THE IMPACT OF CAPITAL STRUCTURE ON PROFITABILITY OF MICRO FINANCE INSTITUTION IN ETHIOPIA

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

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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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Declaration

I, Alemtsehay Bejiga, hereby declare that this MSc thesis entitled “The Impact of capital structure on profitability of micro finance institution in 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 Mitku M(Asst Prof) and Birhanu D(asst prof)

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Alemtsehay Bejiga Signature_____ Date_____.

Certification

This is to certify that the thesis entitled “The Impact of capital structure on profitability of micro finance institution in 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 Alemtsehay Bejiga, 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.

Mitiku M(Asst Prof)) Signature _____ Date _____.

Birhanu D (ASST PROF) Signature _____ Date _____.

Advisors Approval Sheet

This is to certify that the thesis entitled "The Impact of capital structure on profitability of micro finance institution in 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 Alemtsehay Bejiga Id. No 004/13, 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.

Name of Advisors Signature Date

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Examiners Approval Sheet

We, the undersigned, members of the Board of Examiners of the final open defense by Alemtsehay Bejiga have read and evaluated her thesis entitled The Impact of capital structure on profitability of micro finance institution in 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 principal Advisor Signature Date

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Name of Co-Advisor Signature Date

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SGS Approval Signature Date

Final Approval and acceptance of the thesis is contingent upon the submission of the final copy of the thesis to the School of Graduate Studies (SGS) through the School Graduate Committee (DGC/SGC) of the candidate's department.

Abstract

This study tries investigating the impact of capital structure on the profitability of MFI in Ethiopia. In order to achieve the objective explanatory research design and quantitative research approach was used. Data has been collected from a secondary source of twenty four selected MFI in the sample covering the period from 2010 to 2021. MFI specific and macroeconomic variables were analyzed by using the balanced panel fixed effect and random effect regression model. When ROA is the dependent variable, the findings of the study revealed that Debt to asset ratio, GDP and inflation has positive and statistically significant impact on profitability of ROA while size of MFI and Debt to equity ratio has negative and statistically significant effect on profitability of ROA. When ROE is dependent variable, Debt to equity ratio has positive and significant impact on profitability of MFI while Debt to asset ratio and size of MFI has negative significant impact on the profitability of MFI. However, asset tangibility and age are not significant on the ROA and asset tangibility, age, GDP and inflation have no statistically significant effect on the profitability of ROE in MFI. Thus, the study suggests that Debt to equity and Debt to total asset ratio result indicates MFI need more debt to raise the profitability of the MFI and the size of MFI result leads us to change the administrative management style to improve profitability of the MFI.

Key words:- Profitability, Capital structure, Fixed effect model, Microfinance Institution

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Acronym

AMFI:- Association of Microfinance Institutions

ATG:-Asset tangibility

CBE:- Central Bank of Ethiopia

DAR:- Debt to asset ratio

DER:-Debt to equity ratio of MFI

GDP:; Gross Domestic Product

INF:- Inflation

MDG:- Millennium Development Goal

MFI:- Micro finance Institution

NGO:- Nongovernmental organization

MFBs:- microfinance banks

ROA:-Return on Assets

ROE:- Return on Equity

SIZ:- Size of MFI

CHAPTER ONE

1. INTRODUCTION

1.1 Back ground of the study

Microfinance Institutions (MFIs) have risen to the lead as invaluable institutions in the development process. Nevertheless, capital constraints have hindered the expansion of microfinance programs such that the demand for financial services still far exceeds the currently available supply (Asefa T, 2017). Most microfinance institutions obtain funds inform of grants, equity, deposits and various forms of debt from different investors such as commercial banks and other lending institutions (Bogan, 2012).

Throughout the world, poor people are not benefited from formal financial systems. According to Brau and Woller 2004 as cited by Abebaw (2018) exclusion ranges from partial exclusion in developed countries to full or nearly full exclusion in lesser developed countries. In the past decade, financial authorities in most developing and transitional economies have given more emphasis on bringing formal financial services to the large numbers of the world's poor who currently lack adequate access or excluded from formal financial service (CGAP, 2012).

