THE EFFECT OF CAPITAL STRUCTURE ON PROFITABILITY: EVIDENCE FROM MANUFACTURING COMPANIES IN ADDIS ABABA, ETHIOPIA

A THESIS SUBMITTED TO THE SCHOOL GRADUATE STUDIES OF WOLKITE UNIVERSITY PARTIAL FULFILLMENT OF THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN ACCOUNTING AND FINANCE

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THE EFFECT OF CAPITAL STRUCTURE ON PROFITABILITY: EVIDENCE FROM MANUFACTURING COMPANIES IN ADDIS ABABA, ETHIOPIA

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A RESERCH PAPER SUBMITTED TO SCHOOL OF GRADUATE STUDIES WOLKITE UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQURMENTS FOR MASTER OF SCIENCE(MSC)IN ACCOUNTING AND FINANCE

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WOLKITE/ETHIOPIA

Declaration

I, Kenzu Hussen, hereby declare that this MSc thesis entitled “The effect of capital structure on profitability of private large manufacturing industries in Addis Ababa Ethiopia’ ’is my original work and has not been presented for a degree in any other university, and all sources of material used for this thesis have been properly acknowledged. This thesis has been carried out by me under the guidance and supervision of Chernet.B (PhD) and Rukiya.T (asst prof)

.

Kenzu Hussen Signature ……. Date ……..

Certification

This is to certify that the thesis entitled "The effect of capital structure on profitability of private large manufacturing industries in Addis Ababa Ethiopia. Submitted to Wolkite university for the award of the Degree of Master of Science in Accounting and Finance is a record of Valuable research work carried out by Kenzu Hussen, under my guidance and supervision. Therefore, I hereby declare that no part of this thesis has been submitted to any other university or institutions for the award of any degree or diploma.

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Advisors Approval Sheet

This is to certify that the thesis entitled “the effect of capital structure on profitability of private large manufacturing industries in Addis Ababa Ethiopia.” submitted in partial fulfillment of the requirements for the degree of Master of Science in Accounting and Finance, the Graduate Program of the School of Accounting and finance, and has been carried out by Kenzu Hussen Id. No AcFnR/015/13, under our supervision. Therefore, we recommend that the student has fulfilled the requirements and hence hereby can submit the thesis to the school of accounting and finance.

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Examiners Approval Sheet

We, the undersigned, members of the Board of Examiners of the final open defense by Kenzu Hussen have read and evaluated his/her thesis entitled effect of capital structure on profitability of manufacturing industries in Addis Ababa Ethiopia", and examined the candidate. This is, therefore, to certify that the thesis has been accepted in partial fulfillment of the requirements for the degree Master of Science in Accounting and Finance.

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Name of external examiner	Signature	Date
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ABSTRACT

This research study is undertaken to investigate the effect of capital structure on profitability of manufacturing company in Addis Ababa, Ethiopia. The study examines the manufacturing specific and macro-economic factors that affect profitability of manufacturing company of Addis Ababa, Ethiopian. The data covered the period from 2010-2021 GC for the sample of selected seventeen manufacturing company. Quantitative research approach and explanatory design are adopted in carrying out this research. Secondary data is collect from the ERCA and NBE annual report by using purposive sampling technique. The random effect regression technique is used by econometric display EViews9 and Stata. The findings of the study shows that, Solvency and Debt to equity ratio(DER) have positive and statically significant effect on ROE and firm value and liquidity have negative and significant effect on ROE. When we come to ROA, solvency and Debt to asset ratio(DAR)have significant and positive effect on ROA and firm value, liquidity and DER have negative and statically significant effect on ROA. The remaining variables like are not significant. The researcher recommends, manufacturing company who has the axes of market demand, should mainly focus on the efficiently used the available resource to improve profitability of manufacturing company in Addis Ababa Ethiopia.

Key words: - ROE, ROA, capital structure, Manufacturing company, Addis Ababa

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Acronyms

CAPM:- capital asset pricing model

DAR:- Debt to Asset ratio

DER:- Debt to Equity ratio

EMU:- European monetary union

ERCA:- Ethiopia Revenue Custom Authority

FV:- Firm value

INF:- Inflation rate

LQ:- Liquidity

NBE:- National Bank of Ethiopia

ROA:- Return on asset

ROE;- Return on equity

SCP:- structure conduct performance

SOL:- Solvency

CHAPTER ONE

1. Introduction

1.1 Background of the study

In today's competitive and dynamic business world, financial decision plays a fundamental role in the firm's day to day performance and operations. Firm's financial decision affects almost all activities within the company. In the field of corporate finance, capital structure decision is the most debatable issue for academicians and practitioners of corporate finance starting from a seminar work of Modigliani and Miller in 1958. Modigliani and Miller (1958) stated that the firm's value is independent from their capital structure decision, by assuming unrealistic assumptions on the real world; such as no corporate taxes, no transaction cost, and perfect capital market. However, Modigliani and Miller (1963) incorporated corporate taxes into their earlier assumption and they stated that optimal capital structure can be attained from 100 per cent debt financing through getting tax saving advantage of using debt. However, the second proposition also not considered the disadvantages of using more debts, such as bankruptcy cost and default risk.

After the work of Modigliani and Miller (1958 & 1963) a number of theories have been developed to explain optimal capital structure of the firms. Agency cost theory, static trade-off theory, and pecking order theory are the most popular theories of capital structure. However, both debt and equity finance have their own merits and demerits. The merits of debt financing are tax-shield, disciplinary tool and cheapest sources of finance, while bankruptcy cost and default risks are its disadvantage. In the case of equity share, its advantage is there is a low probability of bankruptcy cost, while no tax advantage, costly and difficulty of controlling free cash flow are its disadvantages.

Capital structure plays a role in determining the risk level of the company, and fixed cost is the key factor whether it is involved in production process or fixed financial charges. It should be kept low if the management is likely to confront an uncertain environment but how low or how high is the basic question. The assets of the company can be financed by owner or the loaner. The owner claims increase when the firm raises funds by issuing ordinary shares or by retaining the earnings which belong to the shareholders, the loaners claim increase when the company

borrows money from the market using some instrument other than shares. The various means of financing represent the financial structure of the enterprises. The term capital structure is used to represent the proportionate between debt and equity, where equity includes paid-up capital, share premium, and all reserves & surplus (Nirajini A. and Priya K., 2013).

Profitability is an extremely important creator of value within the firm; a firm can attain profitability by taking advantages of economics of scale, exploring avenues of cost reduction, exterminating all overheads that fail to add value to the product and rendering costs that do not enhance the consumer needs (Rappaport, 1987). Profitability affects the firm's value because it is a measure of firm's performance as measured by the profit generated. Firms that succeed in gaining ever-increasing profit indicate that the firm has a good performance, therefore creating positive response from investors and encouraging a rise in the firm's stock price. High profitable firms means that the managers corporates wealth effectively and efficiently (Manu, et al., 2019).

Factors that affect firm value, namely capital structure, profitability and firm size. The capital structure is the business capital needed by the company to meet the needs of its business activities. The capital can be obtained from internal companies or from external companies in the form of loans. The balance of internal capital (own capital) and foreign capital (foreign capital) is what is referred to as the capital structure. Capital structure has an effect on firm value the purpose of the company's funding policy in determining the ratio of debt and equity is to maximize the value of the company. The financial manager must weigh the cost benefits of the selected funding sources. There are 2 categories of sources of funding within the company, namely internal funding sources obtained from retained earnings and depreciation of fixed assets, as well as external funding sources obtained from creditors who provide loans (debt)(Wahyu Leman,2020).

The essence of this paper is to find out whether the amount of equity and/or debt used affects its market value, in other words, does the effect of capital structure on profitability of manufacturing company decision in Addis Ababa Ethiopia affects its value? This paper would act as guide for the financial managers to design their optimum capital structure so as to maximize the market value of the firm and minimize the agency cost.

1.2 Statement of the problem

Capital structure is the mix of debt and equity used by company to finance it over all operation and growth .debt consist of borrowed money that due back to lender company with interest expense and equity consist of owner right in company without the need to pay back any investment. Financial managers have a responsibility of determining the optimal mix of equity and debt that will ensure maximization of shareholders wealth because to this, it has become necessary to determine whether there is a capital structure that maximizes firm value. Most research on the effect of capital structure on business performance has been done on large, listed companies in developed economies (Muhammed et.al, 2015).

Over the past several years, the problem of capital structure and its effect on business value has received seek attention in the finance literature. For instance Modigliani and Miller, (1958) the irrelevance theory proposed in that the capital structure and firm value are unrelated. Though, Modigliani and Miller (1963) suggested that The quantity of long-term debt used in the company's capital is positively correlated with its market value.. Additionally, there are several perspectives on the capital structure in theoretical models of envisioned capital structure. For instance, the static trade-off hypothesis argues that there exists an optimal financial structure that maximizes firm value, whereas the pecking order hypothesis contends that financing is determined by the risk associated with each financing.

According to Teddy Chandra (2019) finds that the capital structure variables like firm size, growth opportunity, tangibility and liquidity have no significant effect. Variables that influence capital structure are only influenced by growth opportunity, whereas other variables are not significant and variables that affect profitability are firm size, growth opportunity, uniqueness and volatility. The result which has not significant impact are explains the variable did not influence the dependent variable ROA and ROE become the problem of the previous study..

The findings of various studies in Ethiopia have investigated the effect of capital structure on profitability in manufacturing industry of Addis Ababa, Ethiopia.

The study conduct on the capital structure on profitability in manufacturing industry is few in numbers for instance (Tariku Negasa,2013) studied only focused on the variable like

manufacturing company size, total debt, growth rate, tangibility, liquidity, tax shield but have not considered debt to equity, leverage, liquidity, managerial efficiency, inflation etc. On the other hand (Yodit Yirgu, 2017) studied also only focused on the large manufacturing Food industry and also the researcher used variable are Size of company, Leverage of company Liquidity of company, Asset Growth of company Managerial efficiency of company Capital intensity of company Inflation rate of company. The researcher did not include long term and short term debt.

This research studies have done on the effect of capital structure on profitability of manufacturing industry. The researcher use panel data for different manufacturing company in Addis Ababa with different researcher with different variable which has not effect are taken as gap for this research. On the other hand, the serious shortcomings of the current literature, this study contributes to the existing literature gap which is not recently done by using the variable debt to equity ratio and debt to total asset ratio in the previous research issue. The researcher is interested to analyze whether the all variables have significant relation or not to the dependent variable. The aim of this research is to examine the effect of capital structure on profitability in Addis Ababa of Ethiopia over the period of 2010-2021. This helps the manufacturing company managers to give due emphasis on the management of identified variables and provides them with understanding of activities that enhance their profitability.

Research Questions

The researcher wants to explore the current study with reference to the following research questions:

- What has been the effect of Debt to equity ratio on the profitability?
- What has been the effect of Debt to asset ratio on profitability?
- What is the effect of solvency on profitability of large manufacturing companies in Addis Ababa?.
- What is the effect of firm value on profitability of large manufacturing companies in Addis Ababa?.
- Does the liquidity have effect on profitability?

- What is the effect of inflation on the profitability of manufacturing companies in Addis Ababa?

1.3 Objective of the study

General objective

The general objective of the study is to investigate the effects of capital structure on profitability of large manufacturing companies in Addis Ababa, Ethiopia.

Specific Objectives

The specific objectives of the study are:

- To know the impact of Debt to equity ratio(DER) on the profitability(ROE and (ROA).
- To study the effect of Debt to asset ratio(DAR) on the profitability.
- To investigate the effect of solvency on profitability of large manufacturing companies in Addis Ababa.
- To study the effect of firm value on profitability of large manufacturing companies in Addis Ababa.
- To determine the effect of liquidity on the profitability of large manufacturing companies in Addis Ababa.
- To explain the effect of inflation on the profitability of manufacturing companies.

1.4 Research hypothesis

The purpose of this study is mainly focuses on to identify the effect of capital structure on profitability of manufacturing company in Addis Ababa, Ethiopian. Hypotheses of the study stands on the theories associated to a capital structure on profitability of manufacturing company. The results from the literature review (to be discussed in the next chapter) were used to establish expectations for the relationship of the different effects. Hence, based on the objective, the present study tried to test the following hypotheses:

H_1 : Debt to equity ratio of company (DER_{it}) has negative and significant effect on profitability.

H_2: Debt to asset ratio of company (DAR_{it}) has negative and significant effect on profitability.

H_3: Solvency ratio of company (SOL_{it}) has positive and significant effect on profitability.

H_4: Firm value of company (FV_{it}) has positive and significant effect on profitability

H_5: Liquidity of company (LQ_{it}) has negative and significant effect on profitability.

H_6: Inflation rate of company (INF_{it}) has positive and significant effect on profitability.

1.5 Significance of the study

This study deals the effect of capital structure on profitability of private large manufacturing industries in Addis Ababa Ethiopia. It enables the management bodies (board of directors) to understand how to decide their product is spread to all of the country and how to decide to attract their customer and the optimal capital structure to attain profit maximization of the industries, as well as to plan their optimal level of capital structure to achieve maximum level of firm's value and profitability with a minimal cost of capital. To Investors how to decide to their investment would have spread to different area because it would to reduce risk and Investors seek to invest in a firm which has maximum profitability with minimized risk hence; the study can help investors by providing alternative opportunities to decide where to invest more by protecting their investment. finally, the researcher who would sought to how to debt and equity finance has impact on profitability in manufacturing companies and would use reference material for other researchers in the area of corporate finance/capital structure and profitability in the future. The findings of this work are useful as an input for the company managers and policy makers to understand the impact of capital structure on the performance of the company moreover to outline profitability of manufacturing companies.

1.6 Scope of the Study

The scope of the study accommodates of four exceptional dimensions. The dimensions include conceptual scope, time scope, geographical scope, and methodological scope. The conceptually scope of this study be restricted to research the impact of capital structure on profitability of private large manufacturing industries in Addis Ababa Ethiopia. This examine was delimited to

research the impact of capital structure on profitability of private large manufacturing industries in Addis Ababa Ethiopia. This study was considering and addressed Two (2) dependent variable factors, two independent variable and four control variables. Geographically the studies paper can be delimited on Addis Ababa town and also the researcher was taking into account seventeen manufacturing companies (MCs) here in Addis Ababa-Ethiopia that have at least twelve years data i.e., 2010-2021. The study was conducted as in line with the schedule set by way of the university and it'll be finished.

1.7 Limitation of the study

This research has the limitation on unable to use all manufacturing company of Addis Ababa, Ethiopia due to different age of establishment and availability of data.The research only get seventeen manufacturing company which has twelve years data.The manufacturing company which has twelve years old with data. The manufacturing company which has less than 12 years is not part of the research.

1.8 Organization of the study

This research report was organized in five chapters. Chapter one provides the general Introduction about the whole report. Chapter two describes the review of related literatures and Chapter three provide detail description of the methodology employed by the research. Chapter four contains data presentation, analysis and interpretation. Finally, the last chapter concludes the total work of the research and gives relevant recommendations based on the findings.

CHAPTR TWO

2. RELATED LITERATURE REVIEW

The literature review covers the theoretical and empirical study review in the areas of capital structure and its effect on profitability. Furthermore, it also covers the study variable of empirical works conducted in the area together with the knowledge gap of the area and conceptual framework of the study.

