

Determinants of capital structure Decision in Manufacturing PLCs:

(A case study of selected Manufacturing PLCs in Adama city)

A Thesis

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Statements of Declaration

I, Seble Tadesse Terfeta, declare that the thesis work entitled “The Determinants of capital structure Decision in Manufacturing PLCs a case study of selected manufacturing PLCs in Adama city” submitted by me for the award of the degree of Master of Accounting and Finance at Adama science & technology University at Adama Ethiopia, is my original work and it hasn't been presented for the award of any other Degree, Diploma, Fellowship or other similar titles of any other university or institution.

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Abstract

Capital structure decisions are the most important and crucial decisions for any business because of their effect on the value and cost of the company. This research, conducted to examine the validity of theoretical factors that determine capital structure of private limited companies in Adama, Ethiopia. In order to achieve these objectives, eight explanatory variables; liquidity, tangibility, non-tax shields, growth, earning volatility, profitability, age and size of the firm regressed against the dependent variables of total debt ratio. The study was used Explanatory research design. For this purpose , a sample of 11 companies taken and secondary data collected from audited financial statements of selected companies for the period of five years (2002-2006EC). Stratified sampling design has employed and companies selected based on simple random sampling techniques to represent different industrial sectors (strata) within private limited companies. Data analyzed on quantitative basis using multivariable OLS regression. The empirical results show that liquidity, earning volatility, age, and size of the firm variables are the significant determinants of capital structure of manufacturing PLCs in adama city. However, among the hypothesized capital structure determinants tangibility, non-debt tax shield, profit and growth of the firm were found to have insignificant contribution on capital structure of manufacturing PLCs in adama city and the theories that most implemented are trade of theories and peaking order theories for manufacturing PLCs in Adama city .

Key words: private limited companies; capital structure; leverage

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List of Acronyms

DW:	Durbin – Waston
CLRM	classical linear regression model
CSA	central statistic agency
EBIT	Earning before interest and tax
EC:	Ethiopian Calendar
ERCA:	Ethiopia revenues and customs authority
LEV:	Leverage
Max:	Maximum
Min:	Minimum
MM:	Modigliani and Miller
NDTS:	Non-debt tax shields
OLS	ordinary least square
POT	peaking order theory
PLCs:	private limited companies
ROE:	return on equity
TOT	trade of theory

CHAPTER ONE

INTRODUCTION

This chapter presents the general idea of the study. This chapter contains background of the study, statements of the problem, objectives of the study, hypothesis, and conceptual frame work, significant of the study, and finally, scope and limitation of the study presents.

1.1 Background of the Study

Manufacturing is defined here “the physical or chemical transformation of materials or components into new products, whether the work is performed by power - driven machines or by hand, whether it is done in a factory or in the worker’s home, and whether the products are sold at wholesale or retail. The assembly of the component parts of manufactured products is also considered as manufacturing activities.” International Standard Industrial Classification of All Economic Activities (ISIC Rev. 3.1 code D) (2002)

Private Limited Company is a popular incorporated business form in Ethiopia that can be established as per The 1960 Commercial Code of Ethiopia and the Ethiopian Investment Laws. The purpose of the company is free but there are a few sectors limited to citizens and the public sector. The minimum and maximum number of members of a private limited company is two and fifty respectively. The minimum capital requirement to establish a Private limited company is ETB 15,000. The Liability of a Private Limited Company is limited to the company’s assets.

Since the seminal work of Modigliani and Miller (1958), the issue of capital structure has created intense debate in the area of corporate finance. The capital structure of a firm consists of a particular combination of debt and equity issued by the firm to finance the operation of the business. The basic question of whether a unique combination of debt and equity capital maximizes the firm value, and if so, what factors could influence a firm's optimal capital structure have been the subject of frequent debate in the capital structure literature.

Millers and Modigliani (1958) theory of capital structure, also called, irrelevance theory of capital structure, argued that external borrowing has no effect on firm's value. They introduced this theory with a world without transaction costs and taxes and concluded that any capital mix of the firm is irrelevant for achieving the goal of a firm. It states that based on the assumption investors can borrow at the same rate as corporations and they would tend to have the same information as management about the firm's future investment opportunities. The MM theory proves that under some restrictions a firm's value would be unaffected by its capital structure and thus assumes that earnings before income tax (EBIT) would not have been related to the use of debt, that leads to the inference that capital structure may be considered irrelevant. Despite the fact that some of the fundamental assumptions of the theory can be assumed unrealistic in the eyes of investors and other economic agents, the MM irrelevance theory was generally accepted and subsequent research focused on relaxing some of its assumptions to develop a more realistic approach. However, five years after this breakthrough in 1963 they reached a different conclusion after allowing for the inclusion of corporate taxes. In this setting companies should be entirely debt financed. Back then, they paved the way towards the modern trade-off theory. In addition, Miller (1977) included personal taxes and suggested the same solution, this time with less benefit to the investors. Trade-off theory was finally completed by the contribution of Jensen

& Meckling (1976), who introduced the costs of financial distress. According to this final setting, the firm should use leverage to the extent that the marginal benefits of additional debt (tax saving and a lower cost of debt capital) and its costs of financial distress are equal (Jensen & Meckling, 1976).

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 miss combination occurred while financing decision of company is made. Literatures show that the determination of capital structure appeared to existence since Modigliani and Miller (1958) introduced their capital structure irrelevance preposition. Following their theory, currently there are a number theoretical and empirical studies about determinates of the capital structure of a firm. Trade-off, pecking order and agency theories are the most commonly known theories about the capital structure of a firm.

1.2 Statement of the problem

The capital structure decision is one of the most important decisions made by financial managers in this modern era. The capital structure decision is at the center of many other decisions in the area of corporate finance. One of the many objectives of a corporate financial manager is to ensure low cost of capital and thus maximize the wealth of holders. Hence, capital structure is one of the effective tools of management to manage the cost of capital. An optimal capital structure is reached at a point where the cost of the capital is minimal (Gitman, 2009). So financing decision of a the firm is an important issue for insuring its general financial well being and the financing pattern of the firm should to be in a manner that maximizes the value of the firm. That is, selecting the optimal capital structure. However, selecting optimal

capital structure is not an easy job because it needs financial skill for the selection among the different financial sources that minimizes cost and maximizing benefits.

Although a lot of theoretical and empirical studies have been conducted in the area of capital structure, most of them focus on the data obtained from the firms in developed countries. Among the researches that have been investigated based on developing countries data was the research conducted by booth, et.al (2001), examined the capital structure of firms in sample off 10 developing countries. Similarly, Rataporn Deesomake, et.al (2004) also investigated the determinants of capital structure of firms in four countries by using data from the Asia pacific region and they tried to show the effect the variables. According to the research finding firm size has positive effect on the leverage and growth, non debt tax shield, liquidity and share price performance has negative effect on leverage which mainly support to capital structure theory.

In developing countries, particularly in Ethiopia, empirical studies on the financing decisions or generally capital structure of the firm is not yet extensively investigated. As per the researcher knowledge only some empirical studies has been conducted about determinates of capital structure in Ethiopia about medium sized enterprises, Manufacturing firms, construction Companies, insurance industry, commercial banks and small Scale Manufacturing Cooperatives. The first study on the determinants of capital structure investigated by Ashenafi (2005). His study has been considered the Ethiopian medium sized enterprises covering the period from 1991-1996 E.C. The study tested seven firm-specific independent variables including other fiscal benefits, economic risk, size of the firm, age of the firm, asset composition, profitability and growth opportunity of the firm and it found mixed results. Following this study Amanuel (2011), also tried to conduct a study on the determinants of Capital Structure on Addis Ababa Manufacturing firms and found that variables including tangibility of

assets, non-debt tax shield, earning volatility, profitability and size of the firms are the significant determinants of capital structure. Netsanet (2012) has conducted the determinates of capital structure decisions of construction Companies in Addis Ababa and found that growth opportunity, tangibility of assets, liquidity and age of the company's are found as significant variables that explains the variations of the capital structure of construction companies. Daniel (2011) has also conducted the determinates of capital structure in Ethiopia small Scale Manufacturing Cooperatives and found that size, age, tangibility, and growth variables are the most important determinants of capital structure of small scale manufacturing cooperatives.

However, though few studies have been conducted on the determinants of capital structure, to the best of the researcher's knowledge, there is no single study that focused on private limited manufacturing companies in Adama city. Prior research papers were conducted on capital structure decision on PLCs couldn't be found at Adama city as far as the available of literature. Therefore, the absence of studies in the manufacturing PLCs in the case of Adama city and to test capital structure theories are applicable in PLCs in Adama motivated the researcher to conduct the study in Adama city. Therefore, the current study investigates empirically the determinants of capital structure of private limited manufacturing companies in Adama during the period 2002-2006, and this may fills the gap by providing full information about optimal capital structure with its determinants. Moreover, this empirical study is designed to address these short coming and to find out determinants of capital structure by taking PLCs as a case and will attempt to test the validity of these theories to Adama city manufacturing private limited company with their data set.

1.3 Objectives of the Study

1.3.1 General objective

The general objective of this study is to investigate the determinants of capital structure of private limited company in Adama, Ethiopia.

1.3.2 Specific objective

The study has the following specific objectives,

1. To investigate the relationship between the capital structure and liquidity of firms.
2. To investigate the relationship between the capital structure and tangibility of the firms asset.
3. To investigate the relationship between the capital structure and non debt tax shields of firms
4. To investigate the relationship between the capital structure and growth of firms.
5. To investigate the relationship between the capital structure and earning volatility of the firm.
6. To investigate the relationship between the capital structure and age of the firms.
7. To investigate the relationship between the capital structure and profit of firms.
8. To investigate the relationship between the capital structure and size of the firms.

1.4 Research Hypotheses

This study was undertaken to identify which capital structure theory is relevant in Adama city manufacturing PLCs among the existing capital structure theories. The researcher used leverage as a dependent variable and eight explanatory variables such as: liquidity, tangibility, non-tax shields, growth, earning volatilities, age, profitability, and size. Based on the research objective dependent variable against eight independent variables was investigated in this study and In

accordance with the literature about the capital structure determinants the following hypotheses are formulated:

1.4.1 Dependent variables

Total debt ratio (TDR): Total debt ratio is a financial ratio that indicates the percentage of a company's assets that are provided in comparison to debt. It is the ratio of total debt and total assets calculated by dividing total debt to total assets.

$$\text{Leverage ratio} = \frac{\text{Total debt}}{\text{Total asset}}$$

1.4.2 Independent variables

The description of those eight explanatory variables and related hypothesis are described as follows:

1.4.2.1 Liquidity

As predicted by the pecking order theory, firms with high liquidity will borrow less. In addition, managers can manipulate liquid assets in favor of shareholders against the interest of debt holders, increasing the agency costs of debt; and as the firm's profitability and/or liquidity increase, the internal funds available to the firm and its ability to service previous debts will increase. Furthermore, it will earn a good reputation and hence sound more attractive to investors and shareholders, making it easier for the firm to raise more equity funds to meet future investment opportunities (Rataporn et al. 2004). Thus, the need for debt will become minimal; causing the leverage of the firm to fall. It can be hypothesized as follows.