Microfinance institution (MFIs) in the 20th century has been characterized by many new products and discoveries in the financial industry. Capitalism has allowed the increase of so many new ideas in this area therefore microfinance is only one of them. The aim of clients that microfinance serves represents the difference with many of other discoveries even as most of the new ideas target the smaller and richest part of the world population, microfinance reaches a large number of poorer people enabling them to access to financial services such as credit and deposits, insurance and others. The access to financial services has to be considered formal as there are many informal ways in which people tend to borrow for credit and save money for unexpected situations (Abebaw, 2018).

Capital structure describes how firms finance their overall operations and growth by employing various sources of funds. Firms can use either debt or equity or both to finance

their assets. Generally, firms can choose the aforesaid alternative capital structure (Abor, 2005). However, the best choice of capital structure is a mix of debt and equity (Shubita & Alsawalhah, 2012). It is averred that in the event that interest is not tax deductible, owners of firms would be indifferent regarding the options of equity and debt. On the other hand, in the event that interest is tax deductible, owners would maximize the value of their firms by employing absolute (100%) debt financing (Shubita & Alsawalhah, 2012). According to Cull et al (2007), microfinance institutions (MFIs) premise their activities on profitability and poverty alleviation. Since early 90s, these firms have indeed facilitated financial inclusion of people who have hitherto been excluded from the banking sector.

Microfinance institutions have increasingly played a crucial role in the financial systems of most developing countries (Reed, 2011 cited in wameru, 2016). The lack of access to credit is a major obstacle to growth in the continent, where a large majority of households do not have enough collateral to secure a loan. These households depend on both informal-sector and moneylenders where they borrow at skyrocketed interest rates, or are simply denied access to credit and therefore investment (Muriu 2011 as cited by Abebaw, 2018).

As an important part of the financial system, the micro finance institutions sector plays a more and more important role in the development of Ethiopians economy. Microfinance institutions are seen as one of the most known financial institutions to promote economic development and to fight poverty in poorer countries. Numerous microfinance institutions (MFIs) all over the world have proven that financial services can be offered on a sustainable basis with high outreach. So the importance MFIs was increased since it distributes small loans to poor people in order for them to generate income and start their own small businesses, it has the capability to lessen poverty as well as promote entrepreneurship, social and economic development in poor communities (Lazar & P., 2008).

In Ethiopia, the poverty reduction strategy is set as the operational framework to translate the global MDGs targets in to national action. Micro finance service intervention in Ethiopia have also be considered as one of the policy instrument of the government and non government organizations (NGOs) to enable rural and urban poor increase output and productivity, induce technology adoption, improve input and productivity, induce

technology adoption, improve input supply, increase income, reduce poverty and attain food security. The sustainability of MFIs that reach a large number of rural and urban poor who are not served by the conventional financial institutions, such as the commercial banks, has been a prime element of the new development strategy of Ethiopia (Wolday 2000 as cited by Alemayehu,2008).

It is noted that most microfinance institutions obtain funds inform of grants, equity, deposits and various forms of debt from different investors such as commercial banks and other lending institutions (Bogan, 2012). It is therefore the duty of microfinance institution to ensure the best mix of the funds in its capital structure that brings forth maximum returns.

To the best knowledge of the researcher there is some empirical research conducted on the impact of capital structure among MFI in Ethiopia. Among the study by Asefa T (2017) were only jointly contributed 25.55% change in leverage since R-squares of model was 0.2555.

The objective of the study was to analyses the impact of capital structure on profitability of micro finance institution in Ethiopia over the period of 2010-2021. The impact can be examined from both the micro and macro perspectives. On the micro side we should examine MFI specific characteristics or several financial statement ratios developed from the accounts on individual MFIs. On the macro side, the overall growth of the economy and inflation rates can all affect MFI profitability.

