimal capital structure since debt ratio occurs as a result of cumulative external financing requirements. As it is suggested by Myers and Majluf (1984) and Myers (1984) it starts with the assumption of asymmetric information, indicating that managers know more about their company‘s prospects, risks, and values than do outside investors. It assumes the attraction of interest tax shields is the second order. Debt is better than equity when the problem of asymmetric information is considered as the most important issue.

Moreover, Myers (1984) introduced implication similar to the pecking order theory known as the modified pecking order theory. In this framework, both asymmetric information and costs of

financial distress are incorporated. Myers argues that as firm climbs up the pecking order it faces higher probability of both incurring costs of financial distress and passing up future positive net present value projects. Thus, firm may rationally decide to reduce these costs by issuing stock now though new equity is not needed immediately to finance real investment, just to obtain financial slack and move the firm down the pecking order.

The pecking order theory, however, has certain limitations. It does not explain the influence of taxes, financial distress, security issuance costs, agency costs, or the set of investment opportunities available to a firm upon that firm‘s actual capital structure. It also ignores the problems that can arise when a firm‘s managers accumulate so much financial slack that they become immune to market discipline. In such a case it would be possible for a firm‘s management to preclude ever being penalized via a low security price and, if augmented with non-financial takeover defenses, immunes to being removed in a hostile acquisition. For these reasons, pecking order theory is offered as a complement to, rather than a substitution for, the traditional trade-off model. Based on this it‘s said that, the traditional trade-off model is useful for explaining corporate debt levels, pecking order theory is superior for explaining capital structure changes (Myers, 1984).

2.1.1.4. Signaling Theory

Another capital structure theory is the signaling theory which states that information asymmetry between a firm and outsiders leads the former to make certain changes in the firm‘s capital structure. Ross (1977), 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.

2.1.1.5. 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 et al., 2005).

Agency theory also 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 the 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 theory 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 either they predict the existence of the optimal debt-equity ratio for each firm (so-called static

trade-off models) or they declare that there is no well-defined target capital structure (pecking-order hypothesis), Myers (2001, p. 81).

2.1.2. Determinants of company leverage

According to Harris and Raviv (1991), theories of capital structure have identified a large number of potential determinants that might have an impact on debt levels. Among these factors, which have been found by a large number of studies to influence the firms‘ capital structure are size, tangibility, profitability, risk, non-debt tax shield, growth, uniqueness, dividends, free cash flow, liquidity, age, expected inflation, GDP growth, and regulation. This section briefly discusses what theories of capital structure suggest about the relationship between capital structure determinants considered in this study (size, tangibility, profitability, GDP growth, earning volatility, growth, liquidity, expected inflation and age).

2.1.2.1. Tangibility

The firm‘s asset structure plays an important role in determining its capital structure. The degree to which the firm‘s assets are tangible should result in the firm having greater liquidation value Titman and Wessels, 1988; Harris and Raviv, (1991). Referring to the trade-off theory Titman and Wessels, (1988) suggest that the extent to which the firm‘s assets are tangible results in the firm having a greater liquidation value.

This reduces the degree of financial loss incurred by financiers if the firm defaults. Consequently, firms with assets that have greater liquidation value tend to have relatively easier access to finance with lower costs of financing. This results in positive relationships. Under the pecking order theory, Harris and Raviv (1991) argue that the low information asymmetry associated with tangible assets makes equity financing less costly, resulting in a negative relation between leverage and tangibility. Agency theory suggests that equity-holders of leveraged firms

have an incentive to invest in risky investment to expropriate wealth from the firm's debt-holders. If debt can be collateralized, the borrowers are restricted to use the funds for a specified project. Since no such guarantee can be used for projects that cannot be collateralized, creditors may require more favorable terms. This reveals a positive relation between debt ratios and the capacity of firms to collateralize their debt (Jensen and Meckling, 1976).

2.1.2.2. Profitability

The pecking order theory of capital structure shows that if a firm is profitable, then it is more likely that financing would be from internal sources rather than external sources. In other words, firms tend to use internally generated funds first and then resort to external financing. This implies that profitable firms will have less amount of leverage (Myers and Majluf, 1984). In contrast, trade-off theory predicts that profitable firms have more debt since bankruptcy costs are lower and interest tax shields are more valuable for profitable firms (Frank and Goyal 2008). Profitable firms are more attractive to financial institutions as lending prospects; therefore they can always take on more debt capital (Ooi 1999). This theory suggests a positive relationship between profitability and debt.

2.1.2.3. Size

Trade-off theory states that large firms will have more debt since larger firms are more diversified and have lower default risk; as a result, they tend to have higher leverage (Frank and Goyal, 2008). On the other hand, smaller firms tend to have lower debt ratio when the relative bankruptcy costs are an inverse function of the firms‘ size (Titman and Wessels, 1988).

According to pecking order theory by Myers (1984) and Myers and Majluf (1984), in imperfect market firms rely on less information-sensitive securities (such as internal funds and riskless

debts) when insiders and outsiders suffer from asymmetric information. Thus, firms tend to issue debt than equity. In contrast, Frank and Goyal (2008) suggest that the pecking order theory is usually interpreted as predicting an inverse relation between leverage and firm size. The argument is that large firms have been around longer and are better known. Thus, they face lower adverse selection and can more easily issue equity compared to small firms where adverse selection problems are severe. Referring to agency theory, they also suggest that large firms have a reputation in debt markets and consequently face lower agency costs of debt.

2.1.2.4. Earning volatility

Earnings volatility is a proxy for the probability of financial distress and the firm will have to pay a risk premium to outside providers of funds. Given agency and bankruptcy costs, there are incentives for the firm not to utilize the tax benefit of debt within the static framework model. As a firm is exposed to such costs the greater its incentive to reduce its level of debt within its capital structure. One firm variable which impacts upon this exposure is firm operating risk, in that the more volatile a firm‘s earnings streams, the greater the chance of the firm defaulting and being exposed to such costs. To reduce the cost of capital, a firm will first use internally generated funds and then outsider funds. This suggests that earnings volatility is negatively related with leverage. This is the combined prediction of trade-off theory and pecking order theory. According to Cassar and Holmes (2003), if firms are likely to be exposed to agency and bankruptcy costs, they tend to reduce the level of debt within their capital structure. One factor that impacts such exposure is firms operating risk. Consequently, these firms with relatively higher operating risk will have incentives to have lower leverage than firms with more stable earnings.

2.1.2.5. Growth opportunity

Growth is likely to place a greater demand on internally generated funds and push the firm into borrowing (Hall et al., 2004). Pecking order theory by Myers and Majluf (1984) stated that firms finance their projects from the internally generated funds. However, the growing firms may not be capable to finance all its 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. Moreover, this theory predicts that firms with more investments should accumulate more debt over time (Frank and Goyal, 2008). Thus, according to this theory, growth and leverage are expected to be positively related. In contrast, the pecking order theory, also suggests a negative relationship between leverage and growth opportunity.

According to Myers and Majluf (1984), information asymmetry demands an extra premium for firms to raise external funds irrespective of the true quality of their investment project. In the case of issuing debt, the extra premium is reflected in the higher required yield. Therefore, firms with growth opportunities may find it too costly to rely on debt to finance its growth. So, this would suggest that growth to have a negative relationship with long term debt and a positive relationship with short-term debt.

According to agency theory, Titman and Wessels (1988) further argue that since growth opportunities are capital assets that add value to the firm but cannot be collateralized, the costs associated with agency conflicts between equity and debt holders is expected to be higher for firms in growing industries. Accordingly, a negative relationship between debt and growth opportunities suggested.

2.1.2.6. Non-debt tax shields

Other items apart from interest expenses, which contribute to a decrease in tax payments, are labeled as non-debt tax shields (for example the tax deduction for depreciation).The Trade of Theory predicts that companies have an incentive to take debt because they can benefit from the tax shield due to interest deductibility such as depreciation. Thus, Trade of Theory assumes an inverse relationship between non-debt tax shield and leverage. DeAngelo and Masulis (1980) argue that tax deductions for depreciation and investment tax credits are substitutes for the tax benefits of debt financing. As a result, firms with large non-debt tax shields relative to their expected cash flow include less debt in their capital structures.

2.1.2.7. Age

It is believed that as firms continue longer in business, they establish themselves as an ongoing business, thus increase their capacity to access more debt. Esperanca*et al*. (2003), referring to agency theory suggest that financiers use reputation of the firms as a measure of their creditworthiness. Reputation refers to the good name firms have built up over the years (historical) and which is understood by the market, which has observed their ability to meet their obligations in a timely manner.

Managers concerned with a firms‘ reputation tend to avoid riskier investments in favor of safer investments, even when equity-holders do not approve the safer investment, thus reducing debt agency cost. Johnson (1997) also argues that the reputational capital of older firms is sufficient to ensure they will avoid actions harmful to lenders even though they are unmonitored, and thus can borrow in public debt markets. These arguments indicate a positive association between age of the firm and leverage.

In contrast, referring to pecking order theory, Hutchinson,(2003) suggests that older firms are able to accumulate funds and need less to borrow either long-term or short-term. In other words, a new firm will not have had time to retain funds and may be forced to borrow. Consequently age is likely to be negatively related to both short-term and long term debt.

2.1.2.8. Liquidity

Liquid Firms prefer internal financing to external financing. Therefore, firms are likely to create liquid reserves from retained earnings. If the liquid assets are sufficient to finance the investments, firms will have no need to raise external funds. Hence, liquidity is expected to be negatively related to leverage. Trade of theory and Pecking order theory has two contrasting views about the relationship between liquidity and debt ratio (leverage ratio). According to TOT the more liquid firm would use external financing due to their ability of paying back liabilities and to get benefit of tax-shields, resulting in 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 level of external financing, resulting in negative relation between liquidity and leverage.

2.1.2.9. Expected Inflation

According to Taggart (1985), features of the tax code in the U.S. increases the real value of interest tax deductions on debt when inflation is expected to be high. Thus, the static trade-off theory predicts a positive relationship between leverage and expected inflation. By contrast, it is hard to see why inflation would matter for firms‘ leverage decisions in a model of pecking order (Frank and Goyal, 2009). Empirical studies generally find a positive relation between leverage and inflation.

2.1.2.10. GDP growth

Real Gross Domestic Product (GDP) growth can be viewed as a measure of the growth opportunities available to firms in an economy. In a high growth environment, the scarcity of firms‘ tangible assets relative to available investment opportunities implies a higher loss of value when firms go into distress. Hence, the static trade-off theory predicts a negative relation between leverage and GDP growth. By contrast, the pecking order theory predicts a positive relation between leverage and macroeconomic growth, since a high ratio of growth opportunities to internal funds would imply a greater need for external finance. Empirical studies generally find a negative association between leverage and macroeconomic growth (see, for example, Demirgüç-Kunt and Maksimovic, (1996). Following common practice, GDP growths define as the percent change in the annual real GDP.

To sum up, for asset structure both trade of theory and agency theory reveals a positive relation between tangibility and leverage ratio, however the pecking order theory reveals negative relation. With regard to the relationship between company profitability and size with leverage the pecking order and trade of theory reveals a contradicting view the same is true with GDP growth. Pecking order theory has contradicting view for the relationship between growth opportunity of the company and leverage ratio but agency theory reveals negative relation. Trade of Theory assumes an inverse relationship between non-debt tax shield and leverage. Trade of theory and Pecking order theory has two contrasting views about the relationship between liquidity and debt ratio (leverage ratio). Finally age is likely to be negatively related to both short-term and long term debt, as per pecking order theory.

2.2. Empirical review on the determinants of capital structure

Following from the theoretical standpoints, a number of 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); and 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: age of the firm, size of the firm, asset structure, profitability, growth, firm risk, non-debt tax shield and liquidity are discussed in this paper. For the purpose of clarity, this paper classifies the empirical study of the determinants as studies in developed country and developing country specially Ethiopia.

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

Truly, most of the literature seeking an association between the capital structure and the firm specific or industry characteristics has focused on the experience of developed economies (mainly US-based). Therefore, in this section the researcher‘s review few studies in the developed economy.

In their cross-sectional study of the determinants of capital structure, Rajan and Zingales (1995) examine the extent to which, at the level of the individual firm, gearing may be explained by four key factors, namely, growth opportunities, size, profitability and tangibility. Their analysis is performed upon a firm-level sample from each of the G-7 countries: namely the U.S, Japan,

Germany, France, the U.K, Italy and Canada, and although the results of their regression analysis differ slightly across countries, they appear to uncover some fairly strong conclusions. They suggest that, a priori, one would expect a negative relation between growth opportunities and the level of gearing. Secondly, Rajan and Zingales include size (which is proxied by the natural logarithm of sales) in their cross-sectional analysis. There is no clear theory to provide ex ante expectations as to the effect which size should have on gearing. So, they state that:

―The effect of size on equilibrium leverage is more ambiguous. Larger firms tend to be more diversified and fail less often, so size (computed as the logarithm of net sales) may be an inverse proxy for the probability of bankruptcy". [Rajan and Zingales (1995) p.1451] also they suggest profitability to be negatively related to gearing and finally they suggest a positive relation between tangibility, which they define as the ratio of fixed to total assets, and gearing. Their cross-sectional analysis result reveals that, tangibility was positively correlated with leverage for all the countries, the market to book ratio (growth opportunities) seemed to be negatively correlated with leverage except for Italy, Size of firm was positively correlated while profitability was negatively correlated with leverage in all countries except Germany.