HO: There is no a negative relationship between leverage and liquidity.

H1: There is a negative relationship between leverage and liquidity.

1.4.2.2 Tangibility

The value of tangible assets is associated with higher debt capacity. Myers (1984) suggests that issuing debt secured by collateral may reduce the asymmetric information related costs in financing. Hence, debt secured by collateral may mitigate asymmetric information related cost in financing. Therefore, a positive relationship between tangibility and financial leverage is expected in relation to the study. Static trade off theory and pecking order theory also suggested a positive relationship between tangibility and leverage. In this study the hypothesis is formulated based on the rationale stated above.

HO: There is no a positive relationship between leverage ratios and tangibility.

H1: There is a positive relationship between leverage ratios and tangibility.

1.4.2.3 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. 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). According to De Angelo - Masulis (1980): “Ceteris paribus, decreases in allowable investment-related tax shields (e.g., depreciation deductions or investment tax credits) due to changes in the corporate tax code or due to changes in inflation which reduce the real value of tax shields will increase the amount of debt that firms employ. In cross-sectional analysis, firms with lower investment related tax shields (holding before-tax earnings constant) will employ greater debt in their capital structures.” So they argue that non-debt tax shields are substitutes for a debt-related tax shield

and therefore the relation between non-debt tax shields and leverage should be negative. The following hypothesis is formulated based on the rationale stated above.

HO: There is no a negative relationship between leverage ratios and non-debt tax shields.

H1: There is a negative relationship between leverage ratios and non-debt tax shields.

1.4.2.4 Growth

The relationship between growth opportunities and the debt ratio is also quite conflicting. The Trade-off theory predicts that firms with more growth opportunities will have less debt as there is less need for the role of debt. Firms that have growth opportunities would prefer to retain debt capacity as they might need to borrow in the future. Further, growth opportunities are capital assets that add value to a firm but cannot be collateralized and do not generate current taxable income (Titman and Wessels, 1988).

However, Benito (2003) proposes the opposite. As he suggested 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. Based on the above rationale, the hypothesis is formulated as follows:

HO: There is no a positive relationship between leverage ratios and growth.

H1: There is a positive relationship between leverage ratios and growth.

1.4.2.5 Earning 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. Based on the above rationale, the following hypothesis is formulated as follows:

HO: There is no a negative relationship between leverage ratios and earnings volatility.

H1: There is a negative relationship between leverage ratios and earnings volatility

1.4.2.6 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.

HO: There is no a positive relationship between leverage ratios and age.

H1: There is a positive relationship between leverage ratios and age.

1.4.2.7 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. Therefore, the static trade-off theory expects a positive relationship between profitability and leverage, whereas the pecking order theory expects exactly the opposite. Most empirical studies observe a negative relationship between leverage and profitability, for example

(Rajan – Zingales, 1995), (Huang – Song, 2002), (Booth et al., 2001), (Titman – Wessels, 1988), (Friend – Lang, 1988) and (Kester, 1986). In this study, profitability is proxied by return on assets (defined as earnings before interest and taxes divided by total assets).

HO: There is no a negative relationship between leverage ratios and profitability.

H1: There is a negative relationship between leverage ratios and profitability.

1.4.2.8 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.

HO: There is no a positive relationship between leverage ratios and size.

H1: There is a positive relationship between leverage ratios and size.

Conceptual frame work

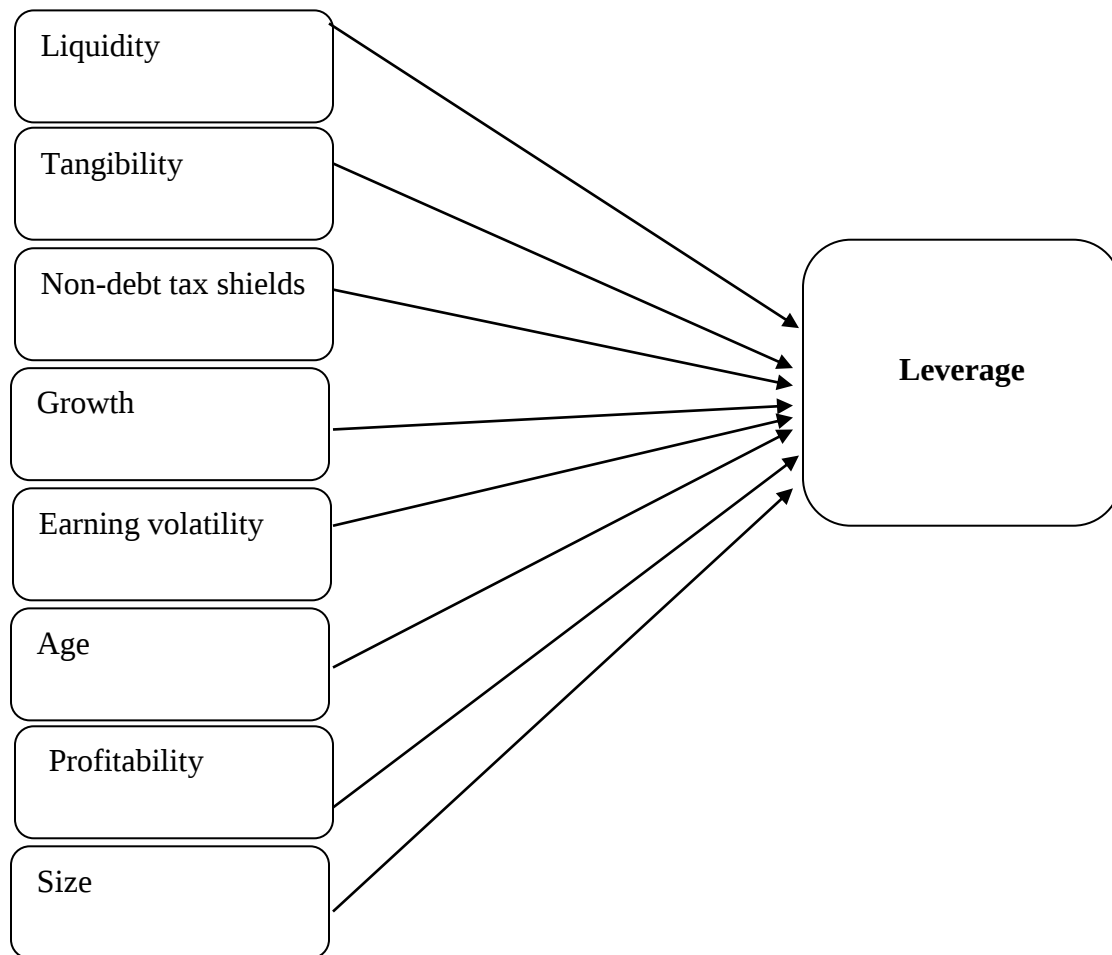


Figure 1.1: Conceptual frame work

1.5 Significance of the Study

The purpose of this proposed research study is to find out and examine the main determinants of capital structure choice of private limited manufacturing companies in Adama, Ethiopian and analyze whether the trade off theory, pecking order theory or other capital structure theory can explain the financing pattern of the firm, in turn findings of the research be add to the existing knowledge on the area of corporate finance. Specifically, the researcher believes that the result of this research has the following significances:

- Allow the identification of the concept and framework of determinants of capital structure decisions in Ethiopian context.
- This study can give information for external investors who will be able to know the main variables that affect the capital structure and to observe manufacturing PLCs Company's performance before making the decisions.
- Create meaningful awareness among the concerned body such as the finance managers of private limited company about the capital structure in general, in turn; it enhance the value of the firm: and
- The research paper adds knowledge on the existing literature related to capital structure and serve as reference for those who are interested to make a research on the same topic.

1.6 Scope and limitation of the Study

The scope of the study is restricted to the determinants of capital structure of private limited manufacturing companies in Adama city. The sample size of the study has been 11 selected manufacturing private limited companies. The empirical analysis utilize Five years data from 2002 through 2006 EC for the study. In order to determine capital structures capital of manufacturing private limited companies the researcher use liquidity, Tangibility, liquidity, Non-debt tax shields, Growth, Earning volatility, Age of the firm, Profitability, size as independent variables.

The study was limited in manufacturing PLCs in Adama city due to absence of unavailability of secondary market the researcher was forced and limited to measure both dependent and explanatory variables in book value rather than market value. And through a lot of variables that affect the capital structure decision, the researcher used only eight specific variables because of limitation of information in manufacturing PLCs. Finally some manufacturing PLCs do not have

necessarily separate accounts of short term and long term debt rather they report their debt as total debt as a result of this the researcher restricted to use only total debt model in regression.

1.7 Organization of the Paper

The paper has be five chapters in this specific study. The 1st Chapter provides the background to the study and also introduces the research problem and hypotheses. It also includes a brief overview of the research objectives, significance of the study, scope of the study and organizations of the paper. The next chapter presents a brief review of theoretical and empirical literatures about the capital structure theory and related concepts and the most important variables to be used in this paper. Then describe the data, model, and technique in chapter three that used in this study. In chapter four the model estimation and discussion of the result be presented. The final chapter presents the major conclusions and recommendation.

CHAPTER TWO

LITERATURE REVIEW

This chapter provides theoretical literature about capital structure theories, empirical studies in global and Ethiopia context and follows over views of manufacturing PLCs in Ethiopia finally research gap of this study are presents.

2.1 Theoretical Literature

How can the capital structure be determined that maximizes the firm's value? This puzzle is introduced by Modigliani and Millers (1958). Whether the costs and benefits of leverage drive the managers to decide leverage in capital structure or they are market opportunities that guide managers to issue debt or equity? Do firms have any target leverage that changes overtime for which manager adjust debt equity ratio continuously or they don't have any target leverage to maintain? To answer these questions three popular theories of capital structure are available in literature are trade-off theory, pecking order theory and market timing theory. Because there is no formula given to find the exact capital structure to maximize firm value, many studies have been conducted to collect the empirical evidence from all over the world to test the hypothesis given by these theories (Ross, et al 2008).

In finance, **capital structure** refers to the way a corporation finances its assets through some combination of equity, debt, or hybrid securities. A firm's capital structure is then the composition or 'structure' of its liabilities. Leverage (or gearing) ratios represent the proportion of the firm's capital that is obtained through debt (either bank loans or bonds).