2.1 Theoretical Literature Review

2.1.1 Definition of Capital Structure

According to Gideon Tayo (2019) explains capital structure as the mix of debt to equity in a firm's total capital employed for activities. Ordinary shares added to retained earnings are known to as equity, even though any fixed interest-bearing stock is regarded debt. according Gajurel (2005), capital structure are described to as The "different sources of funds that make up a firm's capital. According to Abor (2008), Capital structure is the unique combination of asset, debt, and equity that a firm uses to finance its activities. According to Akinsurile (2008), a company's capital structure includes a mixture of debts and equity that it uses to finance its operations.

This mix generally consists of debt capital, preference share capital, and ordinary share capital. The optimal capital structure of a firm is the mix of debt and equity that maximize the firm's value (Ross et al., 2008), and corporate managers must continue making this critical conscious choice (Gatsi and Akoto, 2010).To segregate a section of long-term debt from total debt and to separate equity with either a focus on the issuer's share capital and/or share premium. Therefore, using a disaggregation method, this study examined the impact of capital structure on the profitability of manufacturing firms in Nigeria. The capital structure of manufacturing firms listed on the Nigeria Stock Exchange would be proxies by long-term debt, short-term debt, share premium, and share capital (NSE). Choices concerning capital structure decisions are crucial since they significantly impact an organization's profitability. (2012) Kajananthan & Nimalthasan.

The capital structure of a firm is how it finances its funding sources for assets, which are often assets to use a combination of debt and equity (Saad, 2010). The sources of corporate assets, as

defined by Ahmadpour and Yahyazadehfar (2010), are a combination of debt and equity. The most of capital structure studies argue that capital is determined by the ratios of debt to equity visible on the right hand sides of balance sheets (C.Myers, 2001).

2.1.2 Theoretical review

2.1.2.1 Capital structure theories

A number of theories have been used in examining the relationship between the capital structure and value of a firm, these theories includes the Modigliani and Miller Hypothesis, the Net Income Approach, the Net Operating Income Approach, the Traditional View, the Trade- off theory, the Pecking Order theory, and the Market timing theory. Each of these theories will be briefly examined here.

Modigliani and Miller Hypothesis (1958): This was among the pioneer work in the theory of capital structure of a firm; the hypothesis is a behavioral justification of the net operating income approach. Its argues that without taxes, the cost of capital and market value of the firm remain constant throughout all levels of leverage. They offered two strong propositions to support their hypothesis. They explained that for firms in the same risk class, the total market value is independent of the capital structure and is given by capitalizing the expected net operating income by the rate appropriate to that risk class. If this proposition does not hold, then an investor could buy and sell stocks and bonds in a way to exchange one income stream for another stream, identical in all respects by selling at a lower price – arbitrage. Base on the arbitrage process, they concluded that the cost of capital (or market value of the firm) is not affected by any degree of leverage. This implies that the capital structure (or financing decision) is irrelevant. The second proposition of the M-M hypothesis explained that firms in the same risk-class, the cost of equity is equal to the constant average cost of capital plus a premium for financial risk which is equal to debt-equity ratio times the spread between the constant average cost of capital and the cost of the debt.

The Net Income Approach: This approach explained that the value of the firm can be increase or decrease its overall cost of capital by reducing or increasing the proportion of debt security in the capital structure. It argues that leverage significantly affects the overall cost of capital and that the value of the firm varies with its leverage. This approach is based on the argument that debt

can be substituted for equity by issuing new debt and retiring existing equity. Under this approach, as equity is replaced by more, lower debt, the overall cost of capital declines.

Net Operating Income Approach: This approach argues that the market value of the firm is not affected by the capital structure changes because the market value of the firm depends on the Net Operating Income and cost of capital, which is expected to be constant. The NOI submission rules out the possibility of leverage having any effect on the overall cost of capital.

The Traditional View: This view represents a compromise between the Net Income Approach and the Net Operating Income Approach as it argues that the value of the firm can be increased or the judicious mix of debt and equity capital can reduce the cost of capital. This implies that the cost of capital decreases within the reasonable limit of debt and then increases with leverage. It thus, posits that optimum capital structures exists and occurs when the cost capital is minimum or the value of the firm is maximum (see Oloyede 2000 cited in Adedoyin,2014).

The Trade-off theory: This theory explained that holding a firm's investment plans and assets constant, its optimal leverage ratio is obtained by trading off between the tax benefits and the consequences of using debt instruments. According to this theory, debt financing is attractive, in that, the benefits of tax saving from debt payments shields a number of cost debt financing, thus high profit firms will have higher benefits from debt financing accompany with lower level of financial distress costs, this makes higher leverage attractive to higher profit making firms.

Pecking Order theory: This theory provides an analytical description of the sequence of firm's financing decisions where retained earnings have a preference over debt and debt is favoured over equity. According to Supa Tongkong (2012), under pecking order hypothesis, firms prefer internal financing to external alternatives such that if the firm issue securities, the firm favour debt over equity. The implication is that profitability would be expected to explain the firm leverage level such that more profit will connotes lesser use of debt instruments. This contradicts the trade off theory submission that more profit attracts more leverage.

The Market Timing theory: this theory introduces the impact of timing on firm's financial decision making process. It explained that the choice between the use of capital or equity is a function of manager's ability to time the equity market, as firms will prefer using equity so long

the relative cost of equity is low, and if otherwise preference will be on the use of debt instruments. Under this approach, the stock market condition play crucial role in explaining the firm's leverage condition, for instance, during bullish equity market, firms prefer equity issuance over debt financing (see Beck, T., Levine, R., (2004), Peura, S., Keppo. J., (2006), Gropp, R. and Heider, F. (2010)).

2.1.2.2 The concept of profitability

Profit is the primary objective of a business. In point of view of the heavy investment which is necessary for the success of most enterprises. Profit in the accounting sense tends to become a long term objective which measures not only the success of the product, but also of the development of the market for it. It is determined by matching revenue against cost associated with it. Only those costs are placed against revenue, which have contribution in the generation of such revenue. An enterprise should earn profits to survive and grow over a long period of time. It provides evidence concerning the earnings potential of a company and how effectively a firm is being managed. If the enterprise fails to make profit capital invested is eroded and if this situation prolongs the enterprise ultimately ceases to exist. (Nimalathasan, 2009 cited in Yodit, 2017)).

The word profitability is composed of two words, namely, profit and ability. The term profit has been explained above and the term ability indicates the power of a business entity to earn profits. The ability of a concern also denotes its earning power or operating performance. The profitability may be defined as the ability of a given investment to earn a return from its use. Profitability is a relative concept whereas profit is an absolute connotation. As an absolute term, profit has no relevance to compare the efficiency of a business organization. A very high profit does not always indicate sound organizational efficiency and low profitability is not always a sign of organizational sickness. Therefore, it can be said that profit is not the prime variable on the basis of which the operational efficiency and financial efficiency of an organization can be compared. To measure the productivity of capital employed and to measure operational efficiency, profitability analysis is considered as one of the best techniques. Despite being closely related to and mutually interdependent, profit and profitability are two different concepts. In other words, in spite of their generic nature, each one of them has a distinct role in business. (Tulsian, 2014).

2.1.2.3 Measurement tools of profitability:

The most important measurement of profitability of a company is ratio i.e. profitability of assets variously referred to as earning power of the company return on total investment or total resources committed to operations." (Murthy 1978).

According to Block and Hire(1978) "The income statement is the major device or measuring the profitability of a firm over a period of time." Some managerial decision like rising of additional finance, further expansion, problem of bonus and dividend payments rest upon this measurement. It can be measured for a short term and long term. Profitability provides overall performance of a company and useful tool for forecasting measurement of a company's performance. The overall Objective of a business is to earn a satisfactory return on the funds invested in it, while maintaining a sound financial position, profitability measures financial success and efficiency of management.

Profitability ratios are an indicator for the firm's overall efficiency. It's usually used as a measure for earnings generated by the company during a period of time based on its level of sales, assets, capital employed, net worth and earnings per share. Profitability ratios measures earning capacity of the firm, and it is considered as an indicator for its growth, success and control. Accordingly, the term 'profitability' is a relative measure where profit is expressed as a ratio, generally as a percentage.(Rajkot, 1984. P-61)

2.1.2.4 Models of firm profitability

A model from Industrial organization

Firm profitability and its determinants are a well addressed research topic in the field of industrial organization. Modern literature provides two schools of competing models of firm profitability. Models of firm profitability can be classified into two major groups, structure-conduct performance (SCP) and firm effect models. (Stierwald, 2009)

Structure conduct performance

In the SCP model the market structure determines firm behavior and profitability. The SCP model is embedded in neoclassical theory and asserts that firms in concentrated industries are more profitable than firms in perfectly competitive markets, see (Bain, 1951 as cited in Yodit Yirgu, 2017). A reason for that can be high industry concentration facilitates the exertion of

market power, for example in the form of monopoly pricing. Colluding firms impose a higher markup on those goods with lower elasticity of demand without suffering the loss of demand to competitive rivals. The increased price allows firms to earn profits that exceed competitive rates. Due to the restricted quantity of supply, industry concentration and high profits are associated with sub-optimal welfare levels.(Stierwald,2009)

Firm effect models

In firm effect models, market structure is the result of the distribution of firms and firm profits. The fundamental assumption in firm effect models is that firms are heterogeneous. According to the superior firm hypothesis, introduced by (Demsetz, 1973 as cited in Stierwald,2009), firms can be distinguished with respect to their level of cost or production efficiency. Efficient firms have a competitive advantage over their non-efficient rivals. Higher levels of cost-efficiency can be caused by lower costs of production, economies of scale or higher quality of products. In the Demsetz model, superior performance can exist for some period of time. Potential reasons for that can be the firm's reputation, complex organizational structures, resource heterogeneity, factor immobility or uncertainty of investments. (Jovanovich, 1982, as cited in Yodit Yirgu,2017) argues that only efficient firms survive, stay in the market, grow larger and obtain a higher market share. At the same time, efficient firms are more profitable than non-efficient ones. (Peltzman,1977, as cited in Yodit Yirgu,2017) asserts that high market concentration, in the form of high market shares, and high firm profitability occur simultaneously and are the result of the same cause, differences in productivity levels. Markets function competitively, and no collusion between firms takes place that restricts supply or enables firms to raise their price above marginal costs. For this reason, high firm profitability is not necessarily associated with welfare losses in firm effect models. There has been a substantial amount of empirical research undertaken in the area of profits, market structure and firm-level effects. (Stierwald, 2009)

Taken together, the evidence suggests that both SCP and firm effect models are plausible. This implies that industry effects, such as concentration and entry barriers, and firm effects, such as productivity differences or strategic management, are empirically important. Depending on the study, firm-level or industry-specific effects are found to be the dominant factor on firm profitability. (Stierwald, 2009)

A model from finance

Financial economists have also modeled and assessed firm profitability. Like members of the Chicago school, they tend to construct models in which markets are workably competitive. Nevertheless, in their models, returns to investing in assets such as firms vary considerably depending on the firms' characteristics. One characteristic that has been emphasized is systematic risk, where systematic means risk that is not diversifiable. Specifically, an asset with higher systematic risk should command a higher return. (Slade E.,2003).

The CAPM Model

The simplest model that embodies that notion is the capital asset pricing model or CAPM. Unlike the early IO models, the CAPM is derived from an equilibrium model of optimal decisions taken by economic agents.

The CAPM explains why highly risky assets such as gold need not command high rates of return. Gold is a real asset whose return is not highly correlated with, for example, the return to holding a portfolio of stocks. Indeed, when the stock market is expected to plummet, it is not uncommon for investors to switch from financial into real assets. Such behaviour leads to low risk premia and can even cause the return to holding real assets to be negatively correlated with rm. When this is the case, risk premia are negative. The CAPM predicts that a firm's risk class, not the structure of the market within which it operates, determines profit rates. If there is any possibility that market structure or market share is correlated with systematic risk, it is important to use measures of risk as conditioning variables in tests of IO models.(SladeE.,2003)

> In addition, it is interesting to assess the relationship between risk and return in its own right. Many researchers from finance have attempted to assess the testable predictions of the CAPM. They tend to reject the model in its simplest form but find support for modified versions that include additional explanatory factors. Most of the factors that have been considered, however, are economy wide rather than market or firm specific. (SladeE.,2003).

2.1.3 Effect of Capital Structure on a Firm's Performance/Profitability.

Capital structure and financial performance relationship over the years has received attention in the finance literature .Different researchers have tried to answer the question of how capital structure relates to corporate governance which in turn affects financial performance of firms (Pratheepkanth, 2011)

Corporate governance is key to the financial performance of a company because it brings a control mechanism into the structure of a firm and according to Huson and Nazrul (2008) the relationship between ownership structure and company performance is an issue of interest among various people such as the academicians, investors and policy makers especially in understanding role of corporate governance in financial performance.

The performance of a firm is highly dependent on the capital structure; the capital structure is of great importance to both the managers of the firms and the providers of capital funds. This is because if a wrong mix of capital structure components that is debt and equity then the performance and survival of the firm may be seriously affected (Onalapo, 2010) Capital structure relationship with financial performance is on the hands of the managers of a firm. The firm manager‟s primary duty is to manage the firm in a way that maximizes shareholder‟s wealth which has to be reflected by increased profits and cash flows (Elliot, 2002)

However Jensen and Meckling (1976) argued that a conflict between shareholders and lenders of funds is favourable to the shareholders in that they can venture into risky investments when the capital structure is leans on more debt. The financial performance of a firm is what enables the shareholders and managers to pay the debt plus interest but if the performance is bad it‟s the lenders of the funds who incur the highest loss.

Profitability of a firm is as a result of the capital structure decisions that a firm comes up, this decisions whether short term or long term affect the profitability of a firm while at the same time increase the risk of the firm investment ventures. This is due to the fact that

capital structure comprises of debt and equity, debt increases the risk of future earnings while enabling a firm to expect high returns (Muzir, 2011)

Managers of a firm prefer to use more debt to fund the business operations, according to (Modigliani and Miller, 1963) tax shield due to interest expense is considered to be one of the most important determinant of capital structure decision and is thought to motivate firms to use more debt.

Firms return‟s may be low since there are firms that prefer to keep their leverage ratios low so as to safeguard their profits from being used to pay interest payments associated with debt. Size of the capital structure determines returns in terms of profits since a firm with less capital structure cannot venture into high risk businesses that have high returns (Sivaprasad, 2010)

Past research on American companies has shown that linking management and ownership increases the company‟s profitability dramatically (Dolmat-Connel, 2002). The firm‟s profitability is pegged onto the actions of the managers running the firm, if they are efficient then they are able to minimize on the cost of capital and maximize the firm‟s performance. This is dependent on the interest of the principals and the agents thus the managers always tend to pursue own interests by spending the free cash flows available rather than return it to the shareholders through dividend payments (Boodhoo, 2009)

According to Pinegar and Wilbricht (1989) the principal- agency conflict can be resolved without increasing agency costs but by having a trade-off between equity and debt. Lubatkin and Chatterjee (1994) argue that firm‟s efficiency can be attained by firms increasing their debt to equity ratio because debt will ensure that excess cash flow is returned to the shareholders rather than investing it in risky ventures. High leverage in turn makes the managers to focus on business activities that will enable the firm to meet its financial obligations.

