



**COLLEGE OF BUSINESS AND ECONOMICS
SCHOOL OF MANAGEMENT AND ACCOUNTING
DEPARTMENT OF ACCOUNTING & FINANCE**

**THE EFFECT OF CAPITAL STRUCTURE ON FINANCIAL
PERFORMANCE: EVIDENCE FROM METAL AND ENGINEERING
INDUSTRY IN ADDIS ABEBA**

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**A THESIS SUBMITTED TO THE DEPARTMENT OF ACCOUNTING
AND FINANCE IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTERS OF SCIENCE IN
ACCOUNTING AND FINANCE**

STATEMENT OF DECLARATION

I, the undersigned, declare that this research paper is my original work, prepared under the guidance of **Tamirat Ludego (PhD) & Luchi J (Msc)**. All source of materials used for this paper have been duly.

Acknowledged and this research paper is not presented by any other party for any purpose.

Zinabu Ejigu

Signature

Date

Statement of Certification

This is to certify that the thesis entitled “**The Effect of Capital Structure on Financial Performance: Evidence from Metal and Engineering Industry in Addis abeba**” was carried out by **Zinabu Ejigu** under the guidance and supervision of **Tamirat Ludego (PhD) & Luchi J. (Msc)**, submitted in partial fulfillment for the degree of Master of Accounting and Finance complies with the regulations of the University and meets the minimum requirement and standards with respect to originality and quality.

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External Examiner _____ Signature _____ Date _____

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Advisor _____ Signature _____ Date _____

HAWASSA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

ADVISOR APPROVAL SHEET (1)

This is to certify that the thesis entitled “**The Effect of Capital Structure on Financial Performance: Evidence from Metal and Engineering Industry in Addis abeba**” was carried out by **Zinabu Ejigu** under the guidance and supervision of **Tamirat Ludego (PhD) & Luchi J(Mcs).**, submitted in partial fulfillment for the degree of Master of Accounting and Finance complies with the regulations of the University and meets the minimum requirement and standards with respect to originality and quality.

_____	_____	_____
Name of advisor	Signature	Date
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Name of co-advisor	Signature	Date

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ABSTRACT

In Ethiopia, recently there are few capital structure studies that focused on determining firm specific and macro-economic factors responsible to affect capital structure decision; in these studies researchers include either profitability or performance of companies to understand whether it had an effect on capital structure selection but they ignored the reverse effect of capital structure on financial performance of companies. To understand this reverse effect this thesis analyzes the effects of capital structure and debt maturity choice on financial

performance using audited financial statements collected from each 10 sampled companies of Addis abeba's Metal and Engineering Industry for the time span of six years (2018 to 2023). The multivariate OLS regression result of the study indicates capital structure has a significant and positive effect on financial performance (measured by return on equity) of the Metal and Engineering Industry companies as it is measured by debt ratio; furthermore, short term debt ratio has significant whereas long term debt ratio has insignificant but both positive effect as the study examined if different level maturity of debt has a different effect on financial performance. Thus, the study concluded that data from Addis abeba's metal and engineering industry companies support Tradeoff theories and despite to their significances no different effect in direction on financial performance was found caused by levels of debt maturity. On the other hand, asset tangibility as a controllable variable was found to have a significant and negative whereas company size and asset turnover were not. Finally, the study recommended that companies in Metal and Engineering industry should employ more debt in to their capital structure; however, the industry companies should give a through consideration to determine the optimal point to which they exhaustively take the benefits of debt; otherwise they will be exposed to bankruptcy risk due to excessive utilization of debt.

Key words: *Capital structure; Financial Performance; Return on Equity, Debt ratio*

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the study

Organizations' decisions related to the capital structure are crucial and fundamental because such decisions are inclined towards maximization of the profit of shareholders together with a rise in the financial performance of the organizations (Awais, Iqbal, Iqbal, & Khursheed, 2016).

Consideration of capital structure involves the type of sources which should be involved: equity, short-term debt, long-term debt, or a combination of sources of funding that improve the firms' financial performance (Khanam, Nasreen, & Pirzada). According to Qayyum & Noreen, (2019) a proper arrangement of debt and equity is vital for any organization because it directly affects the organizational performance.

Like, if equity and debt are kept rationally balanced it would improve the organization's performance. Otherwise, the irrational arrangement of debt and equity would lead to the bankruptcy of the organization (Qayyum & Noreen, 2019). Therefore, it can be said that an organization that has an absolute capital structure (optimal capital structure), can minimize its cost and so maximize its profitability (Ahmed, A., & Teru, P., 2020) and thus organization can achieve competitive gain (Riaz, 2016).

An organization's performance is evaluated based on financial and non-financial performance. Financial performance is usually calculated by financial ratios such as Return on equity (ROE), Return on assets (ROA), and numerous other measures. Some other factors which are also related to financial performance are the capital structure, firm size, and liquidity (Sudharika, De Silva, Madhusankha, & Siriwardhana).

The discussion on capital structure and organization performance remained to continue (Uskumbayeva, 2017) since the time of Modigliani and Miller (1958) and the focusing point is an optimal capital structure which is directed towards high performance (R., Baliyan, Dzimiri, & Wally-Dima, 2019).

Due to the importance and fundamental nature of the capital structure, many studies have been undertaken in developed and developing economies over a different period. In this globe, where

unpredicted events as a financial crisis are exerted upon firms, it becomes more critical for firms to manage the capital structure most effectively.

At the same time, we realize that capital structure is the fundamental decision made by the firms in any industry because it increases the firm value and maximizes returns. It is not yet conclusive how the capital structure and financial performance of firms are related in normal market settings, which also compels us to inquire how the same relation presents itself in capital structure and financial performance. The financial crisis in 2008 caused a recession which resultantly had an impact on organizations' capital structure (Uskumbayeva, 2017).

1.2. Statement of the problem

Today, capital structure decision is one of the most important decisions made by financial managers in this modern era. In addition, how an organization financed is a paramount importance to the managers of the firm because, if inappropriate mix of finance is employed, the performance of the business enterprise may be seriously affected (Abor, 2016). He also argues that, poor capital structure decisions may lead to a possible reduction/loss in the value of the firm.

Many researchers have studied the impact of capital structure on financial performance in financial institution such as (Abu-Rub, 2012; Berger & Bonaccorsidipatti, 2016; Degryse, Goeij, & Kappert, 2017; Gill, Biger, & Mathur, 2016; Lindblom, Sandahl, & Sjogren, 2015; O'Brien, 2018; Rajan & Zingales, 2017). However, the researchers found mixed results. Besides; prior studies done largely in developed countries having developed secondary market and most of the research studies on capital structure have used data on listed companies to evaluate the relationship of capital structure and firm's financial performance.

As Eldomiaty (2017) argue that, in emerging economies capital markets are less efficient, incomplete and suffers from higher level of information asymmetry than capital markets in developed countries. Particularly in Ethiopia, there is no stock exchange market starting and the financial sector is under developed and mostly companies can get source of finance from banks.

Therefore, this environment of the market may cause financing decisions of a firm to be incomplete and subject to a considerable degree of irregularity.

Hence, this study provides further evidence to the capital structure theories related to Ethiopia, a developing country that lacks a secondary capital market, by investigating the effect of capital structure on financial performance of metal and engineering industry in Addis abeba.

1.3 Objectives of the study

1.3.1 General Objective

The main essence of the study is to examine the effect capital structure has on financial performance in Addis abeba's metal and engineering industry.

1.3.2 Specific objectives

- To determine the extent Addis abeba's metal and engineering industry companies relied on debt;
- To examine the effect of different maturity level of debt on financial performance;
- To Investigate company size's, asset tangibility's and asset turnover's impact on financial performance;
- To determining which capital structure theory supported in Addis abeba's metal and engineering industry;

1.4 Hypotheses of the study

The study attempted to test the following research hypotheses formulated based on theoretical and empirical review of literature.

- H1: Leverage has statistically significant and negative effect on financial performance of metal and engineering industry in Addis abeba.
- H2: There is a significant positive effect of short term debt on Addis abeba's Metal and Engineering industry companies' financial performance.
- H3: There is a significant negative effect of long term debt on Addis abeba's Metal and Engineering industry companies' financial performance.
- H4: There is a significant positive effect of companies' size on Addis abeba's Metal and Engineering industry companies' performance.
- H5: There is a significant positive effect of Asset tangibility on Addis abeba's Metal and Engineering industry companies' performance.
- H6: There is a significant positive impact of Asset turn over on Addis abeba's Metal and Engineering industry companies' performance.

1.5 Significance of the study

Although numerous studies conducted in developed and recently in developing nations in the area of capital structure, there are few studies done in Ethiopia.

Despite these few studies, to the extent of the researcher knowledge no single study was conducted in the effect of capital structure on financial performance in which debt maturity choice is considered rather those few studies almost all of them are focused on determining factors of capital structure.

Therefore, this study shade a new light for Addis abeba capital structure studies and the importance of giving a thorough thought for different maturity level of debt in studies of capital structure.

Furthermore, currently Ethiopia is struggling in achieving the Growth and Transformation Plan II by the year 2020

Under this plan, the metal and engineering industry, for which no study conducted previously, is among the eight priority sectors for medium and large scale developments in the plan but faces various challenges including lack of loan by companies from banks.

Thus, this research would provide the essence of debt in financing operations of the industry in relation to its effect on their performance to the responsible bodies so that it contributes its own part on achieving the Growth and Transformation Plan II in Ethiopia.

Finally, the result of this study could be used as an input for interested researchers in the field to understand how important is the reverse effect of capital structure on financial performance and the maturity level of debt to capital structure studies.

1.6 The Scope of the study

It is believed that financial performance have different factors to be determined with, but this Study used only capital structure and three control variables since its objective is mainly focused on the effect of capital structure towards companies performance.

The study is also restricted to companies in Ethiopia's Metal and Engineering industry particularly those operating in Addis Ababa , the life span from 2018 -2023.

1.7 Limitation of the study

Audited financial statements (balance sheet and profit and loss statements) are collected from sampled companies but some challenges encountered during the collection in that some companies were not willing to provide statements due to confidentiality questions so that the researcher a general understanding only used for the information academic research purpose to change the companies attitudes .

Besides, by the reason that there is no starting capital market in the country, computing market value of variables in case impossible. As a result, may be the researcher conducts the study using book value of variables.

1.8 Organization of the Paper

The study has five chapters. The first chapter is the introduction of the research and it gives information on the background of the study, statement of the problem, Hypothesis is of the study, objectives, research significance, scope, and limitation of the study. The second chapter contains extensive literature review both in theoretical and empirical studies. In the third chapter, the research methodology adopted for the study is discussed. The fourth chapter devoted to the empirical results of the study and its discussion and the last chapter presents the conclusion of the thesis and the recommendation forwarded to responsible bodies.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter is organized in a way that the first section presents the review of theoretical studies in the nature of the industry and major arguments of capital structure theories; like trade-off theories and pecking order theory are described in more detail.

Then various empirical results from developed, transition and developing nations including Ethiopia are summarized and studies which consider maturity level of debt also reviewed for this study in the second section.

2.2 Theoretical literature review

The metal and engineering industry is a very complex sector which is intrinsically linked with the world economy as a whole. Metal products are needed by many industries, such as automotive, construction, and other manufacturing sectors.

The metal industry uses sign amounts of raw materials (mainly iron ores, coal, and scrap) and energy, and is also a major source of environmental releases such as (among others) emissions of dust, heavy metals, Sulphur dioxide, hydrochloric acid, hydrofluoric acid, polycyclic aromatic hydrocarbons and persistent organic pollutants from sinter plants and coke ovens; waste water from palletization; dust and waste water from blast and basic oxygen furnaces; or emissions of filter dust, slag dust, and inorganic and organic compounds from electric arc furnaces (European Commission. 2020).

Most raw materials are located remote from the areas of highest metal demand, and so both metal products and inputs are traded internationally and in large quantities. This trade is carried out mostly by sea-going vessels, with raw materials flowing from coal and ore-rich producing countries in South America, Africa and Oceania to major producing areas in Europe, North America, and the Far East, followed by shipments through rail and inland waterways, and semi- finished and finished steel products moving in the opposite direction. That has a particular impact on supply and demand patterns, and consequently on prices (Darrell, Landmark 2020).

Metal industry is at the heart of the global economy and equally so at the core of our sustainable modern society. Despite the influence of the pandemic, through its different regional impacts, the global steel industry was fortunate to end 2020 with only a minor contraction in steel demand. Steel use in China expanded while it contracted in the rest of the world. We look forward to normalization in demand during 2021, owing to steady progress on vaccines and changed behavior in the global society.

I believe that the pandemic has accelerated some key trends, which will bring about shifts in metal demand. The Metal industry will see exciting opportunities from rapid developments through digitization and automation, infrastructure initiatives, reorganization of urban centers and energy transformation.

2.3 The Nature the Industry in Ethiopian

Metal Industries are industries engaged in production of metal from ore, scrap, and conversion of billet, slab etc., into primary metal products, while Engineering Industries manufacture fabricated metal products (International Standard Industrial Classification of All Economic Activities, Rev.3.1 and Div. 28-35). Discussions in this paper focus on “Metal and engineering Industry” which is engaged in manufacturing metals from metallic ores to be used as inputs in the manufacturing of various metallic products, and “Engineering Industry” engaged in manufacturing capital goods, accessories, parts, tools and other metallic goods made from metals through engineering.

For the nation, competitiveness means the ability of the nation’s citizens to achieve a high and rising standard of living. In most nations, the standard of living is determined by the productivity with which the nation’s resources are deployed, the output of the economy per unit of labor and/or capital employed.

In Ethiopia on competitiveness of metal and metal products industry. Few studies conducted so far focused on basic metal industries entitled with technical efficiency of the industry sector, technology transfer as a vehicle for industrial development case of basic metals and engineering Industries and ownership, management practices, upgrading, and productivity in the metal working sector (see Maleku, 2017; Gullet, 2018 and Germ, 2020).

Used Stochastic Frontier Model to examine the technical efficiency and total factor productivity (TFP) growth in the Ethiopian manufacturing sector over the period 2016-2020.

The sector has shown better progress after 2019/20 and the growth is largely explained by technical change which is a shift in production frontier. Germ (2020) used longitudinal data to explore why foreign operated enterprises performed better and whether the observed differences in enterprise performance were due to differences in ownership or whether they can be explained by other confounders.

He found that foreign-owned enterprises were endowed with better quality managers. Gullet (2018) showed how industrial development can, through coordinated and integrated transfer of technology, lead to sustainable social and economic development in Ethiopian industries. The researcher proposed various solutions that would enable technology transfer to Basic Metal Engineering Industries in particular and to the country at large Martin, M. (2020).

The Industry Development Strategy of Ethiopia, which has been in place since August 2020, primarily focuses on the promotion of agricultural-led industrialization, export-led development, and expansion of labor intensive industries. KPMG. (2019). Some of the industry sub-sectors that are given top priority in the development effort of the government are textile and garment industry, meat, leather and leather products industry, agro-processing industries and construction industry (Motif, 2020:15-20). Metal and metal products industries are not targeted as priority in this policy document.

2.4 The financial performance' impact on capital structure

It all began in the in the end of 2007, where the financial market in United States was in a midst of a credit crisis of historic proportions. As a result, the stock market collapsed in the fall of 2008 and due to its severe consequences, the crisis in 2008 is perceived as the worst crisis since the great depression in 1930's (Crotty, 2009). As such this had an enormous global effect on many financial institutions and businesses (Argandoña, 2019).

The collapse of the housing and stock market caused the financial crisis that resulted in devastating consequences for several economic sectors across the globe and many businesses ended up with liquidity issues and some even turned insolvent (Imps, 2018; Ann et al., 2018; Corelli and Goldberg, 2019). Cornett et al. (2016) show that the liquidity crisis that many banks experienced resulted in a decrease of their credit supply.

As such, it became more expensive for firms to borrow. All in all, the financial crisis did result in a substantial impact on business capital structure, and focus has been directed towards the debt level as well as different debt alternatives since leverage is connected with risk (MacKay and Phillips, 2005; Briley et al., 2008; Ross et al., 2013; Forsberg, 2018; Custodian et al., 2017).

2.5 Theories of capital structure

The description of the theories as well as their view on the relation between capital structure and firm performance.

2.5.1 Background – Modigliani and Miller theorem

The groundwork for capital structure theory stems from Modigliani and Miller (1958) theorem, which states that a firm's value is not influenced by its capital structure choices. They highlight the irrelevance of capital structure to determine firm's value and the cost of capital, given that management focuses on value maximization.

However, the aforementioned reasoning is concluded when assuming perfect capital markets where for instance no taxes, no bankruptcy costs and no information asymmetries exist. Therefore, the assumptions by Modigliani and Miller (1958) are recognized to be too restrictive (Harrison and WinsWijeya, 2014). Eventually the market imperfections are acknowledged by Modigliani and Miller (1963) and in 1963 they revise their previous work and include the tax benefits of debt as a possibility to increase firm value.

In conjunction with the development of capital markets further weaknesses of the statements by Modigliani and Miller (1958, 1963) are discovered. That resulted in the emergence of capital structure theories as well as research with the purpose of finding evidence for the importance of capital structure choice.

2.5.2 Trade-off theory

According to the trade-off theory every company should have an optimal capital structure. The reasoning behind the statement lies in the trade-off between the potential benefits and costs of debt financing (Kraus and Lichtenberger, 2019; Scott, 2019; Myers, 2020).

As Modigliani and Miller (1963) recognize, firms can benefit from leverage due to the interest deductibility of pre-tax income. In other words, there is a tax shield to take advantage of since interest expenses reduce the taxable income and allow firms to collect tax savings (Graham, 2019).