Following Rajan and Zingales (1995), Bevan, A. and Danbolt, J. (2002) on their study entitled as ―Capital structure and its determinants in the United Kingdom" Having applying the same gearing definition as Rajan and Zingales, based on an analysis of the capital structure of 822 UK companies, they find that the determinants of gearing appear to vary significantly, depending up on which component of debt is being analyzed. In particular, a significant difference exists in the determinants of long and short-term forms of debt. Finally their decomposition procedure reveals that gearing to be significantly positively correlated with tangibility and size, and significantly negatively correlated with the growth and the level of profitability. However, further analysis

revealed that the results are highly model specific. Bradley et al. (1984),Titman and Wessels, 1988; Friend and Lang, (1988);Harris and Raviv, (1991), assert that firms that invest heavily in tangible assets also 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 relation between size and debt ratio. Kester, 1986; Titman and Wessels, 1988; Barton et al., 1989 found positive relationships between sales growth and leverage while Kim and Sorensen, 1986; Rajan and Zingales, 1995 found negative relationships between sales growth and leverage.

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 developed economy includes: Friend and Lang, (1988); Barton et al., (1989); Rajan and Zingales (1995), Bevan, A. and Danbolt, J. (2002) and other. Friend and Lang, (1988) and Rajan and Zingales (1995), also found a positive relation between size and leverage. On the other hand, Kester, (1986), Kim and Sorensen, (1986) and Titman and Wessels, (1988), found a negative relationship size and leverage.

Bradley et al. (1984) in his study, found a negative relationship between earning volatility and leverage while Kim and Sorensen (1986) found a positive relationship. A negative relation between non-debt tax shields and leverage is also found by Kim and Sorensen, (1986) and Titman and Wessels, (1988). However, a positive relationship between non-debt tax shields and leverage is observed by Bradley et al. (1984).

In addition, According to the literature research of developed country, there are several authors investigating the relation 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). They find that there is a negative and significant relation between corporate capital structure and GDP (as well as GDP growth). Gajurel (2006) also argues that there is a negative relation with total debt ratio and short-term debt ratio, but there is a positive influence on the long-term debt ratio. The boost in economy and consequently growth in GDP lead to increase in companies profits.

The next widely investigating external factor is inflation rate. However, the findings of such studies differ. Bastos, Nakamura & Basso (2009) argue that inflation does not influence the capital structure; and Frank & Goyal (2009) find the relation between inflation and the market leverage, but no effect on the book leverage. Camara (2012) shows that macroeconomic conditions included inflation rate have significant relation with capital structure. Sett & Sarkhel (2010), Hanousek & Shamshur (2011) also argue that inflation has strong and positive influence on the capital structure. Rely on debt structure, Gajurel (2006) finds that inflation is negatively related to total leverage and the short-term debt ratio, but positively influences on the long-term debt ratio.

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 attentions are also given to this area in developing economies and some researchers are started conducting a study based on the data from developing countries. Few studies form developing economies in this area are reviewed in the next section.

Booth et al. (2001) provided the first empirical study to test the explanatory power of capital structure models in developing countries. It investigated whether they had more general applicability. The results were somewhat unconvinced of these premises. They provide evidence that firms‘ capital choice decisions in developing countries were affected by the same variables as they were in developed countries.

Nevertheless, there were persistent differences of institutional structure across countries indicating that specific country factors were at work. Their findings suggest that although some of the insights form modern finance theories are portable across counties, much remains to be done to understand their impact of different institutional features on capital structure choices. Assets tangibility, average tax rate, size, business risk, profitability were taken as independent variables. The results showed, the more tangible the firm‘s assets, the greater its ability to issue secured debt and the less information revealed about future profits.” Hence positive relation exists between tangibility and debt ratio and also the result reveals that, more profitable the firm having free internal cash flow, the lower the debt ratio so, negative relation exists between profitability and debt ratio.

Rataporn et al. (2004) are also investigated the determinants of capital structure of firms in four countries from the Asia Pacific region. According to their finding the firm size has positive effect on the leverage and growth opportunities, non-debt tax shield, liquidity and share price performance has the negative effect on leverage which mainly support to major capital structure theories. Abor (2008), by comparing the capital structures of publicly quoted firms, large unquoted firms, and small and medium enterprises (SMEs) in Ghana, found an inverse relationship between risk and long-term debt ratio in all the sample groups, implying that firms with high risk levels exhibit low long-term debt ratios. And he suggests that such firms avoid

accommodating more financial risk by employing less long-term debt. Further, the result shows that age of the firm, size of the firm, asset structure, profitability, risk and managerial ownership are important in influencing the capital structure decisions of Ghanaian firms.

In a Ghanaian study, Aryeetey et al. (1994) also found that, smaller enterprises have greater problems with credit than larger firms do. Their results showed that the rate at which large firms apply for bank loans was higher than that of smaller firms. Hence positive relation exists between size and debt ratio. Other empirical evidence that supports this finding in emerging economy includes: Al-Sakran (2001), Bigsten et al.(2000), Bas et al. (2009) and others.

Likewise, koskal et al. also uses a new and comprehensive dataset to investigate the capital structure of non-financial firms in a major emerging market economy, Turkey. Their study uses both statistical and economic significance of four types of leverage factors: Firm-specific, tax-related, industry specific, and macroeconomic. Their results suggest that tax-related factors and asset tangibility are the most economically significant factors for short-term and long-term debt ratios, respectively. Their results also suggest that inflation is an important determinant of leverage and the most economically significant macroeconomic factor. Moreover, they provide evidence that firms adjust their leverage towards the industry median that firms match the maturity of their assets and liabilities, and that inflows of foreign capital have a marked influence on firms‘ capital structures, particularly on large and mature non-manufacturing firms. Overall, their result reveals that the trade-off theory appears to be more successful than the pecking order theory in accounting for the capital structure of Turkish non-financial firms.

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

Even though, capital structure issue has a critical research area in developed economy, like other emerging economy, research in the area of capital structure and its determinants in Ethiopia is

still under investigated and only few countable studies are conducted in Ethiopia. As per the researcher‘s access and knowledge, the researchers conducted on determinants of capital structure in Ethiopian case are: Mintesinot (2010), Kinde (2011), Amanuel (2011), Daniel Kebede, Fisseha Girmay and Y. L. Lavanya (2012), Netsanet Belay Beyene (2013), and Ashenafi (2013).

Mintesinot (2002) has undertaken the study on the determinants of capital structure of manufacturing firms in Tigray, Ethiopia by using eight explanatory variables: Tangibility, Profitability, Growth, Age, Uniqueness, Size, Earnings Volatility, and Non-Debt Tax Shields. And his regression result reveals that: Tangibility, Firm Growth, Age of the Firm, Firm Size, Earnings Volatility and Non Debt Tax Shields variables are the significant determinants of capital structure in at least one out of the three models for capital structure employed in his study. Likewise, Amanuel (2003) has made a study on the determinants of capital structure evidence from manufacturing share companies in Addis Ababa city with seven explanatory variables i.e. Asset tangibility, non-debt tax shield, firm‘s profitability, age and size of the firm. The variables were regressed against three dependent variables i.e. total debt ratio, short-term debt ratio and long-term debt ratio on a sample of 12 manufacturing firms covering a period of six years from 1996 to 2002 E.C. his regression result shows that: long term debt ratio has a positive relationship with age of the firm only and the remaining variables; tangibility, non debt tax shields, growth, earning volatility, profitability and size of the firm has a negative relationship with long term debt ratio. While no clear and statistical proved relation are obtained for the variables growth of the firm in any of the capital structure models.

Furthermore, Kinde (2003), made an empirical study on the capital structure of nine Ethiopian Insurance Companies over the period from 2004 to 2010, by using Panel data model with OLS regression analysis technique. The study shows that: growth, profitability, business risk and age of the firms are significant variables in explaining the capital structure pattern of those insurance companies included in the sample.

Moreover, Fisseha Girmay and Y. L. Lavanya (2004), undertaken the study on the capital structure decisions of the Ethiopian- Manufacturing Private Limited Companies (PLCs) using firm-level panel data with the aim of understanding which of the capital structure theories are appealing to them, by including five years data from 2006/7 – 20010/11 about 33 companies. They suggest that some of the insights from modern finance theory of capital structure are portable to Ethiopia in that certain firm-specific factors that are relevant for explaining capital structure in developed economies are also relevant in Ethiopia. Their results are consistent with a number of theoretical propositions typically associated with the determinants of debt-equity choice of non-financial firms. Specifically, their evidence support that profitability, growth, and age establish negative relationship and the remaining three variables (tangibility, size, and tax-shield) showed positive relationship with capital structure of Ethiopian Private Limited Companies.

Likewise, Beyene (2005) by studying the determinants of capital structure decision of Medium Enterprises in Ethiopia based on a cross sectional data over 1991 to 1996 EC, found a negative relationship between tangibility and leverage. Thus, he suggests that as Ethiopian Medium firms kept more and more fixed assets, they become attractive to debt. And also he found a negative relationship between growth and leverage. Similarly, Netsanet Belay Beyene (2013), undertaken the study in the same title of this study with the same case by using a panel data collected from

11 randomly selected construction companies, covering the period from 2006 to 2010. The findings of the study reveals that, the variables including growth opportunity, tangibility, and non-debt tax shield positively affect the variations on the capital structure of construction companies. Profitability of the companies, size, earning volatility, liquidity and age, on the other hand, inversely affect their capital structure.

2.3. Conclusions and Research gaps

Most Empirical results show a positive relationship consistent with theoretical argument between asset structure and leverage for the firms, i.e., support the trade-off and agency theories (Bradley et al., 1984; Friend and Lang, (1988) In relation to profitability, Empirical evidences seems to be consistent with the pecking order theory. Most studies found a negative relationship between profitability and capital structure. Friend and Lang, (1988); Barton *et al.*, (1989);

The impact of size on leverage is ambiguous. Several empirical studies reveal a positive relationship between size and leverage of the firms, i.e., support the trade-off and agency theories and some other studies also support a negative relationship between firm size and short-term debt ratio, i.e., support the pecking order theory. Again there is much controversy about the relationship between growth rate and level of leverage. Some researchers found positive relationships between growth and leverage i.e., support the pecking order theory. (See Kester, 1986; Titman and Wessels, 1988; Barton et al., 1989) Other evidence suggests that higher growth firms‘ use less debt i.e., support the trade-off and agency theories (Kim and Sorensen, 1986; Rajan and Zingales, 1995).

To sum up, despite some significant contributions to the general perception of the various workings about corporate capital structure, research produced so far did not provide yet a sound basis for establishing in a decisive fashion. Hence, there is still lack of comprehensive theory to

explain how firms decide about their strategic financing and yet we cannot unmistakably specify the relation between capital structure determinants with firms leverage. So, Empirical studies revolving around the relationship between the capital structure determinants considered in this study (size, tangibility, profitability, non-debt tax shield, earning volatility, growth, liquidity, GDP growth ,inflation and age) and leverage seem inconclusive, i.e., some studies found positive association, while the others found negative association. Beside this, most capital structure studies to date are based on data from developed countries and only few studies provide evidence from developing countries. Moreover like other developing economy, research conducted in Ethiopia in the area of determinants of capital structure generally focused on the level of leverage and on the firm-specific determinants of leverage. However, no study is conducted to see the effect of country-specific factors i.e. GDP and inflation on leverage. Even if analyzing the industry effect in determining capital structure is more important but it is less focused. Therefore, this empirical study is designed to address these short coming and, further, to find out industry specific determinants of capital structure by taking Ethiopian Construction Industry as a case.

Chapter Three

3. Research Design and Methodology

This section provides information as to how the study would carry 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. 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 (i.e., 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 would adopt a quantitative research approach.

According to Yesgat (2009) the quantitative research approach translated the research problem in to specific variables and hypothesis to be tested (Yesgat, 2009, p.70). Thus, it enables the researcher to get a deep understanding about the area being investigated. In investigating the determinants of capital structure of firms in Addis Ababa Construction industry, the researcher would try to test the relationship between leverage ratio, which is a dependent variable, and ten

explanatory variables. Therefore, in such a case a quantitative research approach plays a vital role and Yesgat (2009) noted to support this idea as a ―quantitative research approaches tests the theoretically established relationship between variables using sample data with the intention of statistically generalizing for the population under investigation". Thus, this study would be conduct to test which determinant can best explain the variation on the leverage ratio of the companies by taking the construction industry as a case.