The Modigliani-Miller theorem, proposed by Franco Modigliani and Merton Miller, forms the basis for modern thinking on capital structure, though it is generally viewed as a purely theoretical result since it disregards many important factors in the capital structure process factors like fluctuations and uncertain situations that may occur in the course of financing a firm. The theorem states that, in a perfect market, how a firm is financed is irrelevant to its value. This result provides the base with which to examine real world reasons why capital structure is relevant, that is, a company's value is affected by the capital structure it employs. Some other reasons include bankruptcy costs, agency costs, taxes, and information asymmetry. This analysis can then be extended to look at whether there is in fact an optimal capital structure: the one which maximizes the value of the firm.

2.1.1 Modigliani Miller propositions

Modigliani and Miller, two professors in the 1950s, studied capital-structure theory intensely. From their analysis, they developed the capital-structure irrelevance proposition. Essentially, they hypothesized that in perfect markets, it does not matter what capital structure a company uses to finance its operations. They theorized that the market value of a firm is determined by its earning power and by the risk of its underlying assets, and that its value is independent of the way it chooses to finance its investment or distribute dividends. The basic M&M proposition is based on the following key assumptions:

- No taxes
- No transaction costs
- No bankruptcy costs
- Equivalence in borrowing costs for both companies and investors

- Symmetry of market information, meaning companies and investors have the same information
- No effect of debt on a company's earnings before interest and taxes

Consider a perfect capital market firms and individuals can borrow at the same interest rate; no taxes; and investment returns are not affected by financial uncertainty. Modigliani and Miller made two findings under these conditions. Their first 'proposition' was that the value of a company is independent of its capital structure. Their second 'proposition' stated that the cost of equity for a leveraged firm is equal to the cost of equity for an unleveraged firm, plus an added premium for financial risk. That is, as leverage increases, risk is shifted between different investor classes, while total firm risk is constant, and hence no extra value created.

2.1.2 Trade-off theory

An important motive of trade-off theory of capital structure is to explain the way in which firms can typically be financed partly with debt and partly with equity. Trade-off theory states that there are benefits of financing with debt i.e. tax shield benefit, agency benefit and there are also costs of funding with debt e.g. costs of financial distress, agency costs. Therefore the firm that is maximizing its value will focus on offsetting costs against benefits of debt when making decision about how much debt and equity to use for financing its business. Ross et al (2008) argue that firm can optimize its value at a point where marginal costs of debt and marginal benefits of debt are balanced.

According to Myers (1984), each firm that follows trade-off theory has target debt and it gradually moves toward its target debt. Target leverage is determined by balancing the cost and benefits of leverage but structure of target leverage is not clear. (Frank & Goyal, 2009) argue that this target debt can be classified into two ways. First the target debt may be static which might be

identified by single period trade-off between costs and benefits of debt and is called static trade-off theory. Second the target debt may be adjusting over time with change in magnitude of costs or benefits of debt. While examining the US firms, Huang and Ritter, (2009) say that US firms moving toward their target leverage with moderate speed. US firms take 3.7 years average period to achieve their targeted capital structure in the condition of any deviation from the target debt. The UK firms adjust to their target debt ratio relatively quickly (Ozkan, 2001) showed the behavior of US firms, in time of market friction, adjusting their leverage as if they follow dynamic trade-off policy. Consistent with trade-off model, Cook and Tang, (2010) argue that firms moving faster toward target debt rate in the country where economic condition are good as compared to country where economic conditions are bad. Graham and Harvey (2001) indicate that about 80 percent of chief financial officers confirms having target leverage. Antoniou et al (2008), report that firms have target leverage ratio. Firms that are experiencing higher market to book value ratio, tend to have low target debt ratio (Hovakimian et al 2004).

2.1.3 Agency costs theory

Agency cost is amount that a firm uses on techniques to align management goal with organization goal (maximizing the wealth of shareholders). There are two main sources of agency costs: separation of ownership from management and cost associated with using agents. Separation of ownership from management creates agency problem—refer to conflict of interest (between shareholder and managers) that managers will use organization resource for their own benefits instead of maximizing the wealth of shareholders. Cost associated with using agents are indeed agency costs such as monitoring cost, cost of producing financial statements, use of stock option etc. Firms usually issue the debt in order calm the conflict of interest but appearance of

leverage into picture creates an other potential conflicts of interest between managers, shareholder and creditors because each of them has different goal.

According to Jensen and Meckling (1976), monitoring expenditures by principal, cost of management time and residual loss constitute the agency costs. It has been clearly recognized by literature that agency cost is important determinant of capital structure (Harris & Raviv, 1990), (Pushner, 1995). There are three problems associated with the agency cost: I) overinvestment, II) underinvestment and III) Free cash flow.

❖ **Underinvestment and overinvestment**

Leverage can produce the conflict of interest between owners and creditors. Conflict of interest between owners and creditors arises when owners influence managers to take particular decision in the favor of owners at the cost of creditors. This influenced behavior of manager is outcome of two situations called underinvestment and overinvestment. Underinvestment can be defined as propensity of manager to avoid low risk projects with positive net present value because holding safe project does not generate excess return to owners. Firms prefer to take risky projects with high risk in order to generate excess return to owners but holding risky project does not promise any excess return to bondholders. Furthermore if firm couldn't perform as expected and turns bankrupt then entire loss may be borne by creditors. Brealey and Myers (2000) argue that underinvestment is theoretically affecting all levered firms, but most prominent for highly levered firms that are facing financial distress. Underinvestment problem is likely for the firms whose value primarily depends upon the investment and growth opportunities (Drobetz & Fix, 2005). Myers and Majluf (1984) argue that equity may be mispriced under the asymmetric information and if firm finances its new project by issuing equity, under-pricing of new equity may be harsh thus new investors will gain more from project with positive net present value (NPV) at the loss of existing shareholders. This condition may lead to underinvestment problem

and may reject such project with positive net present value. Myers (1977) argues that agency conflict between manager and shareholder advocate high leverage can create underinvestment problem.

Overinvestment refers to tendency of managers to take more risky projects—in which the probability of generating excess return is less. Any decrease in firm value diminishes the debt value but if project turns successful it increases the equity value. While investigating underinvestment and overinvestment problem with Dutch firms, Degryse and de Jong (2006) argue that overinvestment problem is more important than underinvestment problem, because the probability of failure is more that may even remove the chance of survival for the firm.

❖ **Free cash flow (FCF)**

Free cash flow is another important part of agency cost because it increases conflict of interest between agent (manager) and principal (owner). Firms experiencing stable free cash flows may face agency conflict between the managers and principals. Conflict of interests arises due to the probability of misuse of free cash flow by managers that does not parallel to basic goal of maximizing the wealth of stockholder and or firm value. Free cash flow can be defined as cash flow that is available to managers after funding all the projects that have positive net present value. Jensen (1986) argues high leverage can add the value to firms that largely have assets and generate stable cash flow. Managers may invest excess FCF just to increase the size of firm or purchasing corporate planes and other luxuries for personal use. To avoid such problem the firms issue the debt as disciplinary device, because with the issuance of debt company pledge to pay interest and principal when it is due. If the managers do not maintain their promise, the creditors can file petition against firm into bankruptcy court. Interest payment on debt diminishes not only free amount of managers' discretion but also forbid the managers from high risk investment.

Agency cost has got obvious empirical evidences since 1976. Margaritis and Psillaki, (2007) investigate more than 12000 firms in New Zealand and provide the evidence consistent with agency cost model (Jensen and Meckling, 1976), argue that due to difficulty in finding the measure of firm performance that directly support the agency cost hypothesis, researchers could not produce the conclusive evidence in the support of agency cost hypothesis. Pushner (1995) argues ownership structure and agency costs are two important determinants of leverage in Japan. His findings are consistent with the agency theory on the basis of both conflict between manager and shareholder and conflict between shareholder and bondholder/creditors.

2.1.4 Pecking order theory

Pecking order theory of the corporate capital structure has long root in the literature given by Myers in 1984. Pecking order theory predicts the hierarchy of preference in which firms prefer internal financing e.g. retained earnings to external financing and prefers debt to equity. There are two parts of definition given by Myers (1984). First part of definition emphasizes the preference of internal financing to external financing and second part enlightens the preference of debt to equity. What does it mean to prefer internal financing? Does this mean that firm uses all available sources of internal funding before switching to debt or equity? Or does it mean that other things remain constant; firm will mostly use internal financing before any external one? (Frank & Goyal 2009) argue that last two questions produce strict and flexible modes respectively to interpret first part of definition. If we take strict interpretation, the theory could be more testable. But taking flexible interpretation, any testing of theory will depend on change in other things.

The second part of POT's definition is even more difficult to interpret because it relates to the preference of debt to equity. If we apply the strict mode of interpretation, then we will say that

firm will never issue any equity if the debt is feasible (Frank & Goyal 2009). But it has become crystal clear that researchers have rejected the strict interpretation of POT's definition and recent papers have stuck with flexible mode. Now a question arises that how does firm decide about debt capacity? Or what are the indicators that determine boundary of debt? To determine the limit of debt in pecking order theory many recent papers have used factors commonly used in testing of trade-off theory (Frank & Goyal 2009). If we start from second part of POT's definition, we may not be able to differentiate between POT and TOT.

2.1.5 Signaling theory

This theory attempts to address the problem of under-investment caused by information asymmetries through the choice of capital structure. Ross (1977) develops a model to show that information can be transferred and firm value can be signalled to the outside investors by considering various financing alternatives. He argues that that higher leverage signals higher quality earnings and future cash flows to investors. By increasing debt levels, firms are in effect implicitly stating that they would be able to meet the additional debt obligation (increased interest expense) vis-a-vis higher future profitability and cash flows. Hence, firms may commit to higher debt levels to signal their future expectations to the market.

2.2 Empirical Literature

After knowing theories of capital structure we need so see how much research work has been done on capital structure with regard to justify the predictions of these theories by collecting empirical evidence from all around the world. As mentioned below all the empirical evidence in the literature of capital structure subject to specific condition in which prediction of some theories work while hypothesis of other theories do not. Likewise the behavior of firms to adjust

the capital structure is changing when they are confronted certain internal (company specific) and external (outside of the firm) situation.