A positive impact of leverage on firm value is further proved by Masalas (2018). However, Myers (2020) and Cornett and Travels (2019) argue that although firms can benefit from tax deduction by increasing their debt level, each firm should move toward their own optimal capital structure, which can mean either increasing or decreasing debt. Furthermore, the negative effects of leverage on firm performance are recognized by the trade-off theory.

Debt financing is associated with a commitment for upcoming cash outflow due to the required future interest payments on debt. Therefore, interest payments negatively affect firms' liquidity and financial performance, which increases the financial risk in terms of bankruptcy and insolvency (Kraus and Lichtenberger, 2019; Scott Jr., 2019; Kim, 2019; Myers, 2020; MacKay and Phillips, 2005; Briley et al. 2018; Ross et al., 2019).

Although bankruptcy costs exist, Gruber and Warner (2019) and Miller (1977) conclude that they are much smaller in relation to the tax savings. With that said, the trade-off theory argues for a positive relationship between leverage and firm performance. This positive relationship is further confirmed by many scholars such as Taube (1975), Rodent and Llewelyn (1995), Champion (1999), Berger and Bonaccorsidi Patti (2006), Margaritas and Pillai (2017) and Fossa (2013).

2.5.3 Pecking order theory

Myers (1984) and Myers and Malouf (1984) developed the competitor theory to tradeoff, named pecking order. The rational idea behind the theory is based on the notion of asymmetric information that exists between managers and the investors (Frank and Goyal, 2009; Baker and Martin, 2016).

It is argued that managers have a better understanding and more information about the firm than outsiders about the firm's future and therefore they act in the best interest of the company (Harrison and WinsWijeya, 2014; Boada et al., 2015), Le and Phan (2017).

Pecking order theory does not take an optimal capital structure as a starting point. Instead the theory advocates the fact that firms prefer internal funds (i.e. retained earnings) and use external funds only when internal sourcing is insufficient, as equity to finance their operations, it signals to the outsiders that the company is lack of capital, which can result in falling stock price.

In fact, empirical evidence proves that there is a relation between issuing new equity and decrease in stock price (Baker and Martin, 2011). However, when external financing is necessary, the theory emphasizes that the choice of different finance opportunities rely heavily on the relative costs and the lowest risk for the investment (Myers, 1984; Boada et al., 2015). As such, firms issue debt as a first option and then equity as a last (Myers, 1984; Graham and Harvey, 2001); (Tsoy & Heshmati, 2017).

Due to the reasoning above, pecking order theory argues that firms that are profitable and generate high earnings are also the ones that are expected to use less debt. The reason is that these firms finance their investments with internal funds such as retained earnings (Boada et al., 2015). Since firms are more likely to be profitable and generate earnings in normal market conditions or in booms, the pecking order theory assumes that firms have lower level of debt before a financial crisis takes place.

However, during crises firms become less profitable and often face liquidity issues (Corelli and Goldberg, 2011), which make firms seek external funding. In other words, pecking order theory assumes a higher level of debt during financial additionally, since profitable firms are in less need of debt, pecking order theory rises where there is an increased probability that firms' internal funds are not sufficient. Assumes a negative relation between financial leverage and firm performance. This negative relationship is further concluded by researchers such as Kester (1986), Friend and Lang (1988), Titman and Wessel (1988), Rajang and Zingales (1995), Fame and French (1998), Wald (1999), Wiwattanakantang (1999), Gleason et al. (2000) and Abor (2007).

2.5.4. Static Trade-off theory

The aim of this study is to capture potential industry differences in capital structure changes as a result of the financial crisis in 2008 as well as explore whether firms' capital structure choice has an impact on firm performance, before and during the crisis. The financial crisis in

2008 is not only chosen due to the fact that it is perceived to be the worst economic collapse since the great depression in 1930 (Pender, 2009) but also because this unexpected financial crisis brought attention to the importance of a proper capital structure and made firms more concerned about their financial stability (Bhakra et al., 2010), (Khodavandloo, Zakaria, & Nassir, 2017).

Since the financial crisis took place in 2008 this paper examines and compares the financial information from the period before the crisis in 2004-2007 and the period during the crisis in 2008-2011 in accordance with the study by Harrison and WinsWijeya, (2014). Moreover, this paper uses the classification system Industry Classification Benchmark (ICB) by the FTSE group (FTSE International Limited, 2012) to separate and study different industries, which is in line with previous research by Fossa (2013).

A quantitative research method is used in order to collect sufficient amount of empirical data to be able to draw general conclusions. In line with previous researches within the area of capital structure and firm performance (Berger and Bonaccorsidi di Patti, 2006; Margaritas and Pillai, 2010), this study conducts an Ordinary least squares (OLS) regression. OLS regression is a widely used estimation technique in purpose of finding and analyzing relationships between different variables (Croce et al., 2011; Studenmund and Cassidy, 1997). More specifically, a panel data analysis is done since we aim to study specific variables in the same companies over two time periods (Antoniou et al., 2008; Harrison and WinsWijeya, 2014) (Qayyum & Noreen, 2019).

Moreover, when using panel data it is argued that one needs to adjust for either the fixed or random effects. Since we already control for the industry-fixed effects, by separating the information for different industries in our regression models that are presented below, we do not use fixed nor random effect model.

In order to fulfill the aim of this paper and answer the research question two regression models are conducted:

- Regression model 1 for the purpose of studying the impact of the financial crisis on different industries' capital structure.
- Regression model 2 for the purpose of studying the impact of capital structure on firm performance in different industries, before and during the financial crisis.

2.5.5. Agency Cost Theory

Jensen and Mackling (1976) expounded the definition of agency cost in 1976; they explained the influence to capital structure by agency issues. They think there are two kinds of interest conflicts, one is when outside shareholders exist in a firm, and it would lead to a different goal between principal and agency. Because of the asymmetric information and uncertain of investment environment, principal needs a system to monitor agency to do reasonable decisions in order to fulfill principal's interest. The other conflict is the principal and agency has different option on a risky investment decision due to inequality of risk and profitability (Khodavandloo, Zakaria, & Nassir 2017).

In order to prevent this situation, principal would always choose to additional clauses in contract or take measures to monitor agency, which will definitely increase the relevant cost. In this theory, the optimal capital structure is minimizing the agency cost. In conclusion, there is no accurate answer for the optimal capital structure. Trade-off theory and pecking order theory have a relatively neutral standpoint to debts-level in capital structure comparing with MM theory.

They believe debts have advantages and disadvantages, moreover, trade-off theory confirmed the existence of optimal capital structure; agency cost theory thinks a high debts-level will increase monitoring cost which is not good for the firm's profitability.

2.5 Variables and Research hypothesis

Leverage (Debt ratio):

The static trade-off theory predicts that higher level of debt usage, due to its benefits of tax deductibility of interest payments, will favor companies' performance up to a certain range where this tax advantage eventually disappear as a result of the financial distress aroused from excessive utilization of debt (Scott, 1977).

Consequently, to avoid this risk of bankruptcy companies would try to maintain an optimum mix of debt and equity at the point the marginal benefit of debt and marginal benefit of equity equals.

Accordingly, static trade off theory says there is a positive effect of inclusion of debt in capital structure on financial performance. Likewise, the agency cost theory also predicts that higher leverage is expected to lower agency costs, reduce inefficiency, and thereby lead to improvement in companies' performance.

On the other hand, pecking order theory says that due to asymmetric information occur in between insiders and outsiders, in which there are situations management would have more information about companies' value and investment opportunities whereas investors might not (Myers and Majluf, 1984). In such occasion if management will go for future investment opportunities through external financing, rational investors might consider the management actions as if it is because the management perceived the company is overvalued and as if they are trying to take advantage of it; so that, investors would underprice the company. So that, to avoid such situations management could pass over good investment opportunities that would affect companies' performance unfavorably and further the management will finance their operation in the order as follows: first they will go for internal fund, if this source is exhausted and they have found external financing necessary, they will address their finance deficit using safest debt then to risky one and as a last resort they could use new issuance of equity.

Therefore, unlike the previous two theories, pecking order theory forward debt to have a negative impact on financial performance.

As is clearly shown above there is controversy in the relation between leverage and financial performance in various capital structure theories. Besides, many empirical researches done in testing for these theories to support by data from different countries. Among these many empirical researches most of them favor pecking order theory suggesting a negative relationship between the two variables.

For instance, study by Booth et al. (2001), Gaud et al. (2003), Bauer (2004), Attaullah and Hjazzi (2004), Han-suck song (2005), Reimoo (2008), Abor (2008), Sen and Oruc (2008), Ellili and Farouk (2011) supported pecking order theory by their data. Similarly, most studies in Ethiopia in the area also support this theory like study by Daniel (2011); Weldemikael (2012) and Netsanet (2012) are some of them.

Therefore, based on this the first hypothesis to be tested regarding total level of debt stated as:
Hypothesis 1: Leverage has statistically significant and negative effect on financial performance of metal and engineering industry in Addis abeba.

Short term debt ratio:

Similar to the manner for the variable leverage and as part of it, the above theories explained theoretically the relationship between short term debt ratio variable with the financial performance. Rather than going for their theoretical relationship again the researcher focused on the empirical researches.

The results of these researches indicated mostly a positive relationship in between these two variables which supported a Trade-off theory of capital structure. Carvaliho and Edison (2007) found a positive impact and they suggested for this to occur is the instability of economy to arouse for a need of short run fund to finance their working capital which are the type of resources supposedly offered with relative abundance and easiness by financial institution. Abor (2005) also found a positive relation with performance which he indicated that short term debts are less expensive in which increasing short term debt with a relatively low interest rate will lead to an increase in performance level. Additionally, Ellili and Farouk (2011) supported this and justified that more profitable companies used short term debt in financing their operating activities. The only study by Amanuel (2012) using short term debt as variable for leverage in Ethiopia also supported the positive relationship. From this it is expected a positive impact of short term debt on financial performance and to support Trade off theory; so that, the second hypothesis stated as follows:

Hypothesis 2: There is a significant positive effect of short term debt on Addis abeba's Metal and Engineering industry companies' financial performance.

Long term debt ratio:

Concerning Long term debt as variable for leverage, different studies revealed that it has a negative impact on financial performance and support pecking order theory, which to indicate that highly profitable companies use internal fund in financing their long term investment rather than borrowing a long term debt. This is supported from studies by Carvaliho and Edison (2007), Bas et al. (2009), Abor (2005), Keshtkar et al.(2012), and Bayeh (2011) and

Amanuel (2012) from Ethiopia's case. Based on these, long term debt is expected to have a negative effect on financial performance which would support Pecking order theory. Consequently, the third hypothesis would be as follows;

Hypothesis 3: There is a significant negative effect of long term debt on Addis abeba's Metal and Engineering industry companies' financial performance.

Company size:

The size of the company affects favorably its financial performance in many ways. First, large companies can exploit economies of scale and scope, and thus being more efficient compared to small firms. Second, larger firms have a greater access to long term capital from financial institutions than smaller companies but smaller companies tend to either borrow short by means of bank loans or raising capital from owners. Lastly, large companies would have greater power than smaller companies to compete in highly competitive market.

However, it may have unfavorable consequence if any suffer from inefficiencies as a company grows in size which would lead the company to inferior financial performance. As a result of this relationship with performance the researcher believed it to have an effect on financial performance of Ethiopia's Metal and Engineering sector companies and included it as control variable.

Similarly, Abor (+) (2005), Memon et al. (-) (2010), Ahmed et al. (+) (2012), Adekunle and Sunday (+) (2010) and Osuji and Odita (+) (2012) added company size in their study as control variable and found it to have a significant effect. Considering its impact on performance and from existing literature, it is expected to have a positive effect and the fourth hypothesis stated as;

Hypothesis 4: There is a significant positive effect of companies' size on Addis abeba's Metal and Engineering industry companies' performance.

Asset Tangibility:

Asset tangibility is also considered to be the major factor of a company's performance. Mackie (1990) as cited in Osuji and Odita (2012) argues that a company with high fraction of plant and equipment (tangible assets) has the asset base made debt choice more likely and influence the company performance. Since tangible assets are used as collateral, company which possesses more investment on these assets would have lower borrowing cost to improve performance. Supporting this, Akintoye (2008) argues that companies retaining large

investments in tangible assets will have smaller costs of financial distress that lead to better performance than companies that relies on intangible assets (as cited in Adekunle and Sunday, 2010). However, if there is an inefficient use of these fixed assets, it could leave companies in difficulty (Memon et al., 2009). Relying on this argument, asset tangibility used as a control variable believing that it will also have an effect on financial performance of Ethiopia's Metal and Engineering sector companies. It was also used as control variable in the studies by Memon et al. (2009); by Adekunle and Sunday (2010); and by Osuji and Odita (2012). The effect of asset tangibility is expected to be positive; hence, the fifth hypothesis to be tested is;

Hypothesis 5: There is a significant positive effect of Asset tangibility on Addis abeba's Metal and Engineering industry companies' performance.

Asset turnover

The efficiency of management is also determined companies' performance in that if the management is efficient in utilizing companies' assets to generate income the company will perform better otherwise it would expose the company for operational and financial difficulties. This can be measured by the way and manner they utilize the assets of the firm to yield positive returns to the firm. Asset turnover ratio is an important financial ratio that can be used to achieve the purpose of measuring management efficiency; hence the introduction of a control variable, Asset turnover is valuable for this study. This variable also introduced in the study of Adekunle and Sunday (+) (2012), and Osuji and Odita (+)(2012). In this study it is expected that a positive relationship exists between asset turnovers and companies financial performance. Therefore, the last hypothesis to be tested is;

Hypothesis 6: There is a significant positive impact of Asset turn over on Addis abeba's metal and engineering industry companies' performance.

2.5. Review of empirical studies

Similar to the theoretical results of the issue different results have been found in the empirical researches of this field.

These differences clearly shown between the researches held in developed nations who have well established markets, in which companies could gain an efficient access to raise capital, and in developing nations where their markets are emerged or not developed enough for capital access and as well for restructuring the capital composition

Furthermore, the residing difference not only restricted to the market Situation of respected countries but also observed within same level of market situations as researches indicated both the direct and inverse relation between the capital structure and financial performance had.

In this section of the literature review, the researcher tried to show researches conducted in developed countries with a highlight comparison to those done on developing ones and further tried to depict the mixed results found in different researches.

Then, the review goes to studies which used different levels of debt as a measure for the capital structure to see their impact on performance. Finally, it will end up by summaries of researches on the study area from Ethiopia

2.5.1. Empirical review from developed nations

Despite there are enormous researches done using data from developed countries available, the researcher use only seven of them which are considered enough to create awareness for the audiences.

Besides, from among these seven researches the first two are cross sectional (data taken from different countries) and the remaining done within individual country insignificant effects (Tsoy & Heshmati, 2017).

The first among well-known and referenced researches conducted from developed nations is the paper done by Rajang and Zing ales (1995) which entitled “What do we know about Capital structure?”

This study investigated determinants of capital structure choice using data from public firms in the major industrialized countries named as G-7 (United States [USA], Japan, Germany, France, Italy, United Kingdom[UK] and Canada) with an objective to examine whether capital structure outside USA is related to factors similar to those appearing to influence the capital structure of USA firms.

In this study the researchers took “Profitability” as one factors to see its relation with capital structure; accordingly they have found that profitability is negatively correlated with capital structure in US, Japan, Italy and Canada, while in the UK it is more positively correlated, since the dominant source of external finance in UK is equity.

Whereas, there are no relationship found in Germany and France. As found in Germany and France. Heir result clearly indicated the relationship between capital structure and profitability a substitute for performance vary among countries of developed countries.

The other well-known paper similar with the former is the study undertaken by Chen and Hammers (2003) which used data from seven OECD countries (specifically US, UK, Canada, Denmark, Italy, Sweden and Germany) to analyze factors influencing firm's leverage.

Similar to the Rajang and Zing ales they took profitability as one factor of leverage; however, they have found a negative relation in all countries with a strong relation in Denmark and Sweden whereas a weak relation in US and Germany.

As a result they concluded high performer companies exhibit lower debt. Beyond the cross sectional researches, there are efforts to study by taking from a single countries.

For instance an empirical research on Swiss companies to examine determinants of capital structure using a panel data from 106 companies for the period of ten years indicated profitability to be negatively related with leverage (Gaud et.al, 2018).

Similarly a study by Remo (2019) on UK's 163 non-financial listed companies for a period of ten years from 2010 to 20219 also revealed same result which indicates a negative association in between profitability and leverage.

Han-suck song's (2019) study on the Swedish 6000 Companies for nine year time span arrived at the same conclusion with above researchers.

Above all, these researches reach to the conclusion that the relation between capital structure and performance supports the pecking order theory of capital structure.

Although all the above studies on data from developed countries shows a negative relation in between the two variables, the mixed result found in the two studies of Frank and Goyal(in the year 2016 and 2018) draw some attention.

Their former research which titled as "Capital structure decisions; which factor are reliably important?" examined the relative importance of many factors in the leverage decisions of publicly traded.

American firm for over half century using data from U.S firms on comp stat CRSP revealed a negative correlation between the two variables (profitability and leverage).

However, on their latter research named “profits and capital structure “, they argued towards the wrong impression about Trade of theory held by other authors because of the difference in its theoretical and empirical results.

As a result they tried to support their argument by taking data from the US comp stat CRSP then they have found that more profitable firms tend to issue more debt and repurchase equity or in other words less profitable firms tend to do the reverse which in short a positive relation between them.

As a summary, it is obvious that researches gave much favor to a result of negative relation and pecking order theory as it is tried to describe above but it couldn't be conclusive to say the two variables to have a complete inverse relation since there could be moments they too have direct relation as seen in the works of Frank and Goyal.