However when a firm finances its capital structure by increasing debt then the cost of capital increases which may bring about cash problems and if the situation aggravates

bankruptcy is bound to happen. This means that the firm has to ensure that its business operations are bringing higher returns in terms of increased profits which may in turn attract investors (Boodhoo, 2009)

The management of a firm prefers to invest profits in projects than pay out dividends to the shareholders, this was advanced by Jensen (1989) Free Cash flow argument which states that when top managers have free cash flows, they tend to invest it in projects with negative Net Present Values instead that paying it out to shareholders as dividends. This can be attributed to the fact that manager‟s salary increase with increase turnover thus managers are motivated to increase the size of the firm even with investments that have negative Net Present Value.

In order to assess the relationship between capital structure and profitability the study will use Debt Equity and Debt to total asset ratio as the independent variable whereas dependent variables will be the Return on Equity and return on asset profitability.

2.2 Empirical literature

The empirical review of this study is organized through the various study of previous researchers regarding different sectors of manufacturing companies. The effect of capital structure and on the profitability of manufacturing companies have been empirically examined by different authors. The empirical review explains as follows.

The empirical review in developed country

According to Supa Tongkong (2012) used multiple linear panel regression models to examine the factors influencing capital structure decisions so as to maximize the value of a firm, and a dynamic panel regression model using one-step and two-step Arellano and Bond GMM estimation approach. There is a positive relationship exist between a firm's debt and its median industry leverage. They also observed that a positive relationship exists between firm size and growth opportunity; and firm leverage, though a negative relationship exist between profitability and leverage as stated in pecking order theory. They concluded that the adjustment rate for restructuring of capital composition for the study area is about 63 percent.

According to Suzan et al (2022) founds that the ratio of Total Liabilities to Total Assets (TLsTAs) has a significant and negative impact on return on asset(ROA), whereas the Total Equity to Total Assets (TETAs) has a significant and positive impact on ROA. By using annual data of the telecom industry from 2012 to 2020 in the USA, a panel pooled models.

According to D.K.Y Abeywardhana (2015), On Capital Structure and Profitability: An Empirical Analysis of SMEs in the UK found that Long term debt to total assets (LDA) has a statistically significant negative relationship with profitability while short term debt to total assets (SDA) shows a positive relationship with profitability. Similarly according to Drs. Jafaare M. and Mohammad F. (2012), study's shows that a rise in debt levels is correlated to a reduction in profitability; as a result, the firm's profitability declines as debt levels increase.

Nasimi (2016) analyzed the effect on capital structure on profitability of 30 firms listed at FTSE-100 index of the London Stock Exchange for the year starting 2005 to 2014. The results revealed that debt to equity ratio has negative significant impact on return on asset and return on invested capital where positive significant impact on return on equity. It also revealed that interest coverage has positive significant impact on return on asset, return on equity and return on invested capital. The study concluded that an optimal level of capital structure shall be employed to achieve the targeted efficiency level in business.

Nasimi (2016) examined the determinants of capital structure of firms listed at S&P 500 index of New York Stock Exchange. The study sample was constructed using panel date of 15 IT firms for the period from 2010 to 2014. The study concluded tangibility has positive significant impact on capital structure. Thus study concludes that IT firms in the United States prefer debt in the capital structure.

Asimakopoulos, Samitas and Papadogonas, (2009) cited Yodit (2017) examined the determinants of profitability for a sample of Greek non-financial firms listed in the Athens Stock Exchange for the period 1995- 2003. That was a very important period for the Greek economy on the way to European monetary union (EMU). Employed panel data estimation techniques utilizing firm-specific publicly accounting variables rather than cross-sectional analysis. According to their findings, firm profitability was positively affected by size, sales growth and investment and negatively by leverage and current assets. Additionally, they found that the EMU participation

and the adoption of the euro were negatively related to firm profitability. On their Practical implications the Greek economy has undergone significant transformation during the period under examination on its way to join EMU and to adopt the euro currency, a model has been formulated where both firm specific and economy wide factors determine firm profitability. Their paper focuses on a less developed and efficient stock market. In contrast to previous studies that did not take into account the convergence of the Greek economy to EMU averages and the subsequent adoption of the euro, their paper analyses data for the pre-EMU and the post-EMU periods in an attempt to quantify a potential macroeconomic effect on firm-specific profitability.

According to Narinder and Mahima (2019) found that an increase in total debt results in decrease in return on assets, while increase in equity results in increase in return on assets. The results of the fixed effect model show that increase in total debt results in increase in return on equity, while increase in equity results in decrease in return on equity. This is because increase in debt results in tax shielding, which in turn outcomes in increased return to equity shareholders. Tax has a significant positive influence on return on equity. It may be because with increase tax rate, the quantum of tax shield will increase for a given amount of interest on debt. This further results in increase in return to equity shareholders. Thus, we infer that capital structure has a significant impact on profitability. The study has been undertaken to evaluate the effect of capital structure on the profitability of Nifty 50 companies listed on National Stock Exchange of India from 2008 – 2017.

According to Mohamed M (2014) the researcher found that the total debt has a significant negative impact on ROE and ROA, while size in terms of sales has significantly negative effect only on ROE of the American firms. However, a short debt significantly has a positive influence on ROE. An insignificant either negative or positive relationship was observed between long term debt, debt to equity and size in terms of total assets and profitability. These results cannot be generalized because of a small size of sample. The research use A sample of 30 Energy American firms for a period of nine years from 2005 – 2013 was considered.

The empirical review in developing country

According to Babalola (2012) examined the relationship between Return on Equity (ROE) and the capital structure of a sample of 10 Nigerian firms from year 2000 to 2009, and observed that a strong curvilinear relationship exist between ROE and the debt-to-asset ratio. Their findings which is consistent with the trade-off theory shows that at a reasonable parameter values, the financial distress cost burn by debt do, in fact provide a first-order counterbalance to the tax benefit of debt and that firm's performance is a quadratic function of debt ratio (see Lei, A. C. H. and Song, Z. (2013), Yong Tan and Christos Floros (2013). Using Nigeria data, Ogbulu and Emeni (2012) examined the impact of capital structure on a firm's value; they observed that in an emerging economy like Nigeria, equity capital as a component of capital structure is irrelevant to the value of the firm.

Many empirical studies have been made around the globe to analyze the relationship between capital structure and firm's profitability. In Jordan, Zeitun and Tian (2007) investigated the effect which capital structure has on corporate performance and their result showed that a firm's total debt ratio had significant negative impact on the firm's performance measures, in both the accounting and market's measures. Their results further indicated that variable firm's growth and firm's size have a significant positive influence on the firm's profitability, while assets tangibility negatively related with firm's performance in their study. Kyereboah-Coleman (2007) confirmed that a positive relationship between total debt ratio and profitability. Similarly, Abor (2005) also explained that there is a significant positive relationship between short term debt and return on equity, and it suggests that profitable firms use more short-term debt to finance their operation. However, the same study showed a negative relationship between long-term debt and ROE, there was a significant positive relationship between total debt ratio and ROE.

In Brazilian, Mesquita and Lara (2003), the study revealed a negative relationship between the profitability variable and long-term debt ratio and they conclude that the larger the debt the lower the profitability. However, short-term debt presented a positive relation with profitability. Similarly, Obert and Olawale (2010) made the similar study and found that there was insignificant relationship between debt ratio and profitability of the firms, and they recommended that the selection of debt as a source of capital finance should be done in line with the costs and benefits associated with the use of debt. Zerah, 2011; Adekunle and Sunday, 2010;

Zeitun and Tian, 2007Abu-Rud, 2012; and Raheman et al, 2007 were also tested the effect of capital structure on firms' profitability.

Muhammad, Shah & Islam (2014) examined the effect of capital structure on firms listed at cement sector of Karachi Stock Exchange in Pakistan for a period of five years starting 2009 to 2013. The findings the study showed the debt to equity has positive relation with gross profit margin (GPM) and net profit margin (NPM) whereas negative relation with return on assets (ROA) and return on equity (ROE). It also revealed that negative relation between debt to asset ratio, GPM, NPM, ROA and ROE exits. Thus, the study concluded that an optimal level of capital structure shall be developed in order to achieve the efficient levels targeted by business.

The study specifically found that short-term debt (STD) has no significance positive effect on return on equity (ROE) while Long-term debt (LTD) has positive relation and significant effect on ROE. Foyeke, Olusola and Aderemi (2016), researched on financial structure and the profitability of manufacturing companies in Nigeria. This study employed the use of secondary data. The spearman's rank correlation and regression techniques were used for analysis, using the stats package for a sample of 25 manufacturing companies quoted on the Nigerian stock exchange for the period 2008-2012. The study showed that equity has a significant positive relationship with the profitability of manufacturing companies in Nigeria. The study recommended that managers should improve more facilities on equity capital and policymakers should encourage manufacturing companies to reduce the cost of debt. Siddik, Kabiraj and Joghee (2017) investigated the impacts of capital structure on performance of banks in a developing economy: evidence from Bangladesh. Using panel data of 22 banks for the period of 2005–2014, the study empirically established that capital structure inversely affects bank performance. The findings of this empirical study are of greater significance for the developing countries like Nigeria because it calls for the concentration of the bank management and the policy makers to pursue the policies that reduce reliance on debt to achieve the optimal level of capital structure. The results of this study are also analyzed in the light of earlier studies.

Khaled and Hazem (2015) on their study investigated that the determinants of profitability for industrial firms in Oman. By using a sample of 17 industrial companies listed on Muscat securities market covering the period from 2006 till 2013.Applied the panel ordinary least

squares model the result reveal a positive and statistical significant relationship between profitability, firm size, growth, fixed assets and working capital. On the other hand, the average tax rate and the financial leverage variables show a negative relationship with profitability. However, this relationship is significant only for the financial leverage variable. They conclude on their study that large growing firms with efficiently managed assets improve revenue and ultimately enhance profitability.

Vătavu (2014) cited in Yodit (2017) in his research aimed to establish the determinants of financial performance in 126 Romanian companies listed on the Bucharest Stock Exchange, over a period of ten-years (2003- 2012). His analysis is based on cross sectional regressions. Return on assets is the performance proxy, while the variables expected to have a significant impact on profitability are debt, asset tangibility, size, liquidity, taxation, risk, inflation and crisis. Liquidity affects ROE positively and significant. His findings in regression result indicate that profitable companies operate with limited borrowings. Tangibility, business risk and the level of taxation have a negative impact on return on assets. Although earnings are sustained by significant sales turnover, performance is affected by high levels of liquidity. Periods of unstable economic conditions, reflected by high inflation rates and the current financial crisis, have a strong negative impact on corporate performance.

Solvency refers to a company's capacity to fulfill its long-term debt and other financial obligations. It is one of the indicators of a company's financial health, since it demonstrates the company's capacity to run operations in the near future. It defied the question of whether or not anything can be resolved, as well as the simplicity with which it can be addressed. Solvability, on the other hand, is the state of being solvent, or the ability to pay off all of one's debts. The researcher looked at the relationship between equity and total assets to discover how sensitive it was to the risk of financial distress (Hotchkiss et al.,2008). Because the degree of solvency ratio inside a corporation has an impact on its financial performance, this ratio has a link to the company's financial hardship. According to Abayneh's (2020) findings, there is a negative relationship between a company's solvency and its financial distress. T. Yohannes (2014), on the other hand, concludes that there is a positive relationship between a firm's solvency and its financial distress.

According to Rashid Naim (2018) found that when return on asset become dependent variable, debt to asset and return on asset are negatively related. Debt to equity has an insignificant negative impact on return on assets. When return on equity become dependent variable, the researcher found that the debt ratio has a negative insignificant impact on the return on equity. However, the debt to equity ratio has a positive significant impact on the return on equity. This paper used annual panel data for 20 non-financial firms listed at Pakistan Stock Exchange during 2009 to 2015. The panel econometric technique used to explore the effect of capital structure on firms' profitability is ordinary least squares (OLS).

Empirical literature in Ethiopia

According to Tariku Negash (2016) The study of the researcher investigate the effect of capital structure on firms' profitability with special emphasis on Ethiopian Large Private Manufacturing Firms using panel data. Out of the six explanatory variables, total debt ratio, growth, size and liquidity are found statically significant, while two variables tangibility and non-debt tax shield were founded statically insignificant.

According to Yodit Yirdu (2017) founds that the variable like size, managerial efficiency, leverage, capital intensity and inflation rate are stasticaly significant. The variable managerial efficiency significant positively the other variable are negatively significant. Liquidity and growth are not statically significant. The researcher use panel model.

Different Literatures found out that firms value has direct relationship with profitability of manufacturing companies examples of researchers supported the above idea are (Manu, *et al*., 2019) stated that profitability has a positive effect on firm's value. (Al-Najjar and Al-Najjar, 2017) reported that profitability is positively related to firm's value. (Kontesa, 2015) documented that there is a positive effect of profitability on firm's value.

Gap on Literature

Although the literature review soundly revealed that various studies have been conducted on the effects and determinants of profitability on different manufacturing sectors. The researcher has got an access to visit some areas of studies regarding the topic in the different countries. The research which has been done in Ethiopia are Yodit Yirgu in 2017 and Tariku Negasa in 2016

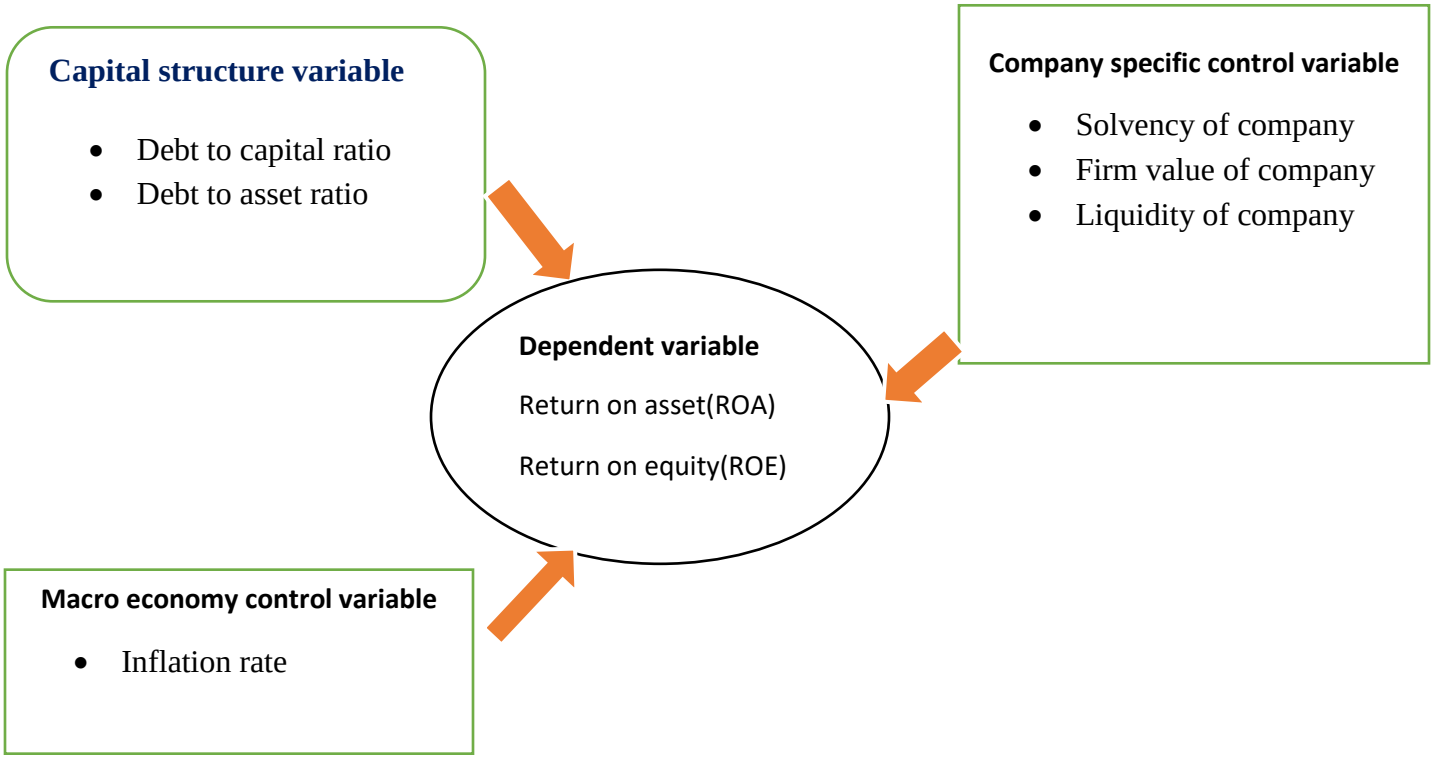
both research did not include the variable in their research the firm value. Not only this, the research which have done in other country like Nigeria, Indonesia, USA, India etc are not used this variable. The other variable which become significant in one research become in other research are not significant.