2.2.1 Evidence from developed countries

It has been unanimously observed that most of the empirical research on corporate capital structure is conducted in developed world (Mazur, 2007). Margaritis & Psillaki (2007) investigate capital structure of 12,240 firms in New Zealand and find evidence consistent with agency cost model. Frank & Goyal, (2009) examine capital structure of publically traded American companies from 1950 to 2003 and find the evidence supporting some versions of trade-off model. Beattie et al (2006) conducted survey research in which they examine the capital structure of listed UK firms and evidence support the predictions of TOT as well as pecking order theories. Huang & Ritter (2009) argue that US firms finance their operations more with external equality than debt if cost of equity capital is low. Lipson & Mortal (2009) investigate the relationship between liquidity and capital structure of US firms and find negative relationship between liquidity and debt. Cook & Tang (2010) investigate. the financing behavior of US firms in good and bad economic condition and find that US firm adjust their capital structure more quickly in good economic condition than bad. Antoniou et al (2008) investigate capital structure of firm and find the evidences supporting POT and TOT of capital structure. Bancel & Mittoo (2004) conduct survey in 16 European countries and find the evidences consistent with TOT of capital structure. Rajan & Zingales (1995) investigate the capital structure of firms in G7 countries and find the similar treatment of variables of capital structure in all seven industrialized countries. Brounen et al (2006) conducted survey to investigate the capital structure of firms in Europe and find the evidences consistent with POT. Allen & Mizuno (1989) examine the financing decision of the Japanese firms and find evidences consistent with

POT. Pushner (1995) analyses the capital structure of Japanese firms and finds evidence consistent with agency cost theory. Polish firms' financing choice is determined by POT (Mazur, 2007). Evidence suggests that financial choice of Spanish firms is determined by trade-off, pecking order and free cash flow theories. The evidence from Switzerland also supports pecking order and trade-off (Drobetz & Fix, 2005).

2.2.2 Evidence from developing countries

Relatively little research work on firms' financing decision has been done in developing countries (Shah & Khan, 2007). The main difference between developing and developed world is that in developed world firms finance their leverage with long term debt and short term debt is mainly contributing in leverage of firms in developing world (Booth et al 2001). Huang and Song (2006) examine capital structure of 1200 Chinese firms and find the results consistent with TOT and POT of capital structure. Teker et al (2009) investigates capital structure of Turkish firm and find evidence supporting POT and TOT of capital structure. Gurcharan, (2010) examines the capital structure firms in selected four developing ASEAN countries and finds significant negative relationship between profitability and growth in all four counties but other determinants of capital structure are treating differently in each country. Booth et al (2001) investigate capital structure of 10 developing countries and argue that there is negative relationship between tangibility and leverage in Pakistan, Brazil, India and Turkey unlike the corresponding results in G7 by (Rajan & Zingales, 1995). While investigating capital structure of Pakistani companies (Shah and Hijazi 2004) also do not find significant relationship between tangibility and leverage. Booth et al (2001) and (Shah and Hijazi, 2004) find evidence supporting POT. As mention above, evidences in developing world indicate the dominancy of pecking order

theory as compared to trade-off theory. Evidence in favor of market timing theory in developing world could not go through my literature review.

2.2.3 Evidence from Ethiopia

The determinants of capital structure of Ethiopian firms are still in under-explored areas in the literature of financing decision. As per the researcher's access and knowledge, the researchers conducted on determinants of capital structure so far in Ethiopian case as follows:

Ashenafi (2005) approached the question of capital structure using data from medium Firms in Ethiopia. He took variables like non-debt tax shield, economic risk, age of firms, size of firms, tangibility, profitability and growth were regressed against leverage. The results proved that non-debt tax shield, economic risk, profitability, growth, tangibility, and age showed a negative coefficient of correlation with debt to equity ratio.

Mintesinot (2010) has undertaken an attention-grabbing study on the determinants of capital structure evidencing manufacturing firms in Tigray, Ethiopia. He used eight explanatory variables: Tangibility, Profitability, Growth, Age, Uniqueness, Size, Earnings Volatility, and Non-Debt Tax Shields. After regressed these variables against leverage, he came up with the result; 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.

Amanual (2011) The research result showed that tangibility, non-debt tax shields, earning volatility, profitability, and size of the firm variables are the significant determinants of capital structure of Addis Ababa manufacturing share companies at least one out of the three models for capital structure employed in the study. While no clear and statistical

proved relation are obtained for the variables growth of the firm and age of the firm in any of the capital structure models.

Bayeh (2011) has conducted Capital Structure Determinants an empirical study on Ethiopian Insurance Industry result showed that growth, profitability and age of the firm were found to have significant influence on capital structure of Ethiopian insurance companies proxied by long term debt and total debt ratios. Liquidity was significant for long term debt and debt to equity. Business risk was also significant for debt to equity and debt ratio whereas age had also significant influence for leverage. However, among the hypothesized capital structure determinants asset tangibility and size of the firm were found to have insignificant contribution on capital structure of Ethiopian insurance companies.

Daniel (2011) has conducted the determinates of capital structure in Ethiopia small Scale Manufacturing Cooperatives and found that size, age, tangibility, and growth variables are the most important determinants of capital structure of small scale manufacturing Cooperatives.

Netsanet (2012) has conducted the determinates of capital structure decisions of construction Companies in Addis Ababa and found that growth opportunity, tangibility of assets, liquidity and age of the company's are found as significant variables that explains the variations of the capital structure of construction companies.

2.3 Research Gap

In the case of Ethiopia, empirical studies on the determinants of capital structure has conducted by different researcher like Ashenafi (2005), His study has considered the Ethiopian medium sized enterprises covering the period from 1991-1996 E.C. Following this study Amanuel (2011), also conducted a study on the determinants of Capital Structure on Addis Ababa Manufacturing firms. Netsanet (2012) has conducted a study on the determinates of capital structure decisions of construction Companies in Addis Ababa. Daniel (2011) has also conducted on determinates of capital structure in Ethiopia small Scale Manufacturing Cooperatives. To the best of the researcher's knowledge, there is no single study that focused on private limited manufacturing companies in Adama city. Prior research papers were conducted on capital structure decision on PLCs couldn't be found at Adama city as far as the available literature. Therefore, the absence of studies in the manufacturing PLCs in the case of Adama city motivated the researcher to conduct the study in Adama city.

CHAPTER THREE

METHODOLOGY AND MODEL SPECIFICATION

This chapter presents the research design, data source and type, data collection instrument, sample design and sample size, data analysis techniques, model, and description and measurement of the variables.

3.1 Research Design

The researcher's intention is to investigate the determinant of capital structure in manufacturing private limited companies of Ethiopia in Adama city. To achieve this objective and to test the hypotheses the researcher choose to use an explanatory research design for this study because it is the best approach to use to test a theory or explanation (Creswell, 2002) since this study tests eight variables which stated in the hypotheses section.

3.2 Data Source and Type

The study is based on quantitative data which is gathered from secondary sources (annual audited financial statements of the selected manufacturing private limited companies). Thus, the data type that used in this research is a quantitative one.

3.3 Sample Design and Sample Size

In selecting sample, three factors that determine the size of an adequate sample includes: nature of population, types of sampling design and degree of precision desired (Salant and Dillman, 1994). Using a sample that is too large is a waste of resources while using a sample that is too small means getting results that are likely to be lacking in validity. In light of this, to select adequate sample size, the following procedures were employed. Since population of the study is

manufacturing PLCs in Adama city, Those firms that have provided audited financial statements to tax authority, at least for the last five years data (2002-2006 E.C) are considered, that is those manufacturing private limited companies which were established after 2002 and started to provide financial statement in the succeeding fiscal are not included, the target companies for this study are companies those who have financial statement on 2002 E.C and on wards.

The target group (population) of the study was private limited manufacturing companies found in Adama city. As per the Ethiopia revenue and customs authority (ERCA) Adama branch data there are around 28 private limited manufacturing companies are found. Based on this population sample size determine as follow:

Table 3.1 stratification of sampling

Types of companies	Population		Sample size	
	Frequency	Proportion	Frequency	Proportion
Manufacturing of garment, leather and Shoe factories.	4	0.143	1	0.09
Manufacturing of steel, glass and glass products, equipments, spare parts, plastic, furniture, paper and paper products factories.	11	0.39	4	0.36
Manufacturing of mineral water, Beverages & soft drink factories.	1	0.04	-	-
Manufacturing of food products, agro industry factories and others	12	0.43	6	0.55
Total	28	100	11	100

Source: researcher own computation from data ISC

Major manufacturing sectors in Ethiopia which are offering attractive potential benefits to prospective investors are here by outlined in the food and beverage, leather and textile, chemical and paper, electrical and electronic, building materials, and non-metallic mineral and metallic industrial sub-sectors, shoe factories, and agro industries (CSA, 2003). The sampling procedure employed in this study is stratified sampling method based on the afore-mentioned Central

Statistics agency (CSA) classifications of manufacturing Companies because it is more appropriate as Manufacturing limited companies.

3.4 Data collection instrument

A five Year data (from 2002-2006 E.C) is gathered from secondary sources .The study uses panel data, where time-series and cross-sectional observations are combined and estimated panel data is used, because it is more useful in studying the dynamics of adjustment, and it is better able to identify and measure effects that are simply not detectable in pure cross-sections or pure time series data. The data is collected from the Audited financial statements (Balance Sheet and Income statement), that been submitted to the tax Authority .Such type of data collection helps to reduce the risk of distortion in the quality of data that could be obtained directly from the respective companies records.

3.5 Data analysis techniques

To test the hypothesis, the relationships between the level of debt and eight explanatory variables representing liquidity, tangibility, non-debt tax shields, growth earnings volatility, age, profitability, and size, were examined for 55 observation for 11 companies by using multivariate ordinary least square regressions and Econometrics soft ware application used to test eight variables.

Multiple regression analysis has been used, satisfying all its five assumptions i.e. the Normality Assumption Test, the Homoscedasticity Assumption Test, the Linearity Assumption Test of each of the independent variables with the dependent variable, the DurbineWatson d Statistic Test for

detecting serial correlation and the Multicollinearity Test in trying to understand the significant and the insignificant variable.

➤ **Dependent variables**

Total debt ratio (TDR): Total debt ratio is a financial ratio that indicates the percentage of a company's assets that are provided in comparison to debt. It is the ratio of total debt and total assets calculated by dividing total debt to total assets.

$$\text{Leverage ratio} = \frac{\text{Total debt}}{\text{Total asset}}$$

➤ **Independent variables**

Tangibility (TG): Asset tangibility refers to all types of tangible assets (e.g. land, building, machines and equipment) that possess some degree of debt capacity. The formula used in this study to measure the value of tangible assets of the firm is the ratio of fixed assets to total assets.

$$\text{Tangibility} = \frac{\text{fixed asset}}{\text{Total asset}}$$

Liquidity (LQ): Liquidity is the ability to convert an asset to cash immediately. It is also known as "marketability". Liquidity was calculated by dividing the total current assets by the total current liabilities.

$$\text{Liquidity} = \frac{\text{current assets}}{\text{current liability}}$$

Non-debt tax shield (NDTS): Other items apart from interest expenses, which contribute to a decrease in tax payments, are labelled as non-debt tax shields. The non debt tax shields measured by annual depreciation expense to total asset.

$$\text{NDTs} = \frac{\text{annual depreciation expense}}{\text{Total assets}}$$

Growth (GR): Firms with growth options are those that have relatively more capacity expansion projects, new product lines, acquisitions of other firms and maintenance, and replacement of existing assets. Firms with high growth options and high cash flow volatility have incentives to decrease debt in their capital structure over a period of time. Growth is measured by the growth rate in total gross assets. The growth factor is measured by the percentage change of assets.

$$\text{Growth} = \frac{\text{Total assets } t - \text{Total Asset } t-1}{\text{Total asset } t-1}$$

Earning volatility (EV): Volatility may be understood as a proxy for risk of a firm (probability of bankruptcy).