2.5.2. Empirical review from transitional and developing nations

In similar way studies from the developing nations also have similar features with that of developed nations despite their level of development. These studies mostly favored the inverse relationship of the studied variables.

To support this idea with some researches we can observe beginning from the cross-country study conducted by Booth et al. (2001), Nandi (2017).

They examined the financial structures of firms by a sample of ten developing countries particularly India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico, Brazil, Jordan and Korea.

They primarily focused on answering a question “Do corporate leverage decision differ significantly between developing and developed countries?” As their finding indicated no significant difference as per the decision was found but they have found profitability to have a significant and negative relation with leverage decision except for Zimbabwe.

Moreover, their consistent result in both the countries and pooled data is that the more profitable the firm, the lower the debt level regardless of how it is measured.

As a result, their finding is consistent with pecking order hypothesis which suggest there is an existence of significant information asymmetries and also gave a hint for costly external financing to be avoided by firms.

The study by Bauer (2004) on Czech Republic firms also revealed a negative correlation between leverage and performance supporting pecking order theory as their part of examining determinants of capital structure & Financial Performance.

Additionally, several studies seeking to know whether capital structure has an impact on performance also reaches to the same conclusion. Among them, a study evidenced from 100 firms in national stock exchange of India (Gupta et al. 2011), study evidenced from 77 non-financial Bangladesh's four most leading sector firms (Chowdhury and Chowdhury, 2010), study evidenced from 30 listed companies traded in Colombo stock exchange Sri Lanka (Pratheepkanth, 2011), and studies evidenced from non-financial firms listed on the Nigerian stock exchange by Atinkle and Sunday (2010), and by Ossie and OData (2012) stating firms' capital structure has a negative impact on financial performance; in other word companies that have good performance would likely to have low debt.

However, a study on 40 Mauritanian listed firms differ slightly from above studies as the result shows firm's performance tends to be negatively related to a certain range of leverage.

But beyond this range the benefit from the tax deductibility of interest expense derived from an increase in the debt ratio to be more than offset by the increase in cost related to financial distress and bankruptcy; therefore it will have a direct relation (Boodho, 2009).

Lastly, in contrast to all studies discussed previously, Abu Rub (2011) has found a positive correlation between firm performance and capital structure for 28 listed companies in Palestine stock exchange.

2.5.3. Empirical review on studies using Debt Maturity level

Once finalizing the review of studies to highlight a comparison between the developed and developing nations in prior section, the researcher is interested to look at what will be the relation different maturity level of debt has with financial performance from prior research findings if any deviation could be observed unlike the total debt value.

As the researcher tried to review some empirical studies which use different maturity level of debt as a measure of leverage, there are differences in results as to their relationship with the financial performance.

To strengthen this argument the researcher discussed and presented review of research findings below. When start the broad discussion, I found the study entitled “Determinants of capital structure in developing countries”.

This paper investigated the capital structure decision of from five regions: Africa, East Asia and Pacific, Latin America and Caribbean, Middle East and North Africa and South Asia with main focus on small and private firms.

In this cross countries study, the researchers tried to look the relationship levels with performance on different categories of firms (small, medium and large) and among private and public companies.

Their result shows, total debt and long term debt have a significant and negative relationship with performance on small, medium and large on small and large firms but not for medium firms.

On the other hand, all of them have been found to have insignificant relationship with performance however all are significant and negative on private firms (Bas et.al, 2009).

From this cross-country study we can understand there are situations as to which maturity level of debt should not be overlooked while studying the effect of capital structure on performance.

Similar to the cross-country study discussed above, there are findings from single countries which suggest the same.

For instance, one study on 70 Brazilian companies by Vithessonhi and Tonsure (2018,p 268) tried to examine the influence of capital structure regarding the factor profitability; under which they have tried to verify the relationship among the rates of return (measures of performance) related to the composition of capital: short term debit, long term debt and equity.

Their finding revealed an inverse relationship with long term financing but a direct relation for short term financing which indicates maturity level of debt to be borrowed has its own part in determining financial performances of companies.

The other study by Murphy et.al (2019) also examined the capital structure effects on 58 Malaysians' consumer and industrial sector listed companies in which they differentiated the short term debt, long term debt and total debt effects considering they will have different risk and return profiles, and to observe how the change in debt level affect firms' financial performance.

Unlike Carballo and Edson, they found long term debt to have a significant and positive relation with return on assets (ROA), but short term debt has a significant and negative relation with ROA; however, both of them have an inverse relation with return on equity(ROE) of another measure of financial performance which magnifies consideration of maturity level is still in need. Margaritas and Psillaki(2018) also investigated the issue by taking all listed Ghanaians' firms. He finds a significant and positive relation between short term debt and profitability suggesting that profitable firms use more short-debt to finance their operation and short term debt is an important source of financing for Ghanaian firms representing 85% of total debt financing.

However, long term debt is negatively correlated with profitability. Likely, Desi and Robertson (2019), on their examination of the issue for 33 firms listed on Abu Dhabi stock exchange, find long term debt negatively correlated with profitability and positively correlated with short term debt.

Following this result, they concluded that more profitable companies may use short term debt in financing their operating activities and use the long term debts in financing their investments.

Although all the above mentioned studies put a variation in between different debt maturity level, the next two researches clearly shown it is not always the case to have various relation with performance.

The first one conducted by Keshtkar et.al (2012) which entitled as "Determinants of corporate capital structure under different debt maturities; evidence from Iran" investigated

factors of capital structure considering different debt maturities in that they have found financial performance and total debt inversely related.

Additionally, it is the same for short term and long term debt as total level. The second one evidenced from manufacturing companies of Nigeria and reached to the conclusion capital structure and performance is insignificantly and negatively correlated. Moreover, all, short term, long term and total debt level are not major determinants of firms' financial performance (Cori celli et.al 2019).

Therefore, as we have seen in the above discussion to one way or another, it is important to know the impact of each maturity level of debt beside the total amount and level of debt since it may have a significant impact on the financial performance which requires a critical decision on structuring their capital mix.

2.5.4. Empirical Review from Ethiopia

There is a dearth of empirical work in Ethiopia on competitiveness of metal and metal products industry. Few studies conducted so far focused on basic metal industries entitled with technical efficiency of the industry sector, technology transfer as a vehicle for industrial development case of basic metals and engineering industries and ownership, management practices, upgrading, and productivity in the metalworking sector (see Maleku, 2017; Gulelat, 2019 and Girum, 2018).

With regard to competitiveness, the researchers got only the work of Gebremedhine. Maleku (2017) used Stochastic Frontier Model to examine the technical efficiency and total factor productivity (TFP) growth in the Ethiopian manufacturing sector over the period 2009-2018. The sector has shown better progress after 2001/2 and the growth is largely explained by technical change which is a shift in production frontier. Girum (2018) used longitudinal data to explore why foreign operated enterprises performed better and whether the observed differences in enterprise performance were due to differences in ownership or whether they can be explained by other confounders.

He found that foreign-owned enterprises were endowed with better quality managers. Gulelat (2019) showed how industrial development can, through coordinated and integrated transfer of technology, lead to sustainable social and economic development in Ethiopian industries.

The researcher proposed various solutions that would enable technology transfer to Basic Metal Engineering Industries in particular and to the country at large.

The proposed solutions mainly focus on technology policy, technical development of institutions of higher learning, practical-oriented science and technology education, coordinated participation of the stakeholders, applied R&D, University-Industry linkage, establishment of Basic Metals and Engineering Industries Technology Transfer and Innovation Centre and Technology Incubation Centre. Gebremedhine (2009) in his paper on “Competition regime: capacity building on competition policy in selected countries of eastern and southern Africa” concluded that state-owned enterprises have been negatively affecting trade, competition, and competitiveness in the country.

Conceptual Framework

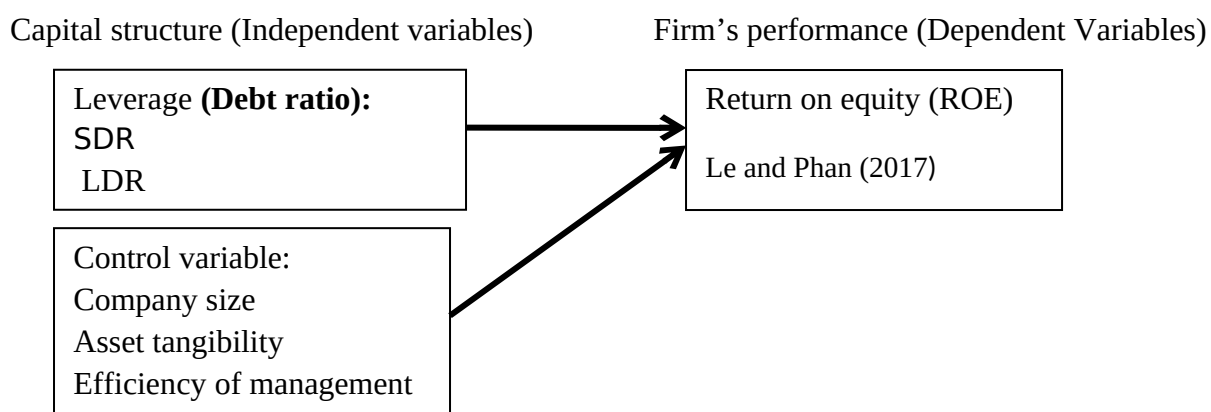


Figure 1: Conceptual Framework

CHAPTER THREE

3. RESEARCH METHODS & METHODOLOGY

3.1 Introduction

The objective of this thesis is to examine the effect of capital structure on financial performance using data in annual reports 2018 to 2023 .

Specifically this study focuses the impact of different maturity level of debt on financial performance.

To accomplish the forgoing research, a regression model used by Oujja and OData (2012) with a slight adjustment for control variable using Memnon, Bhutto, and Abbas (2010) model.

Data for this study comprises only secondary data, audited financial statements particularly balance sheet, and profit and loss statement, obtained from each sampled individual companies.

The purpose of this chapter is to present the research design and approach, variables and hypotheses, and to briefly indicate what type of, from where, and how relevant data is collected and analyzed to achieve the study objectives.

3.2 Research Design

An eligibility of research design primarily based on objectives and purpose used to explanatory research method which the study tried to achieve and a research problem to be answered.

As the researcher tried to state the objectives and problems in the introduction chapter of this thesis, the study exert effort to examine the impact of capital structure on financial performance of Addis abeba's Metal and Engineering sector along with determining which giant capital structure theory is followed.

3.3 Research approach

A quantitative research approach is used a need for investigation of a cause and effect relationship between variables.

This is because quantitative approach is an inquiry that grounded in the assumption that features of social environment constitute an objective reality that is relatively constant across time and setting (Gall et al (1996) as y D'Amato (2019).

When they continued further, the dominant methodology of this is to describe and explain features of this reality by collecting numerical data on observable behavior of samples and by subjecting these data to statistical analysis, which is this study required.

3.4. Target Population, Sampling design and Sample Size

3.4.1 Target Population

The population of this study is Metal and Engineering companies in Addis abeba. As per the Metal Industry Development Institute (MIDI), currently companies involved in major Addis abeba's metal and engineering industry; like in the production of reinforcement bar, steel section and profiles, corrugated sheets and participating in related engineering activities reaches 78, in number.

Cohen (2019) also noted this and states these factors (expense, time and accessibility constraints) as frequent hindrances which prevent researchers from gaining information as a whole population; so he advices researchers to obtain data from a smaller group or subset of total population in such a way that the knowledge gained is representative of the study population under study (cited in Netsanet, 2012).

3.4.2 Sample Design

As a result, the researcher believed to take a sample from this population by using a random sampling technique. As Cress well (2003) described this procedure; the researcher first sample groups or organization (or clusters), then obtains names of individuals with in groups or clusters and samples within the cluster; further, it is believed that each cluster are diverse and somewhat a representative of the population as a whole. Accordingly, this study clustered the whole population in to two broad groups; the first group consists of all metal and engineering companies established and operated in Addis Ababa city administration produce construction material and the second group consists of aoutomtives industry.

3.4.3 Sample Size

Once the clustered group identified, the next step was to take sample from this selected group. Regarding to the selection process, Cress well (2003) recommends a random sampling in which each individual company in the population has an equal probability of being selected. As he noted further randomization helps the study to choose a representative sample from the population and provides the ability to generalize to a population.

In line with this argument 10 companies have been drawn as a sample by using a simple random sampling. As the study required a six year data beginning from the year 2018 to 2023, eight companies which commenced their operation after 2018 excluded and left 70 companies to be eligible population for the study.

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

3.5. Definition and measurement of variables

This study expected consists seven variables; a dependent variable financial performance; three different independent variables of capital structure: Leverage ratio, Short term debt ratio, and Long term debt ratio; and three control variables: Company size, Asset tangibility and Efficiency of management. All these variables are measured based on book value as it provides an easy and accurate way to calculate ratios (Baliyan, Dzimiri, & Wally-Dima, 2019)..

Book Value measures preferred since book values are related to values of these variables already in place while market value depends on present value of growth opportunities (Myer 1984, cited in Daniel, 2012).

3.5.1. Dependent variable

Financial performance;

In the field of finance, various financial ratios; such as return on assets (ROA), return on equity (ROE) and return on investment (ROI) could be used as a proxy measure of

companies' financial performance but in this study the researcher has used only ROE as a proxy measure of financial performance because it is more effectively and widely acceptable measure in the existing literature. Therefore;

$$\text{ROE} = \frac{\text{Earnings before Tax (EBT)}}{\text{Total owners' Equity}}$$

A high percentage of ROE indicate better performance while low percentage represents the reverse. Chin Ai Fu (1997), Abor (2005), Carvaliho and Edison (2007), Abu rub (2012), Ahmed et al. (2012) and Osuji and OData (2012) also used ROE to measure performance.

3.5.2. Independent Variables:

In this study, capital structure used as independent variable using three different level of debt to assets ratios to measure leverage. First, it took the total level of debt of companies for computing leverage ratio. Then decomposing the total debt level into short term debt and long term debt, it computed the short term debt ratio and long term debt ratios respectively to have a better understanding whether there is an effect of different maturity level of debt on Addis's abeba Metal and Engineering sector companies' performance Wazir, M.I. (2017) .

Leverage:

Debt ratio (Dr);

Leverage measured by Debt ratio; total liabilities (short term liabilities and long term liabilities) by total assets used as one of the independent variables to represent capital structure. This ratio reveals that how much percentage of the total assets is financed by debt financing and also viewed as a proxy for what is left for owners in case of liquidation.

This ratio stated as;

$$\text{Dr} = \frac{\text{Total Liabilities}}{\text{Total Assets}}$$

Debt ratio is more familiar as a measure for Leverage in empirical researches of capital structure studies. Among those Rajah and Zing ales (1995), Booth et al. (2001), Gaud et al. (2003), Reimoo (2008), Daniel (2011), Bayeh (2011), and Netsanet (2012) used it to measure leverage(Sabin and Mira's,2017).

Short Term Debt ratio (SDr);

Short term debt ratio also indicates what portion of the total assets of a company is financed using from short term matured debt. And this measured as;

$$\text{SDr} = \frac{\text{Current Liabilities}}{\text{Total Assets}}$$

Note: short term liability is defined for this study as liabilities which are paid within less than one year or one operating cycle. This ratio also introduced in study of Bas et al. (2009), Luper and Isaac (2012), Elilim and Farouk (2011) and Amanuel (2012), Oke et al. (2019) .

Long term debt ratio (LDr);

Similarly, Long term debt ratio depicts how much of total assets are financed by using long term debt financing. And it is measured;

$$\text{LDr} = \frac{\text{Long term Liabilities}}{\text{Total assets}}$$

Note: long term liability is defined for this study as liabilities which will mature beyond one year or one operating cycle. Long term debt ratio also captured to measure maturity level of leverage in the studies of

Bas, Muradoglu and Phylaktis (2009), Luper and Isaac (2012), Ellili and Farouk (2011) Bayeh (2011), and Amanuel (2012).

3.5.3. Control variables:

In addition to the above independent variables, the researcher took three variables, which are found in the literature to have an influence on companies' financial performance, namely, Company size, Asset Tangibility, and Efficiency of management, as control variables in this study.

Company size (SZ);

As companies' financial performance factor, company size included as a control variable. And to achieve the normal distribution and linearity Size of a company measured by natural logarithm of total assets.

$$\text{SZ} = \text{natural logarithm (Total assets)}$$

Nguyen and Ramachandran (2006), Shah and Hijazi (2004), Atinkle and Sunday (2010), Daniel (2011), Bayeh (2011) and Osuji and OData (2012) similarly used natural logarithm of total assets to measure company size.

Asset tangibility (Tang);

Asset tangibility has been found in most literature of capital structure that affects Company's performance and included as a control variable which is measured by dividing Net fixed assets to total assets.

This is written as;

$$\text{Tang} = \frac{\text{Fixed Assets}}{\text{Total Asset}}$$

It has also been used by Chen and Hammers (2003), Han-Suk Song (2016), Zeitun and Tian (2007), Daniel (2011), W/ Mikael (2012) and Amanuel (2012) HAMMES, K. (2018).

Efficiency of management (Turn);

The efficiency of the management of a firm can be measured by the way and manner they utilize the assets of the firm to yield positive returns to the firm.

Asset turnover ratio is an important financial ratio that can be used to achieve the purpose of measuring management efficiency, hence the introduction of the variable, TURN, as a controlled variable, in this study as it is used in Osuji and OData (2012).