Therefore this research paper makes an attempt to get the significant effect of the profitability of listed large manufacturing companies Addis Ababa Ethiopia with a twelve years accounting period from 2010 to 2021.

2.3 Conceptual Framework of the study

The research conceptual framework was a diagrammatic representation of study variables and their perceived relationships. As discussed above the effect of capital structure on profitability of manufacturing company in Addis Ababa. This conceptual framework is designed by the researcher by using the conceptual framework done by Yodit Yirgu research paper as source to do this conceptual framework. The study used both ROA and ROE as dependent variables regarding the independent variable of capital structure are the ratio of Debt to equity and the ratio of Debt to total asset and the control variables are solvency, firm value liquidity and inflation.

Figure 1:- Conceptual framework



Source:- Adopted from Yodit Yirgu(2017)

Chapter three

3. Methodology of the research

3.1 INTRODUCTION

Research methodology is the procedures by which researchers go about their work of describing, explaining and predicting phenomena (Rajasekar et al. 2013). Under this section the researcher see source and method of data collection, target population and sampling frame, sampling techniques and sample size, method of data analysis, variable definition and model specification.

3.2 Research approach

As described in (Creswell, 2009) in terms of research study there are three familiar types of research approaches on business and social science researches namely: quantitative, qualitative and mixed research approaches.

Quantitative study designs are specific, well structured, have been tested for their validity and reliability, and can be explicitly defined and recognized. Moreover, in quantitative research the measurement and classification requirements of the information that is gathered demand that study designs are more structured, rigid, fixed and predetermined in their use to ensure accuracy in measurement and classification. Quantitative study designs have more clarity and distinction between designs and methods of data collection (Kumar, 2011).

Therefore, taking the research problem and objective as stated in the previous sections as well as the quantitative nature of the financial data collected through document survey along with the philosophy of the different research approaches, quantitative research approach is preferred and appropriate for this study.

3.3 Research Design

Research design explain how information gathered for an assessment or evaluation that includes identifying the data gathering method(s), the instruments to be used, how the instruments would be administered and how the information would be organized and analyzed (Assumptah & Muhari, 2017).

A research design is a plan, structure and strategy of investigation so conceived as to obtain answers to research questions or problems. The plan is the complete scheme or program of the research. It includes an outline of what the investigator will do from writing the hypotheses and their operational implications to the final analysis of data (Kumar, 2011).

As explained by Kothari, (2004) explanatory research design examines the cause and effect relationships between dependent and independent variables. Therefore, since this study would have designed to examine the cause and effect relationship between capital structure and profitability of Ethiopian manufacturing company by using profitability as a dependent and capital structure proxies as an independent variable, it is an explanatory research design.

3.4 DATA TYPE, SOURCE AND METHOD OF COLLECTION

3.3.1 Data type

The study use secondary data. As per Zikmund et al. (2009) secondary data is essential when primary data can‘t be obtained and they are quickly available. Selecting appropriate and acceptable data. Data’s are collected from the selected industry level data from 2010 up to 2021. The time period selected is based on the reason that is providing recent time observation.

3.4.2Data source and method of collection

A convenience sampling method would have been collected the data from all manufacturing company which has organized data and which has been the age of 12 years. Target samples are the manufacturing company that has twelve years’ data.

3.5Target of population

The target population of this study would include manufacturing companies operating in Addis Ababa considered under large tax payer category. All manufacturing companies are appropriate for the study since they are operating under the strict government regulations, making their financial and accounting disclosures largely reliable. Currently, there are two hundred four (204) manufacturing companies operating in Addis Ababa under the large tax payer’s office(ERCA customer service, 2022). The researcher used those large tax payers identified by Ethiopian Revenues and Customs Authority located in adds Ababa Ethiopia.

3.6 Sample size and sampling design

This study used sample of 17 manufacturing company from the total population of 204 manufacturing companies located in Addis Ababa categorized under large tax payers office. To be included in the research analysis, the firms had to have available balance sheets and income statement for at twelve consecutive years (2010 to 2021), to allow the researcher obtain sufficient data for calculating the representative from each firm. The researcher was selected the sample data by taking into account the research needs and the compatibility of data in manufacturing company, with long operating period can have sufficient data was represent the population. Therefore, out of the 204 companies with purposive sampling technique the researcher selected 17 manufacturing companies as sample size. Since the data obtained from ERCA's MIS department is a softcopy with coded companies' information. The companies were purposively selected based on the availability of data since 2010G.C. And excluding those manufacturing share company establish after 2010G.C because the researcher needs annual report and financial statement of 12 years. Therefore, two hundred four (12*17) observations were used to empirically investigate the effect of capital structure on profitability of manufacturing companies in Addis Ababa, Ethiopia.

3.7 Source of Data, Method of Data Collection and Analysis

They are two types of the data. Those are Primary data and secondary data. To achieve the purpose of the study, the researcher use secondary data which would be obtained from companies annual financial reports in ERCA and the macro variables are collected from annual report of NBE. The criterion for manufacturing company to be included in the study required companies to have a twelve year data covered a period from 2010 to 2021 inclusive, which have been collected through detail document review. The 2022 years data did not have audited financial and balance sheet report.

3.8 Econometric Model specification

The multiple linear regression analysis has been used to explain the effect whether the group of six variables together predicts the effect of capital structure on profitability Addis Ababa. ROA and ROE are the dependent variables, i is a symbol representative of the cross-section and represents the time. The following model of the linear regression has been used:

$$lnROA_{it} = \beta_0 + \beta_1 lnDER_{it} + \beta_2 lnDAR_{it} + \beta_3 lnSOL_{it} + \beta_4 lnFV_{it} + \beta_5 lnLQ_{it} + \beta_6 lnINF_{it} + \mu_{it}$$

$$lnROE_{it} = \beta_0 + \beta_1 lnDER_{it} + \beta_2 lnDAR_{it} + \beta_3 lnSOL_{it} + \beta_4 lnFV_{it} + \beta_5 lnLQ_{it} + \beta_6 lnINF_{it} + \mu_{it}$$

Where

"ROA_{it}": return on Asset measure for company cross section "i" in time "t". It is measured by the ratio of total profit over total assets.

"β_0": - Y-intercept.

"β_i": Coefficient of variable where "i" ranges from 1 to .

"SOL_{it}" Solvency of company "i" for period "t".

"FV_{it}" Firm value of company "i" for period "t".

"LQ_{it}" Liquidity of company "i" for period "t".

"DER_{it}" Debt to equity ratio of company "i" for period "t".

"DAR_{it}" Debt to capital ratio of company "i" for period "t".

"INF_{it}" Inflation rate of company "i" for period "t".

"μ" Error term

3.9 DESCRIPTION AND MEASUREMENT OF VARIABLES

Dependent variable

Profitability:- In manufacturing company, the commonest measures of profitability are Return on Equity (ROE), which measures the returns produced for the owners, and Return on Assets (ROA), which reflects that organization's ability to use its assets productively.

$$ROE = \frac{\text{Net income}}{\text{Share holder equity}}$$

$$ROA = \frac{\text{Net income}}{\text{Total assets}}$$

Independent variables of capital structure

Leverage

Leverage is the amount of debt a company has in its mix of debt and equity (its capital structure). A company with more debt than average for its industry is said to be highly leveraged. Leverage is not necessarily bad.

Financial leverage results from using borrowed capital as a funding source when investing to expand the firm's asset base and generate returns on risk capital. Leverage is an investment strategy of using borrowed money specifically, the use of various financial instruments or borrowed capital to increase the potential return of an investment. Leverage can also refer to the amount of debt a firm uses to finance assets. Among three leverage ratio the following two will be use:-

The first ratio debt to asset ratio is

$$DAR = \frac{Debt}{Asset}$$

The second ratio debt to capital is

$$DER = \frac{Debt}{Equity}$$

H_1 : Debt to equity ratio of company (DER_{it}) has negative and significant effect on profitability

H_2: Debt to asset ratio of company (DAR_{it}) has negative and significant effect on profitability.

Control variable

Solvency

A solvency ratio is a performance metric that helps us examine a company's financial health. In particular, it enables us to determine whether the company can meet its financial obligations in the long term.

The metric is very useful to lenders, potential investors, suppliers, and any other entity that would like to do business with a particular company. It usually compares the entity's profitability with its obligations to determine whether it is financially sound. In that regard, a higher or strong solvency ratio is preferred, as it is an indicator of financial strength. On the other hand, a low ratio exposes potential financial hurdles in the future. If you examine keenly, you will notice that the numerator comprises the entity's current cash flow, while the denominator is made up of its liabilities. Thus, it is safe to conclude that the solvency ratio determines whether a company's cash flow is adequate to pay its total liabilities.(CFI,2023. The main formula for calculating the solvency ratio is as follows:

$$solvency\ ratio = \frac{Net\ Income + Depreciation}{All\ liabilities}$$

H_3: Solvency ratio of company (SOL_{it}) has positive and significant effect on profitability.

Firms Value (Enterprise Value):- measures a company's total value, often used as a more comprehensive alternative to equity market capitalization. Enterprise value includes in its calculation the market capitalization of a company but also short-term and long-term debt and any cash on the company's balance sheet.The enterprise value is calculated by combining a company's debt and equity and then subtracting the amount of cash not used to fund business operations.

Firm Value = Debt + Equity - Cash

H_4: Firm value of company (FV_{it}) has positive and significant effect on profitability

Liquidity:- The liquidity and profitability of a company are directly related to the working capital. When a company maintains high temporary working capital in current assets, it is known to be more liquid. The companies that maintain a lower level of working capital are known as less liquid. Companies that maintain higher liquidity and considered to be at lower risk. They are able to meet the needs of the company and their reservoir of current assets lets them have the freedom to stay solvent. However, more liquid companies have lower profitability because their funds are tied up in operations and these funds cannot be used for the production and expansion of the company(Probir, 2022).

(LQ): Liquidity Ratio measures the firm's ability to use its current assets to retire its liabilities.

$$\text{Liquidity Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

H_5 : Liquidity of company(LQ_{it}) has negative and significant effect on profitability

Inflation rates (INF): Inflation measures how much more expensive a set of goods and services has become over a certain period, usually a year. It may be one of the most familiar words in economics. Inflation has plunged countries into long periods of instability. Central bankers often aspire to be known as "inflation hawks."

H_6: Inflation rate of company (INF_{it}) has positive and significant effect on profitability.

Variables and expected sign

Expected sign will statistical technique which shows the relationship between two variables. The positive expected sign means that one variable has positive influence on the dependent variable and negative expected sign means one variable would have a negative influence on the dependent variable.

Table 1:- Summary of explanatory/ independent variables and their expected effect on the dependent variable

Variable Nature	No	Variable	Measurement	Symbol	Expected sign
Dependent variable	1	Dependent variable			
	1.1	Return on Assets	The ratio of Net income to total asset	ROA	
	1.2	Return on Equity	The ratio of Net income to Equity	ROE	
Company specific	2	Independent variable			
		Debt to equity ratio	Debt / Capital	DER	-
		Debt to Asset ratio	Debt/Total asset	DAR	-
		Company specific Control variable			
	2.1	Solvency	$\frac{Net\ Income+Depreciation}{All\ liabilities}$	SOL	+
	2.2	Firm value	Debt + Equity - Cash	FV	+
	2.3	Liquidity	Current Assets / Current Liabilities	LQ	-
Macro variable	3	Macro control variable			
	3.1	Inflation	Annual inflation	INF	+

CHAPTER FOUR

4. DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

This chapter present in detail the research objective and to test research hypotheses. The collected data are presented and analyzed as objective and methodology. Initially analyzed the descriptive statistics of the dependent and independent variables and then followed by correlation analysis. Next presents the test for the classical linear regression model/CLRM and finally followed by present the results of the regression analysis.

4.2 Descriptive Statistics

The descriptive statistics of both dependent and all independent variables are presented as follows. This paper has two dependent variables. They are Return on asset(ROA) and Return on equity(ROE) and the independent variables are Solvency, Firm value, Liquidity, Debt to equity ratio, Debt to asset ratio and inflation. The descriptive statistics explain in terms of central tendency mean and on measure of dispersion like standard deviation, range maximum and minimum observation value and also measure of normality like kurtosis(measure the degree of sharpness) and skewness(measure degree of symmetry) as shown below in table 2 below.

Mean is explained as the average value of the data. Similarly, maximum and minimum observation value, standard deviation, skewnes and kurtosis result of explanatory variables are described. The mean value of ROA and ROE are-1.475 and 0.736 respectively for the year from 2010-2021 of 17 manufacturing industry in Addis Ababa, Ethiopia. The maximum value of ROA and ROE is 3.367 and 3.919 respectively and the minimum value Of ROA and ROE -8.447 and -6.341 respectively. Standard deviation measures how far observations from the average value. This data standard deviation of the sample data ROA and ROE are 1.354 and 1.355 far from the mean of the data as shown on the table. This result of high standard deviation shows the variety of ROA and ROE from the mean. Variation are similar for both variable as shown.