Age (AG): Age is the number of years since the establishment of a company.

Profitability (P): Profitability is the financial benefit that is realized when the amount of revenue gained from a business activity exceeds the expenditure, costs, and taxes needed to sustain the activity. Any profit that is gained goes to the owners of the business, who may or may not decide to spend it on the business. Operating profit rate of return (earnings before interest and taxes (EBIT)/total assets) is used as a measure of profitability. Other measures include return on assets and return on sales (profit margin).

$$\text{Profitability} = \frac{EBIT}{\text{Total asset}}$$

Size (SI): Large firms are often more diversified and have more stable cash flows; the probability of defaults for large firms is smaller compared to smaller ones. Thus the financial distress risk can be considered lower for larger firms. The measure of a firm's size used in this study is the natural logarithm of its total assets

3.6. Model

The model is derived on the basis of previous studies such as Ozkan (2001), Bevan and Danbolt (2000), Titman and Wessels (1988) and Amanuel Mekonnen (2011). The chosen model is strongly believed to capture the essence of the subject under study. The following model are specified based on the relation outlined in the hypothesis.

Model for Total Debt Ratio

$$TDR_{it} = \beta_1 + \beta_2 (T_{it}) - \beta_3 (NDTS_{it}) + \beta_4 (G_{it}) - \beta_5 (Ev_{it}) + \beta_6 (A_{it}) - \beta_7 (P_{it}) + \beta_8 (S_{it}) - \beta_9 (LQ_{it}) + e_{it}$$

Where: TDR = Total Debt Ratio

T=Tangibility

NDTS=Non-debt tax shields

G=Growth

EV=Earnings Volatility

A=Age of the firm

P=Profitability of the firm

S=Size and

LQ=liquidity

“i”= company name and

“t” = time

e = the Error Term.

3.7. Variable and measurements

Table 3.2: variable & measurements

Serial no	DEPENDENT VARIABLE	INDICATOR
1	Total debt	Total debt /total asset
Serial no	INDEPENDENT VARIABLE	INDICATOR
1	Liquidity	Current asset/current liability
2	Tangibility	Fixed asset/Total asset
3	Non-debt tax shields	Depreciation expense/Total asset
4	Growth	Percentage change in total asset
5	Earning volatility	Standard deviation of the operating income over mean of the earning
6	Age	Number of years
7	Profitability	Operating income/ Total asset
8	Size	Natural logarithm of total asset

Source: researcher own measurements for dependent and independent variables from literature

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

This chapter of the study presents the results of statistical tools used to analyze data collected for the purpose of identifying the determinants of capital structure of manufacturing PLCs. First, the study presents descriptive statistic result with its discussion. Second, correlation analysis result and its discussion are presented. Thirdly, basic assumptions of classical linear regression model and multiple regression analysis result are presented. Finally, hypotheses testing based on output of regression result is presented.

4.1 Descriptive Analysis

The study examined the determinants of capital structure for eleven PLCs over the time period from 2010-2014. The descriptive statistics of the dependent and explanatory variables for the sample PLCs are summarized in table 4.1. The total observation for each dependent and explanatory variable was 55. First row shows variables and other first columns show mean, median, standard deviation, minimum and maximum respectively.

The mean is the sum of the observations divided by the total number of observations. The standard deviation which is the squared root of the variance indicates how close the data is to the mean. The variance measures the dispersion of the data from the mean. It is the simple mean of the squared distance from the mean. *Min* is the lowest value in the variable. *Max* is the largest value in the variable. Observation refers to the number of observations per variable.

Table 4.1: Descriptive Analysis

	LEV	LQ	TG	NDTS	GR	EV	AG	ROA	SI
Mean	0.319645	1.153768	0.387118	0.106297	0.167221	0.647783	6.854545	0.042774	7.395435
Median	0.312794	1.116746	0.405422	0.119797	0.262830	0.659174	7.000000	0.049086	7.235051
Maximum	0.758885	1.944941	0.687350	0.199375	0.699502	1.831409	12.00000	0.306540	8.723275
Minimum	0.033217	0.512891	0.107520	0.012649	-0.441897	-0.396307	2.000000	-0.430605	6.476149
Std. Dev.	0.217477	0.410068	0.177495	0.059105	0.340901	0.506503	2.497541	0.151197	0.534106
Observations	55	55	55	55	55	55	55	55	55

Source: E-views 6 output from financial statements of sample companies, 2010-2014 G.C.

The mean leverage (total debt to total asset) of PLCs was 31.96 percent with the standard deviation of 21.74 percent. This means that 31.96 cent of each 1birr asset is obtained from debt and the remaining 68.04 cents is the claims of equity holders.

The test statistic shows that the mean of liquidity was 1.1537 this point the manufacturing PLCs have 1.1 current asset for one their liability. This shows that manufacturing PLCs have capacity to pay their liability.

The fixed asset to total asset ratio of the sample organizations ranges from 11% to 69%. The mean fixed asset to total asset ratio of 39% is the reflection of the fact that, manufacturing private limited companies in Adama city relatively invest on fixed and current assets at a rate of 39% and 61% respectively.

The average non tax shields, manufacturing private companies in Adama city, mean to be 11% of the total assets acquired. The maximum of the tax coverage is 20% of the total assets and the smallest coverage on the other hand is 1.26% of total assets.

The growth of assets over the five years study period has recorded an average rate of approximately 16.7% where all the companies score in between negative growth or asset deterioration of -44.1% and a highest growth score of 69.9%

Earning volatility is measured by standard deviation of the first difference in annual earnings so the value which is related to earning volatility in table 4.1, is the average annual risk of manufacturing PLCs that is 64.7%.

The age of the manufacturing PLCs found in Adama city vary from 2 year to 12 years and the mean age is approximated as 6.58 years.

The average annual profitability of the manufacturing PLCs under investigation is found to be 4.27%. Since profitability was measured by the ratio of operating income to total assets, the

maximum attained average profitability rate is 30.6 % whereas the lowest recorded average profitability rate is -43%.

Natural logarithm of total asset was the measure of size of the company asset and the result in Table 4.1 the mean of natural logarithm is 7.395 with standard deviation 0.534.

4.2 Correlation Analysis

Table 4.2, shows the correlation between the explanatory variable and leverage in this study. As noted in Brooks (2008), Correlation between two variables measures the degree of linear association between them. To find the association of the independent variables with the leverage, Pearson product moment of correlation coefficient was used. Values of the correlation coefficient are always ranged between positive one and negative one. A correlation coefficient of positive one indicates that a perfect positive association between the two variables; while a correlation coefficient of negative one indicates that a perfect negative association between the two variables. A correlation coefficient of zero, on the other hand, indicates that there is no linear relationship between the two variables.

The correlation matrix in Table 4.2 result shows that the positive as well as negative relationship among this leverage (Dependent variable) was negatively correlated with liquidity, tangibility, growth, age, profitability and size of the firm. Which indicates that firm with higher leverage have less liquidity, tangibility, growth, age, profitability, and size. However, non debt tax shield and earning volatility have positive correlation with leverage.

Table 4.2: Correlation Matrix

	LEV	LQ	TG	NDTS	GR	EV	AG	ROA	SI
LEV	1.000000	-0.285538	-0.170249	0.122554	-0.137476	0.618659	-0.668924	-0.127579	-0.153441
LQ	-0.285538	1.000000	-0.278445	-0.280875	0.214807	0.070311	0.326450	0.271412	0.091498
TG	-0.170249	-0.278445	1.000000	0.216767	-0.278192	-0.316597	0.048737	-0.120961	-0.191407
NDTS	0.122554	-0.280875	0.216767	1.000000	-0.235874	0.268461	-0.016332	-0.190251	-0.349703
GR	-0.137476	0.214807	-0.278192	-0.235874	1.000000	-0.122693	0.116817	0.481822	0.293491
EV	0.618659	0.070311	0.278192	0.268461	-0.122693	1.000000	-0.530997	0.074344	-0.099202
AG	-0.668924	0.326450	0.048737	-0.016332	0.116817	-0.530997	1.000000	0.027248	-0.182290
ROA	-0.127579	0.271412	-0.120961	-0.190251	0.481822	0.074344	0.027248	1.000000	0.260163
SI	-0.153441	0.091498	-0.191407	-0.349703	0.293491	-0.099202	-0.182290	0.260163	1.000000

Source: E-views 6 output from financial statements of sample companies, 2010-2014 G.C.

4.3 Tests For The Five Assumptions of CLRM

Under this subsection, the study presented five different results for the tests of CLRM assumption such as tests for the assumption that errors have zero mean, tests for the absence of autocorrelation, tests for homoscedasticity, tests for multicollinearity and normality assumption,

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

According to Brooks (2008), if a constant term is included in the regression equation, this assumption will never be violated. Thus, since the regression model used in this study includes a constant term, this assumption is cannot be violated.

4.3.2 Assumption two: homoscedasticity (variance of the errors is constant ($\text{var}(e) = \sigma^2 < \infty$))

If the errors do not have a constant variance, it is said that assumption of homoscedasticity has been violated. This violation is termed as heteroscedasticity.