Thus, the formula stated as:

$$\text{Turn} = \frac{\text{Total Sales}}{\text{Total Assets}}$$

3.6. Types and source of Data

3.6.1 Types of Data

To achieve the purpose of the study, the researcher depends on secondary data taken from companies annual audited reports. The data characterized as panel data, which capture both the cross section and time series dimensions. Baltagi et al. (1994) cited in Chen and points and degree of freedom, and to reduce co-linearity among explanatory variables that lead to improve the efficiency of econometric estimates. They noted additionally, it can also control for individual heterogeneity due to hidden factors that if neglected in time series or cross

sectional estimation which leads to biased result. By this rational the researcher chooses to use panel data type.

3.6.2 Sources of Data

The criterion for companies to be included in the study required companies to have a six year audited financial statements particularly balances sheet and profit and loss statements covering a period from 2018 to 2023 inclusive.

3.7 Data Collection Instruments.

The data for the entire resrch variable as captured in the study model was collected from audit financial statement obtained from the sample company finance office,RCA,website collected panel data by using observation techniques and closed-ended queestonery used.

3.8. Model specification

The study employs Return on Equity (ROE) as dependent variable which measures company's financial performance. Although there is no unique measurement of financial performance in the literature, ROE was chosen because it is important accounting based and widely accepted.

Measures of financial performance; and the independent variables are Debt ratio (DR) to measure total debt level, and short term debt ratio (SDR) and long term debt ratio (LDR) to measure different maturity levels after decomposing total debt.

The models for this study derived on the basis of prior studies such as Osuji and OData (2012), Memnon et.al (2010), Ahmed et.al (2012) and Abor (2005) and these two equations are believed to capture the essence of the subject under study. The general model of this study, as found in other empirical literature is represented by;

$$Y = \beta_0 + \beta_1 D1_{it} + \beta_2 Z2_{it} + e_{it}$$

Where; Y is the dependent variable;

D1 are the independent variables;

Z2 are the control variables

β_1 and β_2 are the coefficient of explanatory variables

e_{it} is the error term. It has zero mean, constant variance and non-auto correlated

Specifically, when the above model is adopted for this study, the regression models could be written as;

Equation 1:

$$ROE = \beta_0 + \beta_1 D_{rit} + \beta_2 Size_{it} + \beta_3 Tangit + \beta_4 Turnit + e_{it}$$

Equation 2:

$$ROE = \beta_0 + \beta_1 D_{rit} + \beta_2 SD_{rit} + \beta_3 LD_{rit} + \beta_4 Size_{it} + \beta_5 Tangit + \beta_6 Turnit + e_{it}$$

Where;

- ROE= Return on equity
- β_0 is the constant term
- β_1 to β_5 are the coefficient of the explanatory and control variables.
- D_{rit} = Debt ratio for “i” company at time “t”.
- SD_{rit} = Short term debt ratio for “i” company at time “t”.
- LD_{rit} = Long term debt ratio for “i” company at time “t”
- $Size_{it}$ = Company size for “i” company at time “t”
- $Tangit$ = Asset tangibility for “i” company at time “t”
- $Turnit$ = Asset turn over for “i” company at time “t”
- e_{it} = the error term

3.9. Data analysis Method

The panel data collected from companies’ audited financial statements analyzed by using ‘E-Views Version 7.0’ statistical package. Using this statistical package, the researcher has undertaken various statistical analysis methods in order to test the proposed hypothesis.

First, the study employed a descriptive statistics of variables to provide the researcher and audience in picturing the situation and to present relevant information (Malhotra, 1997 cited in Bayeh, 2018). Then it conducted Pearson’s correlation matrix test to identify the relationship of each variable among them and with dependent variables, and various specification tests has been done to check for assumptions of classical linear regression model: heteroscedasticity, autocorrelation, multicollinearity, and normality are held along with a test for either a fixed effect or random effect model is appropriate for the study.

Finally, this research used multiple regression models to test the influence of capital structure on Addis abeba’s Metal and Engineering Industry companies’ financial performance minimize

the error between the estimated point on the line and the actual observed points applying Ordinary least square (OLS) regression method with a rationale that it can find the estimated regression line giving the best fit (San and Heng, 2018).

The impact of each explanatory variable on leverage was assessed in terms of the statistical significance of the coefficients ' β s'. Using a 1%, 5%, and 10% level of significance, an estimated coefficient was considered to be statistically significant: at 1%, if $p\text{-value} \leq 0.01$, at 5%, if $p\text{-value} \leq 0.05$ and at 10%, if $p\text{-value} \leq 0.1$. It is conventional to use a 5% significance level, but 10% and 1% are also commonly used (Brooks, 2008). The signs in the model reveal the expected relationship between the dependent variable, and independent variables. Lastly, all results presented through tables and graphs.

CHAPTER FOUR

4. RESULT AND DISCUSSION

The previous three chapters present the problem and purpose of this study, the review of theoretical and empirical researches of the study area and the research methodology adopted for achieving its purpose.

In this chapter, the results of the study along with discussions are presented. The chapter has four major sections; the first section presents a descriptive statistics result, the second section tell us the correlation analysis among the selected variables, and the third section show different statistical tests to assure that classical linear regression model's assumptions are held with a suggestion to correct for assumptions not held. Finally, the OLS regression result presented and discussed so that the research hypothesis are tested.

4.1. Summary of Descriptive Statistics

Use of descriptive statistics in analyzing quantitative data helps to provide information to the researcher and users in such a way that it describes the overall level of the group of observation to show the center of a set of observation, and to compare and investigate values in a set of data among themselves and how much the values vary from the corresponding average. Accordingly, this study employed a descriptive statistics and presented summary of these result in table 4.1. As it is shown in the table descriptive measures used; two of them (mean and median) used to describe the center of observations and the other (Standards deviation) used to measure the variation or dispersion of observations from mean of the observations of the dependent, independent and control variables. Therefore, in this section the results of these statistics are discussed in briefer manner on the following paragraphs.

Table 4.1 Descriptive statistics of dependent, independent variables and control variables

	ROE	DR	SDR	LDR	SIZE	TANG	TURN
Mean	0.40866	0.57280	0.39813	0.17467	18.1716	0.29555	1.23176
Median	0.20841	0.57970	0.45733	0.08729	18.3275	0.28018	0.93258
Maximum	3.24434	0.95568	0.83136	0.63860	19.7044	0.77225	4.62512
Minimum	(1.48985)	0.03229	0.00889	0.00000	16.1430	0.03399	0.08210
Std. Dev.	0.77411	0.23546	0.21966	0.19305	0.94787	0.17898	0.97758
Observations	60	60	60	60	60	60	60

Source: E-views output from sampled audited financial statements from the year 2018 to 2023

First, as depicted in column two of table 4.1 the mean of ROE, a measure of financial performance (dependent variable), is 0.41. This result revealed that for every birr a company financed through equity financing would earn 40 cents in return. The other measure which is not affected by extremely large or small values, the median, similarly indicated that Metal and Engineering industry companies to have a positive return of 21cents for financing through equity. However, as shown in the table there is higher variation ranging from a positive return of Birr 3.24 to a negative (loss) of Birr 1.49 on every birr the owners' invested in their companies, and the variation further indicated by standard deviation of 0.77.

Thus, in Addis abeba's metal and engineering industry there are companies running their operations at loss at one end and companies which have high performance and gaining high return as much as three times to their equity investments; the latter could further indicate that companies may depend more on external financing other than equity to run their operation.

Second, the independent variable, debt ratio, which measures capital structure considering gross amount of debt, has an approximately same mean and median of 0.573 and 0.579 respectively. These figures show that on average or centrally an Addis abeba's Metal and Engineering industry company financed 57% of its assets through debt financing. In other words, the owners' contribution and the retained earnings for companies' financing accounted for the remaining portion of 43%. Furthermore, these ratios give a little hint as to the preference of financing options, equity, or debt, of the industry, since on average these Metal and Engineering industry companies are using large amount of debt compared to the equity they have used. But, we can observe simply that there are companies that restrict themselves from borrowing debt in financing their operating activities; this can be explained by looking at the minimum value of debt ratio of 0.03 which reveals that only 3% of the total assets are financed through debt.

On the other side, there are companies whose assets are financed by debt to the level of 95.5%. This variation is also indicated by standard deviation of 0.22.

In addition to the gross level of debt amount, the study aimed at decomposing it into different maturity levels as short and long term debt to see if there is any different effect and took them as capital structure measures.

In this regard their descriptive statistics results are presented on the column 3 and 4 of table 4.1. The table shows on average companies financed their assets (operation) more by using short term debt, 39.8%, rather than by using long term debt 17.5%.

The median indicated also the same as the mean since their values for short term debt ratio and long term debt ratio are 0.46 and 0.09 respectively to reveal that most of the sampled companies choose short term debt than long term debt. Concerning the range, short term debt ratio gain a maximum value of 83% and a minimum of less than 1%, whereas long term debt ratio took a maximum level of 64% and a minimum of null reflecting those companies which do not use any debt that mature beyond one year.

Comparing one another with respect to the portion they take from the total debt, short term debt accounts 69.5% of total debt (39.8%/57.3%) and long term debt accounts 31.5 % (17.5%/57.3%) depicts that Addis abeba's Metal and Engineering industry companies relied more on short term debt this could be because short term financing are in expensive or it is an important source of financing as Abor (2005) concluded or it could also be that companies relied on short term debt to finance their operating activities as Ellili and Farouk (2011) found.

Additionally, the low level of long term debt in the capital structure could be that companies in Ethiopia largely depends on restricted loans extended by financial institutions and no other source such as raising capital from equity or debt market are available since there are no fully worked capital markets in the country.

Finally, the companies size, asset tangibility's and asset turnover measures of the control variables presented in the last three column of table 4.1. In order to maintain the normal distribution and linearity, company size was measured by transforming to natural logarithm of total assets, but for this discussion the researcher used the real birr value of total assets and to clearly understand the figure the natural logarithm results put under parenthesis along with it.

Accordingly, Addis abeba's Metal and Engineering industry companies have an average size of Birr 77,951,703(18.1716) with a maximum of Birr 361,004,145.6 (19.7044) and a minimum of Birr 10,252,170.53 (16.143) which shows a greater variation between companies reaching to Birr 350,751,975 and a standard deviation of 0.947 also indicates this variations. On the other hand, the asset tangibility as measured by ratio of fixed assets to total assets reflects that on average from total assets of Metal and Engineering companies only 29.6% represent fixed assets.

This result could be described in other words as more than 70% of the total assets are current assets, in most situations are not used as collateral to borrow from financial institutions which in turn makes borrowing difficult or increase cost of borrowing and exposed to financial distress that leads financial performance to decrease (Adekunle and Sunday, 2010).

Though the mean indicated to the level of 29.6%, in the industry there are companies which possessed fixed assets as a larger portion of total assets reaching 77.23% (maximum value) and on the other extreme there are also companies which fixed assets are even less than 3.5% of their total assets. Lastly, when we look at the asset turnover ratio their mean value is 1.23 interpreted as on average for every single birr invested in total assets, Addis abeba's metal and engineering industry companies generated birr 1.23 with a range in between the maximum of 4.62 and minimum .08 which to have a standard deviation of 0.978.

4.2 Correlation analysis

This section of the result discussion provides the linear relationship between the dependent variable (financial performance) and explanatory variables including both the independent and control variables by using correlation matrix. Correlation matrix helps to quantify the extent to which two quantitative variables, dependent and independent variables, go together. Values of the correlation coefficient are always being in between -1 and +1. The sign of the correlation coefficient determines whether the correlation is positive or negative (direct or inverse); whereas, the magnitude of the correlation coefficient determines the strength of the correlation. Accordingly, the closer the correlation coefficient to +1, the stronger the positive correlation would be and if the correlation coefficient is close to -1, it indicates a strong negative correlation in between considered variables. However, if the coefficient of the correlation approaches to zero (0) it inform us, there would be little or no linear relationship exists among the variables. Hence, to perform this correlation analysis this study used a Pearson product moment of correlation coefficient and presented the summary of it in table 4.2.

As shown in table 4.2, the correlation coefficient between ROE and Debt ratio is 0.355 and it is significant at 1%. This shows that as the metal and engineering companies increased their borrowing of debt, their return on equity financing also increased indicating a direct relationship between them. This finding is not consistent with the pecking order theory, which suggests due to asymmetric information between investors and managers, profitable companies finance their operation (project) by using internal source of financing so that they

come up with low debt level, but rather it is supported by trade-off theories in that the use of debt has the advantage to serve as a shield to earnings from tax since interest payments are tax deductible, to lead for better financial performance at one hand or the use of debt reduces the agency cost incurred by owners which in turn to enhance companies' performance by forcing management to focus on profitable investment on the other hand. Similar with the findings of Frank and Goyal (2009), Bayeh (2011) and Abu Rub (2011) but it contradicted with the findings of Rajan and Zingales (1995), Chen and Hammes (2003), Reimoo (2008), Booth et al. (2001), Gupta et al. (2011), Osuji and Odita (2012), Daniel (2011) and with Netsanet (2012). Therefore, Addis abeba's Metal and Engineering industry companies are more likely to use debt to increase their financial performance in line with the suggestions of Trade-off theories as a result of the positive correlation between performance and debt level.

Table 4.2 Person's correlation matrix between the dependent and explanatory variables

Correlation	ROE	DR	SDR	LDR	SIZE	TANG	TURN
ROE	1.000000						
DR	0.355356	1.000000					
SDR	0.0053	0.642143	1.000000				
LDR	0.559727	0.0000	-0.354644	1.000000			
SIZE	0.1189	0.0001	0.0054	0.0909	1.000000		
TANG	0.171055	0.081196	-0.106492	0.220207	0.0909	1.000000	
TURN	0.1913	0.5374	0.4180	0.0909	0.0909	0.0909	1.000000
	-0.427561	0.262419	-0.229139	0.0909	0.0909	0.0909	0.0909
	***	**	*				
	*** Significant at 1%, ** at 5% and * at 10%						
	Source: Generated from E-views						

Continuing our discussion to the other measure of capital structure, short term debt ratio, it has been found a strongly significant and positively correlated with ROE at 0.56, which is more than the total debt level has. Like the total debt level, the short term debt ratio also follows the trade-off theories indicating the direct relationship between the short term debt ratios with financial performance.

This finding is similar with Carvaliho and Edison (2007), Abor (2005), Ellili and Farouk (2011) and with Amanuel (2011) but contradict with Keshtkar et.al (2012), Ahmed et.al (2012) and with Luper and Isaac (2012). However, unlike the short term debt ratio long term debt ratio has an insignificant and negative correlation with ROE that reveals as long term debt borrowing increases the Metal and Engineering industry companies' financial performance decline. This result depicts that these companies would prefer internal fund rather than borrowing long term debt to finance their assets which is consistent to the pecking order theory of capital structure. Findings of Abor (2005), Carvaliho and Edison (2007), Bas et.al (2009), Ellili and Farouk (2011), Amanuel (2011), and Keshtkar et.al (2012) are similar with this study whereas the study by Ahmed et.al (2012) contradicted to this study.

Despite that all of the control variables are expected to have a positive relation with financial performance, only company size and efficiency of management measured by asset turnover have a positive but insignificant relationship with ROE having coefficient of correlation of 0.17 and 0.16 respectively. But unexpectedly asset tangibility of companies turned to has a strongly significant and negative correlation with ROE at -0.43. The sign of the correlation coefficient of company size slightly indicates that the larger the size of the company the better the financial performance will be. This could be described further as larger companies have the chance to exploit economies of scale and scope, to access long term capital and also to have greater power than smaller firms in highly competitive market that leads them to perform better in the industry and this is similar with the finding of Abor (2005), Adekunle and Sunday (2010), Ahmed et.al (2012), and Osuji and Odita (2012); but contradict with Memon et.al (2010). Similarly, the positive correlation of asset turnover with ROE revealed that as the efficiency of the management improved in generating sales improved financially. by efficient use of assets, the performance of Metal and Engineering industry companies'. This result had been found in study of Adekunle and Sunday (2010), and Osuji and Odita (2012).

Regarding the asset tangibility, there was argument saying that “those companies which have large fraction of tangible assets of their total assets have the asset base to give as a collateral that enables them to borrow more debt and have a lower level of financial distress so that they will have a better financial performance”. However, in Addis abeba’s Metal and Engineering industry the case is different since there is a significant and negative correlation coefficient between tangibility and ROE indicating that the more a company invested in tangible (fixed) assets the lower would be its financial performance.

The reason behind this contradiction could be an inefficient use of fixed assets by Metal and Engineering industry companies. This finding is similar with studies of Memon et.al (2010) and Osuji and Odita (2012).

4.3. Test for Classical linear regression Model Assumptions

Prior to any move for running a regression using ordinary least square method there must be some conditions that should be met. For an ordinary least square to be used in estimating coefficients by regressing equations and to have Best Linear Unbiased Estimators (BLUE), at least five assumptions need to hold. These are assumptions stating errors have a zero mean, equal variance of errors, errors are uncorrelated, Zero covariance between explanatory variables and errors, and errors are normally distributed. Thus, in this section the researcher tried to show whether they hold or not using various appropriate statistical tests, and the corrections taken for any invalidity of CLRM assumptions using recommended adjustment. Note that almost all of the discussion of this section depends on the work of Brooks (2008).

Assumption of Mean of errors is zero: ($E(u_t) = 0$)

This assumption required that the average value of the errors is zero (0). According to this assumption, if the average value of the error term is non-zero it may causes undesirable consequence to occur like R^2 which is the measure of goodness of fit statistics would be meaningless as it has a chance to exhibit a negative value is high and biases in the slope coefficient estimates are likely to exist.

However, in order to achieve this assumption the model should contain a constant term in the regression equation so that it will never be violated. Therefore, as it is clearly seen in the model specification, there is a constant term in both equations which assured that the first assumption is not violated.