3.2. Survey Design

Cresswell (2003) also noted that a quantitative research approach employs strategies of inquiry such as experiments and surveys, and collect data on predetermined instruments that yield statistics data. Therefore, this study would use survey strategy using structured record review method than experimental one due to the following reasons: surveys are relatively inexpensive (especially self-administered surveys), the rapid turnaround in data collection and surveys are used to generalize from a sample to a population so that inferences can be made about some characteristic, attitude, or behavior of the intended population (Babbie, 1990), than other method.

3.3. Sampling Design

As noted by Cohen et al. (2005) the ―questions of sampling arise directly out of the issue of defining the population on which the research will focus". Further, they stated that ―factors such as expense, time and accessibility frequently prevent researchers from gaining information from the whole population. Therefore, they often need to be able 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 et al. (2005) P.92 This study is conducted on Addis Ababa Construction companies, which is generally categorized in to three basic categories such as, general contractors, building contractors, and real estate contractors. This study only focuses on

the first category, in which a total of 266 construction companies were currently in operation. Hence, as noted by Cohen et al. (2005), covering the entire construction firms in the category was both costy as well as time consuming. As a consequence of this, the researcher decided to draw only 30 companies as a sample from the total population. In addition to the constraint of time availability and cost, the other reason for taking small sample size is that, since the study is survey i.e. structured document review, taking a small amount of a sample does not affect the researcher to generalize the result to the populations.

The criterion for inclusion in the sample is holding 6 years data from 2001-2006 EC. In other words, companies that are at pre-implementation stage were deliberately excluded from the sample. Or companies which are implemented after 2001 are again excluded from the sample. To give equal chance for each construction company being included in the sample and to insure the representativeness of the sample, simple random sampling technique is used. All the 266 companies mentioned in the population were listed separately on a piece of paper of same size, folded and kept in a basket. By blind fold, 30 construction companies are selected randomly.

3.4. Sources of Data and Data Collection Instruments

To meet the objectives of this study, the researcher highly relayed on secondary source of data. A structured record review would be made to collect a panel data, which comprises both time series and cross-sectional elements, i.e., it embodies information across both time and space. Annual financial report of 30 construction companies, covering the period from 2008 to 2013 would be collected from Ethiopian revenue and custom authority (ERCA) and six year GDP as well as inflation data would be collected from national bank of Ethiopia (NBE). Regarding the use of panel data, Paula & Zelia (2007 P.552) mentioned two basic benefits. The first benefit of working with panel data is, understanding the development overtime of the relationship between

explained variables and explanatory variables. The other benefit of using panel data is allowing the researcher to measure the difference between companies which are not observable and these differences having the name of individual effect. Furthermore, Shah& Khan (2007) noted that ―panel data usually provides the researcher a large number of data points, increasing the degree of freedom and reducing the colinearity among explanatory variables and therefore, it improves the efficiency of econometric estimates".

3.5. Variable Descriptions and Model Specifications

3.5.1. Variable Descriptions

The dependent variable of this study is the financial leverage. In literature, several definitions of leverage were used to investigate its associations with firm-specific characteristics. Rajan and Zingales (1995) used the leverage as the ratio of total debt to net assets, where net assets are total assets less accounts payable and other liabilities instead of the ratio of total liabilities to total assets or the ratio of debt (short term and long term) to total assets. In this study leverage would be measured as the ratio of total debt to total equity using book values instead of market values because of two reasons:

The first reason was the data limitations, which is also discussed in Titman and Wessels (1988) which forced them to measure debt in terms of book values rather than market values. The second reason is the conceptual simplicity and the variables' ability to reflect a firm's total reliance on borrowed funds, which is also brought by Ferri and Jones (1979) who measured the financial leverage as the ratio of total debt to total assets at book value for the stated reasons.

In this study, to identify which of the capital structure theories is relevant in the Ethiopian context, the researcher concentrates only on ten key explanatory variables because of the time

constraints. These explanatory variables were: tangibility, non-tax shields, growth, earning volatilities, age, profitability, liquidity, GDP growth, inflation and size. Their explanation and proxies of these independent variables were separately examined in the following sub-sections referring to the relevant literature.

3.5.1.1. Tangibility

It is assumed, from the theoretical point of view that, tangible assets can be used as collateral. Therefore higher tangibility lowers the risk of a creditor and increases the value of the assets in the case of bankruptcy. As Boothet al. (2001, p. 101) state: "The more tangible the firm's assets, the greater its ability to issue secured debt and the less information revealed about future profits." Thus a positive relation between tangibility and leverage is predicted. In this study, tangibility was measured as tangible assets divided by total assets. The following hypothesis was formulated based on the rationale stated above.

Hypothesis 1*: There is a positive relationship between leverage ratios and tangibility.*

3.5.1.2. Growth Opportunities

According to Myers (1977), firms with high future growth opportunities should use more equity financing, because a higher leveraged company is more likely to pass up profitable investment opportunities. As Huang and Song (2002, p. 9) claim: "Such an investment effectively transfers wealth from stockholders to debt holders." Therefore a negative relation between growth opportunities and leverage is predicted. However, Benito (2003) proposes the opposite. If firms have growth opportunities, then they require more funds to grow. Given that internal resources are not sufficient, firms would then turn to external sources of finance, which would lead to a higher debt level in firms. In this study, the growth of total assets measured by the percentage change in total assets (GTA) would be used as indicator of Growth attribute.

Based on the above rationale, the following hypothesis was formulated:

Hypothesis 2*: There is a positive relationship between leverage ratios and growth.*

3.5.1.3. Non-debt tax shields

Tax deductions for depreciation and investment tax credits are substitutes for the tax benefits of debt financing (De Angelo and Masulis, 1980). As a result, firms with large non-debt tax shields relative to their expected cash flow include less debt in their capital structures. Depreciation divided by total assets was used in order to proxy for non-debt tax shields in this study.

The following hypothesis was formulated based on the rationale stated above.

Hypothesis 3: *There is a negative relationship between leverage ratios and non-debt tax shields.*

3.5.1.4. Volatility

Volatility may be understood as a proxy for risk of a firm (probability of bankruptcy). Therefore it is assumed that volatility is negatively related to leverage. However, as Huang and Song (2002, p. 9) state based on findings of Hsia (1981): ―As the variance of the value of the firm‘s assets increases, the systematic risk of equity decreases. So the business risk is expected to be positively related to leverage.” Conversely, a negative relation is found by (Bradley et al., 1984) and (Titman and Wessels, 1988). As stated by Titman and Wessels (1988), various studies in different countries suggest that a firm's optimal debt level is inversely related to the volatility of earnings. In this study, standard deviation of return on assets was used as a proxy for volatility.

Based on the above rationale, the following hypothesis was formulated:

Hypothesis 4*: There is a negative relationship between leverage ratios and earnings volatility.*

3.5.1.5. Profitability

There are no consistent theoretical predictions on the effects of profitability on leverage. From the point of view of the trade-off theory, more profitable companies should have higher leverage

because they have more income to shield from taxes. The free cash-flow theory would suggest that more profitable companies should use more debt in order to discipline managers, to induce them to pay out cash instead of spending money on inefficient projects. However, from the point of view of the pecking-order theory, firms prefer internal financing to external. So more profitable companies have a lower need for external financing and therefore should have lower leverage. In this study, profitability was proxied by return on assets (defined as earnings before interest and taxes divided by total assets). Based on the above rationale, the following hypothesis was formulated:

Hypothesis 5*: There is a negative relationship between leverage ratios and profitability.*

3.5.1.6. Size

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 less prone to bankruptcy therefore there is a tendency of being more leveraged as size increases, according to Trade-off and Agency Cost theories. The natural logarithm of assets (ln A) was selected as the indicator for size variable in this research.

Hypotheses 6*: There is a positive relationship between leverage ratios and size.*

3.5.1.7. Age of the Firm

Age of the firm is a standard measure of reputation in capital structure models. As a firm continues longer in business, it establishes itself as an ongoing business and therefore increases its capacity to take on more debt; hence age is positively related to debt (Abor, 2008). As firms became aged, the long years of track record will enable them to easily convince creditors.

In addition experience enables the firm expertise in finding alternative credit source cost effectively or in favorable terms when going for debt capital. This induces a positive relationship between leverage ratios and age of the firm. The number of years of stay in business was used as indicators.

Hypothesis 7*: There is a positive relationship between leverage ratios and age.*

3.5.1.8. Liquidity

Firms prefer internal financing to external financing. Therefore, firms are likely to create liquid reserves from retained earnings. If the liquid assets are sufficient to finance the investments, firms will have no need to raise external funds. Hence, liquidity is expected to be negatively related to leverage. Here we use the current ratio (calculated as current assets over current liabilities) as a proxy of liquidity. Firms with higher liquidity ratios are preferred to acquire more debt because of great ability to meet short term obligations (Ozkan, 2001). In this study Liquidity was measured as a ratio of total current asset to short term liability.

Hypothesis 8*: There is a negative relationship between leverage and liquidity of the firm*

3.5.1.9. Expected inflation

According to Taggart (1985), Expected 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 expected inflation would matter within a pecking order theory. Empirical studies generally find a positive relation between leverage and inflation. In the absence of inflation expectations data that spans the whole sample period, the researcher follow previous studies and use data on the realized inflation. In this study,

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

Hypothesis9: *There is a positive relation between leverage and expected inflation.*

3.5.1.10. GDP growth

The trade-off theory predicts a negative relation between leverage and GDP growth. By contrast, the pecking order theory predicts a positive relation between leverage and macroeconomic growth, since a high ratio of growth opportunities to internal funds would imply a greater need for external finance. Empirical studies generally find a negative association between leverage and macroeconomic growth (see, for example, Demirgüç-Kunt and Maksimovic, 1996). Following common practice this study, measured GDP growth as the percent change in the annual real GDP.

Hypothesis10: *there is a negative relation between leverage and GDP growth.*

3.5.2. Model Specifications

The model to this study would be derived from the previous studies such as Ozkan (2001), Bevan and Danbolt (2002) and Titman and Wessels (1988). The chosen model is highly believed to capture the essence of the subject under study. The following model was specified based on the relationship outlined in the hypothesis.

$$\mathbf{LEV}_{it} = \alpha + \beta 1\ Prof_{it} + \beta 2 Tang_{it} + \beta 3 Size_{it} + \beta 4 Grh_{it} + \beta 5 EarVol_{it} + \beta 6 Ndts_{it} + \beta 7 Age_{it} + \beta 7 Lq_{it} + GDP_{it} + INF_{it} \ldots\ldots\ldots + \varepsilon_{it}$$

Where Lev_{it} is the dependent variable and it is the leverage of company (i) to the period t, which starts from the year 2008 to 2013. α is the intercept of the equation. β is the slope coefficient for

X_{it} independent variables. X_{it} represents the ten independent variables. Where i = 1, 2, 3…….30 sampled companies and ε represents the error term.

3.6. Method of Data Analysis

To test the hypothesis, the relationships between the level of debt and ten explanatory variables, multiple regression analysis would be used for the study. In analyzing the data, the researcher uses Eviews6 software packages. The diagnostic tests and estimating the result for the study would be conducted through Eviews6 software package, because the researcher believes that Eviews6 software package is relatively simple to understand for diagnostic test, estimating and interpretation of the result.

3.7. Expected outcome of the paper

Table: 3.1, Expected outcome of the paper

Determinants	**Definitions of variables**	**Predicted signs by theories**	**Expected outcome of the paper**
Tangibility	Fixed asset/total asset	+ (trade of theory and agency theory) -(pecking order theory)	+
Profitability	EBIT/total asset	+ (trade of theory) -(pecking order theory)	-
Growth opportunities	Percentage change in total asset	+ or - (pecking order theory) -(agency theory)	+
Size	In(total asset)	+ (trade of theory and agency theory) + or - (pecking order theory)	+
Earning volatility	standard deviation of return on assets	- (pecking order, agency cost and trade off theory)	-

Non-debt tax shields	Annual Depreciation Expense / Total Assets	- (trade of theory)	-
Age	Number of years stayed in the business	+ (trade of theory and agency theory) -(pecking order theory)	+
Liquidity	Current asset/current liability	+ (trade of theory) -(pecking order theory)	-
Expected inflation	Percentage change in CIP	+ (trade of theory) _(pecking order theory)	+
GDP growth	Percentage change in real GDP	- (trade of 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. Analysis and Discussions of Results

This section of the paper focuses on the analysis, and discussion of findings. Regression analysis was conducted and inferences were drawn from it. Summary of descriptive statistics and regression results from the Eview output were presented in a tabular form, from where detailed analysis and discussion of the result was given. In addition, the researcher also conducts unit root test for data stationary, Haussmann test to know whether the model is fixed or random effect as well as a diagnostic test is conducted to increase the reliability of the study.