1.2 Statement of the Problem

Financing decisions are one of the most critical areas for finance managers that have a direct influence on capital structure and financial performance of the firm. Because capital structure is directly related with the financing decision of the organization typically, it comprises the mix of debt and equity used to finance the firm. Thus, the theories of capital structure are among the most interesting in the field of finance. Since they give explanations in questions like how much firms should borrow, what is the linkage between capital structure and firms value, how firms choose their capital structure, and so on(Tesfaye, 2018).

The large and midsized MFIs have a lower debt equity ratio than the industry average. The small MFIs debt equity ratio cannot be normal even after Ln transformations (Letenah; 2007). He argued that the large and midsized MFIs are not properly using their debt capacity. This might be due to the fear of commercial sources of capital such as commercial banks in lending to MFIs or due to negligence on the part of MFIs managers. However, the MFIs have the potential to levered its equity up to 11 times, the limited prescribed by the Basle convention the international capital adequacy standard for regulated financial institution.

Other studies on profitability and capital structure report that both the short and the long run liability-financing leads to reduced profitability (Chiang, Chan, & Hui, 2002; Caesar & Holmes, 2003; Olivares-Polanco, 2005 and Gleason, Mathur, & Mathur, 2000 as cited by Afsheen,2016). With contradictory results from among the previous researches, it becomes apparent that the link between profitability and the relative financing-decision is viable of a research focus.

According to Association of Ethiopian Micro finance Institution (2010) performance of the industry analysis report shows debt financing on average at amounts equivalent to 0.95 times of their equity. Moreover, to fill the existing debt financing problem gap and to be more sustainable the institution deposits have boosted the growth and expansion in the industry. Meanwhile, the report indicates adding deposits in to debt ratio the institutions remain underleveraged at two times which indicates debt financing is under utilized in Ethiopian MFI industry (AEMFI, 2010). As a result, this may have several implications for their financial sustainability as (Letenah, 2009) noted. Because the presence of low debt may exerts pressure on management to ensure efficiency and productivity.

When there are challenges on capital structure of MFIs, these firms will have inadequate funds to loan out to their customers. Interest charged on credit advanced to borrowers is the spine of MFIs. Therefore, when MFIs lack sufficient funds to give their customers in form of loans is likely to lead to foregone profits, losses, and ultimately collapse of these institutions. Indeed, it 2014 Sector Report on the Microfinance Sector in Kenya by the Association of Microfinance Institutions (AMFI 2014 as cited by Waweru,2016) indicated that MFIs portfolio yield reflects higher operational costs incurred. Operating expenses

ratio as at 2014 was 23.5% amongst credit-only MFIs. Moreover, these MFIs have limited availability of affordable financial resources and also have limited bargaining power to source funds at competitive rates as compared to microfinance banks (MFBs) and banks. Therefore, such MFIs have lower portfolio quality compared to banks and MFBs. In the same light, the report indicated that, MFIs capitalization is not deemed sufficient because, unlike MFBs and banks, they are not regulated, a situation that presents a higher risk profile.

This study aims to fill the existing empirical research gap by analyzing the impact of capital structure on profitability of MFI in Ethiopia. Various studies have been conducted on the impact of capital structure on profitability of micro finance institution in Ethiopia. The research which has been done in the previous study in Ethiopia did no use the variable like asset tangibility and inflation. In addition to the variable which has been not used in the previous research the variable used in the previous researcher did not gain significant impact on the profitability variable like capital adequacy and GDP. And also the research did on this topic before 5 years because of this to see the change need research in Ethiopia. Those problems invited me to do this research on this topic.

1.3 General Objective

The general objective of the study was to investigate the impact of capital structure on profitability of selected micro finance institution in Ethiopia.