Assumption of Homoscedasticity: $(Var (u_t) = \delta^2 < \infty)$

The assumption of homoscedasticity assumes that the variance of the errors is constant, but if this assumption is failed the errors are said to be heteroscedastic. In the presence of heteroscedasticity in errors, OLS estimators could give unbiased and consistent coefficient of estimates, but they are no longer BLUE since the OLS standard errors are wrong in such a way that both it will be too large for intercept, and too low or too big for the slope; hence any inferences made could be misleading. Therefore, in order to detect whether the errors are heteroscedastic or not, this study employed Breusch-Pagan-Godfrey and White's tests for heteroscedasticity (see tables on appendix A-1 to A-4) for both equations. From these tables, it is obvious that both tests rejected the null hypothesis stating that errors are homoscedastic since both the F and χ^2 ("LM") versions of the test statistic give the same conclusion that there is evidence for the presence of heteroscedasticity, since the p-value depicts that it is significant even at 1% level. Thus, the assumption of homoscedasticity did not hold so that there should be some correction measures which cure this problem.

The first option could be using a heteroscedasticity-consistent standard error estimates like the White's Modified standard error estimates, but it needs greater caution since it is only appropriate when the residuals of the estimated equation are heteroscedastic but serially uncorrelated. As shown in the next section, errors are found auto correlated so a need for other correction measures which is consistent in the presence of heteroscedasticity and autocorrelation; so, the study found a Newey-West variance-covariance estimator appropriate and applied for this study.

Assumption of no autocorrelation: $cov (u_i, u_j) = 0$

This assumption states that the covariance between the errors term overtime or cross section ally is zero or simply errors are uncorrelated with one another. But if the errors are not uncorrelated with one another, they are said to be auto correlated or that they are "serially correlated". Estimating an equation in the presence of autocorrelation has similar consequence with heteroscedasticity that the coefficient estimates derived using OLS are still unbiased, but they are inefficient and are not BLUE so that standard errors estimate could be wrong. Thus, there exist the possibilities that wrong inference could be made about whether a variable is or is not important factor of variation in the dependent variable, and the tendency to reject the null hypothesis when it is correct is increase and R^2 is likely to be inflated relative to its correct value. Since violation of this assumption has such consequences, a test of this

assumption is required using Durbin-Watson (DW) and Breusch- Godfrey tests. DW is a test only of whether consecutive errors are related to one another and E-views by default provides this test with the regression result. Unlike others this test does not follow a standard statistical distribution such as 't', 'F', ' χ^2 ' rather it has two (2) critical values: an upper (du) and lower (dl) and there is also an intermediate region where the null hypothesis of no autocorrelation can neither be rejected nor not rejected. The relevant lower and upper 1% critical value for 60 observations having four explanatory variables of DW statistic are dl=1.28 and du=1.56; and of having five explanatory variables are dl=1.25 and du=1.60 (see Appendix G). Therefore, the rejection, non-rejection and inconclusive regions of the DW statistic test are shown in appendix B-1 and B-2 in the Appendix B. Based on this the DW test statistics as indicated from the regression results in table 4.3 and 4.4 are found 1.32 and 1.45 for the first and second equations respectively, and both statistic results laid on the inconclusive region where neither rejected nor not rejected. As a result of the DW tests did not assure the exact pattern of the autocorrelation so that the researcher used another test, Breusch-Godfrey serial correlation LM test, which is a more general test for autocorrelation that allows examination of the relation between the immediate error and several of its lagged values at the same time.

From tables on Appendix B-3 and B-4, the Breusch-Godfrey serial correlation LM test depicted that there is an autocorrelation in between errors found when it is examined the relation between immediate error terms with 4 lagged error term values since the p-value of the statistics are significant at 5%. Therefore, to avoid the effect of autocorrelation, Newey West variance-covariance estimator used as mentioned in the previous sub-section.

Assumption of covariance of explanatory variables and errors are Zero:

(X_t are non-stochastic)

OLS estimator is consistent and unbiased in the presence of stochastic regresses, provided that the regresses are not correlated with the error terms of the estimated equation. Moreover, as long as the first assumption ($E(u) = 0$) hold, the estimator will be unbiased even if the regresses are stochastic. As a result of the inclusion of intercept in the model makes the first assumption achieved and in the other way this assumption also holds.

Assumption of normality: ($u_t \sim N(0, \delta)$)

Normality assumption assumed that errors are normally distributed or symmetric about its mean. This assumption is required to conduct single or joint hypothesis tests about the model

parameters. For this study the researcher used a histogram residual normal distribution graph in which the Bera-Jarque (*BJ*) normality test is considered. Accordingly, the normality test for the second equation of the model (when short term debt ratio and long term debt ratio used as independent variables) is shown in Appendix C-2. The P-value of the BJ test is not significant at 5% and even also at 10% so that the normality assumption is hold for the second equation of the model. However, the BJ test for the first equation (when debt ratio used as independent variable) is significant at 5% (see Appendix C-1) indicating that there is no normal distribution of errors which have unfavorable effect on estimated coefficients. As a way to resolve this unfavorable effect various attempts has been done for instance an inclusion of dummy variables (for observations 3-08, 3-11, 5-08 and 5-09) separately and jointly to the regression in order to remove outliers but no improvement have been seen in the normal distribution of the errors. Furthermore, giving a thought that the non-normality could be intrinsic to all of the data and removal of outliers would not make residuals of such a model normal, the researcher tried another attempt to check for autoregressive conditionally heteroscedastic (ARCH) effect (see Appendix c-3). Despite all these efforts no ARCH effect is there and normality problem also not cured.

Test for Multicollinearity

An implicit assumption that is made when using OLS estimation method is that the explanatory variables are not correlated with one another. If there is no relationship between the explanatory variables, they would be said to be orthogonal to one another.

If this assumption will not be hold R^2 will be high but individual coefficients will have high standard errors so the regression look good as a whole but the individuals are not significant, regressions become very sensitive to small changes in the specification, and makes confidence interval for the parameters very wide and significant test might therefore give in appropriate conclusion and so make it difficult to draw a sharp inference. As a result, the researcher conduct this test by using a correlation matrix for the explanatory variables as depicted in appendix D-1 when debt ratio considered as independent variable of the first equation and for the second equation (see appendix D-2).

From the tables in appendix D the larger observed correlations are 0.58 between long term debt ratio and asset tangibility in the second equation and -0.42 between tangibility and asset

turn over. As rule of thumb it is suggested that if the pair wise correlation coefficient between two regresses is high, say, in excess of 0.8, multicollinearity will be a serious problem (Gujarati, 2003). Therefore, based on this criterion there is no serious multicollinearity problem in the explanatory variables.

Appropriateness either Random Effect or Fixed Effect model used

Finally, the researcher checks for whether a random effect or fixed effect model is appropriate for this study.

To determine the best from among them the study used Hausman specification test. Accordingly, the investigation indicates that period random effect has been found appropriate since its chi-square p-value is insignificant as shown in Appendix E-1 and E-2 equation one and two respectively. For the matter of comparison with others: two dimensions of random effect, cross-sectional dimension, and the cross-sectional and period fixed effect (using redundant fixed effect tests) attached in the appendix E-3 to E-10.

4.4 Discussion of regression analysis result

In the previous sections of this chapter the study tried to provide important information about the characteristics of the data, observations and variables using a descriptive statistics, and it also tried to see the relation between the dependent variable and the independent and control variables to determine the direction and magnitude of their relationships using a correlation matrix. Then it followed by the tests of the classical linear regression model assumptions which are the pillar for this section by applying different appropriate statistical tests so that the resulted estimates would be best, unbiased and consistent. Now in this section the chapter present the result of the regression based on the model specifications appear in chapter three and suggested additional correction measures along with the specified models to be used in the previous section and then followed by the hypothesis testing and result discussion.

4.4.1 Regression result

As the objective of this study is to examine the effect of capital structure on Addis abeba Metal and Engineering industry company's financial performance, the study took ROE as a measure of financial performance (dependent variable) and three different measures of capital structure (independent variables): debt ratio which used to measure for the gross debt level; short and long term debt ratio after decomposing the total level of debt to see if there is a

significant effect of debt maturity on performance along with three control variables (company size, asset tangibility and asset turn over) which were found most in similar studies. Therefore, ROE is regressed over the capital structure and control variables so that this study has two equations one having debt ratio as independent variable and the other having both short term debt and long term debt ratio as independent variables.

4.4.1.1 Estimation result of ROE model when DR used

The model empirically to be tested for ROE as it includes DR in independent variables is;

$$RoE = \beta_0 + \beta_1 Dr_{it} + \beta_2 Size_{it} + \beta_3 Tang_{it} + \beta_4 Turn_{it} + e_{it}$$

The result of the least square regression presented in table 4.3 indicates that the adjusted R², which measures how well the regression model explain the actual variation in the dependent variable, has a value of 0.407. This result reveals that 40.7% of the total variability of financial performance of Addis abeba's Metal and Engineering industry is explained by the considered variables (debt ratio, size, tangibility and turnover) which lead to the conclusion that the selected explanatory variables provide good explanatory power. Furthermore, the *F-statistic* value of 11.3 with zero p-value to five decimal strengthened this conclusion depicting that the variables in the model are capable of explaining variation of financial performance measured by ROE rejecting none of the variables could explain it.

The table also shows that debt ratio has a significant and positive effect on the financial performance at 5% significance level, and asset tangibility (a control variable) also found to have a statistically significant effect on financial performance but unlike debt ratio it affects negatively. Though both size and turnover did not have a significant effect on ROE even at 10% significance level, it is clear that size has a positive effect but turnover has negative effect to companies' financial performance. Besides when we compare these results with the one computed using the Newey-west variance-covariance estimator (see Appendix F-1) the same result has been found.

Table 4.3 OLS regression result of ROE model as DR used

Dependent Variable: ROE

Method: Panel EGLS (Period random effects) Sample: 2018 2023

Periods included: 6

Cross-sections included: 10

Total panel (balanced) observations: 60

Swamy and Arora estimator of component variances White period standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.869576	2.030336	-0.920821	0.3612
DR	1.651190	0.669112	2.467733	0.0167
SIZE	0.118649	0.109817	1.080424	0.2847
TANG	-2.574201	0.730396	-3.524391	0.0009
TURN	-0.050987	0.064145	-0.794871	0.4301
R-squared	0.447275	Mean dependent var		0.408660
Adjusted R-squared	0.407076	S.D. dependent var		0.774115
S.E. of regression	0.596080	Sum squared resid		19.54214
F-statistic	11.12673	Durbin-Watson stat		1.327045
Prob(F-statistic)	0.000001			

Source: E-views output

4.4.1.2 Estimation result of ROE mode I when SDR and LDR are used

Beyond the objective of examining the effect of capital structure on financial performance this study also aimed at decomposing the gross debt level to short and long term debt to see whether debt maturity choice have an effect on financial performance. Therefore, the ROE model which is to be tested empirically would be;

$$ROE = \beta_0 + \beta_1 SDrit + \beta_2 LDrit + \beta_3 Sizeit + \beta_4 Tangit + \beta_5 Turnit + eit$$

Table 4.4 OLS regression result of ROE model as SDR and LDR used

Method: Panel EGLS (Period random effects) Sample: 2018 2023

Periods included: 6

Cross-sections included: 10

Total panel (balanced) observations: 60

Swamy and Arora estimator of component variances White period standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.419054	1.903462	-1.270871	0.2092
SDR	2.102956	0.769542	2.732737	0.0085

LDR	0.712168	0.458978	1.551640	0.1266
SIZE	0.143878	0.099621	1.444252	0.1544
TANG	-2.028712	0.523817	-3.872938	0.0003
TURN	-0.120830	0.088087	-1.371720	0.1758
<hr/>				
R-squared	0.503625	Mean dependent var	0.408660	
Adjusted R-squared	0.457665	S.D. dependent var	0.774115	
S.E. of regression	0.570085	Sum squared resid	17.54981	
F-statistic	10.95776	Durbin-Watson stat	1.456290	
Prob(F-statistic)	0.000000			

Source: E-views output

Similar to the first equation of the model, as it is shown in table 4.4 the adjusted R^2 of the model give information that explanatory variables have a good explanatory power. This is because 45.7% of the variability of ROE (measure of financial performance) is explained by explanatory variables of SDR, LDR, SIZE, TANG, and TURN. Additionally, the F- statistics value of 10.96 with a zero P-value to six decimal confirms this conclusion.

As shown in the table 4.4 SDR, LDR and SIZE have a positive effect on financial performance whereas TANG and TURN have a negative impact on performance. From this all explanatory variables only SDR and TANG have been found statistically significant at 1 %, the remaining three variables including LDR are not statistically significant even at 10%. Nonetheless, the regression result by using the Newey-West variance-covariance estimator which introduced to correct the autocorrelation and heteroscedasticity problem shows that SIZE has a significant effect on performance at 10% significance level but others are not changed (See Appendix F-2).

4.4.2 Hypothesis testing and Result discussion

In the previous sub section the study shows the overall result of the regression of the two equations of the model in which it identified the appropriateness of the model in explaining the variability of the ROE (measure of financial performance), and it has determined variables which have significant impact on performance along with their direction of the effect.

In this sub section the study discussed the regression result of each capital structure and control variables and their relative effect on financial performance in more detail. Besides, the statistical findings of the capital structure variables discussed in relation to underlying capital structure theories and with previous empirical studies. Finally, the research hypothesis developed to be rejected or not rejected is known.

Capital structure

Regarding the effect capital structure has on financial performance, there are two giant theories of capital structures (Trade-off theories and Pecking order theory) which they have their own arguments. A Static trade-off theory (one of trade-off theory) argued that higher level of debt usage, due to its benefits of tax deductibility of interest payments, will favor companies' performance to the extent this tax advantage eventually disappear as a result of bankruptcy risk and financial distress.

Accordingly, static trade off theory says there is a positive effect of inclusion of debt in capital structure on financial performance. Likewise, Agency cost theory (the other Trade-off theory) argued that higher leverage is expected to lower agency costs, reduce inefficiency, and thereby lead to improvement in companies' performance so that it is expected leverage (debt) to have a positive or direct impact on financial performance. On the other hand, Pecking order theory argued against these theories and states that external financing, including debt, could be undervalued by investors since they may perceived that management are taking advantage of it and company is overvalued so that this leads to an unfavorable effect on companies' performance. As a result, pecking order theory says debt has a negative effect on financial performance. For this study debt ratio, short term debt ratio and long term debt ratio used to measure capital structure.

Debt Ratio;

As it is presented on table 4.3, the period random effect estimation result shows a positive effect of debt ratio on financial performance of Addis abeba's Metal and Engineering industry companies, with a regression coefficient 1.65, t-statistic of 2.446 and p-value of 0.0167. This value indicated that debt ratio has significant effect on performance at 5% significance level.

Even though this study has expected the effect of debt ratio to be negative and it would follow a pecking order theory, the finding from this study does not support it, rather it supports the Trade-Off theory suggesting that higher debt usage enhance financial performance since it has an advantage of tax deductibility of interest payments, lowering agency cost and reducing inefficiencies. Therefore, financing an operation through debt would lead companies in Metal and Engineering industry to perform better financially or other words as companies increase debt in their capital structure it provides them to enhance their financial performance. Consequently, the first hypothesis stated that debt ratio has a significant and negative effect on

financial performance of Addis abeba's Metal and engineering industry companies is rejected. Studies of Frank and Goyal (2009), Abu-Rub (2011), Abor (2005) Bayeh (2011) and Rajan and Zingales (1995) for companies in UK. But inconsistent with studies by Booth et.al (2001), Chen and Hammes (2003), Gaud et.al (2003), Bauer (2004), Frank and Goyal (2007), Reimoo (2008), Han-Suck Song (2009), Chowdhury and Chowdhury (2010), Pratheepkanth (2011), Daniel (2011), Weldemikael (2012) and Netsanet (2012).

Short term debt ratio

As mentioned in the beginning of the result discussion, this study attempted to see the effect of debt maturity choice on financial performance and to achieve this end it decomposed the gross level of debt into short term mature and long term mature debt.

As expected in this study, short term debt ratio has a statistically significant and positive effect on financial performance. This result is confirmed by looking at the coefficient, t-statistics and p-value of short term debt ratio presented in table 4.10 and accordingly, they are 2.10, 2.732, and 0.008 respectively. Since it is significant at 1% significance level, short term debt is a major factor to affect performance.

This significant effect could be explained as the Metal and Engineering industry companies use short term debt as an integral part of their financing could be because it is inexpensive or it is an important source of financing available for them in the country as Abor (2005) suggested so that when these companies use more short term mature debt their performance is enhanced. This finding of the study is consistent to the trade-off theory which argues that the inclusion of debt in capital structure has a positive effect as a result of the advantage tax is deductible for interest payments but is not consistent with the pecking order theory which says companies prefer internal fund to finance their operation.

Thus, the second hypothesis, stating that short term debt ratio has a significant and positive effect on financial performance is not rejected. Similarly, prior studies consistent to this finding are Abor (2005), Carvaliho and Edison (2007), Ellili and Farouk (2011) and Amanuel (2011) suggesting that companies use a short term debt to finance their operation activities. On the other hand, studies of Bas et.al (2009), Ahmed et.al (2012), Keshtkar (2012) are contradicted to this finding which concludes short term debt has a negative impact on financial performance.

Long term debt ratio

The third hypothesis predicted that using long term maturity debt has a significant and negative effect on financial performance. However, the result from table 4.10 shows that it has an insignificant and positive effect with a coefficient of 0.71 and a p-value of 0.126, and this statistics further indicated that it is not significant even at significance level of 10% which is against the hypothesis so that it is rejected. From this result, though it is not significant statistically, the sign of the effect shows that long term debt usage in Addis abeba's metal and engineering industry has followed a Trade-off theory of capital structure which suggests an inclusion of debt in capital structure has a positive impact on performance, but not consistent to pecking order theory that companies finance their operation through an internal fund since debt could have an unfavorable effect to their performance.