4.1. Data Stationery and Unit Root Testing

According to Chris Brooks, (2008), a stationary series can be defined as one with a constant mean, constant variance and constant autocovariances for each given lag. Test of data stationary 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 totally unrelated. So, if standard regression techniques are applied to non-stationary data, the end result could be a regression that _looks' good under standard measures (significant coefficient

estimates and a high R^2), but which is really valueless. Such a model would be termed a _spurious regression'. Chris Brooks, (2008)

Levin, Lin and Chu (LLC) (2002) have shown that the use of a unit root test for a 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 statistical foundation for panel unit root tests. The following table repots the LLC unit root test summary result 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 not unit root (stationary)

Table: 4.1, Unit Root Test Results

Variables	T-Statistic	Prob.**	Decision
LEV	-15.6071	0.0000	H0: is rejected at level i.e. stationary
TAG	-81.6374	0.0000	H0: is rejected at level i.e. stationary
GRO	-35.8566	0.0000	H0: is rejected at level i.e. stationary
NDTS	-15.4704	0.0000	H0: is rejected at 1st deference i.e. stationary
RISK	3.12	1.0000	H0: is not rejected at level i.e. non-stationary
PRO	-28.5422	0.0000	H0: is rejected at level i.e. stationary
SIZE	-10.0745	0.0000	H0: is rejected at level i.e. stationary

AGE	25.9459	1.0000	H0: is not rejected at level i.e. non-stationary
LIQ	-14.8599	0.0000	H0: is rejected at level i.e. stationary
INF	-17.5847	0.0000	H0: is rejected at level i.e. stationary
GDP	-13.8539	0.0000	H0: is rejected at level i.e. stationary

–*" significant at 1% level except risk and age (**Source:** Regression output of Eview 6)

As it is clearly indicated by the above table (4.1), the data of eight variables including dependent variables are stationary at level, the data of one variable has become stationary after 1st differenced and the data for two variable i.e. risk and age are non-stationary at all. This is because single calculated risk rate for each single company is applied for six consecutive years. The same is true for the variable age. It is therefore, possible to validly undertake hypothesis tests about the regression parameters of this study by using this data, because, the data are stationary except for the two variables because of the above stated reasons.

4.2. Diagnostics test

4.2.1. Assumption 1: Errors have zero mean or $E(ut) = 0$

The first assumption required is that the average value of the errors is zero. According to Chris Brooks, (2008), if a constant term is included in the regression equation, this assumption will never be violated. Since the regression model used in this study includes a constant term, this assumption cannot be violated.

4.2.2. Assumption 2: Homoscedasticity (variance of the errors are constant var(ut) = σ2 < ∞)

It has been assumed that the 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 not efficient because the estimated variances and covariance of the coefficients (βi) are biased and inconsistent. Thus, the tests of hypotheses are no longer valid. Chris Brooks, (2008).There are many methods used to test the existence of heteroskedasticity, in this study the researcher used Breusch-Pagan-Godfrey test. Table (4.2) bellow presents the test statistics.

Table: 4.2, Heteroskedasticity test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.832198	Prob. F(10,168)	0.0585
Obs*R-squared	17.60197	Prob. Chi-Square(10)	0.0621
Scaled explained SS	22.02160	Prob. Chi-Square(10)	0.0150

Source: Regression output of Eview 6

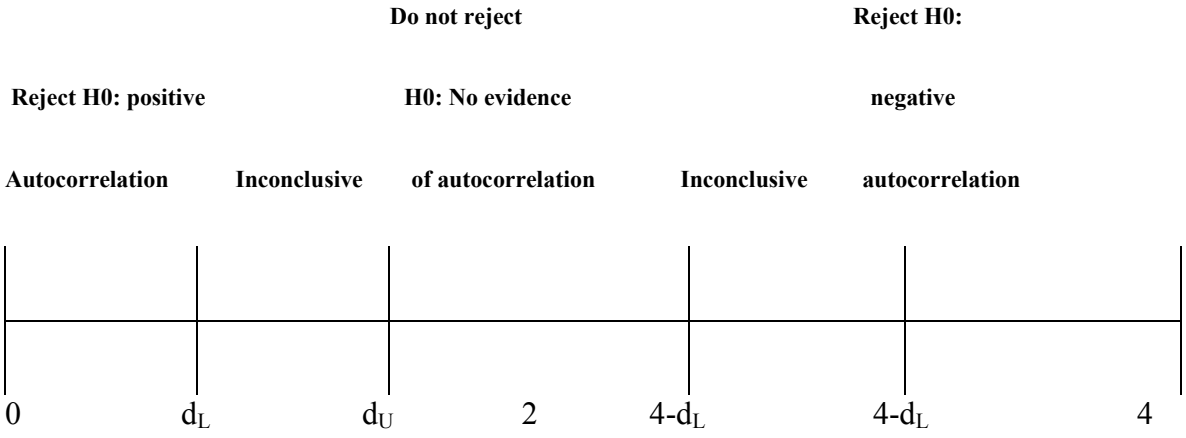
From Breusch-Pagan-Godfrey test result above, it is obvious to say that there is no evidence for the presence of heteroskedasticity, because both the test-statistics i.e. F-and χ2 reveals the absence of heteroskedasticity since the p-value is more than 5% significant level. Therefore, the **H0**: that the variances disturbances are homoscedastic will not be rejected.

4.2.3. Assumption 3: covariance between the error terms over time is zero (autocorrelation)

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 that they are _serially

correlated‘. A test of this assumption is therefore required. There are again many methods to test this assumptions but for the purpose of this study the researcher used DW test because the condition for DW i.e. (there was a constant term in the regression, the regressors were non-stochastic, and no lags of dependent variable) are fulfilled. The following figure will show the DW test result;

Figure: 4.1, Rejection and Non-Rejection Regions for DW Test



Source: Chris Brooks, (2008) p. 147

According to Chris Brooks, (2008), DW has 2 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 can neither be rejected nor not rejected. the null hypothesis is rejected and the existence of positive autocorrelation presumed if DW is less than the lower critical value; the null hypothesis is rejected and the existence of negative autocorrelation presumed if DW is greater than 4 minus the lower critical value; the null hypothesis is not rejected and no significant residual autocorrelation is presumed if DW is between the upper and 4 minus the upper limits. To test this assumption, the DW statistics value in the main regression table should be used.

So as per the result indicated in the table (4.7) bellow, the value of DW statistics is 1.9 which is in the non-rejection region. Therefore, there is no autocorrelation problem.

4.2.4. Assumption 4: Multicollinearity Test

Multicollinearity means that there is linear relationship between explanatory variables which may cause the regression model biased (Gujarati, 2003). According to Chris Brooks, in any practical context, the correlation between explanatory variables will be non-zero, although this will generally be relatively benign in the sense that a small degree of association between explanatory variables will almost always occur but will not cause too much loss of precision. However, a problem occurs when the explanatory variables are very highly correlated with each other, and this problem is known as multicollinearity. This poses problems in interpreting regression coefficients. And it also results in large standard errors of the estimated regression coefficients and leads to instability of regression estimates. This is not a problem of model specification, but of data (Hair et al., 2006). In order to examine the possible degree of multi collinearity among the regressors, correlation matrixes of the variables were presented in table (4.3) bellow.

Table: 4.3, Pearson correlation Coefficient matrix

	LEV	TAG	GRO	NDTS	RISK	PRO	SIZE	AGE	LIQ	INF	GDP
LEV	1	0.39	0.31	0.095	-0.335	-0.093	0.553	-0.028	-0.459	0.026	-0.02
TAG	0.39	1	0.021	-0.058	0.276	0.15	0.25	-0.082	-0.22	0.039	-0.00035
GRO	0.31	0.021	1	0.263	0.039	0.11	0.087	0.012	-0.194	-0.004	0.099
NDTS	0.095	-0.058	0.263	1	0.163	0.034	0.069	0.099	-0.02	0.04	-0.092
RISK	-0.335	0.276	0.039	0.163	1	0.231	-0.358	0.035	0.132	-0.01	0.003

PRO	-0.093	0.15	0.11	0.034	0.231	1	0.066	0.072	0.118	-0.058	0.02
SIZE	0.553	0.25	0.087	0.069	-0.358	0.066	1	-0.113	-0.29	-0.006	0.005
AGE	-0.028	-0.082	0.012	0.099	0.035	0.072	-0.113	1	0.20	-0.258	-0.08
LIQ	-0.459	-0.22	-0.194	-0.02	0.132	0.118	-0.29	0.20	1	-0.015	-0.02
INF	0.026	0.039	-0.004	0.04	-0.01	-0.058	-0.006	-0.258	-0.015	1	-0.52
GDP	-0.02	-0.00035	0.099	-0.092	0.003	0.02	0.005	-0.08	-0.02	-0.52	1

Source: Regression output of Eview 6

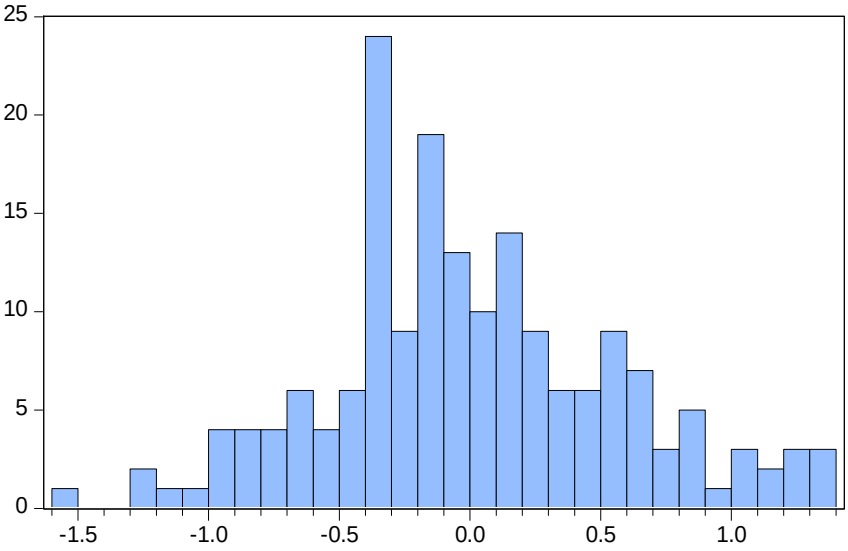
The conventional measures for multicollinearity are tolerance and the variance inflation factor (VIF). In this study only tolerance value is used as a measure of muliticollinearity. The tolerance value is the amount of an independent variable‘s predictive ability that is not predicted by the other independent variables in the equation (Hair et al, 2006). As a rule of thumb, the inter-correlation among the independents above 0.80 signals a possible multicollinearity problem (Gujatati, 2003). However, as indicated in the table (4.3) above, almost all variables have low correlation power and this implies no multicollinearity problem in the explanatory variables included in this model.

The result presented on table (4.3) above, also confirms that; tangibility, size, non debt tax shield, inflation and growth have positive correlation with leverage whereas risk, age, GDP, liquidity and profitability are negatively correlated with the dependent variable. This therefore means that an increase in tangibility, size, non debt tax shield, inflation and growth will result to increase in debt. On the other hand, a decrease in tangibility, size, non debt tax shield, inflation and growth will lead to decrease in leverage. However, the inverse relation is true for the variable; risk, age, GDP, liquidity and profitability with leverage.

4.2.5. Normality test

One of the most commonly applied tests for normality is the Bera—Jarque (BJ) test. BJ uses the property of a normally distributed random variable that the entire distribution is characterized by the first two moments the mean and the variance. Bera and Jarque (1981), Formalize these ideas by testing whether the coefficient of skewness and the coefficient of excess kurtosis are jointly zero. A normal distribution is not skewed and is defined to have a coefficient of kurtosis of 3 with the histogram should be bell-shaped 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 bigger than 0.05 to not reject the null of normality at the 5% level. Figure:4.2, Bellow presents the BJ test result for normality:

Figure: 4.2, BJ normality test



Series: Standardized Residuals	
Sample 2001 2006	
Observations 179	
Mean	0.000913
Median	-0.063573
Maximum	1.387629
Minimum	-1.540367
Std. Dev.	0.562269
Skewness	0.229948
Kurtosis	3.061200
Jarque-Bera	1.605401
Probability	0.448117

Source: Regression output of Eview 6

Based on the test result above, the residuals were normally distributed because the kurtosis is almost equal to 3 and its Jargue-Bera is insignificant at 5%, significant levels. And also the histogram is relatively bell-shaped. Therefore, **HO:** that states residuals follow a normal distribution would not be rejected.

4.3. Descriptive statistics

The following table bellow provides a summary of the descriptive statistics for the dependent and independent variables included in this study.

