



## **THE DETERMINANTS OF CORPORATE FINANCIAL PATTERN: EVIDENCE FROM CONSTRUCTION COMPANIES**

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### **ABSTRACT**

*Capital structure has attracted intense debate in the financial management arena for nearly half-century. This paper examines empirically the problem of corporate 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 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 (2009-2014). The collected data was analyzed on quantitative basis through multiple regressions by using Eviews7 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, Liquidity, Profitability, pecking order theory, trade of theory, MM theory, and agency cost theory

### **Background of the study**

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. It is noted that about one-tenth of the global economy is dedicated to constructing and operating homes and offices (UNEP, report, 1996). Construction financing is mainly concerned with; Project financing, and Company financing. Project financing is effectively a short term activity tied to –line of credit issues and protocols. Short term financing, as the name indicates, has to do with loans or credits, which must be paid 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.

### **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. 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.

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, 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. Moreover, research in the capital structure of construction had received a very limited attention; 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.

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 fund 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. 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), Singh et al. (1992) and Singh (1995) 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 construction industry? Or whether and how closely, do those significant determinants of capital structure support the finance theory? More specifically:

1. What internal and external factors determine the capital structure decisions of construction companies?
2. To what extent can those significant factors of capital structure decisions of Construction companies support the finance theory?

## **Objectives of the study**

The main purpose of this study is to identify the factors which influence the capital structure of Construction companies; 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 Construction Companies.

## **Literature Review**

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.

### ***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. 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 MMs 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.

### ***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. 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. 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.

### ***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. 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. 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, immune 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.

### ***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.

### ***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.

### **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. 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. they also 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.

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 from modern finance theories are portable across countries, 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.

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 – 2010/11 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.

LiufangLi (2010) has undertaken a study on the Chinese listed Real estate companies by using panel data. The regression result revealed that there is negative relationship between leverage and profitability and growth opportunity while there is positive relationship between leverage,

size and tangibility. The estimation results are compared with the literature study of capital structure theories including Miler and Modigliani's, trade-off and pecking order theories. Most of the estimations from the model are consistent with the trade-off and pecking-order theories. The study argues these two theories cannot fully provide convincing explanations for the capital choices of the Chinese Real estate firms. Instead, some of the results are explained by the practical situation gained from series of interviews with Chinese developers suggesting that the institutional differences and financial constraints in the capital markets especially for Real estate firms in China are also the factors influencing firms' capital structure decisions.

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.

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. In relation to profitability, Empirical evidences seem to be consistent with the pecking order theory. Most studies found a negative relationship between profitability and capital structure. 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. Other evidence suggests that higher growth firm's use less debt i.e., support the trade-off and agency. 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. 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. Therefore, this empirical study is designed to address these short coming and, further, to find out industry specific determinants of capital structure by taking construction industry as a case.

### **Research Design and Methodology**

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 and to know which capital structure theory explains the variations on the capital structure of the companies the study adopts a quantitative research approach.

### **Sampling Design**

This study is conducted on Addis Ababa Construction companies, which are 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 costly 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. The criterion for inclusion in the sample is holding 6 years data from 2009-2014. In other words, companies that are at pre-implementation stage were deliberately 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.

### **Sources of Data and Data Collection**

To meet the objectives of this study, the researcher highly relayed on secondary source of data. A structured record review was 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 2009 to 2014 were collected from the selected companies and six year GDP as well as inflation data was collected from National Bank of Ethiopia (NBE).

### **Research Hypotheses**

In this study, in order to identify which factors best explains capital structure of Construction Companies and to know which of the capital structure theories is relevant, the researcher identifies ten key variables and hypnotized 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 and following ten hypotheses developed to achieve the main and specific objective of the study

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.

### **Method of Data Analysis**

To test the hypothesis, the relationships between the level of debt and ten explanatory variables, multiple regression analysis were used in the study. In analyzing the data, the researcher uses Eviews7 software packages. The diagnostic tests and estimating the result for the study were conducted through Eviews7 software package, because the researcher believes that Eviews7 software package is relatively simple to understand for diagnostic test, estimating and interpretation of the result.

### **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.

$$LEV_{it} = \alpha + \beta_1 \text{Profit} + \beta_2 \text{Tangit} + \beta_3 \text{Sizeit} + \beta_4 \text{Grhit} + \beta_5 \text{EarVolit} + \beta_6 \text{Ndtsit} + \beta_7 \text{Ageit} + \beta_7 \text{Lqit} + \text{GDPit} + \text{INFit} + \dots + \epsilon_{it}$$

Where:

Levit is the dependent variable and it is the leverage of company (i) to the period t, which starts from the year 2008 to 2013.

$\alpha$  is the intercept of the equation.

$\beta$  is the slope coefficient for  $X_{it}$  independent variables.  $X_{it}$  represents the ten independent variables.

$i = 1, 2, 3, \dots, 30$  sampled companies and  $\epsilon$  represents the error term.

### **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: 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, 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.

**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 Booth et 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

**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. 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.

**Non-debt tax shields:** 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. Depreciation divided by total assets was used in order to proxy for non-debt tax shields in this study.

**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. 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.

**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. In this study, profitability was proxied by return on assets (defined as earnings before interest and taxes divided by total assets).

**Firm 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.

**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 become 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.

**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.

**Expected inflation:** 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.

**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. Following common practice this study, measured GDP growth as the percent change in the annual real GDP.

### **Results and Discussion**

In this study as mentioned in previous section diagnostic tests were carried out to ensure that the data fits the basic assumptions of classical linear regression model. Regression analysis was conducted and inferences were drawn from it. Regression results from the Eview output were presented in a tabular form, from where detailed analysis and discussion of the result was given.

### **Estimation of the Model**

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 Hausmann test and Breusch-Pagan-Godfrey LM test. A classical application of the Hausmann 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 Hausmann test: the hypothesis is;

**H<sub>0</sub>:** Random effect model is appropriate

**H<sub>1</sub>:** Fixed effect model is appropriate

**Table:1** Hausmann test

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

**Source:** Regression output of Eview

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-2 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:2** 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-2 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 Hausmann 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-3 bellow.

**Regression analysis:** The summary of the regression results from the Eview output were presented in table-3, from where detailed analysis and discussion of the result was given.

Table-3: 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
<b>Weighted Statistics</b>				
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-3, 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-3, 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) 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  $\beta$  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 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 Pandey (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, GDP is statistically insignificant in this model.

Finally, the regression result on the above table-3, 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), Pandey

(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.

## **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 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.

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