Study by Ahmed et.al (2012) and Luper and Isaac (2012) are consistent to this study finding, but studies by Abor (2005), Bas et.al (2009), Keshtkar (2012), Ellili and Farouk (2011), Carvaliho and Edison (2007), Bayeh (2011) and Amanuel (2011) contradict to this finding.

Control variables

As mentioned in the third chapter, the study has used control variables which are found in most empirical studies and more likely expected to have effect on Addis abeba's Metal and Engineering industry companies' financial performance. These are company size, asset tangibility and efficiency of management (Asset turn over). The following paragraphs discussed their result and their contribution as control variables to the study.

Company Size

Due to the capacity larger companies can exploit economies of scale and scope, they would be more efficient; have greater access to long term capital from financial institutions and they could have also a greater power in competitive market than smaller companies, this study predicted that company size has a significant and positive effect.

The findings from table 4.3 and 4.4 confirm that there is a positive effect but it is statistically insignificant even at 10% significance level so that the fourth hypothesis of this study is rejected.

Although company size does not contribute for this study as a control variable, its positive effect is consistent with Abor (2005), Adekunle and Sunday (2010), Ahmed et.al (2012) and Osuji and Odita (2012) findings but contradicted with Memon et.al (2010).

Asset tangibility

The fifth hypothesis predicted that asset tangibility has a significant and positive effect on financial performance of Addis abeba's Metal and Engineering industry companies. As presented in table 4.3 and 4.4, it is clearly seen that asset tangibility has been found the most important factor in determining financial performance since its t-statistics value is the greatest of all variables in both equations as it exhibit -3.52 and -3.87 in the first and second equation respectively and highly statistically significant effect at 1% significant level. However, different from this study's expectation, it has a negative impact on performance. Thus, the fifth hypothesis is rejected.

This finding could be explained by argument of Memon et.al (2009) stating that if there is an inefficient use of fixed assets in operation, it would have created difficulty on company's performance. Therefore, from the finding it can be said that Addis abeba's Metal and Engineering industry companies have problem inefficiency on using fixed (tangible) assets in their operation. Memon et.al (2009), Adekunle and Sunday (2010) and Osuji and Odita (2012) findings are agreed with this study.

Asset turnover

Asset turnover; due to the argument that if the management is efficient in utilizing companies' assets to generate income the company will perform better otherwise it would expose the company for operational and financial difficulty, it is expected to has a significant and positive effect on financial performance. But, its t-statistic values of -0.79 and -1.37 with a p-value of 0.43 and 0.17 in tables 4.3 and 4.4 indicated that it is the least important among considered variables and statistically insignificant even at 10% significance level. Furthermore, its sign of coefficient notifies that it has a negative impact contradicted to this study prediction so that it does not contribute for this study as a control variable. However, prior studies indicates the more a company will be able to generate sales through it assets, the more efficient will be the company and profit will also be higher. Thus, the last hypothesis also rejected and this result is consistent to A. Chowdhury and S.P. Chowdhury (2010) but contradicted to studies by Adekunle and Sunday (2010) and Osuji and Odita (2012).

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

This chapter consists of the study conclusions and recommendations and an indication for future researches;

5.1 Conclusions

The choice of fund sources to finance an organization's operation and investment activities is one of the major activities organization managers have to decide. This decision of managers in financing their firm's operation and investment could involve; borrowing of debt, raising new equity, or retaining of capital from earnings generated from operations; and selection from among them largely depend on the effect they have on the organizations' performance. As a result, this thesis aimed at examining the effect of capital structure on Addis abeba's metal and engineering industry companies' financial performance.

To achieve this objective, the study reviewed the residing giant capital structure theories to see the arguments how and why capital structure is related and in what manner it affects performance. Accordingly, three giant theories: static and agency cost of Trade-off theories and pecking order theory were reviewed and discussed in the thesis. Further, the study employed the quantitative research approach to investigate the casual and effect relationship of capital structure and financial performance in which audited financial statements of 10 sampled Addis abeba's metal and engineering industry companies for the time span of six year (2018 to 2023) were collected and analyzed using a descriptive statistics, correlation analysis and most importantly a multivariate regression analysis by employing E-views statistical package. Beyond searching for a support for any effect of capital structure effects to the performance the thesis also tried to see whether any effect on financial performance could

be seen if the maturity of debt differed, by decomposing the gross level of debt to short term maturity and long term maturity debt, and the thesis also used company size, asset tangibility and asset turnover, which are found in similar empirical studies, as control variables of the study. Now, the following paragraphs provide the conclusion of the findings of the study;

- Addis abeba's Metal and Engineering companies on average finance 57% their asset using debt. From this total level of debt they finance their operation with, 69.5% is accounted by short term debt indicating that short term debt source is an important sources of fund in Ethiopia. On the other hand, the industry companies invest less on tangible assets (less than 30% of their total assets) which could be the responsible for the low level of long term debt, since they are required as collateral by financial institutions to extend loan and/or no other sources of fund is available since no capital markets starting in the country.
- Capital structure has been found to have a significant and positive effect on financial performance as measured by debt ratio in Metal and Engineering industry; so that it is essential to understand this reverse effect beyond that determining performance as a factor to a capital structure decision in Addis abeba .
- The investigation to determine effect of debt maturity choice on financial performance indicated that both short term and long term mature debt have the same positive effect in the Metal and Engineering Companies. However, only short term debt ratio has significant effect but not long term debt.
- The results of all capital structure measures; total debt, short term debt and long term debt ratios, supported that the metal and engineering industry follows the arguments Trade-off capital structure theories rather than pecking order theory.
- Finally, asset tangibility, a control variable to the study, has a significant and negative impact on financial performance and it has contributed well for the study as a control variable. On the other hand, company size and asset turn over were not found significant in the metal and engineering industry though they have took a positive and negative coefficients respectively.
Thus they did not much contribute for the study as control variable.

5.2 Recommendations

Based on the findings and the conclusions of the study, the researcher forwards these recommendations to Addis abeba's Metal and engineering industry companies;

- As depicted in the conclusion, the industry capital structure was found in accordance with the tradeoff theories. According to this theory, inclusion of debt to the capital structure enhances the performance of a company since debt has the advantage of tax deductibility of interest payments and it also provides a company to reduce agency costs and inefficiencies. Therefore, the metal and engineering companies can take these advantages by employing more debt in their capital structure to finance their operations and investment. However, it needs a thorough consideration to what extent this actions should be taken because trade-off theory mentioned also that excessive utilization of debt would deteriorate the benefits of the tax deductibility of debt, increase cost of capital and problem of cash would exist, these all in turn lead the company to be exposed to bankruptcy risk. Thus, the researcher recommends that the industry should determine the optimal capital structure beyond understanding to the positive impact of debt.

The result from the study indicated that Addis abeba's metal and engineering industry companies use less of long term debt in financing their assets. But its impact on performance is positive though it is insignificant. Therefore, the researcher recommends for these companies to exert an effort to access long term debt by using every possible means even to invest on tangible assets that assists them to secure debt using them as collateral and for the government to facilitate long term funds for metal and engineering industry companies since it promotes the industry to achieve the Growth and Transformation Plan.

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APPENDICES

Appendix A- Heteroscedasticity tests

Appendix A-1

Heteroscedasticity Test: Breusch-Pagan-Godfrey

F-statistic	6.910227	Prob. F(4,55)	0.0001
Obs*R-squared	20.06820	Prob. Chi-Square(4)	0.0005
Scaled explained SS	32.10388	Prob. Chi-Square(4)	0.0000

Test Equation:

Dependent Variable: RESID² Method: Least Squares Sample: 1 60

Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.760719	1.483162	-1.861374	0.0680
DR	1.433990	0.317684	4.513884	0.0000
SIZE	0.137123	0.079065	1.734295	0.0885
TANG	-0.380345	0.460666	-0.825643	0.4126
TURN	-0.092789	0.085609	-1.083871	0.2832
R-squared	0.334470	Mean dependent var	0.325702	
Adjusted R-squared	0.286068	S.D. dependent var	0.640912	
S.E. of regression	0.541536	Akaike info criterion	1.690839	
Sum squared resid	16.12935	Schwarz criterion	1.865368	
Log likelihood	-45.72518	Hannan-Quinn criter.	1.759107	
F-statistic	6.910227	Durbin-Watson stat	1.946075	
Prob(F-statistic)	0.000140			

Appendix A-2

Heteroscedasticity Test: White

F-statistic	3.987428	Prob. F(14,45)	0.0002
Obs*R-squared	33.22066	Prob. Chi-Square(14)	0.0027
Scaled explained SS	53.14438	Prob. Chi-Square(14)	0.0000

Test Equation:

Dependent Variable: RESID² Method: Least Squares Sample: 1 60

Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	34.39920	34.47778	0.997721	0.3237

Appendix A-3

Heteroscedasticity Test: Breusch-Pagan-Godfrey

F-statistic	6.335996	Prob. F(5,54)	0.0001
Obs*R-squared	22.18487	Prob. Chi-Square(5)	0.0005
Scaled explained SS	29.59000	Prob. Chi-Square(5)	0.0000

Test Equation:

Dependent Variable: RESID² Method: Least Squares Sample: 1 60

Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.325537	1.228792	-1.892539	0.0638
SDR	1.333761	0.296841	4.493186	0.0000
LDR	1.094575	0.393989	2.778189	0.0075
SIZE	0.117719	0.065338	1.801705	0.0772
TANG	-0.343647	0.415027	-0.828009	0.4113
TURN	-0.115074	0.073580	-1.563923	0.1237
R-squared	0.369748	Mean dependent var		0.292497
Adjusted R-squared	0.311391	S.D. dependent var		0.535288
S.E. of regression	0.444195	Akaike info criterion		1.309533
Sum squared resid	10.65469	Schwarz criterion		1.518968
Log likelihood	-33.28599	Hannan-Quinn criter.		1.391454
F-statistic	6.335996	Durbin-Watson stat		2.047845
Prob(F-statistic)	0.000107			

Appendix A-4

Heteroskedasticity Test: White

F-statistic	7.559851	Prob. F(5,54)	0.0000
Obs*R-squared	24.70560	Prob. Chi-Square(5)	0.0002
Scaled explained SS	32.95213	Prob. Chi-Square(5)	0.0000

Test Equation:

Dependent Variable: RESID^2 Method: Least Squares Sample: 1 60

Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.092331	0.594438	-1.837587	0.0716
SDR^2	1.770804	0.355743	4.977768	0.0000
LDR^2	2.597183	0.807275	3.217222	0.0022
SIZE^2	0.002862	0.001750	1.635357	0.1078
TANG^2	-0.398471	0.579134	-0.688045	0.4944
TURN^2	-0.022239	0.014634	-1.519712	0.1344
R-squared	0.411760	Mean dependent var		0.292497
Adjusted R-squared	0.357293	S.D. dependent var		0.535288
S.E. of regression	0.429135	Akaike info criterion		1.240548
Sum squared resid	9.944460	Schwarz criterion		1.449983
Log likelihood	-31.21644	Hannan-Quinn criter.		1.322469
F-statistic	7.559851	Durbin-Watson stat		2.211210
Prob(F-statistic)	0.000019			

Appendix B- Autocorrelation tests

Figure B-1 Rejection and non-rejection regions for DW test (when DR used as independent)

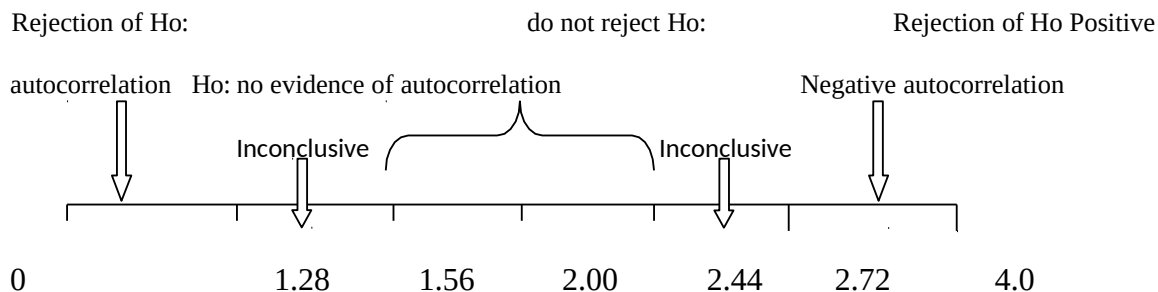
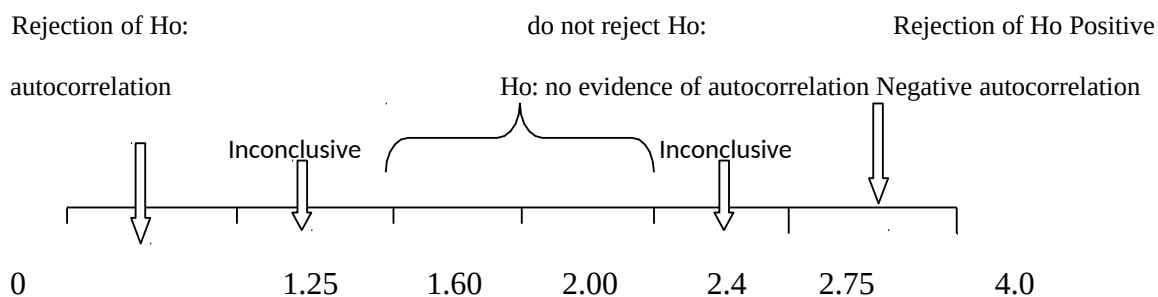


Figure B-2 Rejection and non-rejection regions for DW test (when SDR and LDR used as independent)



Appendix B-3

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.645647	Prob. F(4,51)	0.0439
Obs*R-squared	10.31063	Prob. Chi-Square(4)	0.0355

Test Equation:

Dependent Variable: RESID Method: Least Squares Sample: 1 60

Included observations: 60

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.438757	1.582041	0.277336	0.7826
DR	-0.114977	0.339583	-0.338583	0.7363
SIZE	-0.024164	0.084374	-0.286386	0.7757
TANG	0.124062	0.490097	0.253137	0.8012
TURN	0.023697	0.091099	0.260123	0.7958
RESID(-1)	0.444646	0.140910	3.155524	0.0027
RESID(-2)	-0.170286	0.151633	-1.123010	0.2667
RESID(-3)	0.075160	0.153733	0.488900	0.6270
RESID(-4)	-0.117549	0.144236	-0.814974	0.4189
R-squared	0.171844	Mean dependent var		-4.61E-16
Adjusted R-squared	0.041937	S.D. dependent var		0.575519
S.E. of regression	0.563322	Akaike info criterion		1.827552
Sum squared resid	16.18394	Schwarz criterion		2.141704
Log likelihood	-45.82656	Hannan-Quinn criter.		1.950434

F-statistic	1.322823	Durbin-Watson stat	1.943040
Prob(F-statistic)	0.253685		

Appendix B-4

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.144572	Prob. F(2,52)	0.0514
Obs*R-squared	6.473738	Prob. Chi-Square(2)	0.0393

Test Equation:

Dependent Variable: RESID Method: Least Squares Sample: 1 60

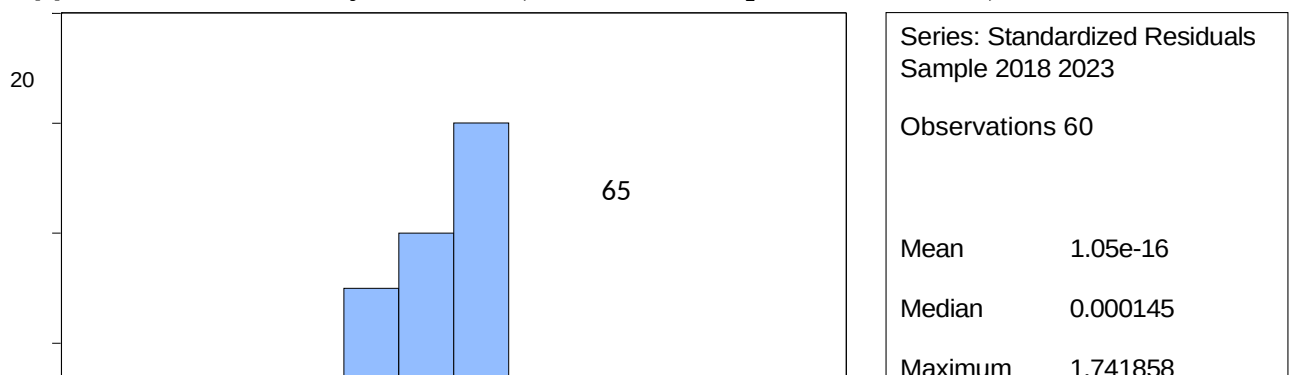
Included observations: 60

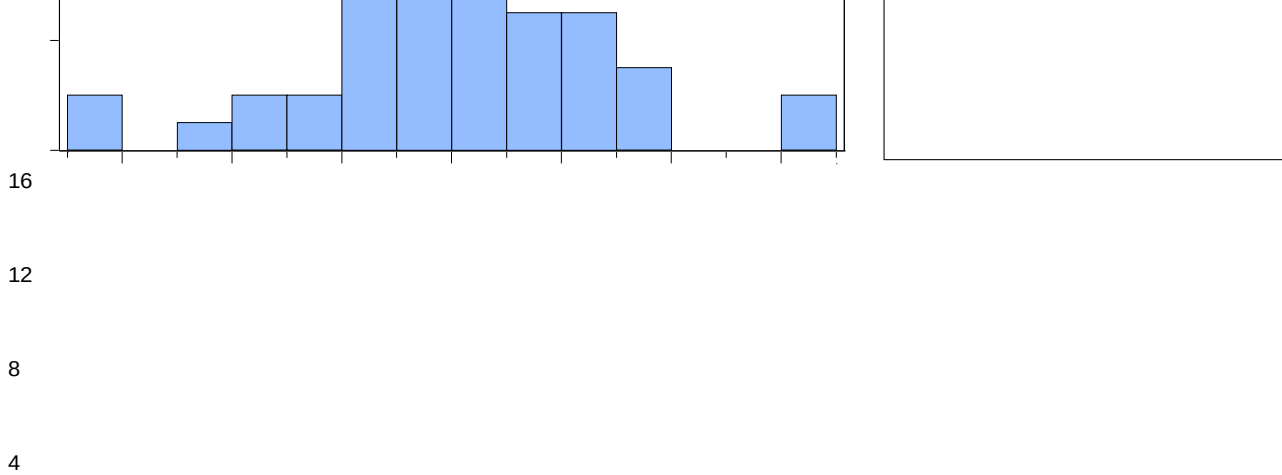
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.519504	1.548556	0.335476	0.7386
SDR	-0.084954	0.370303	-0.229417	0.8194
LDR	0.127972	0.495812	0.258105	0.7973
SIZE	-0.030211	0.082525	-0.366082	0.7158
TANG	0.008269	0.513377	0.016107	0.9872
TURN	0.031247	0.091966	0.339763	0.7354
RESID(-1)	0.352286	0.142114	2.478895	0.0165
RESID(-2)	-0.133934	0.138779	-0.965087	0.3390
R-squared	0.107896	Mean dependent var	-1.35E-15	
Adjusted R-squared	-0.012195	S.D. dependent var	0.545394	
S.E. of regression	0.548709	Akaike info criterion	1.761070	
Sum squared resid	15.65626	Schwarz criterion	2.040316	
Log likelihood	-44.83210	Hannan-Quinn criter.	1.870298	
F-statistic	0.898449	Durbin-Watson stat	1.974995	
Prob(F-statistic)	0.514797			