Table: 4.4, Descriptive statistics of variables

Variables	Observations	Mean	Median	Maximum	Minimum	Std. Dev.
Lev	180	2.021774	1.992000	4.600000	0.586200	0.776527
Tag	180	0.095905	0.083000	0.501100	0.003200	0.066615
Gro	180	0.158830	0.107400	0.730000	-0.234000	0.175949
Ndts	180	0.106054	0.087500	0.421000	0.005700	0.071420
Risk	180	0.429051	0.235000	2.011000	0.010950	0.464513
Pro	180	0.080017	0.063100	0.630000	-0.190800	0.094789
Size	180	15.77373	15.96100	20.01300	10.92300	2.417309
Age	180	7.575419	7.000000	13.00000	6.000000	2.308472
Liq	180	1.145803	1.114000	1.661000	0.680000	0.183644
Inf	180	0.187352	0.135000	0.364000	0.028000	0.125369
GDP	180	0.100514	0.103000	0.114000	0.087000	0.008100

Source: Regression output of Eview

Table (4.4), above reveals that, the average leverage proportion in financing the total asset of Construction Company in Ethiopia is 200%. Which means 2x of the total asset invested by Construction Company in Ethiopia is financed from debt source. The minimum and the maximum value of leverage ratio are 58.6% and 460% respectively. This implies that, to the minimum 58.6% of the total asset invested by Construction Company in Ethiopia is financed

from debt and the maximum debt finance goes to 4x... of the total asset invested. This provides evidence that, how Construction Companies highly depends on debt financing to cover their huge finance need. The standard deviation 77.65% indicates a wide variation in leverage ratio among sampled Construction companies.

The average fixed asset to total asset ratio is 9.6% with minimum and the maximum value of 50% and 3% respectively. This is the reflection of the fact that, Construction Company in Ethiopia invest slight on fixed assets and a tendency of investing more on current asset. This may disagree with actual practical situation, because Construction companies generally assumed to have huge machinery and equipment used in their operation. The standard deviation 6.67% is a sign of a small variation in leverage ratio among sampled Construction companies.

In terms of profitability, Table (4.4), above also indicates that, the average profitability; when measured in terms of return on assets (ROA), or the ratio of operating income (EBIT) to total asset, accounted for 8% per annum. The standard deviation 9.5% indicates the existence of small variation in the profitability among the sampled firms. The maximum attainable average profit is 63% whereas the lowest observed average profitability rate is -19%.

Likewise, growth which is measured as a percent change in total asset was an average rate of, approximately 16% during the six-year period. While the maximum and minimum growth rate were 73% and -23.4% respectively. In addition, firms included in the study have an age distribution between 6 years and 13 years time span and the average age is approximated as 8 years. This implies that, largest observed operating experience of sampled firm is 13 years while the smallest amount is 6years of operating experience.

In terms of size which is measured as the natural logarithm of total asset; the descriptive statistics‘ result also reveals that, the average size of the sampled firm is 15.77 which is around 70603134 Ethiopian birr With the maximum and minimum asset value of birr 490041187 and 55270798 respectively. The standard deviation 2.4 indicates the existence of very wide variation in the asset value among the sampled firms.

The table (4.4), above also point out that, the average liquidity ratio of the sampled firm was 1.145 with the minimum and maximum liquidity ratio of 0.68 and 1.67 respectively. This fact may be interpreted as; there is a problem of liquidity or insufficiency of funds to pay creditors. Because, as a Rule of thumb or arbitrary standard of the liquidity of the firm 2:1 is satisfactory but not enough. However, when we see the result in the above table even the maximum liquidity ratio was not meets the minimum requirement.

Regarding to the non-debt tax shield, the average tax shields enjoyed by Construction Company in Ethiopia from depreciation without considering interest were found to be 10.6% of the total assets invested. The upper limit of the non-debts tax shields was42% of the total assets and the lowest coverage on the other hand is 0.57% of the total assets. Again following the above table (4.4), descriptive statistics result also reveals that, average inflation and GDP were found to be 18.73% and 10.05% respectively. The highest inflation rate was 36.4% which were recorded in 2010 while the lowest is 2.8%. This implies there was high inflation during the selected sample period.

Finally, as it was disclosed on table (4.4) above, the mean value of risk (earning volatility) which is measured as the standard deviation of return on asset was 42.9% and its minimum and maximum value were 1.1% and 200% respectively. This indicates that there is high volatility of

earnings in construction companies or the sector is more risky given that they are the fastest growing sector. A reasonable explanation is that high growth opportunities may provide enough incentive to management to undertake risky investments in order to grow the firm. And also standard deviation of 46.45% point outs the existence of wide variation in the risk level among the sampled firms.

4.4. Estimation of the Model

In panel data, there are three models such as: pooled OLS regression model, random effect model and fixed effect 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. That‘s why 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: 4.5 Haussmann test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.0000	10	1.0000

Source: Regression output of Eview 6

Based on the test result the p-value is very large (100%) therefore, we cannot reject null hypothesis which states Radom effect model is appropriate. Again in order to know whether this random effect model is appropriate or not, it is necessary to double check against the pooled regression model by using Breusch-Pagan-Godfrey LM test. The test result is presented in table (4.6) bellow: 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: 4.6 Breusch-Pagan-Godfrey LM tests

Breusch- Pagan LM Test for random effect model			
F-statistic	94.02839	Prob. F(2,166)	0.0000
Obs*R-squared	95.07561	Prob. Chi-Square(2)	0.0000

Source: Regression output of Eview

The result of the above table (4.6) reveals that, we can reject the null hypothesis because p-value is very small i.e. 0%. Meaning that random effect model is appropriate. Thus, both Haussmann

test and Breusch-Pagan test are telling that, random effect model is the best model to represent this data. Therefore, final estimation method used in this research is Radom effect. The results of Radom estimation are shown in table (4.7) bellow.

4.5. Regression analysis

The summary of the regression results from the Eview output were presented in table (4.7), from where detailed analysis and discussion of the result was given.

Table: 4.7 Random effect regression model result

Variable	Coefficient	S td. Error	t-Statistic	Prob.
C	1.806109	0.622569	2.901056	0.0042
TAG	2.142959	0.473393	4.526811	0.0000
GRO	0.504032	0.233986	2.154108	0.0327
NDTS	0.225742	0.358997	0.628815	0.5303
RISK	-0.389440	0.182996	-2.128140	0.0348
PRO	-0.708650	0.326150	-2.172772	0.0312
SIZE	0.078283	0.029993	2.610070	0.0099
AGE	0.005517	0.009629	0.572964	0.5674
LIQ	-0.843740	0.136103	-6.199269	0.0000
INF	0.046788	0.147689	0.316800	0.7518
GDP	-1.415799	2.153559	-0.657423	0.5118

	Weighted Statistics		
R-squared	0.471382	Mean dependent var	0.319752
Adjusted R-squared	0.439916	S.D. dependent var	0.254248
S.E. of regression	0.290565	Sum squared resid	6.100954
F-statistic	14.98096	Durbin-Watson stat	1.932040
Prob(F-statistic)	0.000000		

Source: Regression output of Eview

From the above regression result of Random effect model, it would be observed that the coefficient of determination of R-squared and Adjusted R-squared were 47% and 44% respectively. This implies that 44% of the change in leverage is successfully explained by the selected firm specific factors as well as microeconomic factors (profitability, size, growth, tangibility, age, liquidity, risk, inflation, GDP, and non-debt tax shield) or independent variables included in the model. However, the remaining 66% changes in leverage were caused by other factors that were not included in the model. This indicates that the model is an average fit with almost average predictive power.

Regarding to the adequacy of the model which is measured by the standard error of the model as well as f-statistics‘, also, the result reveals that, the Standard Error of Regression (SER) is 29% which is considered relatively good enough to confirm the predictive power of the model. In addition, The F-test which measures the existence of linear relationship between the dependent and independent variable revealed that a highly significant relationship exist between the variables. Furthermore, the observed value of DW is 1.9 which is approximately 2.00, revealed that there is the absence of serial correlation in the regression results. Therefore, the model is good model for policy making purposes. And this implies that the result can be used to draw policy suggestion.

It can be also observed from the above Table (4.7), estimated regression result that, six out of ten explanatory variables in this model were statistically significant at 5% with the dependent variable whereas the remaining four being GDP, inflation, age and non debt tax shield were not. This implies that; variation in this variables i.e. GDP, inflation, age and non debt tax shield does not affect debt ratio (leverage) as per the model. Again the result disclosed that, the coefficient of

three statistically significant explanatory variables, such as: tangibility, size and growth were positive while, liquidity, profitability and risk have a negative coefficient.

In agreement with the research hypothesis, the regression result in Table (4.7), exhibit positive relationship between tangibility and leverage of the firm. This, positive relation between tangibility and leverage found in this study confirms the findings of Rajan and Zingales (1995), Bradley et al. (1984) and Titman and Wessel (1988). The logical explanation for this finding is that, a fixed asset serves as collateral for loans, since, the greater the proportion of tangible assets on the balance sheet, the more willingness of lenders to supply loans, consequently, leverage should be come high. In other words, firms with more tangible assets have a greater ability to secure debt and lenders suffer a smaller loss of value when firms go into distress; Because, these assets are insurance for the lenders in the event of winding up.

Similarly, having the incentive of getting debt at lower interest rate, a firm with higher percentage of fixed asset is expected to borrow more as compared to a firm whose cost of borrowing is higher because of having less fixed assets. By looking to the β coefficient, tangibility is found to be the major determinant of the level of debt financing for Construction Company in Ethiopia. Because, the result makes obvious that, the coefficient of tangibility is very high as compared to other determinants. As mentioned, in the literature this observation supports the idea of both the static trade-off theory and agency theory. But, in a pecking order framework this relation is predicted to be negative due to information asymmetries. In contrast to this finding, the study conducted by Wiwattanakantang (1999) and Booth et al. (2001), found negative relationship between tangibility and leverage for Thai firms.

Empirically, there is much controversy about the relationship between growth rate and level of leverage. The result of this study shows, a statistically significant and positive relation between debt ratio (leverage) and growth. This positive relationship obtained on the relationship between growth and leverage may be explained in the light of the explanation forwarded by Myers and Majluf (1984)‘ pecking order theory, where they stated that firms finance their projects from the internally generated funds. However, the growing firms may not be capable to finance all its 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.

This finding, is consistent with the works of, Frank and Goyal,(2008), and Hall et al., (2004). However, contrary to the positive relationship discovered in this study; Titman and Wessels (1988), Barclay, et al., (1995) and Rajan and Zingales (1995) all found a negative relationship between growth opportunities and leverage. This negative relation is explained in line with agency cost theory, in that, agency costs for growing firms are expected to be higher as these firms have more flexibility with regard to future investments. The reason is that bondholders fear that such firms may go for risky projects in future as they have more choice of selecting between risky and safe investment opportunities. Considering their investments at risk in future, bondholders will impose higher costs of lending to growing firms. Growing firms, thus, facing higher cost of debt will use less debt and more equity. Again this negative relationship can also be explained according to trade-off theory as, firms holding future growth opportunities, which are a form of intangible assets, tend to borrow less than firms holding more tangible assets because growth opportunities cannot be collateralized.

As it is initially expected in this study, profitability is negatively and strongly related with debt ratio (leverage). This is again in line with Myers‘ pecking order theory; in that profitable firms initially rely on less costly internally generated funds and subsequently look for external sources if additional funds are needed. It is expected that more profitable firms will require less debt finance. This is because profitable firms would have a preference for inside financing over outside debt financing, when the cost of external financing is greater for the firm. This result is consistent with the findings made by Titman and Wessels (1988), Rajan and Zingales(1995), and Bevan and Danbolt (2002) in developed countries, Booth et al, (2001), and Pandy (2001) in developing countries. However, in contrary to this finding, positive relationship is expected according to Static trade-off theory, provided that, bankruptcy costs are lower and interest tax shields are more valuable for profitable firms (Frank and Goyal 2008). Profitable firms are more attractive to financial institutions as lending prospects; therefore they can always take on more debt capital (Ooi, 1999).

The results also revealed that, both risk (earning volatility) and liquidity have an inverse and statistically significant relationship with debt ratio or leverage. This negative relation of, risk and leverage implying that firms with high risk levels exhibit low debt ratios. In other words, they may avoid accommodating more financial risk by employing less debt. Likewise, firms that are viewed as risky by creditors find it more difficult to borrow long-term. In addition, given agency and bankruptcy costs, the less stable earnings of the enterprises, the greater is the chance of business failure and the greater will be the weight of bankruptcy costs on enterprise financing decisions. Similarly, as the probability of bankruptcy increases, the agency problems related to debt become more aggravated. This finding is in line with the combined prediction of trade-off, agency cost and pecking order theory. Since firms having relatively severe volatile earnings are

assumed to make less use of debt in their financing. In agreement with this finding, Bradley et al. (1984), found a negative relationship between earning volatility and leverage while Kim and Sorensen (1986) found a positive relationship which is in contrary to this study.