Table 4.3: Heteroskedasticity Test: White

F-statistic	1.361258	Prob. F(44,10)	0.3119
Obs*R-squared	47.13109	Prob. Chi-Square(44)	0.3457
Scaled explained SS	45.21152	Prob. Chi-Square(44)	0.4211

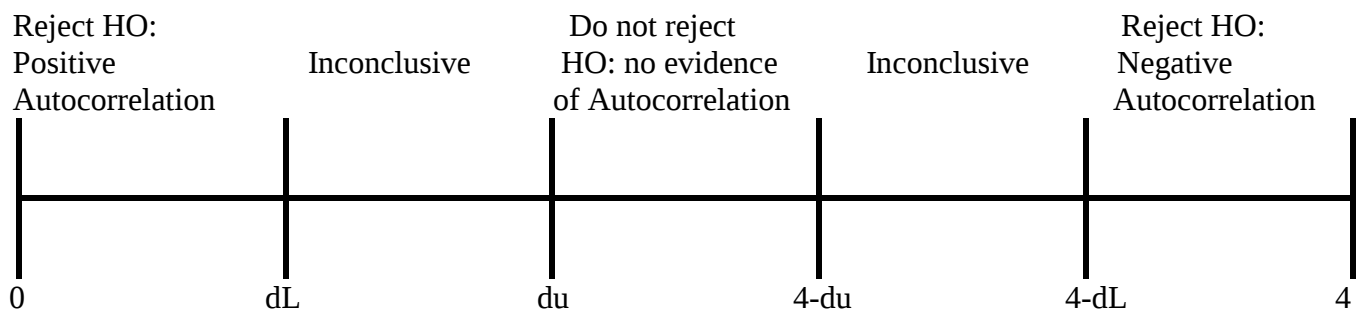
Source: E-views 6 output from financial statements of sample companies, 2010-2014 G.C.

For test of homoscedasticity the study used white test. The F-statistic, Obs*R-squared, and Scaled explained SS versions of the test statistic give the same conclusion that reveals the absence of Heteroskedasticity, since the p-values this test is 0.3119 are considerably greater than 0.05.

4.3.2 Assumption three: auto covariance test (covariance between the error terms over time is zero ($\text{cov}(e_i, e_j) = 0$ for $i \neq j$))

This is an assumption that the errors are linearly independent of one another (uncorrelated with one another). If the errors are correlated with one another, it would be stated that they are auto correlated. To test this assumption, the DW test value in the main regression table should be considered.

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

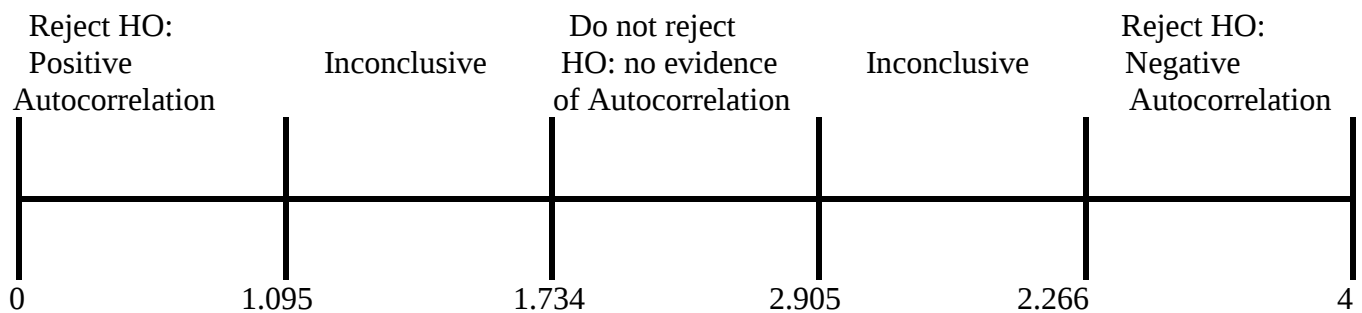


Source: computation of research from brook, (2008)

According to 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 rejection, non-rejection, and inconclusive regions are shown on the number line in figure 4.1. So, 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; the null hypothesis is neither rejected nor not rejected if DW is between the lower and the upper limits, and between 4 minus the upper and 4 minus the lower limits.

Figure 4.2: Durbin- Watson (DW) test



Source: computation of research from brook, (2008)

DW test result was 1.803476 this indicates that there was no evidence of autocorrelation in the data since the DW test result is not far from two, because Chris brooks (2008) pointed out the there is no autocorrelation problem if the *DW* is near 2. The DW test statistic value in the multivariate regression result table 4.5 is 1.803476. The relevant critical values for the test are $d_L = 1.095$, $d_U = 1.734$, so $4 - d_U = 2.905$ and $4 - d_L = 2.266$. The test statistic is clearly between the lower and the upper values and thus the null hypothesis of no evidence of autocorrelation.

4.4.4 Assumption four: Multicolleniarity test

Multicollinearity is the existence of a perfect, or exact, linear relationship among some or explanatory variables of a regression model. If the explanatory variables were correlated to one another, adding or removing a variable from a regression equation would cause the values of the coefficients on the other variables to change. If an independent variable is an exact linear

combination of the other independent variables, then it says the model suffers from perfect collinearity, and it cannot be estimated by OLS (Brooks, 2008).

In order to examine the possible degree of multicollinearity among the explanatory variables, correlation matrixes of the selected explanatory variables were presented in table 4.4. Usually the multicollinearity exists if the correlation between two independent variables is more than 0.75 (Malhotra, 2007). As it appears in the correlation matrix table 4.4 show that the highest correlation of 0.53 which is between EV and AG .For the purpose of this study, there is no Correlation above the aforementioned levels. Hence, it is possible to conclude that there is no multicollinearity problem among the independent variables so that the results can be successfully estimated.

Table 4.4: Multicollinearity test

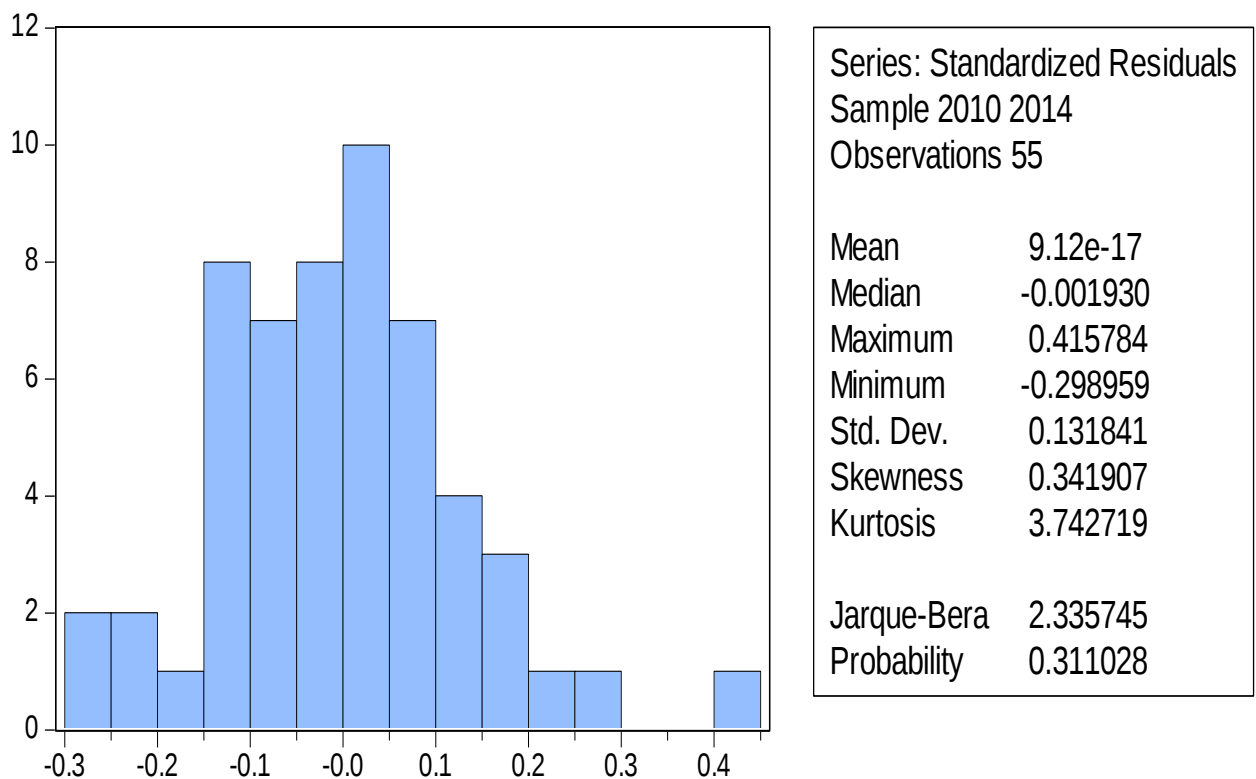
	LQ	TG	NDTS	GR	EV	AG	ROA	SI
LQ	1.000000							
TG	-0.278445	1.000000						
NDTS	-0.280875	0.216767	1.000000					
GR	0.214807	-0.278192	-0.235874	1.000000				
EV	0.070311	-0.316597	0.268461	-0.122693	1.000000			
AG	0.326450	0.048737	-0.016332	0.116817	-0.530997	1.000000		
ROA	0.271412	-0.120961	-0.190251	0.481822	0.074344	0.027248	1.000000	
SI	0.091498	-0.191407	-0.349703	0.293491	-0.099202	-0.182290	0.260163	1.000000

Source: E-views 6 output from financial statements of sample companies, 2010-2014 G.C

4.4.4 Assumption five: Normality Test

According to Brooks (2008), if the residuals are normally distributed, the histogram should be bell-shaped and the Jarque-Bera measure. As the results show on figure 4.1, histogram is bell shaped implying that the distribution is normal. Jarque-Bera statistic is 2.335745 with a p-value of 0.311028. Since the p-value is greater than 0.05, it supports the null hypothesis of presence of normal distribution. In addition, the histogram also signifies that skewness is nearer to zero that is 0.341907 and kurtosis is closer to 3 implying that a normal distribution assumption.