The Specific Objectives of the study are:

- To investigate the impact of MFI size on the profitability of MFI in Ethiopia.
- To study the effect of asset tangibility on financial profitability.
- To know the impact of Debt to asset ratio on profitability MFI in Ethiopia.
- To determine the impact of Debt to equity ratio on profitability of MFI.
- To study the impact of age on the profitability of MFI.
- To investigate the effect of economy growth on the MFI of Ethiopia.
- To know the impact of inflation on the profitability of MFI. .

1.4 RESEARCH HYPOTHESIS

The purpose of this study is mainly focuses on to explain the impact of capital structure on

profitability of micro finance institution in Ethiopia. Hypotheses of the study stands on the theories associated to a Microfinance capital structure and profitability that has been established over the years by banking area researchers and previous empirical studies related to a capital structure on profitability on MFI. The results from the literature review (to be discussed in the next chapter) will used to establish expectations for the relationship of the different variables. Hence, based on the objective, the present study tried to test the following hypotheses:

- : Size of MFI() has positive and significant effect on profitability.
- : Asset tangibilityI(ATG) has positive and significant impact on profitability.
- *: Debt to asset ratio() has negative and significant effect on profitability.*
- *: Debt to equity ratio() has negative and significant effect on profitability.*
- : Age of MFI() has positive and statically significant effect on profitability.
- : Gross Domestic Product () has positive and statically significant effect on profitability.
- *: Inflation() has negative and significant effect on profitability.*

1.5 Scope of the study

The scope of the study was to identify the impact of capital structure on profitability of 24 MFIs in Ethiopia. The study will observed detail document of MFI from the periods of last 12 year start from the 2010-2021 G.C data without any missing available document in the selected MFIs.

1.6 SIGNIFICANCE OF THE STUDY

Creswell J. W., (2003), suggested that this section elaborates on the importance and implications of a study for researchers, practitioners, and policy makers. According to him, in designing this section, one might include three or four ways in which the study adds to the scholarly research and literature in the field, helps improve practice and why the study will improve policy. Thus, the researcher suggests the potential benefits for potential audiences as below.

The study should have great contribution to the Ethiopian MFI to assess their capital structure on profitability requirement and to produce their capital profitability policy and to give due attention on those which have significant impact on capital structure on

profitability.

The study as a whole should have great contribution to the supervisory authority, policy makers, MFI and other researchers to gain knowledge about the impact of capital structure on profitability of MFI on internal and macro-economic variable that have impact profitability of MFI.

1.7 Limitation of the study

The study was analyzed the panel data collected from twenty four MFIs for the period 2010- 2021. Even though MFIs, as financial institutions, are expected to have nearly similar lending performance and procedures, we may not be able to set generalized conclusions with full confidence about factors affecting lending behavior of microfinance institutions in Africa or other countries depending on findings of data analysis results conducted for Ethiopian MFIs. The study was not include all MFI in Ethiopia because the some MFI are did not have 12 years' experience in Ethiopia.

1.8 Organization of the Paper

In addition to the preliminary pages, this research paper consisted five chapters. The first chapter with its sub topics is introductory parts incorporated the introduction, background of study, statement of the problem, research objectives, significant of the study, scope and limitations of the study. The second chapter describes the detail review of related literatures regard to impact of capital structure on profitability of MFI in Ethiopia. The third chapter expresses the information regarding the methodology and sampling techniques that had been used to conduct the research. The fourth chapter is about data analysis and interpretation followed by conclusion and recommendations. Finally, references and appendices are included as part of the paper.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 THEORETICAL LITERATURE REVIEW

2.1.1 History of Microfinance Institution (MFI)

Thinking globally, microfinance started in Bangladesh and parts of Latin America in the mid- 1970s to offer credit to the poor, who were generally excluded from formal financial services (CGAP, 2006). The first organization to receive attention was the Grameen Bank, which was started in 1976 by Muhammad Yunus in Bangladesh. In its modern form, micro financing became popular on a large scale after the 1976. When it comes to Africa, the Nigerian government reminded into this popular thinking in 2005 when it initiated the microfinance banking scheme. This was founded to provide finance to economically active poor excluded from financing by conventional banks, provide employment, stimulate rural development and reduce poverty. One of such living in Nigeria today, and influencing lives positively, is Dr. Godwin Esewei Ehigiamusoe, the Founder of the Lift above Poverty Organization (LAPO) and Managing Director of LAPO Microfinance Bank Limited.