Concerning the determinant liquidity, the negative relationship found in this study is in line with the pecking order theory, since more liquid firms tend to use less debt in their financing. Moreover, liquid firms are in possession of relatively more internal funds and the pecking-order theory assumes that these internal funds are used first when financing is needed. This could mean that, firms which have accumulated high capital reserves seem to be willing to employ them to fund new investments before going to external financing. Therefore, more liquid firms are relatively little leveraged according to the pecking-order theory. This is consistent with the work of; Rataporn et al. (2004).

Theoretically, the expected relationship between age of the firm and leverage is contradicting and also the empirical findings are inconclusive. Referring to the agency and trade-off theory; the age of the firm connotes a standard measure of reputation in capital structure models (Shehu, 2011). As a firm grows longer in business, it establishes itself as an ongoing business and therefore increases its capacity to take on more debt; hence age is positively related to debt. On the contrary, by referring to pecking order theory, Hutchinson, (2003) suggests that older firms are able to accumulate funds and need less to borrow either long-term or short-term. In other words, a new firm will not have had time to retain funds and may be forced to borrow. Consequently age is likely to be negatively related to leverage. However, based on the results of this study, it‘s difficult to see the effect of age on leverage; because, it is statistically insignificant even if, it‘s coefficient is positive.

For non-debt tax shields, the result contradicts theoretical prediction, i.e., a positive relation to leverage. But, it is not statistically significant in this study.

As far as inflation is concerned, the results show a statistically insignificant relationship between inflation and leverage. This implies that; increase or decrease inflation does not have any effect on leverage. by the same token, Bastos et al. (2009), argue that inflation does not influence the capital structure; and Frank & Goyal (2009), find that inflation have positive effect on market leverage, but have no effect on the book leverage. However, Camara (2012) shows that macroeconomic conditions included inflation rate have significant relation with capital structure. Similarly, GPD is statistically insignificant in this model.

Finally, the regression result on the above table (4.7), also exhibits statistical evidence that Size of the firm was found to have significantly positive relationship with leverage. This finding, coupled with the fact that, large firms would have more debt since larger firms are more diversified, have greater access to debt markets, easily disclose necessary information and have lower default risk; as a result, they tend to have higher leverage. On the other hand, smaller firms may find it relatively more costly to resolve issues of information asymmetries with the providers of capital debt, thus, may present lower debt ratios. Furthermore, large firms have a reputation in debt markets and consequently face lower agency costs of debt.

This finding was in line with the combined prediction of trade-off, pecking-order and agency cost theory. In consistence with this finding, the finding of Al-Sakran (2001), Pandy (2001), Booth et al, (2001), and Huang and Song (2002) shows a significant positive relationship between leverage ratio and size of a firm in developing countries. The following table presents the comparisons of the test result with expected sign of the study and prediction of the theory.

Table: 4.8 Comparisons of test result and expected sign of the study

Determinants	**Predicted signs by theories**	**Expected outcome of the paper**	**Actual test result**
Tangibility	+ (trade of theory and agency theory) -(pecking order theory)	+	+ significant
Profitability	+ (trade of theory) -(pecking order theory)	-	- significant
Growth opportunities	+ or - (pecking order theory) -(agency theory)	+	+ significant
Size	+ (trade of theory and agency theory) + or - (pecking order theory)	+	+significant
Earning volatility	- (pecking order, agency cost and trade off theory)	-	- significant
Non-debt tax shields	- (trade of theory)	-	+But insignificant
Age	+ (trade of theory and agency theory) -(pecking order theory)	+	+But insignificant
Liquidity	+ (trade of theory) -(pecking order theory)	-	- significant
Expected inflation	+ (trade of theory) _(pecking order theory)	+	+But insignificant
GDP growth	- (trade of theory) + (pecking order theory)	+	- But insignificant

Source: from table (1) and (8)

Hence, it vividly seen from the table (4.8) that, the expected result of the study was the same with the actual test result of the regression output except for the two variables i.e. GDP and non-debt tax shield. So, the estimated model was written bellow but, because of the model was random effect the β coefficient was not constant throughout the period.

$$\mathbf{LEV}_{it} = 1.8 - 0.7\ \text{Prof}_{it} + 2.14\text{Tang}_{it} + 0.078\text{Size}_{it} + 0.504\text{Grh}_{it} - 0.389\text{EarVol}_{it} - 0.843\ \beta 7\text{Lq}_{it} + \ldots + \varepsilon_{it}$$

Chapter Five

5. Conclusions and Recommendations

This particular chapter of the study deals with the conclusion, implication and recommendation of the study which is based on what is discussed in the previous chapter and the main finding of this study.

5.1. Conclusions

Capital structure has attracted intense debate in the financial management arena for nearly half-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 have been the subject of frequent debate in the capital structure literature. While, 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. Therefore, this study examined the determinants of capital structure decisions of Construction Company in Ethiopia, using the methodology of panel data estimation to extend empirical work on this area of corporate financing behavior. For this purpose, eight firm-specific determinants (internal factors); namely tangibility, non tax shields, growth, earning volatility, profitability, liquidity, age and size of the firm as well as two macroeconomic (external factors); i.e. GDP and inflation were selected from the existing prominent capital structure literature to see their effect on leverage (debt ratio) .

For analysis purpose descriptive statistics and random effect multiple regression were used. A panel regression analysis result revealed that, debt ratio (leverage) have: a positive relation, with

asset tangibility, growth opportunity, and size of the firm. But, have a negative relation, with profitability, liquidity and risk (earning volatility). However, in contrast to the findings of existing literature, this study found that; age of a firm, non-debt tax shield, inflation and GDP have no statistically significant impact on a firm‘s choice of debt ratio. This implies that, firm-specific factors are significant factors influencing capital structure decision of construction companies in Ethiopia, as compared to macroeconomic condition which were insignificantly associated to firm leverage.

These empirical results were consistent with a number of theoretical propositions typically associated with the determinants of debt-equity choice of non-financial firms. Specifically, the finding supports that, among the six statistically significant firm-specific determinants, three firm-specific determinants such as: growth opportunity, profitability, and liquidity particularly supported a literal prediction of the pecking order theory. While, the two firm-specific determinants i.e. risk and size: supported the combined prediction of, trade-off, pecking-order and agency cost theory. And the remaining significant firm specific factor i.e. tangibility, supports the combined prediction of, both trade-off and agency cost theory.

This clearly implies that, the pecking order theory appears to be dominated in the Ethiopian capital structure story. Thus, the findings of the study therefore suggested that, some of the insights from the modern finance theory were portable to the Ethiopia in that certain firm specific factors that were relevant for explaining capital structure in the developed countries were also relevant in Ethiopian context even if, institutional differences exist between Ethiopia and the developed countries.

Therefore, based on the result of the study, it is confirmed that: profitability, tangibility, liquidity, Size, growth and earnings volatility; were very important factors, which affects financial decision (leverage) in either of both directions i.e. positively and negatively or, play determining roles in accessing debt finance within the Ethiopian context particularly; construction sector. Hence, knowing these factors could help, a financial manager to predict the financial pattern of a firm.

5.2. Research implications and Recommendations

The results of this study have brought some insights on the capital structure of Ethiopian firms. From the view point of the determinants of capital structure, the findings of this study would assist in establishing financial policy guidelines that will mitigate financial risk in the various firms. Similarly, given the outcome of this study, the model used in this study could be used as a basis for formulating debt equity policy in Ethiopia that will maximize the wealth of shareholders and increase the value of firms. For this reason, on the basis of the findings of this study and literature reviewed the following points were recommended by the researchers; to improve the decision of capital structure choice of the firm or, to increase the Company‘s financial performance.

As per the result of descriptive statistics‘, Construction Companies highly depends on debt financing to cover their huge finance need. Given that, collateral value (tangibility) is the major determinant of the level of debt financing for Construction Company in Ethiopia, Thus, it is recommended that firms in construction industry should, kept more and more fixed assets, in order to become attractive to debt finance. Or, firms tend to match their duration of assets and liabilities by financing their fixed assets with long-term debt and their current assets with short-term debt instead of accumulating excess current assets. And also, Management of the

construction company should keep track of the firm‘s capital structure, and ensure that changes in various policies affecting the factors that determine the capital structure does not affect the firm. This is not only for the single variable i.e. tangibility but also for all significant factors.

Based on the result of the study, it is clearly observed that; the pecking order theory appears to dominate the construction company‘s capital structure story. It is therefore important for company‘s policy to be directed at improving the information environment. This is whey; 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 discloses there true status to the public.

Finally the study also recommend that; in carrying out their debt financing decision, Construction Companies in Ethiopia, should carefully ascertain and properly measure the impact of those significant variables like profitability, tangibility, liquidity, growth, earnings volatility and Size of the firm, on the leverage in order to set the best possible mix of debt and equity that maximum their value.

The last but not the least is, even if, the study includes many variables and seems to confirm the most important and widespread prescriptions of the theory of capital structure, but at the same time it stresses the fact that further research to identify the fundamental determinants of capital structure is still called for. Therefore, it is recommended that future studies on capital structure determinant should accommodate other external variables like; interest rate, corporate governance, legal framework and impact of the country‘s financial system.

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Appendix

1. **Regression output for unit root test only for five variables other variables are done in the same way**

Panel unit root test: Summary
Series: LEV

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-15.6071	0.0000	30	150
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.04410	0.0012	30	150
ADF - Fisher Chi-square	101.080	0.0007	30	150
PP - Fisher Chi-square	125.765	0.0000	30	150

Panel unit root test: Summary
Series: TAG

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-81.6374	0.0000	30	149
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-12.3145	0.0000	30	149
ADF - Fisher Chi-square	65.5499	0.2904	30	149
PP - Fisher Chi-square	79.3416	0.0480	30	149

Panel unit root test: Summary
Series: GRO

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-35.8566	0.0000	30	150
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.49973	0.0000	30	150
ADF - Fisher Chi-square	101.455	0.0007	30	150
PP - Fisher Chi-square	130.330	0.0000	30	150

Panel unit root test: Summary

Series: NDTS

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.68286	0.0000	30	150
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.86916	0.1924	30	150
ADF - Fisher Chi-square	73.1773	0.1181	30	150
PP - Fisher Chi-square	88.9934	0.0089	30	150

Panel unit root test: Summary
Series: PRO

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-28.5422	0.0000	30	150
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.80407	0.0001	30	150
ADF - Fisher Chi-square	99.6534	0.0010	30	150
PP - Fisher Chi-square	117.722	0.0000	30	150

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

2. Regression result for heteroskedasticity test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.832198	Prob. F(10,168)	0.0585
Obs*R-squared	17.60197	Prob. Chi-Square(10)	0.0621
Scaled explained SS	22.02160	Prob. Chi-Square(10)	0.0150

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/24/15 Time: 17:38
Sample: 2001 2180
Included observations: 179

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.973076	0.882241	1.102959	0.2716
TAG	0.350478	0.287236	1.220173	0.2241
GRO	0.241069	0.265355	0.908475	0.3649
NDTS	0.425944	0.652697	0.652590	0.5149
RISK	0.028363	0.113189	0.250582	0.8024
PRO	0.474722	0.514942	0.921894	0.3579
SIZE	0.005405	0.020749	0.260492	0.7948
AGE	0.000726	0.020841	0.034843	0.9722
LIQ	-0.741251	0.263307	-2.815155	0.0055
INF	0.252089	0.433817	0.581095	0.5620
GDP	-1.025307	6.556133	-0.156389	0.8759

R-squared	0.098335	Mean dependent var	0.349299
Adjusted R-squared	0.044664	S.D. dependent var	0.590359
S.E. of regression	0.577024	Akaike info criterion	1.797618
Sum squared resid	55.93678	Schwarz criterion	1.993491
Log likelihood	-149.8868	Hannan-Quinn criter.	1.877043
F-statistic	1.832198	Durbin-Watson stat	0.742619
Prob(F-statistic)	0.058466		

3. Haussmann test regression result

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

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	10	1.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
TAG	1.929567	2.142959	0.020729	0.1383
GRO	0.018556	0.074835	0.000582	0.0196
NDTS	0.035278	0.225742	0.014595	0.1149
RISK	0.043593	-0.389440	0.216274	0.3518
PRO	-0.389154	-0.276125	0.001925	0.0100
SIZE	0.012507	0.078283	0.001263	0.0642
AGE	0.004657	0.005517	0.000006	0.7300
LIQ	-0.917764	-0.843740	0.003461	0.2083
INF	0.029004	0.046788	0.000166	0.1679

GDP	-1.516363	-1.415799	0.022221	0.4999

Cross-section random effects test equation:
Dependent Variable: LEV
Method: Panel Least Squares
Date: 05/24/15 Time: 18:51
Sample: 2001 2006
Periods included: 6
Cross-sections included: 30
Total panel (unbalanced) observations: 179