Figure 4.1: normality test result



Source: E-views 6 output from financial statements of sample companies, 2010-2014 G.c

4.4 Hypothesis testing and interpretation of the results

Table 4.5: Regression output by random effect

Dependent Variable: LEV

Method: Panel EGLS (Cross-section random effects)

Date: 05/03/15 Time: 18:32

Sample: 2010 -2014

Periods included: 5

Cross-sections included: 11

Total panel (balanced) observations: 55

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.362597	0.334543	4.073010	0.0002
LQ	-0.100553	0.053068	-1.894797	0.0644***
TG	-0.114612	0.118990	-0.963209	0.3405
NDTS	-0.381892	0.363087	-1.051792	0.2984
GR	0.041569	0.062899	0.660884	0.5120
EV	0.165848	0.053748	3.085660	0.0034*
P	-0.138098	0.138323	-0.998376	0.3233
SI	0.092564	0.038032	-2.433813	0.0189**
AG	-0.038792	0.010241	-3.788066	0.0004*
Effects Specification				
			S.D.	Rho
Cross-section random			0.000000	0.0000
Idiosyncratic random			0.127151	1.0000
Weighted Statistics				
R-squared	0.632484	Mean dependent var		0.319645
Adjusted R-squared	0.568568	S.D. dependent var		0.217477
S.E. of regression	0.142846	Sum squared resid		0.938631
F-statistic	9.895576	Durbin-Watson stat		1.803476
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.632484	Mean dependent var		0.319645
Sum squared resid	0.938631	Durbin-Watson stat		1.803476

*, **, * ** indicates significance at 1%, 5% and 10% level respectively

Source: E-views 6 output from financial statements of sample companies, 2010-2014 G.C

The dependent variable (leverage ratio) is measured by total debt to total assets and the explanatory variables liquidity (LQ), tangibility (TG), non-debt tax shield (NDTS), growth (GR), earning volatility (EV), profit (P), size (SI), age (AG) are measured with the most known proxies used by different researchers in many related studies. The model of this study explained as follows:

$$\begin{aligned} LEV = & 1.362597 - 0.100553LQ - 0.114612TG - 0.381892NDTs + 0.041569GR \\ & + 0.165848EV - 0.138098P + 0.092564S - 0.038792AG \end{aligned}$$

The results of the random effect between the dependent variable and the independent variables are presented in table 4.5. The R-squared value measures how well the regression model explains the actual variations in the dependent variable (Brooks, 2008). R^2 Always lies between 0 and 1. When R^2 is close to one, the model fit the data well. From table 4.5 above table the regression output R^2 and adjusted R^2 are 0.632484 and 0.568568 respectively. The value indicates that more than 56.8% of the total variability of capital structure of PLCs is explained by the model, so it can be concluded that the independent variables provide good explanatory power. The regression f-statistic (9.89) and the p-value of zero attached to the test statistic reveal that the null hypothesis that all of the coefficients are jointly zero should be rejected. Thus, it implies that the independent variables in the model are able to explain variations in the dependent variable. the explanatory variables (liquidity, earning volatility size, and age,) have been found being statistically significant at 10%, 1%, 5% and 1% significance level respectively, whereas tangibility, non debt tax shield, growth, and profitability variables found being statistically insignificant.

4.4.1 Liquidity

The results of fixed effect model in table 4.5 indicated that liquidity had a negative relationship with the coefficient of -0.100553 and statistically significant ($p\text{-value} = 0.0644$) at 10% level. This finding agrees with the researcher's first hypothesis predicted that a negative relationship exists between leverage and liquidity. This negative sign shows the inverse relationship between the liquidity and leverage. In other word it implies that every one percent change increase or decrease in the manufacturing PLCs liquidity keeping the other thing constant had a result change of 10 percent on the leverage in the opposite direction. The negative and statistically significant influence of liquidity in this study was consistent with a theoretical analysis of pecking order and agency cost theory, which state that high liquidity firms use internal resources instead of external to finance their projects. Therefore, this negative effect of Liquidity on leverage was also largely consistent with the empirical evidence of Deesomsak et al. (2004), Ahmed et al., (2010), Najjar and Petrov (2011) , Weldemikael Shibru(2012).

Hence, the null hypothesis of "There is no a negative relationship between liquidity and leverage" is rejected.

4.4.2 Tangibility

Research hypothesis 2 predicts a positive relationship between leverage and tangibility. In contrast to the hypothesis, the regression result showed significant negative relationship between leverage and tangibility. The coefficient of the result is -0.114612 and 0.3405 p-value. This result contradicts with various previous research findings like Harris and Raviv (1991), Rajan and Zingales, Frank , Esperanca *et al.* (2003), Bradley (1984) , Daniel Kebede(2011) and Bayhe Asnakaw(2012) suggest that firm's and borrowing capability depends upon collateralizable value

of assets (tangibility) and theories. Static trade-off theory, asymmetric theory and agency cost theory state the positive relation between leverage and tangibility.

This relation communicates the fact that every one percent change (increase or decrease) in the company tangibility keeping the other thing constant has a resultant change of 11.46 % on the leverage measure total debt ratio in the opposite direction of change. The implication of this relationship might be that manufacturing PLCs which has high value of fixed asset do not prefer to utilize debt related sources in satisfying additional need for fund.

The finding agrees with the finding of Grossman and Hart (1982), Nguyen and Ramachandran (2006), Daskalakis and Thanou (2010) , and Amanuel Mekonen (2012) who propose leverage to be negatively correlated with asset tangibility in line with the agency theory. Higher levels of debt can be undertaken to align the interests of the managers and the shareholders. Higher leverage would induce higher bankruptcy costs and thus limit the expropriation of private benefits by managers. Grossman and Hart (1982) argue that agency costs maybe higher for firms having lower collateralizable assets as it is more difficult to monitor the capital outlay of such firms. It may thus be the case that firms with low collateral value of assets may be more levered in an attempt to discipline managers.

Hence, fails to reject the null hypothesis of “There is no a positive relationship between tangibility and leverage” is rejected.

4.4.3 Non debt tax shields

Non tax shield is found to have a negative relationship with total debt ratio and is statistically significant with the coefficient of -0.3881892. It has the t-value of -1.051792 and 0.2984 p-values. This finding agrees with the researcher’s third hypothesis predicted that a negative relationship exists between leverage and non tax shield, and the regression result showed that

there is negative but insignificant relationship between leverage and non debt tax shield of the PLCs. As a result manufacturing PLCs found in Adama city with large non-debt tax shields relative to their expected cash flow include less debt in their capital structures. Thus, Non-debt tax shield does not influence on debt ratio and capital structure in manufacturing PLCs Adama city.

This result is consistent with DeAngelo and Masulis (1980), Amanual Mekonen (201) argue that tax deductions for depreciation and investment tax credits are substitutes for the tax benefits of debt financing.

Hence, the null hypothesis of “There is no a negative relationship between non debt tax shield and leverage” is rejected.

4.4.4 Growth

The regression coefficient of 0.041569 with t-statistics of 0.660884 and p-value of 0.5120 suggests that the growth variable has a statistically insignificant positive relation with leverage. This finding agrees with the researcher’s fourth hypothesis predicted that a positive relationship exists between leverage and growth, and the regression result showed that there is positive but insignificant relationship between leverage and growth of the PLCs . The positive result of 0.041569 coefficient linked to growth accepts the hypothesis. To conclude, growth is found to be also insignificant factor for deciding the capital structure issues manufacturing PLCs found in Adama.

The finding is consistent with the result of Marsh (1982); and Hall et al.(2004) who found a positive relationship and suggest growth tends to place a greater demand on internally generated funds and push the firm into debt. And it contrasts with Myers (1977), Titman and Wessels (1988), and Daniel Kebede (2011) who found a negative relationship.

Hence, the null hypothesis of “There is no a positive relationship between growth and leverage” is rejected.

4.4.5 Earning volatility

Risk was considered to be one of the key factors that can affect the capital structure. Both theories i.e., static trade of theory and pecking order theory predict a negative relationship between risk and leverage ratio for at least two reasons: first, earnings volatility reduces investors ability to predict about future performance and earnings; second, the higher volatility lead to higher probability of default. However, the results show a positive relationship between risk and leverage as opposed to hypothesis 5, and its relationship was statistically significant at 1% level with leverage and the coefficient of 0.165848 and p-value of 0.0034. This may suggest that higher risk may leave the indebted firms to demand more debt; it is in line with the agency theory and supported by Naveed et al. (2010) empirical study. This indicates that in order to fulfill the claims of the holder, risky companies acquire external funds. But most theories and empirical findings (Titman and Wessels 1988) indicate inverse relationship between risk and leverage.

Prior empirical studies support this positive relationship e.g. Bayeh asnakaw (2011) and Booth et al (2001) reports on table 4.7 that developing counties empirical finding of earning volatility may be positive or negative.

Hence, fails to reject the null hypothesis of “There is no a negative relationship between earning volatility and leverage” is rejected.

4.4.6 AGE

Age variable is included in the model in an intention that good image or reputation has a Positive effect on the firms' creditworthiness. The regression result, however, contrasts with this expectation; age is found being statistically significant at 1% significance level and negatively related to leverage with a coefficient of -0.038792. The t-statistics value of -3.788066 and p-value of 0.004. The finding rejects the researcher's hypothesis that age of the firm is positively related to leverage. This inverse relationship reveals the attractiveness of newer firms to financiers for extending credit, while older firms are less attractive. It may also reveal that older PLCs are able to accumulate funds, thus they rely less on debt. In other words, newer firms may not have had time to retain funds, thus may rely more on debt. The finding indicates also that newly established PLCs are favored regarding debt financing; this is may be in an intention to encourage new investment considering the role being played by these co-operatives. The finding is consistent with the pecking order theory that suggests older and more experienced firms need less external financing as they can rely more on internally generated funds during previous experiences. In contrary, the finding is against the agency theory that suggests as firms grow old they develop reputation and this reputational capital is sufficient to ensure that they will avoid actions harmful to lenders even though they are unmonitored, and thus can borrow high debt.

The finding agrees with Hutchinson (2003), Daniel Kebede (2011) they found a negatively relationship. And it contrasts with Esperanca (2003), Amanuel Mekonnen (2011) they suggest positive relationship.

Hence, fails to reject the null hypothesis of "There is no positive relationship between age and leverage" is rejected.

4.4.7 Profitability

The relationship between profitability and leverage is the most critical means of testing the Pecking Order theory proposed by Myers and Majluf (1984). According to this theory, firms follow a financing hierarchy. In an environment characterized by information asymmetry, it is costly to issue a security about which outside investors have little information. Thus, internal financing is the cheapest means of funding projects. As debt-holders have a higher claim on firm assets as compared to equity-holders and they receive regular streams of interest payments, debt suffers less from information asymmetry as compared to equity. Hence in deciding the sources of financing, firms will prefer internal funds to debt and debt to equity.

In this study Profitability variable, which has the t-statistics of -0.998376 and p-value of 0.3233, is statistically insignificant; and it's the second least important explanatory variable. The coefficient is -0.138098. The negative sign validates the acceptance of the third hypothesis that profitability and leverage have an inverse correlation because of the lower cost and accessibility of internal fund. The inverse relationship reveals that PLCs rely less on debt as profitability gets better. The finding is consistent with the pecking order theory, which predicts a negative relationship between profitability and leverage. This theory suggests that internal funds and external funds are used hierarchically, i.e., internal funds and then outside funds. In contrast, the finding disagrees with the trade-off theory that suggests profitable firms tend to have more debt since bankruptcy costs are lower and interest tax shields are more valuable for profitable firms.

This finding agrees with Titman and Wessels (1988), Cassar and Holmes (2003), Rajan and Zingales (1995), Huang and Song, (2002), Booth et al., (2001), Friend and Lang (1988) and Kester, (1986), Daniel Kebede (2011), Amanuel Mekonnen (2011) and Nestanet Belay (2012) reports a negative relationship between leverage and profitability. And contrasts with Frank and

Goyal (2008); and Abor (2005) who found a positive relationship and suggest high profit level gives rise to a higher debt capacity.