When we come to the skewness, it measures the degree of asymmetry of the series. Both ROA and ROE are negatively skewed. The negative result of skewness is normally happen because the

mean of the data is less than the median as shown in table 2 below. Similarly FV and DER are positively skewed and SOL,LQ,DAR and inflation are negatively skewed. In the kurtosis side, Kurtosis measures the peachiness or flatness of the distribution of the series. The result of kurtosis the measure of leptokurtic(Positive kurtosis) have ROA, ROE, LQ, DER, INF and DAR value are greater than 3 and the kurtosis result measure of platykurtic(Negative kurtosis) are SOL and FV result are below 3. The measure of normality is measured by kurtosis and skewness. The different level measure of Kurtosis are Mesokurtic, Leptokurtic and Pletykurtic. In eview9 for mesokurtic(normal distribution) equal to the value 3, for leptokurtic(Positive kurtosis) greater than 3 and for platykurtic(Negative kurtosis) less than 3.

Table 2:- Descriptive statics

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
LNROE	-0.736	-0.617	3.913	-6.341	1.355	-0.576	7.827
LNROA	-1.475	-1.394	3.367	-8.449	1.354	-1.463	13.679
LNSOL	-1.341	-1.302	2.152	-5.107	1.297	-0.267	2.902
LNFV	19.741	19.831	23.517	15.452	1.512	0.052	2.861
LNLQ	-1.088	-1.004	5.449	-8.280	2.620	-0.208	3.897
LNDAR	-0.878	-0.765	1.372	-3.837	0.744	-0.490	5.457
LNDER	-0.139	-0.138	5.423	-3.594	1.246	0.838	6.453
LNINF	2.472	2.603	3.529	1.030	0.615	-0.654	3.400

Source: Researcher's computation with Eivew software, 2023

4.3 The Diagnostic Tests

Every estimator of the model should have to meet the Ordinary Least Squares (OLS) assumptions before the estimation carried out. If the estimators of the model satisfy the OLS assumption, it is possible to say the estimators are blue (best linear unbiased estimator) (Brooks, 2008). The econometric estimation technique that used in this study is ordinary least square (OLS). The diagnostic test in this research is described as follows:-

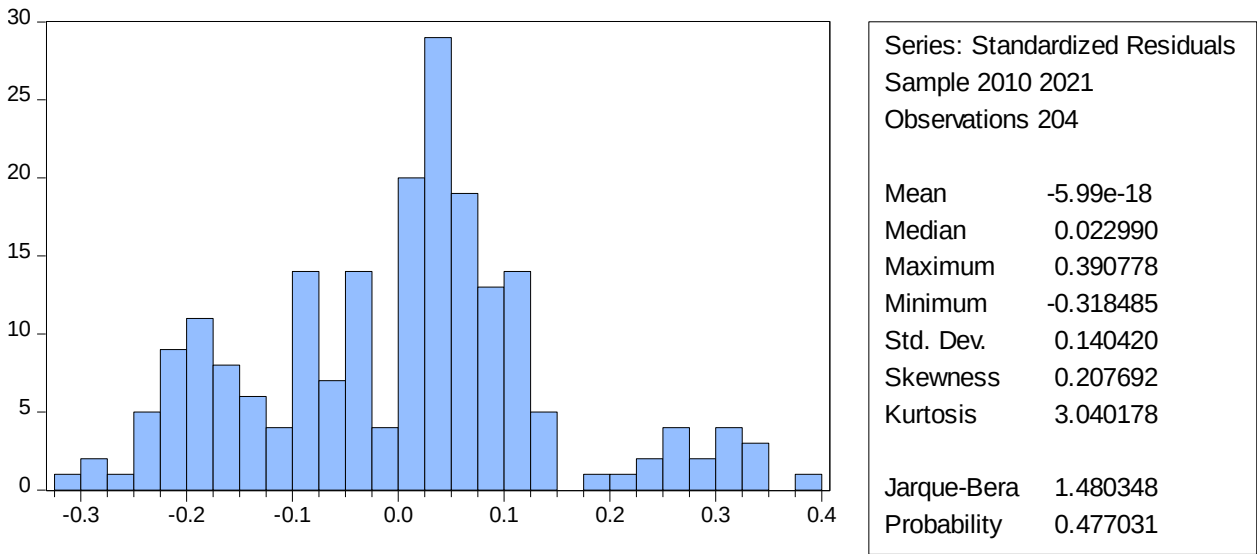
4.3.1 The Normality Test

A normal distribution is not skew and defined to have a coefficient of kurtosis 3. Jarque-Bera formalizes this by testing the residuals for normality and testing whether the coefficient of skewness and kurtosis are zero and three respectively. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how far the tails of the

distribution are. The Jarque-Bera probability statistics /P-value/ is also expected not to be significant even at 10% significant level (Brooks, 2008). The study develops the following hypothesis to check the normality: Ho: The residuals are normally distributed H1: The residuals are not normally distributed

As shown in the below Histogram, the value of skewnes and kurtosis is 0.207612 and 3.040178 respectively and the Jarque-Bera statistics was not significant even at 10% level of significance as per the P-values shown in the histogram (i.e. 0.477031). Hence, the null hypothesis of normally distributed is failed to reject at 5 percent of significant level. This implying that there is no significant evidence for the presence of not normally distributed. The Jarque Bera P-value of the model also supports the presence of normally distribution of the residuals. Therefore, we could conclude that the residuals are asymptotically normal in this study.

Figure 2:- Normality test result



Source: Researcher's computation with Eview9, 2023

4.3.2 The Multicollinearity test

Multicollinearity in the research refers to a linear relationship between explanatory variables, which may cause the regression model, biased (Gujarati, 2004). Most of the time, it is common to test if there is Multicollinearity among explanatory variables before going into estimation and interpretation of the model. Most econometric literatures reveal that the presence of

Multicollinearity results in inflated standard errors which make inferences from estimation highly problematic (Gujarati, 2004). If an explanatory variable is an exact linear combination of the other explanatory variable, then we say the model suffers from perfect co linearity and it cannot be estimate by OLS (Brooks 2008).

In the multicollinearity, perfect problem will usually be observed only when the same explanatory variable is carelessly used twice in a regression. This assumption does allow the independent variables to be correlated but they cannot be perfectly correlated. How much correlation causes multicollinearity however, is not clearly defined. While Hair et al (2006) argue that correlation coefficient below 0.9 may not cause serious multicollinearity problem. Therefore, in this study correlation matrix for six of the independent variables shown below in the table 3 had been estimated. The results in the following correlation matrix show that the highest correlation is 0.7678 which is between Debt to asset ratio and Debt to equity ratio.

As presented in the table 3 and table 4, the multicollinearity issue of explanatory variables of this study was checked by correlation coefficient and Variance Inflation Factor (VIF). Multicollinearity problem exists if the correlation coefficients between two explanatory variables are more than 0.9 as explained above and variance inflation factor (VIF) of the predictor variable is greater than 10 (Assfaw, 2019).

Table 3:- multicolinearity

	lnSOL	LnFV	LnLQ	lnDAR	lnDER	LnINF
LnSOL	1					
LnFV	-0.2062	1				
LnLQ	0.139	-0.3651	1			
LnDAR	-0.4117	0.0991	-0.1546	1		
LnDER	-0.4769	0.1353	-0.1431	0.7678	1	
LnINF	0.0423	0.1347	-0.0771	-0.0732	-0.0463	1

Table 4 Variance Inflation Factor (VIF)

Variable	VIF	1/VIF
LnDER	2.64	0.378474
LnDAR	2.48	0.403849
LnSOL	1.34	0.745197
LnFV	1.21	0.827212
LnLQ	1.18	0.850588
LnINF	1.03	0.970727
Mean VIF	1.65	

Source: Financial statement of manufacturing company and own computation through STATA (2023)

4.3.3 The Heteroscedasticity Test

Heteroscedasticity occur when the error terms do not have a constant variance (Brooks,2008),. If Heteroscedasticity occur, the estimators of the ordinary least square method are inefficient and hypothesis testing is no longer reliable or valid, as it will underestimate the variances and standard errors. There are several tests to detect the Heteroscedasticity problem, which are Park Test, Glesjer test, Breusch-Pagan-Goldfrey test, White's test, Durbin-Watson stat and Autoregressive Conditional Heteroscedasticity (ARCH) test. In this study, the Durbin-Watson stat test is employed to test for the presence of Heteroscedasticity or not.

In linear regression analysis, an estimator of the asymptotic covariance matrix of the OLS estimator is said to be heteroscedasticity-robust if it converges asymptotically to the true value even when the variance of the errors of the regression is not constant. "Robust" standard errors is a technique to obtain unbiased standard errors of OLS coefficient under heteroscedasticity. Rem ember, the presence of heteroscedasticity violates the Gauss Markov assumptions that are necessary to render OLS the best linear unbiased estimator (BLUE). You can find the consequences of heteroscedasticity on the OLS estimator here. Possible solutions to handle heteroscedasticity can be found here. "Robust" standard errors have many labels that essentially refer all the same thing. Namely, standard errors that are computed with the sandwich estimator of variance. Typical terms for "robust" standard errors include White's Standard Errors, Huber–

White standard errors, Eicker–White or even Eicker–Huber–White standard errors(Economic theory Blog, 2022).

As shown in the table 5 Evidence showed that the presence of heteroskedasticity in the ON profitability, with significant p-values less than one percent (1%). Table 5 presents a summary of the test for heteroskedasticity. The researcher make the regression result Robust to obtain unbiased standard errors of OLS

Table 5:- Heteroskedasticity Tests

Test		**Manufacturing company**	
		For model one(ROE)	For model two(ROA)
Hetroscedasticity	Wald chi square	368.54	80.77
	P value	0.00	0.00

Autocorrelation

Serial correlation tests apply to macro panels with long time series (over 20-30 years). Not a problem in micro panels (with very few years). Serial correlation causes the standard errors of the coefficients to be smaller than they actually are and higher R-squared (Oscar, 2007).

The test of Durbin Watson statistic is a test for autocorrelation in the residuals from a statistical model or regression analysis. The Durbin-Watson statistic always have a value ranging between 0 and 4. A value of 2.0 indicates there is no autocorrelation detected in the sample. Values from 0 to less than 2 point to positive autocorrelation and values from 2 to 4 means negative autocorrelation (Will Kenton, 2021). Hence, as explained by eview regression model in annex I, the value of Durbin-Watson statistics model result ROA and ROE are 1.068and 1.041 which are more or less far from 2.0 and it has clearly not totally free from autocorrelation.

Table 6:- Test of autocorolation

Test		**Model of ROE**	**Model of ROA**
Autocorrelation	Durbin Watson test	1.041	1.068
	Border	2	2

4.4 Correlation Analysis

Correlation analysis, also known as bivariate, is primarily concerned with finding out whether a relationship exists between variables and then determining the magnitude and action of that relationship (Adobe,2021). Correlation is a way to index the degree to which two or more variables are associated with or related to each other. The sample size is the key element to determine whether or not the correlation coefficient is different from zero/statistically significant. The values of the correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that the two variables are perfectly related in a positive linear sense; while a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense. A correlation coefficient of 0, on the other hand indicates that there is no linear relationship between two variables (Brooks, 2008). The correlation result supported by Mayers et.al, (2006) As a sample size approaches to 100, the correlation coefficient of about or above 0.20 is significant at 5% level of significance.

Table 7:- correlation matrix (with dependent variable)after ln transformation

	ROE	ROA	SOL	FV	INF	LQ	DAR	DER
ROE	1.00	0.8139	0.2935	-0.1547	0.0226	0.0252	0.4602	0.4776
ROA	0.8139	1.00	0.5079	-0.2277	0.0206	0.0819	0.3037	-0.0204

Source: Own estimation of research data (2023)

According to ROE, the correlation result of ROA,SOL, DAR and DER are statistically significant and positive linear relationship with Return on equity(ROE). The remain variable inflation, liquidity and firm value have not significant relationship with ROE. Similarly with respect to Return on asset, the correlation result of ROE, SOL, DAR have statically significant and positive linear relationship with Return on asset(ROA) and FV has negative and statically significant relationship with ROA. The remain variable like INF, liquidity, and Debt to equity ratio(DER) have not significant relation with ROA.

4.5 Choosing Fixed Effect Vs Random Effect Models

In panel data analysis the most commonly estimated models are the fixed effects (FE) and random effects (RE) models. The crucial distinction between fixed and random effects is whether

the unobserved individual effect embodies elements that are correlated with the regresses in the model or not. Fixed Effects explore the relationship between predictor and outcome variables within an entity (country, person, company). Fixed effect models control for, or partial out, the effects of time invariant variables with time-invariant effects. When there is many variables that rise over time, and when one is interested in analysing the impact of variables over time FE models are essential to capture the effect of these variables (Maziya et al, 2005 cited in Mulugeta,2019)

This study uses a panel data model fixed effects models (FEM) and random effects models (REM) by using the rule of the model.

The effect of capital structure on profitability (ROE and ROA) in Ethiopia is specified and the model is formulated in chapter three. The organized data's are estimated based on the panel model, which includes cross sectional and time series dimensions for 17 manufacturing company of Addis Ababa, Ethiopia over the period 2010 to 2021. Fixed effects and random effects models are commonly used models for the panel data. In order to choose fixed or random effect model a formal test so called hausman test has used. The null hypothesis states as: Ho: Random effect model is appropriate and H_1:Random effect model is not appropriate or FE model is appropriate. The decision rule is when the prob>chi2 or the P- value is greater than the given level of significant (usually 5%), then we fail to reject the null hypothesis (Ho), thus random effect model is appropriate. On the other hand, if the P- value is less than a given level of significant or 5% we reject the null or the fixed effect model is appropriate (Woodridge, 2006).

The Hausman Test

Ho: Random effect model is appropriate. If P-value>5%, we fail to reject the null

Ha: Fixed effect model is appropriate. If P-value<5%, we reject the null.

When ROE is a dependant variable, the Hausman test result shows the p value 0.594 is greater than 0.05 which indicate random effect is appropriate for this model.

Table 8:- Hausman test result for the dependent variable ROE

	fixed	random	Difference	S.E.
lnSOL	.6280559	.6410814	-.0130255	.0101109
lnFV	-.2283727	-.1916356	-.0367371	.0315495
lnLQ	-.06769	-.0547155	-.0129745	.0043442
lnDAR	.2644233	.3266334	-.0622101	.0265899
lnDER	.6606246	.6540218	.0066028	.0042364
lnINF	.0352765	.0295624	.0057141	.

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 12.12
Prob>chi2 = 0.0594

When ROA is a dependant variable, the Hausman test result shows the p value 0.0758 is greater than 0.05 which indicate random effect also appropriate for this model.

	fixed	random	Difference	S.E.
lnSOL	.6257345	.637495	-.0117604	.0100212
lnFV	-.2296867	-.1944838	-.035203	.0305747
lnLQ	-.0665687	-.0539959	-.0125729	.0044521
lnDAR	1.26131	1.317064	-.0557541	.0258935
lnDER	-.3428192	-.347914	.0050948	.0061365
lnINF	.0375053	.032808	.0046973	.0027982

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 11.44
Prob>chi2 = 0.0758

Both model Hausman test result 0.0593 and 0.0758 as shown in the hausman test table above which is greater than 5%. Hence, the null hypothesis of the random effect model did not reject at 5 percent of significant level. Hence random effect model is more appropriate.