Ethiopia is one of the poorest countries in the world. Following the 1984/85 severe drought and famine, many NGOs taking place to offer micro credit along with their relief activities although this was on a limited scale and not in a sustained manner (Alemayehu, 2008). Micro financing in Ethiopia was started in 1994/95 to reduce poverty, and since then developing microfinance in Ethiopia has encouraged the further spread of modern financial services in the country. The program believes to reduce the poverty by giving loans for the poor. Although the development of deposit-taking MFIs started only in 1996, the

industry has shown outstanding growth Microfinance started in Ethiopia after the issuance of the proclamation of licensing and supervision of microfinance institutions (proclamation number 40/1996) E.C or 40/2004 G.C. After the issuance of this proclamation 30 microfinance institutions (MFIs) such as have been licensed by National Bank of Ethiopia. Currently, there are 35 Micro Finance Institutions operating in different regional states of Ethiopia (Association of Ethiopia Micro Finance Institution, 2020).

2.1.2 Capital Structure and Micro Finance Institutions

According to Investopedia (2020), the capital structure is the exact combination of debt and equity used by a company to finance its overall operations and growth. Debt comes in the form of bond issues or loans, while equity may come in the form of common stock, preferred stock, or retained earnings.

Both debt and equity can be found on the balance sheet. Company assets, also listed on the balance sheet, are purchased with this debt and equity. Capital structure can be a mixture of a company's long-term debt, short-term debt, common stock, and preferred stock. A company's proportion of short-term debt versus long-term debt is considered when analyzing its capital structure. When analysts refer to capital structure, they are most likely referring to a firm's debt-to-equity (D/E) ratio, which provides insight into how risky a company's borrowing practices are. Usually, a company that is heavily financed by debt has a more aggressive capital structure and therefore poses greater risk to investors. This risk, however, may be the primary source of the firm's growth.

Debt is one of the two main ways a company can raise money in the capital markets. Companies benefit from debt because of its tax advantages; interest payments made as a result of borrowing funds may be tax deductible. Debt also allows a company or business to retain ownership, unlike equity. Additionally, in times of low interest rates, debt is abundant and easy to access. Equity permits outside investors to take partial ownership in the company. Equity is more expensive than debt, especially when interest rates are low. However, unlike debt, equity does not need to be paid back. This is a benefit to the company in the case of declining earnings. On the other hand, equity represents a claim by the owner on the future earnings of the company (Tchakoute Tchuigoua, H, 2015).

While there is a considerable amount of literature with respect to the optimal capital structure of corporate firms, studies by Lislevand (2012) indicate that maximum of the MFIs are highly leveraged, they use approximately four times more debt financing than equity. Consequently, there appears to be no well-defined theoretical notion of an optimal capital structure for a lending institution. As an added level of complexity, an MFI is a unique type of lending institution with risk and return characteristics different from standard lending operations. Given this, we take an empirical approach to examining MFI capital structures to identify those with the strongest record of financial sustainability (Bogan et al, 2007).

On other hand, Silva (2008) found that microfinance institutions use long term debt financing for their operations that might have less burden on the management of MFIs. It also highlights that profitable microfinance institutions depend more on long term debt financing. Finally, Tehulu (2013), examine that leverage has a significant and negative impact on financial sustainability of MFIs. Financial sustainability is positively and significantly influenced by the gross loan portfolio to total asset and size of the firm whereas efficiency and credit risk have a negative and significant impact on financial sustainability of MFIs.