Hence, the null hypothesis of “There is no a negative relationship between profit and leverage” is rejected.

4.4.8 Size

The result of fixed effect model table 4.5 indicated that Size has significant positive coefficient of 0.092564 at 5% significance level relationships with the leverage. It has the t-value of -2.433813 and 0.0189 p-values. This implies that every one percent change (increase or decrease) in the manufacturing PLCs size keeping the other thing constant had a resultant change of 5 percent on the leverage in the same direction. The results also suggested that the bigger the manufacturing PLCs, the more external funds it will use. The possible reason is that, larger manufacturing PLCs have lower variance of earnings, and the providers of the debt capital are more willing to lend to larger manufacturing PLCs as they are perceived to have lower risk levels. This finding agrees with the researcher’s eight hypothesis predicted that a positive relationship exists between leverage and size, and the regression result showed that there is positive significant relationship between leverage and size of the manufacturing PLCs.

In addition, the results confirm the concept that large firms can borrow more easily, either because of a better reputation or because of a perceived lower risk due to better diversification. This is largely consistent with the Static Trade-off Theory and agency cost theory. Beside, many previous studies indicated a similarly strong significant positive relationship, for example Titman & Wessels, (1988), Rajan and Zingales, (1995), Booth et al., (2001), Amidu (2007), and Caglayan and Sak (2010) were some of them.

Hence, the null hypothesis of “There is no a positive relationship between size and leverage” is rejected.

Table 4.6 Summary of theoretical and empirical finding

Variables	Theoretical prediction	Empirical finding Developing countries
Non-debt tax shield	-	
Tangibility	+	-(+)
Growth	-	+(-)
Profitability	+/-	-
Earning volatility	+/-	-(+)
Size	+/-	+(-)

Source: Booth et al 2001

Summary of theoretical and empirical finding on table 4.7 indicate that the empirical finding for developing countries `may be fit with theoretical prediction or not. The Results of this study is not contrast the empirical findings of Booth et al (2001) that means the earning volatility and tangibility explanatory variables result contrast with so many theoretical and empirical finding however, Booth et al (2001) empirical finding for developing country support the results of this study.

4.5 Comparison of the test result with expectations

Table 4.7 below summarizes the comparison of the test result for manufacturing PLCs with the expectations. Therefore, as the table shows except the variables including Tangibility, earning volatility and Age test result of the variables are consistent with the hypothesis formulated for the study

Table 4.7. Comparison of the test result with expectations'

Variables	Expected relationship with leverage	Test result for manufacturing PLCs
Liquidity	-	-(POT)
Tangibility	+	-(POT)
Non-debt tax shield	-	-(TOT)
Growth	+	+(POT)
Earning volatility	-	+
Age	+	-(POT)
Profit	-	-(POT)
Size	+	+(TOT)

Note: Supporting theory is in parenthesis

CHAPTER FIVE

CONCLUTION AND RECOMMENDATION

The preceding chapter presented the results and discussion, while this chapter deals with the conclusions and recommendations based on the regression analysis sections. Accordingly this chapter is organized into two sub-sections. Section 5.1 presents the conclusions and section 5.2 presents the recommendations.

5.1 Conclusion

The influential paper of Modigliani and Miller on capital structure irrelevancy has initiated intense debate in corporate finance as to what determines the optimal capital structure of a firm. Some theories such as the Pecking Order Theory have been proposed which attempt to explain the capital structure of firms. These theories draw reference to the potential costs and benefits regarding agency costs, transaction and bankruptcy costs and information asymmetry in determining the financing behavior of firms.

The objectives of this study was to investigates the determinants of capital structure decisions of manufacturing PLCs in Adama with respect to eight firm-specific variables , namely liquidity , tangibility, NDTs ,profitability, growth, earnings volatility , size and age. This study used secondary data such as (balance sheet and income statement) from the period 2010 to 2014 G.C of 11 companies which are listed at Ethiopia revenue and customs authority office in adama city. The data were analyzed by using multiple OLS regressions method. The correlation matrix result shows that the positive as well as negative relation among leverage. Dependent variable was negatively correlated with liquidity, tangibility, growth, age, profitability and size of the firm. Which indicates that firm with higher leverage have less liquidity, tangibility, growth, age,

profitability, and size. However, non debt tax shield and earning volatility have positive correlation with leverage.

According to the results of OLS regression for panel data with fixed effects estimation empirical results indicates that: leverage of the firm is positively correlated to size, growth and earnings volatility and negatively correlated with liquidity, tangibility non-debt tax shield, profitability, age. Concerning the firm specific variables, Liquidity had a negative and statistically significant relationship with leverage. A negative sign suggests that PLCs with high liquidity ratios or more liquid assets are prefer to utilize these assets to finance their investments and discourage to raise external funds. Moreover, the result for liquidity clearly supports the pecking order and agency theories. The empirical study also found statistical significant positive relationship between earnings volatility and leverage ratio of manufacturing PLCs. it indicate that the manufacturing PLCs with relatively more risky have use more debt than equity. The justification of such result might be that the investors in Ethiopia tend to be highly risk averse and low trusting due to information asymmetry.

Age of the firm is negatively related to leverage. This inverse relationship reveals the attractiveness of newer firms to financiers for extending credit, while older firms are less attractive. It may also reveal that older PLCs are able to accumulate funds, thus they rely less on debt. In other words, newer firms may not have had time to retain funds, thus may rely more on debt. The finding indicates also that newly established PLCs are favored regarding debt financing. Size has significant positive indicate that the bigger the manufacturing PLCs, the more external funds it will use. The possible reason is that, larger manufacturing PLCs have lower variance of earnings, and the providers of the debt capital are more willing to lend to larger manufacturing PLCs as they are perceived to have lower risk levels.

Generally, Based on the finding it can be conclude that liquidity, earning volatility, size and age have significant effect on leverage ratio of the PLCs. This means any increase or decrease on the value variables leads to an increase or decrease on leverage ratio manufacturing PLCs in Adama city. However, firms' specific variables like non-debt tax shield, tangibility, growth and profitability do not have statically significant effect on the leverage off manufacturing PLCs in Adama city. Thus they are not significant factors to affect the capital structure decision of the manufacturing PLCs in Adama town. In conclusion, the result of the study reveals that trade of theory and pecking order theory are the most implemented for manufacturing PLCs in Adama.

5.2 Recommendation

Based on the major findings obtained from the result, the researcher recommends the following:

- The contradiction finding of earning volatility is positive relation between earning volatility and leverage result contradicting with both trade of theory and pecking order theory so the prospective researcher should proof the relationship of this variables with leverage.
- In this study external (macroeconomic) variables like inflation, GDP growth, interest rate, corporate governance, legal framework and impact of the country' s financial system are not included because of lack of time so the researcher recommend for future researcher to accommodate the external factors which can affect capital structure of PLCs.
- Furthermore, the time period covered under this study is only 5 years ranging from 2002 to 2006, due to unavailability of organized data for long period of time. Thus, future researchers could extend this period of time in examining the determinants of capital structure decisions of PLCs over long period of time and can produce more reliable and better result.

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Appendix

Appendix I: correlation matrix

	LEV	LQ	TG	NDTS	GR	EV	AG	ROA	SI
LEV	1.000000	-0.285538	-0.170249	0.122554	-0.137476	0.618659	-0.668924	-0.127579	0.153441
LQ	-0.285538	1.000000	-0.278445	-0.280875	0.214807	0.070311	0.326450	0.271412	0.091498
TG	-0.170249	-0.278445	1.000000	0.216767	-0.278192	-0.316597	0.048737	-0.120961	-0.191407
NDTS	0.122554	0.280875	0.216767	1.000000	-0.235874	0.268461	-0.016332	-0.190251	-0.349703
GR	-0.137476	0.214807	-0.278192	-0.235874	1.000000	-0.122693	0.116817	0.481822	0.293491
EV	0.618659	0.070311	0.278192	0.268461	-0.122693	1.000000	-0.530997	0.074344	-0.099202
AG	-0.668924	0.326450	0.048737	-0.016332	0.116817	-0.530997	1.000000	0.027248	-0.182290
ROA	0.127579	0.271412	-0.120961	-0.190251	0.481822	0.074344	0.027248	1.000000	0.260163
SI	0.153441	0.091498	-0.191407	-0.349703	0.293491	-0.099202	-0.182290	0.260163	1.000000

Appendix II: Descriptive Analysis

	LEV	LQ	TG	NDTS	GR	EV	AG	ROA	SI
Mean	0.319645	1.153768	0.387118	0.106297	0.167221	0.647783	6.854545	0.042774	7.395435
Median	0.312794	1.116746	0.405422	0.119797	0.262830	0.659174	7.000000	0.049086	7.235051
Maximum	0.758885	1.944941	0.687350	0.199375	0.699502	1.831409	12.00000	0.306540	8.723275
Minimum	0.033217	0.512891	0.107520	0.012649	-0.441897	-0.396307	2.000000	-0.430605	6.476149
Std. Dev.	0.217477	0.410068	0.177495	0.059105	0.340901	0.506503	2.497541	0.151197	0.534106
Observations	55	55	55	55	55	55	55	55	55

Appendix III: Heteroskedasticity Test: White

F-statistic	1.361258	Prob. F(44,10)
Obs*R-squared	47.13109	Prob. Chi-Square(44)
Scaled explained SS	45.21152	Prob. Chi-Square(44)

Dependent Variable: LEV
Total panel (balanced) observations: 55

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.362597	0.334543	4.073010	0.0002
LQ	-0.100553	0.053068	-1.894797	0.0644***
TG	-0.114612	0.118990	-0.963209	0.3405
NDTS	-0.381892	0.363087	-1.051792	0.2984
GR	0.041569	0.062899	0.660884	0.5120
EV	0.165848	0.053748	3.085660	0.0034*
P	-0.138098	0.138323	-0.998376	0.3233
SI	0.092564	0.038032	-2.433813	0.0189**
AG	-0.038792	0.010241	-3.788066	0.0004*

Effects Specification		S.D.	Rho
Cross-section random		0.000000	0.0000
Idiosyncratic random		0.127151	1.0000

Weighted Statistics			
R-squared	0.632484	Mean dependent var	0.319645
Adjusted R-squared	0.568568	S.D. dependent var	0.217477
S.E. of regression	0.142846	Sum squared resid	0.938631
F-statistic	9.895576	Durbin-Watson stat	1.803476
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.632484	Mean dependent var	0.319645
Sum squared resid	0.938631	Durbin-Watson stat	1.803476