4.6 DISCUSSION OF REGRESSION RESULTS

This section presents the regression result of Random effect model that make to examine the effect of capital structure on the profitability(ROE and ROA) of manufacturing industry in Addis Ababa, Ethiopia. Accordingly, the regression result is done by Eview 9 and stata 13 software. As

stated earlier in model selection Random effect regression model is an appropriate model in this study. Thus, in this study the model uses to examine the effect of capital structure on profitability. The Model equation is:-

$$lnROA_{it} = 4.18 + 0.63lnSOL_{it} - 0.19.4lnFV_{it} - 0.05lnLQ_{it} - 0.35lnDER_{it} + 1.32lnDAR_{it} + 0.03lnINF_{it}$$

$$ROE_{it} = 4.15 + 0.64lnSOL_{it} - 0.18.9lnFV_{it} - 0.06lnLQ_{it} + 0.65lnDER_{it} + 0.34lnDAR_{it} + 0.02lnINF_{it}$$

Where: "β_0": - Y-intercept. "β_i": Coefficient of variable, "ROA_{it}": Return on asset, "ROE_{it}": Return on equity "SOL_{it}: Solvency, "FV_{it}": Firm Value, "LQ_{it}": Liquidity, "DCR_{it}" Debt to capital ratio, "DAR_{it}" Debt to Asset ratio, "INF_{it}": Inflation rate and "μ" Error term.

The coefficients of explanatory variable estimated by the use of ordinary least square (OLS) technique, the regression result in Table demonstrates both coefficients of explanatory variables and corresponding p-values.

Table 9:- Results of panel regression analysis of profitability(ROA and ROE)

	Random Effect of ROE				Random effect of ROA			
	cofie	Std. Err.	Z	P>z	Coef.	Std. Err.	z	P>z
LNSOL	0.647968	0.04898	13.23	0	0.637495	0.048543	13.13	0
LNFV	-0.1893	0.055139	-3.43	0.001	-0.19448	0.054999	-3.54	0
LNLQ	-0.05942	0.022486	-2.64	0.008	-0.054	0.022284	-2.42	0.015
LNDAR	0.345105	0.11279	3.06	0.002	1.317064	0.111798	11.78	0
LNDER	0.656231	0.064568	10.16	0	-0.34791	0.063923	-5.44	0
LNINF	0.021188	0.077677	0.27	0.785	0.032808	0.076871	0.43	0.67
_cons	4.151879	1.047959	3.96	0	4.179801	1.045425	4	0

Source: Researcher's computation with Stata software, 2023. Notes: ROA = Return on assets; ROE = Return on equity; FV = firm value; LQ = Liquidity; DAR = Debt to asset ratio; DER = Debt to equity ratio; INF = Inflation. ***, **, * indicate significant at 1%, 5% and 10% significance level respectively.

As explained earlier, there were the problems with heteroscedasticity and autocorrelation. To alleviate these issues, clustered robust standard error estimations on the fixed effect model were functional. Then, the estimation results of the linear regression model on the effect of capital structure on profitability in manufacturing company in Ethiopia are presented in Table 11.

Summary result of cluster Robust Fixed effect model

	Random effect of ROE				Random Effect of ROA			
	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	z	P>z
LNSOL	0.647968	0.135898	4.77	0***	0.637495	0.137611	4.63	0***
LNFV	-0.1893	0.085789	-2.21	0.027**	-0.19448	0.086079	-2.26	0.024**
LNLQ	-0.05942	0.018803	-3.16	0.002***	-0.054	0.017643	-3.06	0.002***
LNDAR	0.345105	0.243033	1.42	0.156	1.317064	0.241846	5.45	0***
LNDER	0.656231	0.069889	9.39	0***	-0.34791	0.070441	-4.94	0***
LNINF	0.021188	0.039743	0.53	0.594	0.032808	0.045753	0.72	0.473
_cons	4.151879	1.997568	2.08	0.038	4.179801	2.020297	2.07	0.039

Source: Researcher's computation with Stata software, 2023. Notes: ROA = Return on assets; ROE = Return on equity; FV = Verm value; LQ = Liquidity; DAR = Debt to asset ratio; DER = Debt to equity ratio; INF = Inflation. ***, **, * indicate significant at 1%, 5% and 10% significance level respectively.

Thus, to analyzing the above regression result, the researcher has been used the developed model.

As shown in Annex I, R-squared coefficient of ROE is 0.6607 revealed that, 66% of variation in industry company in Addis Ababa explained by the selected explanatory variables such as: SOL_{it} , FV_{it}, LQ_{it}, DER_{it}, DAR_{it}, and INF_{it}. The R-square result makes sense because there are other factors that are not included in the model but could help in explaining manufacturing company in Addis Ababa, Ethiopia account for the remaining amount 34%. As shown in Annex II, R-squared coefficient of ROA is 0.627447 revealed that, 63% of variation in industry company in Addis Ababa explained by the selected explanatory variables as explained above. The R-square result affect by other factors that are not included in the model but could be explained in manufacturing company in Addis Ababa, Ethiopia account for the remaining amount 37%.

An adjusted R-squared value in the model, which takes into account the loss of degrees of freedom associated with adding extra variables inferred to see the explanatory powers of the models. In other words, the adjusted R-squared shows satisfactory levels, which mean that nearly 65.% of the volatilities in ROE(Return on equity), explained by the volatilities of independent variables included in the equation. Therefore, in Annex I, an adjusted R square having value of 0.650596 shows that 65% of dependent variable explained by the independent variables included in the model. The adjusted R-squared when ROA is the dependent variable nearly 61.61% of the volatilities in ROA(Return on asset), explained by the volatilities of independent variables included in the equation. Therefore, in Annex II, below an adjusted R square having value of 0.616101 shows that 61.6% of dependent variable explained by the independent variables included in the model.

Interpretation of F-Statistics

The F-statistics tests the fitness of the model and a recommended F-statistics should be greater than 5 for it to be considered fit. The regression in the model, F-statistic of ROE takes a value of 63.94 result which is greater than 5 hence the model is fit for estimation. Furthermore, F-statistics tests for the joint impact of all explanatory variables on the dependent variable (ROE). A corresponding p-value of zero attached to the test statistic shows that the null hypothesis that all of the slope parameters are jointly zero should be rejected even at 1 percent level of significance. This implies that explanatory variables can affect the level of Return on Equity (ROE).

The F-statistic when ROA become dependent variable, the value of F-statics is 55.29 which is greater than 5 hence the model is fit for estimation. Furthermore, F-statistics tests for the joint impact of all explanatory variables on the dependent variable ROA. A corresponding p-value of zero attached to the test statistic shows that the null hypothesis that all of the slope parameters are jointly zero should be rejected even at 1 percent level of significance. This implies that explanatory variables can affect the level of Return on asset (ROA).

Debt to Equity ratio and Manufacturing company profitability

The Debt to equity ratio of manufacturing company has a significant positive effect on the return on equity at less than 1% level of significance. The results of clustered robust random effect regression model indicate that an increase in a Debt to equity ratio by 100%, being other factors held constant, results in a 65.6% increase in return on equity position. This positive relationship also reflected in the study of other scholars (Reshid Naim,2018,Nasimi 2016, Kyereboah 2007 however contradict with Muhamed, Shar and Islam,2014,).

The Debt to equity ratio of manufacturing company has a significant negative effect on the return on asset at less than 1% level of significance. The results of clustered robust random effect regression model indicate that an increase in a Debt to equity ratio by 100%, being other factors held constant, results in a 34.8% decrease in return on asset position. This negative relationship also reflected in the study of other scholars (Muhamed, Shar and Islam,2014, Nasimi 2016).

Debt to Asset ratio and Manufacturing company profitability

Debt to asset ratio of manufacturing company was found to have a positive and significant impact on the return on asset at less than a 1% level of significance. The result of clustered robust random effect regression model indicates that a 100% increase in the Debt to asset ratio, being other factors held constant, had a 132% increment of return on asset. This positive relationship also reflected in the study of other scholars Kyereboah 2007 but contradict the reflected in the study of other scholars (Reshid Naim,2018, Tongkong, 2012).

Solvency and Manufacturing company profitability

The finding of the study, the solvency of manufacturing company has a significant positive effect on the return on equity at less than 1% level of significance. The results of clustered robust random effect regression model indicate that an increase in a solvency of manufacturing company by 100%, being other factors held constant, results in a 65% increase in Return on

equity. This positive relationship is also similar to the finding of the author Yohanes, (2014). Howevere the finding of Abayneh, (2020) contradict.

Similarly, the solvency of manufacturing company has a significant positive effect on the return on asset at less than 1% level of significance. The results of clustered robust random effect regression model indicate that an increase in a solvency of manufacturing company by 100%, being other factors held constant, results in a 64% increase in Return on asset. This positive relationship is also similar to the finding of the author Yohanes, (2014). Hence the finding of Abayneh, (2020) contradict.

Firm value and Manufacturing company profitability

The firm value of manufacturing company was adversely and significantly affecting the return on equity position of manufacturing company at less than 5% level of significance. The result of clustered robust random effect regression model shows, being other factors held constant, a 100% increase in firm value leads to 18.9% decrease in profitability level.

The firm value of manufacturing company was also adversely and significantly affecting the return on asset position of manufacturing company at less than 5% level of significance. The result of clustered robust random effect regression model shows, being other factors held constant, a 100% increase in firm value leads to 19.5% decrease in profitability level.

Liquidity and Manufacturing company profitability

Liquidity was found to have a negative and significant influence on the return on equity position of manufacturing company at less than a 1% level of significance. The estimation result of the model revealed that a 100% increase in liquidity of manufacturing company would have a 6% decreasing effect on return on equity level. This negative relationship is contradict to the finding of the author Vatavu, (2014).

Similarly Liquidity was found to have a negative and significant influence on the return on asset position of manufacturing company at less than a 1% level of significance. The estimation result of the model revealed that a 100% increase in liquidity of manufacturing company would have a 5.4% decreasing effect on return on asset level. This negative relationship is contradict to the finding of the author Vatavu, (2014).

Table 10;- The expected and actual sign of the study

No	Variable	Dependent variavle	Symbol	Expected sign	Actual sign	Result
1	Solvency	ROE	SOL	+	+	Significant
		ROA	SOL	+	+	Significant
2	Firm value	ROE	FV	+	-	Significant
		ROA	FV	+	-	Significant
3	Liquidity	ROE	LQ	-	-	Significant
		ROA	LQ	-	-	Significant
4	Debt to capital ratio	ROE	DER	-	+	Significant
		ROA	DER	-	-	Significant
5	Debt to Asset ratio	ROE	DAR	-	+	NOT Significant
		ROA	DAR	-	+	Significant
6	Inflation	ROE	INF	+	+	Not significant
		ROA	INF	+	+	Not significant

CHAPTER FIVE

5. Summary, Conclusion and Recommendation

5.1. Summary

The manufacturing industry specific factors solvency and Debt to equity ratio had a positive and statistically significant relationship with ROE (profitability). Firm value and liquidity has a negative and statically significant effect on ROE. When ROA is the dependent variable, solvency and Debt to asset ratio have positive and significant effect on ROA. Firm value, liquidity and Debt to equity ratio have negative and significant effect on ROA of manufacturing company in Addis Ababa, Ethiopia. The result is consistent with expectation of the result except firm value and leverage(Debt to equity and Debt to asset ratio). The unexpected result Debt to asset and Debt to equity ratio implies that in manufacturing company need more Debt ratio to raise their profitability. The theory of capital structure works for the efficiently used company that is inversely relationship between profitability and capital structure. The firm value negative relation result implies that idle money put without production. This result indicates fear of risk. The other external factor inflation has negative and insignificant effect on profitability and Debt to asset ratio has insignificant effect on ROE manufacturing company of Addis Ababa, Ethiopia.

5.2 Conclusion

The target of this research paper is to get the effect of capital structure on profitability of manufacturing companies in Addis Ababa, Ethiopia by using the dependent variable of profitability. The period considered to address the stated objectives has been from 2010 up to 2021. The population of this study was all the manufacturing company in Addis Ababa, Ethiopia currently licensed by the government of Ethiopia among 204 manufacturing company the researcher took seventeen companies that generates financial statement from 2010-2021. To see the effect of capital structure on profitability of manufacturing company use panel data regression analysis has been carried out. The data was drawn from ERCA the financial statements of sampled manufacturing company and the macroeconomic variables from National Bank of Ethiopia annual report from 2010-2021. The data was analyzed using descriptive analysis and multiple regression analysis.

The objective of this study was to find the effect of capital structure on profitability of manufacturing company in Addis Ababa, Ethiopia. This study examines the effect of manufacturing company specific and external factors of profitability. The coefficient of Debt to asset ratio has positive and statistically significant effect on return on asset(ROA). This indicates that the rise Debt to asset ratio raise the profitability. This result indicates that the manufacturing company use debt to raise their profitability. Therefore debt has positive relationship to raise profitability but contradict to theory of capital structure. The coefficient of Debt to equity ratio has positive and statistically significant effect on ROE. This result also indicates that rise of Debt to equity ratio raise profitability of manufacturing company of Addis Ababa, Ethiopia. But Debt to equity ratio has negative effect on return on asset is the expected effect.

The regression result of control variables shown that, the coefficient of the solvency is positive and statically significant effect on profitability. This implies that well-done of

solvency generate higher amounts of profitability of manufacturing company. Solvency Company would have higher profit by increasing net income of manufacturing company. Liquidity has significant and negative effect on profitability (ROE and ROA).

5.3 Recommendation of the study

The findings of the research have prompted the researcher to suggest the following policy recommendation

According to the finding of the study manufacturing company high solvency has advantage gaining high profitability. One reason for this situation is that the rise of net income reduces the liability of company. So, this recommended that the company should increase their solvency to improve profitability of manufacturing company.

The firm value of manufacturing company was adversely and significantly affecting the profitability. This result indicates all available capital (money) was not fully used. Unproductive income available in the industry. I suggest that that available resource fully utilized.

In addition to fully utilized of resource as administrative cost less than the profit in the manufacturing industry, the manufacturing company rise the ratio of debt to asset ratio can improve profitability.

Further research direction

Recommendation for further study: As this study identified only limited manufacturing industry specific and macroeconomic variables for a sample of seventeen manufacturing company of Addis Ababa, Ethiopia which have 12 years and above experience with data. This research also does two dependent and six independent variable only. The other variable like:- capital adequacy, short run debt, long run debt etc. are not included in this research. Therefore, there have to be further researches which include more manufacturing industry specific variables, macroeconomic variables and regulatory factors that affect the profitability of manufacturing industry in Addis Ababa, Ethiopian.