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.820037	0.884659	3.187711	0.0018
TAG	1.929567	0.494803	3.899670	0.0001
GRO	0.018556	0.111754	0.166042	0.8684
NDTS	0.035278	0.378779	0.093137	0.9259
RISK	0.043593	0.499762	0.087227	0.9306
PRO	-0.389154	0.223458	-1.741512	0.0838
SIZE	0.012507	0.046508	0.268927	0.7884
AGE	0.004657	0.009946	0.468239	0.6403
LIQ	-0.917764	0.148273	-6.189674	0.0000
INF	0.029004	0.148251	0.195638	0.8452
GDP	-1.516363	2.158712	-0.702439	0.4836

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.956229	Mean dependent var	2.021774
Adjusted R-squared	0.943949	S.D. dependent var	0.776527
S.E. of regression	0.183844	Akaike info criterion	-0.355439
Sum squared resid	4.698024	Schwarz criterion	0.356826
Log likelihood	71.81183	Hannan-Quinn criter.	-0.066622
F-statistic	77.86292	Durbin-Watson stat	1.411884
Prob(F-statistic)	0.000000		

4. Regression result for Breusch-pagan LM test

Breusch- Pagan LM Test for random effect model:

F-statistic	94.02839	Prob. F(2,166)	0.0000
Obs*R-squared	95.07561	Prob. Chi-Square(2)	0.0000

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 05/24/15 Time: 19:03
Sample: 2001 2180
Included observations: 179
Presample and interior missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.278499	0.538045	-0.517613	0.6054
TAG	0.185216	0.462277	0.400661	0.6892
GRO	-0.275944	0.162888	-1.694072	0.0921
NDTS	0.211642	0.400339	0.528657	0.5977
RISK	-0.031264	0.070790	-0.441643	0.6593
PRO	-0.249886	0.296856	-0.841775	0.4011
SIZE	-0.004450	0.013299	-0.334629	0.7383
AGE	-0.004405	0.012644	-0.348432	0.7280
LIQ	0.160653	0.160322	1.002062	0.3178
INF	-0.047344	0.263827	-0.179452	0.8578
GDP	2.298333	3.984342	0.576841	0.5648
RESID(-1)	0.731054	0.076942	9.501393	0.0000
RESID(-2)	0.017309	0.078030	0.221831	0.8247

R-squared	0.531149	Mean dependent var	-2.65E-16
Adjusted R-squared	0.497256	S.D. dependent var	0.493525
S.E. of regression	0.349931	Akaike info criterion	0.807694
Sum squared resid	20.32703	Schwarz criterion	1.039180
Log likelihood	-59.28862	Hannan-Quinn criter.	0.901560
F-statistic	15.67140	Durbin-Watson stat	1.917093
Prob(F-statistic)	0.000000		

5. Summary of Converted raw data

Com	DATE	LEV	TAG	GRO	NDTS	RISK	PRO	SIZE	AGE	LIQ	INF	GDP
1	2001	4.6	0.5011	0.28	0.25	0.059	0.16	17.46	7	0.68	0.364	0.098
1	2002	4.05	0.25	0.34	0.04	0.059	0.01	18	7	0.94	0.028	0.103
1	2003	3.52	0.21	0.04	0.0133	0.059	0.014	17.9	7	1.02	0.181	0.114
1	2004	4.2	0.263	0.114	0.023	0.059	0.0033	18.011	7	1.04	0.341	0.087
1	2005	3.71	0.17	0.23	0.334	0.059	0.0045	18.01	7	1.023	0.135	0.098
1	2006	3.63	0.154	0.32	0.117	0.059	0.012	17.98	7	1.05	0.0810	0.1030
2	2001	3.16	0.22	0.73	0.175	2.011	0.13	17.32	8	1.03	0.3640	0.0980
2	2002	3.46	0.31	0.35	0.21	2.011	0.432	17.64	8	0.98	0.0280	0.1030
2	2003	3.14	0.21	0.58	0.23	2.011	0.12	18.04	8	1.04	0.1810	0.1140
2	2004	3.33	0.25	0.283	0.253	2.011	0.22	18.42	8	1.02	0.3410	0.0870
2	2005	3.21	0.231	0.32	0.226	2.011	0.24	18.6	8	1.012	0.1350	0.0980
2	2006	3.13	0.192	0.47	0.12	2.011	0.63	17.71	8	1.011	0.0810	0.1030
3	2001	2.31	0.024	0.12	0.13	0.0303	0.43	14.85	8	0.96	0.3640	0.0980
3	2002	2.24	0.06	0.25	0.092	0.0303	0.48	15.07	8	0.987	0.0280	0.1030
3	2003	2.3	0.033	0.013	0.081	0.0303	0.072	15.062	8	1.01	0.1810	0.1140
3	2004	2.18	0.013	0.05	0.102	0.0303	0.17	15.13	8	1.12	0.3410	0.0870
3	2005	1.91	0.0041	0.32	0.079	0.0303	0.152	14.52	8	1.123	0.1350	0.0980
3	2006	1.82	0.0032	0.27	0.075	0.0303	0.197	14.95	8	1.15	0.0810	0.1030
4	2001	2.881	0.026	0.237	0.23	0.0493	0.0451	16.196	7	1.13	0.3640	0.0980
4	2002	2.892	0.0271	0.645	0.167	0.0493	0.0463	16.545	7	1.03	0.0280	0.1030
4	2003	2.721	0.0251	0.343	0.19	0.0493	0.0521	16.97	7	1.21	0.1810	0.1140
4	2004	2.852	0.0262	0.182	0.239	0.0493	0.0506	17.388	7	1.04	0.3410	0.0870
4	2005	2.825	0.0261	0.652	0.208	0.0493	0.041	17.487	7	1.051	0.1350	0.0980
4	2006	2.812	0.0234	0.542	0.221	0.0493	0.0497	17.513	7	1.061	0.0810	0.1030
5	2001	1.8356	0.0378	0.667	0.241	0.0457	0.0419	14.32	9	0.98	0.3640	0.0980
5	2002	1.872	0.039	0.531	0.248	0.0457	0.0475	14.692	9	0.923	0.0280	0.1030
5	2003	1.798	0.0286	0.723	0.0493	0.0457	0.0588	15.334	9	1.03	0.1810	0.1140
5	2004	1.7912	0.0277	0.34	0.421	0.0457	0.0728	15.268	9	1.021	0.3410	0.0870
5	2005	1.804	0.0305	-0.13	0.223	0.0457	0.0432	15.397	9	1.011	0.1350	0.0980
5	2006	1.923	0.0316	0.215	0.193	0.457	0.0389	15.421	9	0.91	0.0810	0.1030
6	2001	1.944	0.0328	0.236	0.0835	0.0592	0.0439	13.65	9	1.352	0.3640	0.0980
6	2002	1.85	0.0317	0.172	0.11	0.0592	0.0485	13.91	9	1.525	0.0280	0.1030
6	2003	1.876	0.0359	0.526	0.107	0.0592	0.062	14.23	9	1.423	0.1810	0.1140
6	2004	1.865	0.0353	0.428	0.133	0.0592	0.0556	14.15	9	1.453	0.3410	0.0870
6	2005	1.868	0.0362	-0.234	0.093	0.0592	0.0419	14.17	9	1.431	0.1350	0.0980
6	2006	1.892	0.0368	0.342	0.089	0.0592	0.0426	14.21	9	1.332	0.0810	0.1030
7	2001	2.866	0.0354	0.341	0.211	0.2625	0.059	16.536	6	1.056	0.3640	0.0980
7	2002	2.911	0.0372	0.463	0.152	0.2625	0.0595	16.985	6	0.987	0.0280	0.1030
7	2003	2.804	0.0366	0.562	0.188	0.2625	0.0609	17.638	6	1.131	0.1810	0.1140
7	2004	2.815	0.0404	0.492	0.115	0.2625	0.0631	17.743	6	1.112	0.3410	0.0870
7	2005	2.807	0.0429	-0.088	0.197	0.2625	0.0675	17.787	6	1.123	0.1350	0.0980
7	2006	2.734	0.0421	0.153	0.212	0.2625	0.0567	16.756	6	1.351	0.0810	0.1030
8	2001	1.7524	0.0348	0.1684	0.0219	0.174	0.0602	15.484	9	1.26	0.3640	0.0980
8	2002	1.882	0.0405	0.272	0.02728	0.174	0.041	16.386	9	1.012	0.0280	0.1030
8	2003	1.715	0.0356	0.202	0.0343	0.174	0.049	16.958	9	1.34	0.1810	0.1140
8	2004	1.751	0.0406	0.115	0.01481	0.174	0.029	17.058	9	1.28	0.3410	0.0870
8	2005	1.746	0.0368	-0.1872	0.033	0.174	0.054	17.088	9	1.351	0.1350	0.0980

8	2006	1.874	0.0572	0.1045	0.0057	0.174	0.042	17.923	9	1.023	0.0810	0.1030
9	2001	2.131	0.074	0.396	0.0745	0.132	0.0724	13.672	6	0.92	0.3640	0.0980
9	2002	2.274	0.083	0.193	0.0653	0.132	0.0441	13.849	6	0.87	0.0280	0.1030
9	2003	2.239	0.0775	0.251	0.0642	0.132	0.0754	14.073	6	0.901	0.1810	0.1140
9	2004	2.31	0.072	-0.065	0.0567	0.132	-0.075	14.063	6	0.867	0.3410	0.0870
9	2005	2.175	0.063	-0.046	0.0935	0.132	0.0677	14.013	6	0.972	0.1350	0.0980
9	2006	2.135	0.0531	0.251	0.0953	0.132	0.0731	14.012	6	0.986	0.0810	0.1030
10	2001	0.973	0.204	0.054	0.0572	0.742	0.0567	11.536	8	1.311	0.3640	0.0980
10	2002	0.987	0.0207	0.0696	0.0541	0.742	0.0632	11.952	8	1.246	0.0280	0.1030
10	2003	1.27	0.0231	0.0851	0.0523	0.742	0.0512	12.07	8	1.132	0.1810	0.1140
10	2004	1.311	0.0242	0.102	0.0511	0.742	0.0421	12.13	8	0.985	0.3410	0.0870
10	2005	1.067	0.0214	0.0893	0.0553	0.742	0.0471	12.012	8	1.234	0.1350	0.0980
10	2006	1.096	0.0216	0.0921	0.0533	0.742	0.0452	12.023	8	1.116	0.0810	0.1030
11	2001	2.129	0.096	0.0111	0.0793	0.105	0.045	17.99	7	1.32	0.3640	0.0980
11	2002	2.264	0.103	0.0357	0.0652	0.105	0.009	18.31	7	1.113	0.0280	0.1030
11	2003	3.451	0.132	0.0624	0.0687	0.105	0.024	18.89	7	1.032	0.1810	0.1140
11	2004	3.446	0.129	0.0613	0.0693	0.105	0.002	18.9	7	1.0428	0.3410	0.0870
11	2005	3.447	0.131	0.0612	0.0596	0.105	0.037	18.902	7	0.987	0.1350	0.0980
11	2006	2.873	0.089	0.0586	0.0437	0.105	0.034	17.993	7	1.431	0.0810	0.1030
12	2001	1.922	0.0351	0.0356	0.132	0.01095	0.0435	19.861	7	1.014	0.3640	0.0980
12	2002	2.013	0.088	0.0587	0.0643	0.01095	0.0167	20.013	7	0.9726	0.0280	0.1030
12	2003	1.9125	0.0704	0.0536	0.07032	0.01095	-0.03092	19.715	7	0.9586	0.1810	0.1140
12	2004	2.167	0.0862	-0.0875	0.0294	0.01095	-0.01995	19.623	7	0.9104	0.3410	0.0870
12	2005	1.257	0.0875	-0.1195	0.1432	0.01095	0.008774	19.496	7	1.0956	0.1350	0.0980
12	2006	0.9024	0.0578	0.3547	0.0405	0.01095	0.1848	19.7999	7	1.4399	0.0810	0.1030
13	2001	0.7224	0.0382	0.25	0.07059	0.389	0.1557	18.216	8	0.9318	0.3640	0.0980
13	2002	0.9721	0.0521	0.1252	0.0984	0.389	0.035	16.736	8	1.236	0.0280	0.1030
13	2003	1.297	0.05234	0.0878	0.1021	0.389	0.0665	16.967	8	1.048	0.1810	0.1140
13	2004	1.908	0.05263	0.0654	0.1315	0.389	0.0326	17.035	8	0.9781	0.3410	0.0870
13	2005	1.873	0.04782	0.675	0.0973	0.389	0.0328	17.0685	8	0.9976	0.1350	0.0980
13	2006	0.9782	0.03642	0.0996	0.152	0.389	0.0793	16.311	8	1.562	0.0810	0.1030
14	2001	2.2036	0.06506	0.4767	0.108	0.7808	0.1184	12.031	11	0.972	0.3640	0.0980
14	2002	2.2081	0.06357	0.5413	0.0638	0.7808	0.1011	12.0483	11	0.956	0.0280	0.1030
14	2003	2.2379	0.06648	0.0714	0.0605	0.7808	0.1048	12.0804	11	0.9537	0.1810	0.1140
14	2004	1.925	0.06398	0.0709	0.0618	0.7808	0.224	11.9124	11	1.321	0.3410	0.0870
14	2005	1.835	0.0536	0.0219	0.1902	0.7808	0.0523	11.8286	11	1.365	0.1350	0.0980
14	2006	1.9888	0.05407	0.0686	0.2194	0.7808	0.0796	11.8595	11	1.332	0.0810	0.1030
15	2001	1.884	0.06089	0.2782	0.113	0.9956	-0.0652	13.854	6	1.208	0.3640	0.0980
15	2002	1.158	0.05677	0.2662	0.083	0.9956	0.0567	13.812	6	1.336	0.0280	0.1030
15	2003	1.2464	0.05785	0.2747	0.0783	0.9956	0.1484	13.977	6	1.1225	0.1810	0.1140
15	2004	1.203	0.05069	0.1045	0.1201	0.9956	0.0769	13.776	6	1.125	0.3410	0.0870
15	2005	1.2341	0.05749	0.1323	0.0749	0.9956	-0.1301	13.819	6	1.118	0.1350	0.0980
15	2006	1.354	0.07352	0.13173	0.0694	0.9956	-0.1908	13.945	6	1.064	0.0810	0.1030
16	2001	2.8168	0.1038	0.1132	0.0259	0.1537	0.235	17.85	7	0.9667	0.3640	0.0980
16	2002	2.8634	0.1047	-0.0418	0.0246	0.1537	0.188	17.836	7	0.9643	0.0280	0.1030
16	2003	2.9142	0.1011	0.0495	0.0247	0.1537	0.186	17.858	7	0.96227	0.1810	0.1140
16	2004	2.9111	0.0511	0.0479	0.0101	0.1537	0.136	18.142	7	0.9658	0.3410	0.0870