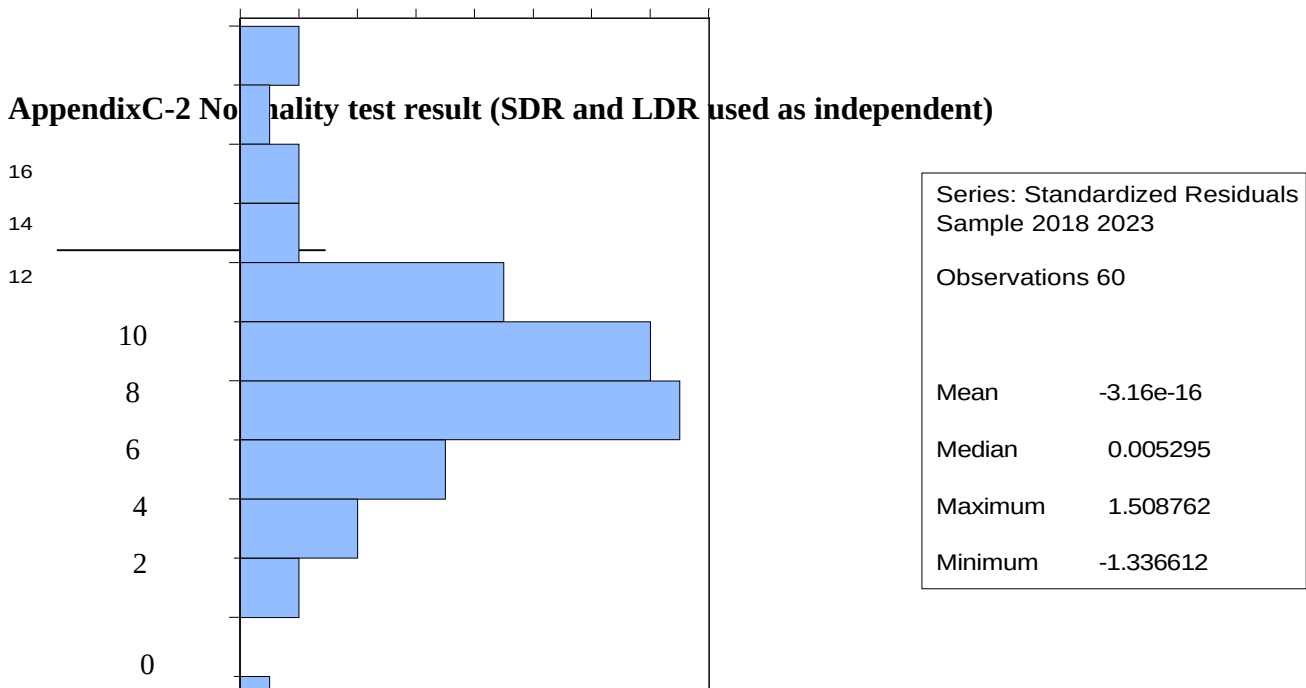
Appendix C Normality test

Appendix C-1 Normality test result (DR used as independent variables)





Appendix C-2 Normality test result (SDR and LDR used as independent)



Appendix C-3 Heteroscedasticity Test ARCH

F-statistic	1.569072	Prob. F(5,49)	0.1864
Obs*R-squared	7.590677	Prob. Chi-Square(5)	0.1803

Test Equation:

Dependent Variable: RESID^2 Method: Least Squares Sample (adjusted): 60
 Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.238970	0.120124	1.989366	0.0523
RESID^2(-1)	0.297279	0.142779	2.082100	0.0426
RESID^2(-2)	0.160978	0.148020	1.087540	0.2821
RESID^2(-3)	-0.102453	0.149044	-0.687401	0.4951
RESID^2(-4)	-0.096233	0.147986	-0.650281	0.5185
RESID^2(-5)	0.038246	0.142732	0.267960	0.7899
R-squared	0.138012	Mean dependent var	0.343638	

Adjusted R-squared	0.050054	S.D. dependent var	0.664606
S.E. of regression	0.647760	Akaike info criterion	2.072075
Sum squared resid	20.56004	Schwarz criterion	2.291057
Log likelihood	-50.98206	Hannan-Quinn criter.	2.156757
F-statistic	1.569072	Durbin-Watson stat	1.989655
Prob(F-statistic)	0.186374		

Appendix D Multicollinearity tests

Appendix D-1 Pearson's correlation matrix among explanatory variables

Correlation Probability	DR	SIZE	TANG	TURN
DR	1.000000			
SIZE	0.081196 0.5374	1.000000		
TANG	0.262419 0.0428	0.058294 0.6582	1.000000	
TURN	0.038625 0.7695	-0.305818 0.0175	-0.424691 0.0007	1.000000

Source: E-views output

Appendix D-2 Pearson's correlation matrix among explanatory variables

Correlation Probability	SDR	LDR	SIZE	TANG	TURN
SDR	1.000000				
LDR	-0.354644 0.0054	1.000000			
SIZE	-0.106492 0.4180	0.220207 0.0909	1.000000		
TANG	-0.229139 0.0782	0.580800 0.0000	0.058294 0.6582	1.000000	
TURN	0.411110 0.0011	-0.420677 0.0008	-0.305818 0.0175	-0.424691 0.0007	1.000000

Appendix E Housman and redundant fixed-effect tests

Appendix E-1

Correlated Random Effects - Housman Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	5.533728	4	0.2368

Period random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
DR	1.803812	1.651190	0.005209	0.0345
SIZE	0.101547	0.118649	0.000717	0.5231
TANG	-2.588895	-2.574201	0.012501	0.8954
TURN	-0.012832	-0.050987	0.000513	0.0920

Appendix E-2 Correlated Random Effects -Hausmann test

Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	6.933533	5	0.2256

Appendix E-3

Period random effects test equation: Dependent Variable: ROE

Method: Panel Least Squares Sample: 2018 2023

Periods included: 6

Cross-sections included: 10

Total panel (balanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.688892	1.695801	-0.995926	0.3241
DR	1.803812	0.355307	5.076772	0.0000
SIZE	0.101547	0.090633	1.120428	0.2679
TANG	-2.588895	0.516722	-5.010229	0.0000
TURN	-0.012832	0.096447	-0.133045	0.8947

Effects Specification

Period fixed (dummy variables)

	0.502632	Mean dependent var	0.408660
R-squared			
Adjusted R-squared	0.413106	S.D. dependent var	0.774115
S.E. of regression	0.593042	Akaike info criterion	1.943908
Sum squared resid	17.58493	Schwarz criterion	2.292966
Log likelihood	-48.31725	Hannan-Quinn criter.	2.080444
F-statistic	5.614351	Durbin-Watson stat	1.315478
Prob(F-statistic)	0.000024		

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

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	11.503488	4	0.0215

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
DR	0.003939	0.938813	0.101231	0.0033
SIZE	0.045524	0.114314	0.013680	0.5564
TANG	-0.877057	-1.763015	0.085830	0.0025
TURN	0.055226	-0.009817	0.004595	0.3373

Appendix E-3

Cross-section random effects test equation: Dependent Variable: ROE

Method: Panel Least Squares Sample: 2018 2023

Periods included: 6

Cross-sections included: 10

Total panel (balanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.229655	2.890532	-0.079451	0.9370
DR	0.003939	0.506657	0.007774	0.9938
SIZE	0.045524	0.158165	0.287826	0.7748
TANG	-0.877057	0.583418	-1.503308	0.1396
TURN	0.055226	0.120362	0.458829	0.6485

Cross-section fixed (dummy variables)

R-squared	0.701034	Mean dependent var	0.408660
Adjusted R-squared	0.616543	S.D. dependent var	0.774115
S.E. of regression	0.479362	Akaike info criterion	1.568242
Sum squared resid	10.57024	Schwarz criterion	2.056922
Log likelihood	-33.04726	Hannan-Quinn criter.	1.759392
F-statistic	8.297193	Durbin-Watson stat	1.826955
Prob(F-statistic)	0.000000		

Correlated Random Effects - Hausman Test Equation: Untitled

Test cross-section and period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	328.275136	4	0.0000
Period random	0.000000	4	1.0000
Cross-section and period random	16.600425	4	0.0023

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
DR	0.003939	0.912299	0.066495	0.0004
SIZE	0.045524	0.113520	0.010764	0.5122

TANG	-0.877057	-1.736073	0.034872	0.0000
TURN	0.055226	-0.008198	0.002516	0.2061

Appendix E-4

Cross-section random effects test equation: Dependent Variable: ROE

Method: Panel EGLS (Period random effects) Sample: 2018 2023

Periods included: 6

Cross-sections included: 10

Total panel (balanced) observations: 60

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.229655	2.822527	-0.081365	0.9355
DR	0.003939	0.494737	0.007961	0.9937
SIZE	0.045524	0.154444	0.294761	0.7695
TANG	-0.877057	0.569692	-1.539528	0.1305
TURN	0.055226	0.117531	0.469883	0.6407

Effects Specification

	S.D.	Rho
Cross-section fixed (dummy variables)		
random	0.000000	0.0000
Idiosyncratic random	0.468084	1.0000

Weighted Statistics

R-squared	0.701034	Mean dependent var	0.408660
Adjusted R-squared	0.616543	S.D. dependent var	0.774115
S.E. of regression	0.479362	Sum squared resid	10.57024
F-statistic	8.297193	Durbin-Watson stat	1.826955

Prob(F-statistic) 0.000000

Unweighted Statistics

R-squared	0.701034	Mean dependent var	0.408660
Sum squared resid	10.57024	Durbin-Watson stat	1.826955

Period random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
DR	1.141203	0.912299	-0.015140	NA
SIZE	0.060079	0.113520	0.001067	0.1018
TANG	-1.731051	-1.736073	-0.025724	NA
TURN	0.053720	-0.008198	-0.000840	NA

Appendix E-5

Period random effects test equation: Dependent Variable: ROE

Method: Panel EGLS (Cross-section random effects) Sample: 2018 2023

Periods included: 6

Cross-sections included: 10

Total panel (balanced) observations: 60

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.891310	2.180478	-0.408768	0.6845

DR	1.141203	0.403893	2.825507	0.0068
SIZE	0.060079	0.118977	0.504959	0.6158
TANG	-1.731051	0.513763	-3.369357	0.0015
TURN	0.053720	0.102258	0.525343	0.6017

Effects Specification

	S.D.	Rho
Cross-section random	0.313339	0.3094
Period fixed (dummy variables)		
Idiosyncratic random	0.468084	0.6906

Weighted Statistics

R-squared	0.291534	Mean dependent var	0.408660
Adjusted R-squared	0.164010	S.D. dependent var	0.551408
S.E. of regression	0.504166	Sum squared resid	12.70915
F-statistic	2.286115	Durbin-Watson stat	1.554930
Prob(F-statistic)	0.030974		

Unweighted Statistics

R-squared	0.448443	Mean dependent var	0.408660
Sum squared resid	19.50081	Durbin-Watson stat	1.013385

Cross-section and period random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
DR	0.244788	0.912299	0.095215	0.0305
SIZE	-0.214509	0.113520	0.034133	0.0758
TANG	-0.703363	-1.736073	0.073137	0.0001
TURN	0.145762	-0.008198	0.004269	0.0185

Appendix E-6

Cross-section and period random effects test equation: Dependent Variable: ROE

Method: Panel Least Squares Sample: 2018 2023

Periods included: 6

Cross-sections included: 10

Total panel (balanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.194747	3.925578	1.068568	0.2915
DR	0.244788	0.522957	0.468084	0.6422
SIZE	-0.214509	0.217307	-0.987125	0.3294
TANG	-0.703363	0.602340	-1.167716	0.2497
TURN	0.145762	0.124764	1.168297	0.2494

Effects Specification

Cross-section fixed (dummy variables) Period fixed (dummy variables)

R-squared	0.745921	Mean dependent var	0.408660
Adjusted R-squared	0.634374	S.D. dependent var	0.774115
S.E. of regression	0.468084	Akaike info criterion	1.572223
Sum squared resid	8.983211	Schwarz criterion	2.235432

Log likelihood	-28.16670	Hannan-Quinn criter.	1.831641
F-statistic	6.687061	Durbin-Watson stat	2.014988
Prob(F-statistic)	0.000000		

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	4.338251	(9,46)	0.0004
Cross-section Chi-square	36.871825	9	0.0000

Appendix E-7

Cross-section fixed effects test equation: Dependent Variable: ROE

Method: Panel Least Squares

Sample: 2018 2023

Periods included: 6

Cross-sections included: 10

Total panel (balanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.869576	1.632549	-1.145188	0.2571
DR	1.651190	0.349682	4.721974	0.0000
SIZE	0.118649	0.087029	1.363325	0.1783
TANG	-2.574201	0.507065	-5.076671	0.0000
TURN	-0.050987	0.094231	-0.541082	0.5906
R-squared	0.447275	Mean dependent var		0.408660
Adjusted R-squared	0.407076	S.D. dependent var		0.774115
S.E. of regression	0.596080	Akaike info criterion		1.882772
Sum squared resid	19.54214	Schwarz criterion		2.057301
Log likelihood	-51.48317	Hannan-Quinn criter.		1.951040
F-statistic	11.12673	Durbin-Watson stat		1.327045
Prob(F-statistic)	0.000001			

Redundant Fixed Effects Tests Equation: Untitled

Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	4.362095	(9,41)	0.0005
Cross-section Chi-square	40.301099	9	0.0000
Period F	1.448664	(5,41)	0.2276
Period Chi-square	9.761118	5	0.0823
Cross-Section/Period F	3.442263	(14,41)	0.0010
Cross-Section/Period Chi-square	46.632943	14	0.0000

Appendix E-8

Cross-section fixed effects test equation: Dependent Variable: ROE

Method: Panel Least Squares Sample: 2018 2023

Periods included: 6

Cross-sections included: 10

Total panel (balanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.688892	1.695801	-0.995926	0.3241
DR	1.803812	0.355307	5.076772	0.0000
SIZE	0.101547	0.090633	1.120428	0.2679
TANG	-2.588895	0.516722	-5.010229	0.0000
TURN	-0.012832	0.096447	-0.133045	0.8947

Effects Specification

Period fixed (dummy variables)

R-squared	0.502632	Mean dependent var	0.408660
Adjusted R-squared	0.413106	S.D. dependent var	0.774115
S.E. of regression	0.593042	Akaike info criterion	1.943908
Sum squared resid	17.58493	Schwarz criterion	2.292966
Log likelihood	-48.31725	Hannan-Quinn criter.	2.080444
F-statistic	5.614351	Durbin-Watson stat	1.315478
Prob(F-statistic)	0.000024		

Appendix E-9

Period fixed effects test equation: Dependent Variable: ROE Method: Panel Least Squares Sample: 2018 2023

Periods included: 6

Cross-sections included: 10

Total panel (balanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.229655	2.890532	-0.079451	0.9370
DR	0.003939	0.506657	0.007774	0.9938
SIZE	0.045524	0.158165	0.287826	0.7748
TANG	-0.877057	0.583418	-1.503308	0.1396
TURN	0.055226	0.120362	0.458829	0.6485

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.701034	Mean dependent var	0.408660
Adjusted R-squared	0.616543	S.D. dependent var	0.774115
S.E. of regression	0.479362	Akaike info criterion	1.568242
Sum squared resid	10.57024	Schwarz criterion	2.056922
Log likelihood	-33.04726	Hannan-Quinn criter.	1.759392
F-statistic	8.297193	Durbin-Watson stat	1.826955
Prob(F-statistic)	0.000000		