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Annex I

Output when ROE is dependent variable

Dependent Variable: LNROE
Method: Panel EGLS (Cross-section random effects)
Date: 05/19/23 Time: 13:41
Sample: 2010 2021
Periods included: 12
Cross-sections included: 17
Total panel (balanced) observations: 204
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNSOL	0.647967	0.048670	13.31343	0.0000
LNFV	-0.189304	0.054790	-3.455049	0.0007
LNLQ	-0.059415	0.022344	-2.659110	0.0085
LNDAR	0.345105	0.112077	3.079186	0.0024
LNDER	0.656231	0.064159	10.22816	0.0000
LNINF	0.021188	0.077186	0.274501	0.7840
C	4.151879	1.041331	3.987087	0.0001

Effects Specification	S.D.	Rho
Cross-section random	0.523680	0.3909
Idiosyncratic random	0.653734	0.6091

Weighted Statistics

R-squared	0.660729	Mean dependent var	-0.244366
Adjusted R-squared	0.650396	S.D. dependent var	1.112675
S.E. of regression	0.657895	Sum squared resid	85.26665
F-statistic	63.94293	Durbin-Watson stat	1.106614
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.616327	Mean dependent var	-0.720790
Sum squared resid	144.0948	Durbin-Watson stat	0.654828

Annex II

When ROA is dependent variable

Dependent Variable: LNROA
Method: Panel EGLS (Cross-section random effects)
Date: 05/19/23 Time: 13:44
Sample: 2010 2021
Periods included: 12
Cross-sections included: 17
Total panel (balanced) observations: 204
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNSOL	0.637495	0.048217	13.22126	0.0000
LNFV	-0.194484	0.054630	-3.560013	0.0005
LNLQ	-0.053996	0.022135	-2.439438	0.0156
LNDAR	1.317064	0.111048	11.86030	0.0000
LNDER	-0.347914	0.063494	-5.479492	0.0000
LNINF	0.032808	0.076356	0.429672	0.6679
C	4.179801	1.038415	4.025174	0.0001

Effects Specification		
	S.D.	Rho
Cross-section random	0.537891	0.4091
Idiosyncratic random	0.646460	0.5909

Weighted Statistics			
R-squared	0.627447	Mean dependent var	-0.484444
Adjusted R-squared	0.616101	S.D. dependent var	1.050401
S.E. of regression	0.650824	Sum squared resid	83.44373
F-statistic	55.29740	Durbin-Watson stat	1.068886
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.604478	Mean dependent var	-1.477978
Sum squared resid	145.9046	Durbin-Watson stat	0.611302

Annex III

Data of manufacturing company

Company	year	LNROE	LNSOL	LNFV	LNLQ	LNDAR	LNDER	LNINF	LNROA
Water	2010	-4.00677	-1.83241	21.8863	-1.679	-3.83721	-3.38936	1.029619	-4.45462
Water	2011	-2.24177	-1.90936	20.05903	-2.00549	-1.50223	-1.26808	2.895912	-2.47591
Water	2012	-1.24981	-1.97937	20.0944	-2.09399	-1.47382	-1.21474	3.529297	-1.5089
Water	2013	-1.07441	-1.8748	20.07166	-2.15985	-1.44871	-1.18099	2.60269	-1.34212
Water	2014	-0.9129	-3.49589	20.26983	-2.64245	-1.31414	-1.0012	2.091864	-1.22584
Water	2015	-0.73643	-3.6824	20.34167	-1.42923	-0.59013	0.217882	2.04122	-1.54444
Water	2016	-1.19086	-0.51443	20.02741	-0.6167	-0.47701	0.492262	2.272126	-2.16013
Water	2017	-0.71079	-2.97642	20.03174	-3.09308	-0.45336	0.555846	2.00148	-1.72
Water	2018	-0.24292	-2.94535	20.22307	-2.36651	-0.37778	0.778602	2.681022	-1.3993
Water	2019	0.43581	-3.18201	20.30387	-2.27545	-0.19591	1.53056	2.533697	-1.29066
Water	2020	0.43581	-3.18201	20.44364	-2.27545	-0.19591	1.53056	2.99072	-1.29066
Water	2021	0.43581	-3.18201	20.53895	-2.27545	-0.1006	1.62587	3.005683	-1.29066
Manufac	2010	-0.10984	-2.85424	16.57296	4.512947	-0.13745	1.963364	1.029619	-2.21065
Manufac	2011	-0.8752	-1.71545	17.06043	1.000499	-0.44692	0.180098	2.895912	-1.50221
Manufac	2012	-0.95833	-1.49953	17.18472	0.947639	-0.87151	-0.07601	3.529297	-1.75383
Manufac	2013	-0.45807	-1.39911	17.41895	1.089398	-0.54466	0.291355	2.60269	-1.29408
Manufac	2014	-1.02195	-0.36492	17.55702	-0.80762	-1.61303	-1.39079	2.091864	-1.2442
Manufac	2015	-2.53132	-1.09606	18.11211	-1.4393	-2.64207	-2.5682	2.04122	-2.6052
Manufac	2016	-1.71866	0.274936	18.43547	-1.28238	-2.67358	-2.60208	2.272126	-1.79016
Manufac	2017	-1.3688	0.285483	18.745	-0.16798	-2.17741	-2.05712	2.302585	-1.48909
Manufac	2018	-1.23214	0.958158	18.88586	1.378039	-2.69162	-2.62145	2.681022	-1.30232
Manufac	2019	-1.58131	0.152277	18.91207	-0.04331	-2.45966	-2.37033	2.533697	-1.67065
Manufac	2020	-1.58131	0.152277	19.05183	-0.04331	-2.45966	-2.37033	2.99072	-1.67065
Manufac	2021	-1.58131	0.152277	19.19159	-0.04331	-2.3199	-2.23056	3.005683	-1.67065
BREWERY Manuf.	2010	-0.0508	-0.31561	19.58096	-0.53054	-0.74368	-0.08718	1.029619	-0.7073
BREWERY Manuf.	2011	2.720875	-1.55116	20.27753	-1.38547	-0.12185	3.751614	2.895912	-1.15259
BREWERY Manuf.	2012	-1.12526	-1.97547	21.02797	-1.88976	-0.3106	-0.12384	3.135494	-1.31202
BREWERY Manuf.	2013	-2.05531	-2.91481	20.83464	-2.50695	-0.91604	-0.40505	2.60269	-2.5663
BREWERY Manuf.	2014	-0.71659	-1.48012	20.83464	-2.74013	-1.01701	-0.40505	2.091864	-1.32855
BREWERY Manuf.	2015	0.012583	-1.93498	20.86941	-4.6484	-0.33962	0.905313	2.04122	-1.23235
BREWERY Manuf.	2016	-0.38643	-1.07139	21.0231	-4.45467	-0.48999	0.458396	2.272126	-1.33481
BREWERY Manuf.	2017	1.232973	1.168705	19.09104	0.509126	-1.09238	-0.68379	2.00148	0.82438
BREWERY Manuf.	2018	0.111265	-1.51745	21.00436	-3.55044	-0.28412	1.112943	2.681022	-1.2858
BREWERY Manuf.	2019	-0.60004	-1.68558	21.45149	-4.02761	-0.31775	0.983429	2.533697	-1.90121

BREWERY Manuf.	2020	-0.60004	-1.68558	21.59126	-4.02761	-0.31775	0.983429	2.99072	-1.90121
BREWERY Manuf.	2021	-0.60004	-1.68558	21.68657	-4.02761	-0.22244	1.078739	3.005683	-1.90121
Foods	2010	-0.81025	-0.53097	18.11058	5.094316	-1.05727	-0.6301	1.029619	-1.23742
Foods	2011	-1.20554	-1.30712	18.15402	4.587801	-1.10645	-0.70488	2.895912	-1.60711
Foods	2012	-1.21592	-1.39312	18.32665	1.832925	-1.37123	-0.51146	3.529297	-2.07569
Foods	2013	-1.54448	-3.66748	18.38616	1.162886	-0.77019	0.771617	2.60269	-3.0863
Foods	2014	-1.70285	-5.10686	19.55534	1.007116	-0.20488	0.742292	2.091864	-2.65003
Foods	2015	1.725553	-1.79556	19.227	0.881622	-0.00441	5.422752	2.04122	-3.7016
Foods	2016	1.725553	-2.59693	19.07989	0.319056	0.078016	2.589591	2.272126	-1.89341
Foods	2017	0.067666	-1.98926	18.11685	0.427672	0.392673	-0.7719	2.00148	1.232236
Foods	2018	3.912731	-4.02246	19.38205	1.138469	-0.00469	5.359061	2.681022	-1.45102
Foods	2019	-1.70655	-3.22111	20.23539	1.332032	-1.06842	-0.64751	2.533697	-2.12746
Foods	2020	-1.70655	-3.22111	20.37515	1.332032	-1.06842	-0.64751	2.70805	-2.12746
Foods	2021	-1.70655	-3.22111	20.51491	1.332032	-0.92866	-0.50775	3.005683	-2.12746
Manufac	2010	-0.33918	-1.23488	19.89115	-1.75369	-0.3036	0.705517	1.029619	-1.3483
Manufac	2011	-0.41414	-1.57957	19.82937	-2.07847	-0.3125	1.002838	2.895912	-1.72948
Manufac	2012	-0.15437	-1.265	20.07099	-2.39229	-0.34037	0.915025	3.529297	-1.40977
Manufac	2013	-0.0908	-0.84706	20.22484	-1.47551	-0.56355	0.611659	2.60269	-1.266
Manufac	2014	-0.1917	-1.18654	20.18337	-3.27023	-0.52689	0.754041	2.091864	-1.47262
Manufac	2015	-0.35448	-1.65465	19.9946	-4.97749	-0.35945	0.838066	2.04122	-1.552
Manufac	2016	-0.36225	-2.04233	20.15431	-4.984	-0.27881	1.134568	2.272126	-1.77563
Manufac	2017	-0.07267	-1.7665	19.7074	-1.89673	-0.26371	1.198141	2.00148	-1.53453
Manufac	2018	-1.12897	-4.1744	20.11321	-2.2282	-0.23967	1.306247	2.681022	-2.67489
Manufac	2019	-0.07546	-2.18231	19.8331	-2.77928	-0.22284	1.38783	2.533697	-1.68612
Manufac	2020	-0.07546	-2.18231	19.97286	-2.77928	-0.22284	1.38783	2.99072	-1.68612
Manufac	2021	-0.07546	-2.18231	20.11262	-2.77928	-0.08307	1.527592	3.005683	-1.68612
BREWERY Manuf.	2010	-0.30557	-0.79967	21.2138	-0.71739	0.819751	-0.20832	1.029619	0.722501
BREWERY Manuf.	2011	-0.29999	-0.4363	21.47583	-0.60926	-0.91444	-0.43364	2.895912	-0.78079
BREWERY Manuf.	2012	-0.23839	-0.23194	21.70623	0.808008	-1.06413	-0.64096	3.529297	-0.66155
BREWERY Manuf.	2013	-0.22201	-0.21542	21.99027	0.31504	-1.0523	-0.62284	2.60269	-0.65147
BREWERY Manuf.	2014	-0.20507	-0.49989	22.21406	-0.3182	-1.39568	-0.42157	2.091864	-1.17918
BREWERY Manuf.	2015	-0.3982	-0.5559	22.31857	0.063979	-1.20131	-0.84349	2.04122	-0.75602
BREWERY Manuf.	2016	-0.1987	0.059143	22.15123	-3.49009	-1.20779	-0.85275	2.272126	-0.55374
BREWERY Manuf.	2017	-0.50001	0.39285	22.48754	-3.30904	-1.66958	-1.46092	2.00148	-0.70867
BREWERY Manuf.	2018	-0.57626	-0.64644	22.95923	-0.14363	-1.13677	-0.74985	2.681022	-0.96318
BREWERY Manuf.	2019	-0.70161	-1.01155	23.23753	-8.24129	-0.97783	-0.50602	2.533697	-1.17341
BREWERY Manuf.	2020	-0.70161	-1.01155	23.37729	-8.24129	-0.97783	-0.50602	2.99072	-1.17341
BREWERY Manuf.	2021	-0.70161	-1.01155	23.51706	-8.24129	-0.83807	-0.36626	3.005683	-1.17341
FOODS Manuf.	2010	-0.44993	-0.59707	17.46403	-1.11169	-0.64845	-0.57445	1.029619	-0.52392
FOODS Manuf.	2011	-0.14257	1.090457	17.68523	-0.36643	-1.72393	-1.52747	2.895912	-0.33903

FOODS Manuf.	2012	0.035345	0.193245	18.22009	0.272903	-1.13038	-0.4187	3.367296	-0.67633
FOODS Manuf.	2013	0.419108	-0.40051	18.45622	-0.56222	-0.73038	0.392536	2.60269	-0.70381
FOODS Manuf.	2014	-0.38545	-2.10754	18.33816	0.284317	-0.67731	0.685426	2.091864	-1.74819
FOODS Manuf.	2015	-0.22012	-1.59916	17.9635	-0.61808	-0.60656	0.181389	2.04122	-1.00807
FOODS Manuf.	2016	-0.08032	-0.99976	18.79991	0.509112	-0.57436	0.25361	2.272126	-0.90829
FOODS Manuf.	2017	-0.25024	-0.44679	19.16315	0.820938	-0.81851	-0.23674	2.00148	-0.832
FOODS Manuf.	2018	-0.42044	-1.04949	18.97017	0.246072	-0.74593	-0.10292	2.681022	-1.06346
FOODS Manuf.	2019	-0.5968	-2.01675	18.88983	-1.00374	-0.58029	0.240095	2.533697	-1.41718
FOODS Manuf.	2020	-0.5968	-2.01675	19.0296	-1.00374	-0.58029	0.240095	2.99072	-1.41718
FOODS Manuf.	2021	-0.5968	-2.01675	19.12491	-1.00374	-0.48498	0.335405	3.005683	-1.41718
MANUFACTURING	2010	-1.4007	-1.18083	19.09484	-0.02042	-1.15885	-0.66443	1.029619	-1.89512
MANUFACTURING	2011	-3.48144	-1.30374	21.01585	0.139866	-0.86609	-2.50331	2.895912	-1.84422
MANUFACTURING	2012	-1.2177	-1.32581	19.32889	-2.18706	-1.37831	-0.26223	3.529297	-2.33377
MANUFACTURING	2013	-1.12985	-1.35928	19.40413	-2.33924	-1.31195	-0.14088	2.60269	-2.30093
MANUFACTURING	2014	-1.2279	-2.08797	19.50436	-2.05771	-0.66319	0.061539	2.091864	-1.95262
MANUFACTURING	2015	-0.55873	-1.59705	20.33353	1.68007	-0.43367	0.610822	2.04122	-1.60322
MANUFACTURING	2016	-1.35836	-1.06677	20.77424	4.569064	-0.9357	-0.43761	2.272126	-1.85645
MANUFACTURING	2017	0.543235	-0.72568	19.99529	-1.86737	-0.39325	2.081998	2.00148	-1.93201
MANUFACTURING	2018	-1.01972	-3.67719	20.28701	-0.34887	-0.29784	1.058603	2.681022	-2.37616
MANUFACTURING	2019	-0.97576	0.214467	20.13213	-0.34435	-1.64348	-1.42867	2.533697	-1.19057
MANUFACTURING	2020	-0.97576	0.214467	20.2719	-0.34435	-1.64348	-1.42867	2.99072	-1.19057
MANUFACTURING	2021	-0.97576	0.214467	20.41166	-0.34435	-1.50372	-1.28891	3.005683	-1.19057
FOODS Manuf.	2010	-0.898	-1.18715	17.69368	-1.49446	-0.71688	-0.04691	1.029619	-1.56797
FOODS Manuf.	2011	-0.59825	-0.56548	17.73467	-1.62612	-0.89465	-0.36913	2.895912	-1.12376
FOODS Manuf.	2012	-1.17445	-2.42656	17.7832	-0.88741	-0.70132	-0.01628	3.529297	-1.85949
FOODS Manuf.	2013	-0.59417	-1.07244	17.82386	-0.88741	-0.72419	-0.06116	2.60269	-1.2572
FOODS Manuf.	2014	-2.55791	-1.93313	19.0206	4.867402	-1.98117	-1.4817	2.091864	-3.05739
FOODS Manuf.	2015	-2.55885	-3.23037	19.20364	3.683601	-1.33076	-1.02386	2.04122	-2.86575
FOODS Manuf.	2016	-2.33123	-2.52193	19.4535	0.386113	-1.53905	-1.29751	2.272126	-2.57277
FOODS Manuf.	2017	-0.86476	-2.53225	20.26578	-1.87275	-0.36959	0.80488	2.00148	-2.03923
FOODS Manuf.	2018	-0.88978	-0.87195	20.40196	-0.7093	-0.97939	-0.50852	2.681022	-1.36065
FOODS Manuf.	2019	-0.50173	-0.7928	20.76454	-0.06785	-0.74461	-0.10041	2.533697	-1.14594
FOODS Manuf.	2020	-0.50173	-0.7928	20.9043	-0.06785	-0.74461	-0.10041	2.99072	-1.14594
FOODS Manuf.	2021	-0.50173	-0.7928	21.04406	-0.06785	-0.60485	0.039349	3.005683	-1.14594
BREWERY Manuf.	2010	0.449972	-1.1204	20.01221	-1.28143	-0.28257	1.119226	1.029619	-0.95182
BREWERY Manuf.	2011	0.997717	-1.94821	20.05638	-5.37032	-0.23059	1.548368	2.895912	-0.78124
BREWERY Manuf.	2012	-0.09987	-1.41395	20.78039	-6.60059	-0.60365	0.187798	3.529297	-0.89132
BREWERY Manuf.	2013	-1.43774	-2.86013	21.58996	-7.07261	-1.16013	-0.52264	2.60269	-2.07523
BREWERY Manuf.	2014	-1.51354	-1.60763	22.07725	-7.81311	-0.669	-0.0294	2.091864	-2.15314
BREWERY Manuf.	2015	-1.5004	-3.16712	22.21454	-8.11142	-0.42632	0.631835	2.04122	-2.55856