16	2005	2.964	0.0588	0.0636	0.0085	0.1537	0.127	18.171	7	0.9603	0.1350	0.0980
16	2006	2.3072	0.0508	-0.0854	0.0305	0.1537	0.201	17.58	7	0.9665	0.0810	0.1030
17	2001	1.324	0.0454	0.335	0.2521	0.653	0.0152	15.757	8	1.362	0.3640	0.0980
17	2002	1.486	0.0466	0.0167	0.3007	0.653	0.0144	15.765	8	1.136	0.0280	0.1030
17	2003	1.293	0.0429	0.0749	0.3049	0.653	-0.0094	15.798	8	1.172	0.1810	0.1140
17	2004	1.265	0.0431	0.0827	0.3261	0.653	0.0283	15.813	8	1.193	0.3410	0.0870
17	2005	1.592	0.0472	0.0368	0.3046	0.653	0.0216	16.035	8	1.053	0.1350	0.0980
17	2006	1.865	0.04877	0.03254	0.2731	0.653	0.0191	16.266	8	1.032	0.0810	0.1030
18	2001	1.362	0.0364	0.0532	0.0831	0.751	0.0668	13.113	6	1.332	0.3640	0.0980
18	2002	1.193	0.0362	0.0529	0.0642	0.751	0.0859	13.11	6	1.466	0.0280	0.1030
18	2003	1.086	0.0355	0.05113	0.0983	0.751	0.0872	12.974	6	1.4863	0.1810	0.1140
18	2004	0.965	0.0478	0.0474	0.107	0.751	0.075	12.577	6	1.621	0.3410	0.0870
18	2005	1.467	0.0729	0.0681	0.0536	0.751	0.06337	13.553	6	1.114	0.1350	0.0980
18	2006	1.538	0.0863	0.0863	0.0483	0.751	0.0586	13.644	6	1.027	0.0810	0.1030
19	2001	2.0882	0.1322	0.193	0.065	0.1811	0.0813	17.3772	7	0.9663	0.3640	0.0980
19	2002	2.239	0.1408	0.1882	0.0583	0.1811	0.0752	17.663	7	1.028	0.0280	0.1030
19	2003	2.194	0.14011	0.1733	0.0657	0.1811	0.0786	17.628	7	1.139	0.1810	0.1140
19	2004	2.035	0.1092	0.1466	0.0896	0.1811	0.0892	17.174	7	1.1227	0.3410	0.0870
19	2005	1.936	0.1179	0.1085	0.0996	0.1811	0.1077	16.9779	7	1.279	0.1350	0.0980
19	2006	2.0574	0.1196	0.1274	0.0853	0.1811	0.0936	16.992	7	1.017	0.0810	0.1030
20	2001	2.341	0.075	0.056	0.0942	0.163	-0.0352	14.563	9	1.137	0.3640	0.0980
20	2002	2.553	0.0862	0.135	0.0648	0.163	0.057	15.225	9	1.085	0.0280	0.1030
20	2003	1.988	0.0743	0.1109	0.06322	0.163	0.0892	14.059	9	1.346	0.1810	0.1140
20	2004	2.472	0.129	0.148	0.0735	0.163	0.0538	14.093	9	1.0321	0.3410	0.0870
20	2005	2.679	0.1508	0.1536	0.0583	0.163	0.05116	15.112	9	1.026	0.1350	0.0980
20	2006	2.774	0.1585	0.184	0.0457	0.163	0.0372	15.743	9	1.0118	0.0810	0.1030
21	2001	1.173	0.176	0.128	0.0669	0.975	0.0851	19.032	6	0.965	0.3640	0.0980
21	2002	1.026	0.138	0.105	0.0971	0.975	0.0892	18.941	6	1.253	0.0280	0.1030
21	2003	1.035	0.136	-0.089	0.1308	0.975	0.0915	18.793	6	1.276	0.1810	0.1140
21	2004	0.975	0.103	-0.106	0.142	0.975	0.126	18.189	6	1.429	0.3410	0.0870
21	2005	0.982	0.115	0.057	0.131	0.975	0.1073	18.256	6	1.307	0.1350	0.0980
21	2006	1.086	0.1297	0.0852	0.109	0.975	0.0974	18.742	6	1.086	0.0810	0.1030
22	2001	0.9821	0.179	0.0561	0.0675	1.113	0.1522	12.352	8	1.455	0.3640	0.0980
22	2002	0.9833	0.1831	0.0695	0.0699	1.113	0.1393	12.464	8	1.389	0.0280	0.1030
22	2003	0.9955	0.1906	0.0881	0.0559	1.113	0.1325	12.666	8	1.335	0.1810	0.1140
22	2004	0.9752	0.1539	0.0865	0.0655	1.113	0.1452	12.337	8	1.447	0.3410	0.0870
22	2005	0.9961	0.1788	0.1062	0.0534	1.113	0.117	12.654	8	1.172	0.1350	0.0980
22	2006	0.8793	0.1377	0.0779	0.1309	1.113	0.1631	12.022	8	1.556	0.0810	0.1030
23	2001	2.336	0.0893	-0.0578	0.0558	0.235	0.0782	15.356	7	1.332	0.3640	0.0980
23	2002	2.437	0.0978	0.0359	0.0689	0.235	-0.0235	15.448	7	1.125	0.0280	0.1030
23	2003	2.566	0.119	0.1033	0.0431	0.235	-0.0573	15.608	7	1.109	0.1810	0.1140
23	2004	2.087	0.0991	0.0938	0.0735	0.235	0.0548	15.229	7	1.331	0.3410	0.0870
23	2005	2.112	0.1053	0.0977	0.0644	0.235	0.05125	15.275	7	1.305	0.1350	0.0980
23	2006	2.336	0.1077	0.1022	0.0831	0.235	0.0507	15.365	7	1.115	0.0810	0.1030
24	2001	0.775	0.118	0.0357	0.0965	0.992	0.0367	11.086	7	0.975	0.3640	0.0980
24	2002	0.5862	0.102	-0.0785	0.126	0.992	0.0539	10.923	7	1.115	0.0280	0.1030
24	2003	0.9736	0.142	0.0576	0.0738	0.992	-0.0953	11.271	7	0.993	0.1810	0.1140
24	2004	0.9951	0.1476	0.05992	0.0669	0.992	-0.136	11.462	7	0.9653	0.3410	0.0870
24	2005	0.8256	0.1338	0.05271	0.0853	0.992	0.0583	11.126	7	0.973	0.1350	0.0980
24	2006	0.8838	0.1365	0.0539	0.08321	0.992	0.0509	11.308	7	0.971	0.0810	0.1030

25	2001	2.663	0.173	0.259	0.0733	0.0638	0.0982	18.237	6	1.015	0.3640	0.0980
25	2002	2.365	0.157	0.1806	0.0942	0.0638	0.163	18.119	6	1.113	0.0280	0.1030
25	2003	2.136	0.139	0.1635	0.0991	0.0638	0.1775	18.066	6	1.279	0.1810	0.1140
25	2004	2.083	0.104	0.1381	0.107	0.0638	0.105	17.59	6	1.2933	0.3410	0.0870
25	2005	1.992	0.0758	0.0782	0.119	0.0638	0.1911	17.381	6	1.332	0.1350	0.0980
25	2006	1.981	0.0653	0.0359	0.136	0.0638	0.1873	17.118	6	1.387	0.0810	0.1030
26	2001	2.527	0.115	-0.075	0.0667	0.0571	0.0672	19.182	6	0.986	0.3640	0.0980
26	2002	2.653	0.146	0.0472	0.0543	0.0571	0.0836	19.335	6	0.923	0.0280	0.1030
26	2003	2.348	0.118	0.0451	0.0982	0.0571	0.0659	19.317	6	0.9775	0.1810	0.1140
26	2004	2.271	0.103	0.0439	0.125	0.0571	0.0974	18.963	6	1.117	0.3410	0.0870
26	2005	2.726	0.174	0.113	0.1036	0.0571	0.0341	19.774	6	0.858	0.1350	0.0980
26	2006	2.883	0.216	0.165	0.0528	0.0571	-0.0668	19.921	6	0.829	0.0810	0.1030
27	2001	2.118	0.0957	0.235	0.0971	0.0746	0.0826	16.753	7	1.253	0.3640	0.0980
27	2002	2.662	0.176	0.262	0.0258	0.0746	0.0472	16.994	7	0.997	0.0280	0.1030
27	2003	2.217	0.118	0.1074	0.0549	0.0746	0.0941	16.425	7	1.157	0.1810	0.1140
27	2004	2.029	0.1092	0.0859	0.0684	0.0746	0.137	16.126	7	1.351	0.3410	0.0870
27	2005	2.013	0.1066	0.0689	0.0925	0.0746	0.175	15.961	7	1.372	0.1350	0.0980
27	2006	1.994	0.0547	0.0462	0.0983	0.0746	0.243	15.573	7	1.557	0.0810	0.1030
28	2001	0.994	0.0982	-0.0792	0.0375	0.976	0.0673	12.783	8	1.226	0.3640	0.0980
28	2002	0.957	0.0946	0.0635	0.0753	0.976	0.0889	12.648	8	1.332	0.0280	0.1030
28	2003	0.882	0.0727	0.0559	0.0894	0.976	0.126	11.956	8	1.356	0.1810	0.1140
28	2004	0.895	0.0753	0.0564	0.0877	0.976	0.1281	11.981	8	1.472	0.3410	0.0870
28	2005	0.809	0.0671	0.0523	0.121	0.976	0.1609	11.725	8	1.491	0.1350	0.0980
28	2006	0.756	0.0558	0.0487	0.153	0.976	0.1772	11.118	8	1.661	0.0810	0.1030
29	2001	1.774	0.114	0.118	0.065	0.359	0.156	14.561	6	1.256	0.3640	0.0980
29	2002	1.872	0.118	0.1206	0.074	0.359	0.0953	14.653	6	1.227	0.0280	0.1030
29	2003	1.9118	0.1209	0.1235	0.086	0.359	-0.0752	14.667	6	1.174	0.1810	0.1140
29	2004	1.927	0.1256	0.1461	0.092	0.359	-0.0855	14.921	6	1.132	0.3410	0.0870
29	2005	1.943	0.135	0.1473	0.097	0.359	0.0542	15.078	6	1.101	0.1350	0.0980
29	2006	1.957	0.1507	0.168	0.107	0.359	0.0326	15.116	6	1.027	0.0810	0.1030
30	2001	2.336	0.165	0.283	0.127	0.263	0.158	17.422	13	1.325	0.3640	0.0980
30	2002	2.475	0.1682	0.234	0.1092	0.263	0.1364	17.673	13	1.227	0.0280	0.1030
30	2003	2.553	0.1847	0.286	0.0875	0.263	0.0971	17.779	13	1.214	0.1810	0.1140
30	2004	2.741	0.1893	0.325	0.0674	0.263	-0.0563	18.095	13	1.108	0.3410	0.0870
30	2005	2.286	0.1751	0.215	0.113	0.263	0.126	17.651	13	1.328	0.1350	0.0980
30	2006	2.119	0.1526	0.1956	0.127	0.263	0.178	17.554	13	1.409	0.0810	0.1030