TANG	-2.028712	0.583326	-3.4778320.0010
TURN	-0.120830	0.087068	-1.3877770.1709

Appendix E-10

Cross-section and period fixed effects test equation: Dependent Variable: ROE

Method: Panel Least Squares Sample: 2018 2023

Periods included: 6

Cross-sections included: 10

Total panel (balanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.869576	1.632549	-1.145188	0.2571
DR	1.651190	0.349682	4.721974	0.0000
SIZE	0.118649	0.087029	1.363325	0.1783
TANG	-2.574201	0.507065	-5.076671	0.0000
TURN	-0.050987	0.094231	-0.541082	0.5906
R-squared	0.447275	Mean dependent var		0.408660
Adjusted R-squared	0.407076	S.D. dependent var		0.774115
S.E. of regression	0.596080	Akaike info criterion		1.882772
Sum squared resid	19.54214	Schwarz criterion		2.057301
Log likelihood	-51.48317	Hannan-Quinn criter.		1.951040
F-statistic	11.12673	Durbin-Watson stat		1.327045
Prob(F-statistic)	0.000001			

Appendix F: Dependent Variable: ROE

Appendix F1:

Method: Least square

Sample: 1 60

Including: observation: 60

HAC Standard error and covariance (Bartlett kernel, Neway- west fixed

Bandwidth = 4.0000

DR	-9.487278	9.857424	-0.962450	0.3410
DR^2	4.116030	1.210431	3.400467	0.0014
DR*SIZE	0.308656	0.517409	0.596541	0.5538
DR*TANG	3.037255	2.345926	1.294694	0.2020
DR*TURN	0.210661	0.658831	0.319749	0.7506
SIZE	-3.856271	3.742553	-1.030385	0.3083
SIZE^2	0.108946	0.102822	1.059555	0.2950
SIZE*TANG	-0.585920	0.659456	-0.888490	0.3790
SIZE*TURN	-0.012299	0.138942	-0.088520	0.9299
TANG	10.85247	12.40313	0.874978	0.3862
TANG^2	-2.297261	2.702128	-0.850167	0.3997
TANG*TURN	-0.467882	0.976666	-0.479061	0.6342
TURN	0.572651	2.513592	0.227822	0.8208
TURN^2	-0.083694	0.070971	-1.179268	0.2445
R-squared	0.553678	Mean dependent var		0.325702
Adjusted R-squared	0.414822	S.D. dependent var		0.640912
S.E. of regression	0.490278	Akaike info criterion		1.624631
Sum squared resid	10.81677	Schwarz criterion		2.148217
Log likelihood	-33.73892	Hannan-Quinn criter.		1.829434
F-statistic	3.987428	Durbin-Watson stat		2.629467

Appendix F-2

Dependent Variable: ROE Method: Least Squares Sample: 1 60

Included observations: 60

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.419054	1.513583	-1.598230	0.1158
SDR	2.102956	0.673802	3.121030	0.0029
LDR	0.712168	0.551338	1.291708	0.2020
SIZE	0.143878	0.080504	1.787211	0.0795
TANG	-2.028712	0.583326	-3.477832	0.0010
TURN	-0.120830	0.087068	-1.387777	0.1709

R-squared	0.503625	Mean dependent var	0.408660
Adjusted R-squared	0.457665	S.D. dependent var	0.774115
S.E. of regression	0.570085	Akaike info criterion	1.808576
Sum squared resid	17.54981	Schwarz criterion	2.018010
Log likelihood	-48.25727	Hannan-Quinn criter.	1.890497
F-statistic	10.95776	Durbin-Watson stat	1.422469
Prob(F-statistic)	0.000000		

Appendix G Lower and upper 1% critical values for Durbin–Watson statistic

T	k_ = 1		k_ = 2		k_ = 3		k_ = 4		k_ = 5	
	dL	dU	dL	dU	dL	dU	dL	dU	dL	dU
15	0.81	1.07	0.70	1.25	0.59	1.46	0.49	1.70	0.39	1.96
16	0.84	1.09	0.74	1.25	0.63	1.44	0.53	1.66	0.44	1.90
17	0.87	1.10	0.77	1.25	0.67	1.43	0.57	1.63	0.48	1.85
18	0.90	1.12	0.80	1.26	0.71	1.42	0.61	1.60	0.52	1.80
19	0.93	1.13	0.83	1.26	0.74	1.41	0.65	1.58	0.56	1.77
20	0.95	1.15	0.86	1.27	0.77	1.41	0.68	1.57	0.60	1.74
21	0.97	1.16	0.89	1.27	0.80	1.41	0.72	1.55	0.63	1.71
22	1.00	1.17	0.91	1.28	0.83	1.40	0.75	1.54	0.66	1.69
23	1.02	1.19	0.94	1.29	0.86	1.40	0.77	1.53	0.70	1.67
24	1.04	1.20	0.96	1.30	0.88	1.41	0.80	1.53	0.72	1.66
25	1.05	1.21	0.98	1.30	0.90	1.41	0.83	1.52	0.75	1.65
26	1.07	1.22	1.00	1.31	0.93	1.41	0.85	1.52	0.78	1.64
27	1.09	1.23	1.02	1.32	0.95	1.41	0.88	1.51	0.81	1.63
28	1.10	1.24	1.04	1.32	0.97	1.41	0.90	1.51	0.83	1.62
29	1.12	1.25	1.05	1.33	0.99	1.42	0.92	1.51	0.85	1.61
30	1.13	1.26	1.07	1.34	1.01	1.42	0.94	1.51	0.88	1.61
31	1.15	1.27	1.08	1.34	1.02	1.42	0.96	1.51	0.90	1.60
32	1.16	1.28	1.10	1.35	1.04	1.43	0.98	1.51	0.92	1.60
33	1.17	1.29	1.11	1.36	1.05	1.43	1.00	1.51	0.94	1.59
34	1.18	1.30	1.13	1.36	1.07	1.43	1.01	1.51	0.95	1.59
35	1.19	1.31	1.14	1.37	1.08	1.44	1.03	1.51	0.97	1.59
36	1.21	1.32	1.15	1.38	1.10	1.44	1.04	1.51	0.99	1.59
37	1.22	1.32	1.16	1.38	1.11	1.45	1.06	1.51	1.00	1.59
38	1.23	1.33	1.18	1.39	1.12	1.45	1.07	1.52	1.02	1.58
39	1.24	1.34	1.19	1.39	1.14	1.45	1.09	1.52	1.03	1.58
40	1.25	1.34	1.20	1.40	1.15	1.46	1.10	1.52	1.05	1.58
45	1.29	1.38	1.24	1.42	1.20	1.48	1.16	1.53	1.11	1.58
50	1.32	1.40	1.28	1.45	1.24	1.49	1.20	1.54	1.16	1.59
55	1.36	1.43	1.32	1.47	1.28	1.51	1.25	1.55	1.21	1.59
60	1.38	1.45	1.35	1.48	1.32	1.52	1.28	1.56	1.25	1.60
65	1.41	1.47	1.38	1.50	1.35	1.53	1.31	1.57	1.28	1.61
70	1.43	1.49	1.40	1.52	1.37	1.55	1.34	1.58	1.31	1.61
75	1.45	1.50	1.42	1.53	1.39	1.56	1.37	1.59	1.34	1.62
80	1.47	1.52	1.44	1.54	1.42	1.57	1.39	1.60	1.36	1.62
85	1.48	1.53	1.46	1.55	1.43	1.58	1.41	1.60	1.39	1.63
90	1.50	1.54	1.47	1.56	1.45	1.59	1.43	1.61	1.41	1.64
95	1.51	1.55	1.49	1.57	1.47	1.60	1.45	1.62	1.42	1.64
100	1.52	1.56	1.50	1.58	1.48	1.60	1.46	1.63	1.44	1.65
Note: T, number of observations; k_, number of explanatory variables (excluding a constant term).										
Source: Brooks (2008)										

raw data of the study							
comp-yr obs.	ROE	DR	SDR	LDR	Size	tang	Turn
1 – 07	-0.05862	0.612972	0.216223	0.396749	18.58565	0.496313	0.329568
1 – 08	0.329411	0.540402	0.200041	0.340361	18.81339	0.369495	0.800579
1 – 09	0.156146	0.542865	0.150823	0.392042	18.93464	0.282445	0.680868
1 – 10	0.192451	0.498098	0.201069	0.297029	18.98591	0.338815	0.648221
1 – 11	0.199468	0.623835	0.297343	0.326492	19.43035	0.209787	0.557323
1 – 12	0.134683	0.684741	0.481488	0.203252	19.70439	0.14504	1.051278
2 – 07	0.393666	0.54576	0.54576	0	17.66272	0.138434	1.356153
2 – 08	0.769996	0.684063	0.684063	0	18.0258	0.149124	1.213615
2 – 09	0.802783	0.582255	0.579607	0.002648	18.07054	0.125736	1.430316
2 – 10	0.156819	0.601152	0.600895	0.000257	18.12224	0.101055	0.787113
2 – 11	-0.01055	0.760392	0.196525	0.563867	18.97733	0.653483	0.403856
2 – 12	-0.01694	0.785599	0.366356	0.419243	19.07163	0.688915	0.50288
3 – 07	1.007212	0.830294	0.590612	0.239681	18.19183	0.091823	0.98602
3 – 08	1.337637	0.900063	0.641332	0.258732	18.74891	0.051072	0.955976
3 – 09	3.244338	0.910684	0.760363	0.150321	18.86127	0.045566	1.313472
3 – 10	2.391365	0.932645	0.831365	0.10128	19.14347	0.139232	0.854948
3 – 11	2.912125	0.946203	0.779759	0.166444	19.32552	0.298668	0.914679
3 – 12	2.230837	0.955675	0.573578	0.382097	19.56191	0.253116	0.884264
4 – 07	0.072184	0.516321	0.516321	0	18.77032	0.310047	1.589906
4 – 08	0.118415	0.629268	0.629268	0	19.11562	0.308425	1.674254
4 – 09	0.041571	0.674359	0.072514	0.601845	19.27446	0.280378	1.175178
4 – 10	0.043058	0.155736	0.106839	0.048897	19.4676	0.230654	1.18887
4 – 11	0.013775	0.055152	0.055152	0	19.36255	0.405203	0.730826
4 – 12	0.056353	0.219561	0.219561	0	19.58852	0.317064	0.511236
5 – 07	-0.20637	0.77729	0.350717	0.426573	18.54031	0.772249	0.129622
5 – 08	-1.48985	0.936109	0.297507	0.638601	18.6452	0.722764	0.256291
5 – 09	-1.15762	0.932893	0.382846	0.550048	17.98981	0.543611	0.897141
5 – 10	0.903526	0.840719	0.315003	0.525715	17.88142	0.532011	0.713909
5 – 11	0.915477	0.787226	0.429233	0.357994	17.86581	0.503274	0.950491
5 – 12	0.203277	0.707415	0.434719	0.272695	17.73872	0.34859	0.590145
6 – 07	0.142941	0.690197	0.690197	0	16.98326	0.398049	0.824268
6 – 08	0.106421	0.53262	0.53262	0	16.63654	0.541182	1.537988
6 – 09	0.222346	0.534964	0.534964	0	16.83222	0.422391	0.790763
6 – 10	0.237075	0.555343	0.555343	0	17.01792	0.389207	1.124358
6 – 11	0.371766	0.517062	0.517062	0	16.96658	0.412796	1.375086
6 – 12	0.362108	0.606639	0.479933	0.126706	17.42904	0.305413	1.068609

7 – 07	-0.18864	0.586723	0.139278	0.447445	16.77585	0.497015	0.353665
7 – 08	0.021979	0.546446	0.162436	0.384009	16.83413	0.456354	0.475735
7 – 09	0.090033	0.495474	0.212033	0.283441	17.06618	0.355943	0.471681
7 – 10	0.331435	0.450611	0.377304	0.073308	17.16322	0.305577	1.017355
7 – 11	0.073277	0.147395	0.097238	0.050157	18.39911	0.10411	0.290096
7 – 12	0.070255	0.133835	0.066221	0.067614	18.3937	0.172781	0.373038
8 – 07	0.591819	0.755428	0.728001	0.027428	18.09686	0.279975	3.435438
8 – 08	0.102283	0.604753	0.580985	0.023768	18.1376	0.266337	4.494416
8 – 09	1.464515	0.604176	0.586867	0.017308	18.3406	0.215899	1.916856
8 – 10	0.817539	0.543429	0.529641	0.013788	18.43912	0.223148	2.042448
8 – 11	0.518431	0.543245	0.529137	0.014109	18.26808	0.27008	2.194795
8 – 12	0.739341	0.51441	0.506112	0.008299	18.61258	0.246984	2.542753
9 – 07	0.385034	0.348255	0.348255	0	18.36865	0.118272	1.721861
9 – 08	0.42452	0.150792	0.150792	0	18.4765	0.116141	1.732281
9 – 09	-0.03309	0.03229	0.03229	0	18.29218	0.143268	0.842124
9 – 10	-0.05611	0.069679	0.069679	0	18.31448	0.140109	0.820421
9 – 11	0.012859	0.385627	0.008888	0.376739	18.71358	0.496314	0.408437
9 – 12	-0.12312	0.737754	0.495864	0.24189	19.41653	0.374129	0.082096
10 – 07	0.334317	0.577151	0.577151	0	16.143	0.033986	2.894417
10 – 08	0.402443	0.511198	0.511198	0	16.20084	0.06002	3.303439
10 – 09	0.213539	0.51224	0.51224	0	16.68538	0.15229	2.208782
10 – 10	0.213662	0.475685	0.235065	0.24062	16.88259	0.125475	2.512686
10 – 11	0.226887	0.282939	0.083985	0.198954	16.72978	0.162993	0.345752
10 – 12	0.757104	0.751886	0.529975	0.22191	17.22151	0.094233	4.625117



**THE EFFECT OF CAPITAL STRUCTURE ON FINANCIAL PERFORMANCE:
EVIDENCE FROM METAL AND ENGINEERING INDUSTRY IN ADDIS ABEBA**

Dear respondents,

The purpose of this research is to identify the effect of capital structure on Financial Performance: Evidence from metal and engineering industries in Addis abeba as requirements for the completion of Master's Degree in Accounting and Finance in Hawassa University.

Your voluntary participation and accurately responding survey questions has an added value to the successful completion of this research. Your response will be used for academic purpose only and will be kept confidential.

Thank you for your cooperation,

Zinabu Ejigu

Tel: 0926-19 63 28

E-mail: Zinabubela@gemial.com

Instructions: Check one of the followings in the space provided.

1. Demographic Characteristics of respondents

1.1 Age:

20-25

25-30

30-35

35-39

> 40

1.2 Sex:

Male

Female

1.3 Education:

Diploma

Master's degree

Bachelor degree

PhD

SECTION A: CHARACTERISTICS OF METAL & ENGINEERING INDUSTRY

A1: For questions 1-4, provide the answer that describes or indicate the characteristics of your industry/firm/business

No	Questions and Filters	Response
1	Number of years the Industry has been in operation (in completed years)	<input type="text"/> <input type="text"/>
2	Number of fulltime employees	<input type="text"/> <input type="text"/>
3	Ownership Structure:	Sole proprietorship1 Partnership.....2 Limited company.....3

		Others: (specify).....4
4	What is the sector in which your business Operates?	Services.....1 Manufacturing industry.....2 Importer.....3 Others (specify).....4

SECTION B: ASSESSMENT OF CAPITAL STRUCTURE

B1: LEVERAGE & SHORT-TERM DEBT ASSESSMENT

The section below focuses on sources of short-term financing for Metal & Engineering industry for the period 2018-2023.

Using the scale below, tick the option that best describes your business on a scale of 1-5 with: Strongly Disagree = 1; Disagree = (2); Neutral = 3; Agree = 4; Strongly Agree = 5.

LEVERAGE & SHORT-TERM DEBT ASSESSMENT		1	2	3	4	5
1	Leverage has statistically significant & negative effect on financial performance in metal industry.					
2	The industry has outstanding trade accounts payable.					
3	The industry has outstanding overdrafts					
4	The industry has outstanding interest payments on short-term obligations.					
	The Industry has short term loans from financial institutions.					

B2: ASSESSMENT OF LONG-TERM DEBT

The section below focuses on long-term sources of finance for Metal & engineering Industry for the period 2018-2023.

Using the scale below, tick the option that most applies to your business on a scale of 1-5 with: Strongly Disagree (SDA) = 1; Disagree (D) = (2); Neutral (N) = 3; Agree (A) = 4; Strongly Agree (SA) = 5

ASSESSMENT OF LONG-TERM DEBT	1	2	3	4	5

The industry uses its assets to obtain finance from third parties periodically (leasing)					
The industry uses loans repayable in a period exceeding 12 months (direct borrowing)					
The industry issues debt instruments (debentures, bonds) to obtain finance for investment					
The industry uses employees' pension funds in its investment plan					

B4: ASSESSMENT OF COMPANY SIZE, ASSET TANGIBILITY, & ASSET TURNOVER

The section below focuses on company size, asset tangibility, & asset turnover sources of finance for Metal & engendering Industry for the period 2018-2023.

Using the scale below, tick the option that most applies to your business on a scale of 1-5 with:

Strongly Disagree (SDA) = 1; Disagree (D) = (2); Neutral (N) = 3; Agree (A) = 4; Strongly Agree (SA) = 5

ASSESSMENT OF COMPANY SIZE, ASSET TANGIBILITY & ASSET TURNOVER	1	2	3	4	5
A significant positive effect of company size on the industry performance					
A significant positive effect on asset tangibility in the industry performance					
The industry have a significant effect of asset turnover on the company performance					