BREWERY Manuf.	2016	-1.9136	-1.29969	21.93022	-8.28	-0.63621	0.117308	2.272126	-2.66712
BREWERY Manuf.	2017	0.843444	-1.85028	21.88504	-1.08294	-0.10617	2.189186	2.00148	-1.45191
BREWERY Manuf.	2018	1.041431	-3.38535	21.9927	-2.22855	-0.05072	2.956008	2.681022	-1.96529
BREWERY Manuf.	2019	-6.34098	-4.54514	22.665	-2.54393	-1.50768	0.600793	2.533697	-8.44945
BREWERY Manuf.	2020	-6.34098	-4.54514	22.80476	-2.54393	-1.50768	0.600793	2.99072	-8.44945
BREWERY Manuf.	2021	-6.34098	-4.54514	22.94452	-2.54393	-1.36792	0.740554	3.005683	-8.44945
FOODS Manuf.	2010	-1.12829	-0.94576	18.59466	-2.93363	-1.00791	-0.55381	1.029619	-1.58239
FOODS Manuf.	2011	-0.86697	-0.36383	18.75513	-2.49194	-1.18558	-0.82092	2.895912	-1.23164
FOODS Manuf.	2012	-1.65572	-1.8735	18.75337	-0.20833	-1.16025	-0.78425	3.367296	-2.03171
FOODS Manuf.	2013	-1.66026	-1.7001	18.7474	-0.46082	-1.29206	-0.97088	2.60269	-1.98144
FOODS Manuf.	2014	-1.60578	-2.33865	19.14349	-0.73299	-0.53739	-0.19189	2.091864	-1.95128
FOODS Manuf.	2015	-0.81612	-0.24189	19.17891	4.613417	-1.21744	-0.86648	2.04122	-1.16708
FOODS Manuf.	2016	-1.10472	2.152269	19.12638	1.328372	-3.77164	-3.5944	2.272126	-1.28196
FOODS Manuf.	2017	-0.72994	-2.82618	19.45634	-1.93308	-1.59136	-1.36364	2.00148	-0.95766
FOODS Manuf.	2018	-1.24794	0.351612	19.38017	-0.0691	-2.00078	-1.85548	2.681022	-1.39323
FOODS Manuf.	2019	-1.55308	0.057902	19.77445	-0.0691	-2.12073	-1.99296	2.533697	-1.68085
FOODS Manuf.	2020	-1.55308	0.057902	19.91421	-0.0691	-2.12073	-1.99296	2.99072	-1.68085
FOODS Manuf.	2021	-1.55308	0.057902	20.05397	-0.0691	-1.98097	-1.8532	3.005683	-1.68085
FOODS Manuf.	2010	-0.67589	-1.15509	18.74543	-1.23841	-0.7423	-0.096	1.029619	-1.32219
FOODS Manuf.	2011	-0.33248	-0.98349	18.92187	-1.23841	-0.62545	0.096283	2.895912	-1.05421
FOODS Manuf.	2012	-0.63423	-1.92049	19.04358	-4.64611	-0.70221	0.187948	3.529297	-1.52439
FOODS Manuf.	2013	-0.91777	-2.05469	18.98861	1.817639	-0.82053	-0.24516	2.60269	-1.49314
FOODS Manuf.	2014	-1.60314	-2.62935	18.9851	1.817639	-2.43351	-0.1203	2.091864	-3.91634
FOODS Manuf.	2015	-0.75827	-1.45573	19.07386	1.597265	-0.74174	-0.09494	2.04122	-1.40507
FOODS Manuf.	2016	-0.23559	-1.68254	19.00945	-1.84302	-0.62422	0.142955	2.272126	-1.00277
FOODS Manuf.	2017	-0.36605	-1.07868	19.18795	-0.16212	-0.71311	-0.03953	2.00148	-1.03963
FOODS Manuf.	2018	-0.06856	-0.35234	19.28092	-2.02301	-0.73845	-0.08864	2.681022	-0.71837
FOODS Manuf.	2019	-0.302	-0.62708	19.834	-0.49636	-0.71709	-0.04733	2.533697	-0.97176
FOODS Manuf.	2020	-0.302	-0.62708	19.97376	-0.49636	-0.71709	-0.04733	2.99072	-0.97176
FOODS Manuf.	2021	-0.302	-0.62708	20.06907	-0.49636	-0.62178	0.047979	3.005683	-0.97176
WATER Manuf.	2010	2.514777	-0.88667	18.7945	-2.46938	0.459996	-0.32826	1.029619	3.30303
WATER Manuf.	2011	2.660307	-0.33421	18.89319	-2.46938	0.928916	0.221819	2.895912	3.367404
WATER Manuf.	2012	3.149823	-0.34843	19.04363	-1.46897	0.40728	0.723927	3.529297	2.833177
WATER Manuf.	2013	1.312826	-1.80578	17.10921	0.331337	-0.25349	-0.16479	2.60269	1.224123
WATER Manuf.	2014	0.318596	-3.69708	16.829	0.331337	-0.3424	-0.13582	2.091864	0.11201
WATER Manuf.	2015	2.50126	0.85168	17.73946	0.331337	-0.7231	-0.05903	2.04122	1.837192
WATER Manuf.	2016	1.216295	0.485499	18.44823	-2.06027	-0.44394	0.581886	2.272126	0.190465
WATER Manuf.	2017	3.196688	-0.7956	19.05173	-3.82115	0.042702	3.17478	2.00148	0.064611
WATER Manuf.	2018	2.458524	-1.36492	19.61721	-1.75832	-0.14179	1.881708	2.681022	0.435031
WATER Manuf.	2019	0.534754	-1.32542	20.81587	4.272551	-0.41348	0.66929	2.533697	-0.54802

WATER Manuf.	2020	0.534754	-1.32542	20.95564	4.272551	-0.41348	0.66929	2.99072	-0.54802
WATER Manuf.	2021	0.534754	-1.32542	21.0954	4.272551	-0.27372	0.809052	3.005683	-0.54802
FOODS Manuf.	2010	-4.24458	-1.97117	17.79528	2.826575	-1.10186	-0.69802	1.029619	-4.64843
FOODS Manuf.	2011	-4.14618	-3.12122	18.26456	-2.21649	-0.96407	-1.13547	2.895912	-3.97478
FOODS Manuf.	2012	-1.77047	-1.6304	17.68747	-2.18712	-1.10112	-0.69691	3.529297	-2.17468
FOODS Manuf.	2013	-2.13784	-1.58681	18.17934	-2.84447	-1.12729	-1.18223	2.60269	-2.0829
FOODS Manuf.	2014	-0.03508	-1.28209	19.0171	-6.7392	-0.10027	0.021621	2.091864	-1.61953
FOODS Manuf.	2015	-0.03508	-0.41927	18.12504	-6.30855	-1.00488	0.855583	2.04122	-1.89555
FOODS Manuf.	2016	-1.51463	-1.11899	19.0037	1.368586	-0.59969	0.19656	2.272126	-2.31088
FOODS Manuf.	2017	-1.56985	-1.55449	18.91276	-5.39421	-0.39346	0.729596	2.00148	-2.69291
FOODS Manuf.	2018	-1.68258	-0.57207	19.12967	-5.14891	-0.99159	-0.52799	2.681022	-2.14619
FOODS Manuf.	2019	-3.09786	-2.61078	19.30233	-4.84113	-1.32463	-1.01552	2.533697	-3.40697
FOODS Manuf.	2020	-3.09786	-2.61078	19.4421	-4.84113	-1.32463	-1.01552	2.99072	-3.40697
FOODS Manuf.	2021	-3.09786	-2.61078	19.58186	-4.84113	-1.18487	-0.87576	3.005683	-3.40697
MANUFACTURING	2010	-1.19097	-1.23864	18.74457	0.001633	-0.74873	-0.10824	1.029619	-1.83146
MANUFACTURING	2011	-0.59865	0.307905	19.1155	5.448609	-1.31647	-1.00438	2.895912	-0.91073
MANUFACTURING	2012	-0.49228	0.460868	19.70311	4.379558	-1.32678	-1.01844	3.529297	-0.80062
MANUFACTURING	2013	-0.89022	-0.41241	19.9811	0.905965	-1.1818	-0.65542	2.60269	-1.41661
MANUFACTURING	2014	-1.34702	-1.22746	20.35333	0.516373	-1.03777	-0.38435	2.091864	-2.00043
MANUFACTURING	2015	-1.53837	-1.06189	20.43206	1.932396	-1.0859	-0.67403	2.04122	-1.95025
MANUFACTURING	2016	-0.7453	-0.1531	20.69677	-0.36455	-1.08845	-0.67787	2.272126	-1.15588
MANUFACTURING	2017	-0.58183	0.997186	20.55847	0.619524	-1.79958	-1.61881	2.00148	-0.76259
MANUFACTURING	2018	-0.78324	0.578614	20.55128	0.566127	-1.64971	-1.43639	2.681022	-0.99656
MANUFACTURING	2019	-0.85176	-0.6507	20.67581	-1.19922	-0.86891	-0.3252	2.533697	-1.39547
MANUFACTURING	2020	-0.85176	-0.6507	20.81557	-1.19922	-0.86891	-0.3252	2.99072	-1.39547
MANUFACTURING	2021	-0.85176	-0.6507	20.91088	-1.19922	-0.7736	-0.22988	3.005683	-1.39547
MANUFACTURING	2010	-0.81025	-3.07041	15.45219	0.982195	-0.6913	0.004345	1.029619	-1.5059
MANUFACTURING	2011	-0.31534	0.88662	16.23459	-0.2537	-1.72054	-1.52334	2.895912	-0.51253
MANUFACTURING	2012	-0.69751	0.668299	16.24563	1.241013	-1.98653	-1.83899	3.529297	-0.84505
MANUFACTURING	2013	-0.33999	0.300146	16.83895	3.956926	-1.33228	-0.99917	2.60269	-0.67309
MANUFACTURING	2014	0.049826	0.751615	17.30202	3.956926	-1.33228	-0.99917	2.091864	-0.28328
MANUFACTURING	2015	-0.0296	0.359362	17.17017	-1.31566	-1.09826	-0.69262	2.04122	-0.43524
MANUFACTURING	2016	0.002791	0.040494	17.659	-0.7388	-0.85681	-0.30427	2.272126	-0.54975
MANUFACTURING	2017	0.120903	-0.39087	17.76367	-3.26554	-0.61357	0.166045	2.00148	-0.65871
MANUFACTURING	2018	-0.61037	0.820384	18.12674	-6.17996	-1.95844	-1.80636	2.681022	-0.76245
MANUFACTURING	2019	-0.61695	0.754895	18.3592	-1.31979	-1.88983	-1.72601	2.533697	-0.78076
MANUFACTURING	2020	-0.61695	0.754895	18.49896	-1.31979	-1.88983	-1.72601	2.99072	-0.78076
MANUFACTURING	2021	-0.61695	0.754895	18.63873	-1.31979	-1.75006	-1.58625	3.005683	-0.78076
BREWERY Manuf.	2010	-0.47039	-2.74684	19.9511	-0.02239	1.345386	1.396237	1.029619	-0.52124
BREWERY Manuf.	2011	-0.48872	-2.74801	20.14667	-0.2405	1.329849	1.420466	2.895912	-0.57934

BREWERY Manuf.	2012	-0.48872	-2.74913	20.32696	-0.2405	1.372409	1.463026	3.529297	-0.57934
BREWERY Manuf.	2013	-2.81375	-2.75021	21.54379	-2.54159	0.190789	-0.81945	2.60269	-1.80352
BREWERY Manuf.	2014	-1.5344	-2.75124	20.96792	-2.60596	-0.02445	0.502467	2.091864	-2.06132
BREWERY Manuf.	2015	-2.24097	-3.63755	20.98343	1.332223	-0.93139	-0.43051	2.04122	-2.74185
BREWERY Manuf.	2016	-0.84922	-3.40572	21.61586	-2.50628	-0.57956	0.241757	2.272126	-1.67053
BREWERY Manuf.	2017	-0.21388	-1.78452	21.61586	-2.64604	-0.57956	0.241757	2.00148	-1.03519
BREWERY Manuf.	2018	-0.31314	-1.37132	21.86107	-2.64604	-0.7607	-0.13083	2.681022	-0.94301
BREWERY Manuf.	2019	-0.35933	-0.87191	22.02687	-2.54341	-0.8298	-0.25686	2.533697	-0.93228
BREWERY Manuf.	2020	-0.35933	-0.87191	22.16663	-2.54341	-0.8298	-0.25686	2.99072	-0.93228
BREWERY Manuf.	2021	-0.35933	-0.87191	22.30639	-2.54341	-0.69004	-0.1171	3.005683	-0.93228