2.1.3 Theories of Capital Structure

In financial management, capital structure theory refers to a systematic approach to financing business activities through a combination of equities and liabilities. There are several competing capital structure theories, each of which explores the relationship between debt financing, equity financing, and the market value of the firm slightly differently (Investopedia, 2020). These are discussed as follow:

2.1.3.1 *Net Income Approach to Capital Structure Theory*

David Durand first suggested this approach in 1952, and he was a proponent of financial leverage. He postulated that a variation in financial leverage results in a change in capital costs. In other words, if there's an increase in the debt ratio, capital structure increases, and the weighted average cost of capital (WACC) decreases, which results in higher firm value. In this approach to Capital Structure Theory, the cost of capital is a function of the capital structure. It's important to remember, however, that this approach

assumes an optimal capital structure. Optimal capital structure indicates that at a certain ratio of debt and equity, the cost of capital is at a minimum, and the value of the firm is at a maximum. In summary, Net Income Approach was presented by Durand. The theory suggests increasing value of the firm by decreasing the overall cost of capital which is measured in terms of Weighted Average Cost of Capital. This can be done by having a higher proportion of debt, which is a cheaper source of finance compared to equity finance (Efinancemanagement, 2020).

2.1.4 Pecking Order Theory

Myers and Majluf have developed the pecking order theory in 1984. The theory is applicable by financial managers in relationship to the trade-off theory. The pecking order theory underlying assumption is that there exists asymmetric information among the managers of the firm and outside stakeholders. It is assumed that managers who work on behalf of the company's stakeholders have better information than the company's stakeholder and other investors. According to this theory, manager's first choice is to use internal financing or retained earnings. Internal financing indicates that there is no need to issue debt or equity and the firm can inject its own money to finance a project. If the firm does not possess enough internal resources, the second option will be external financing. The external financing is divided into issuing debt and equity, and there is a preference with the issuance of debt and equity. The first choice in external finance is issuing debt. Debt is a safer security and less risky than equity. The pecking order allows issuing equity when the capacity of debt is fully used (Myers and Majluf, 1984). The pecking order theory focuses on asymmetrical information costs. This approach assumes that companies prioritize their financing strategy based on the path of least resistance. Internal financing is the first preferred method, followed by debt and external equity financing as a last resort.

2.1.5 Trade-Off Theory of Capital Structure

The trade-off theory of capital structure is the idea that a company chooses how much debt finance and how much equity finance to use by balancing the costs and benefits. An important purpose of the theory is to explain the fact that corporations usually are financed partly with debt and partly with equity (Frank et al, 2011).

The trade-off theory states that the optimal capital structure is a trade-off between interest

tax shields and cost of financial distress. The present value of tax shields is then added to form the red line. Note that PV (tax shield) initially increases as the firm borrows more, until additional borrowing increases the probability of financial distress rapidly. In addition, the firm cannot be sure to benefit from the full tax shield if it borrows excessively as it takes positive earnings to save corporate taxes. Cost of financial distress is assumed to increase with the debt level. .Higher probability of financial distress is in terms of start-ups and high growth businesses. The company is exposed to the risk of uncertain cash flow streams and low tangible asset base. Therefore, these type of companies should not place high confidence on the debt in their capital structure. On the other hand, firms with a stable revenue stream and sound asset base facing a lower risk of bankruptcy. This company can apply a moderately higher level of leverage in their capital structure (Ebrary, 2020).

2.1.6 Agency Theory of Capital Structure.

A significant amount of research during the last two decades has been dedicated to models in which capital structure is determined by agency costs, costs due to conflict of interest (Harris and Raviv, 1991). Firstly, conflicts of interest between shareholders and managers begin because managers are not allowed to 100% of the residual claims. Consequently the managers do not capture the entire gain from the profit enhancement activities, but they do accept the entire costs of these activities. The managers may hence put in less efforts in value enhancement activities and may also undertake to maximize their private gains by lavish perquisites, plush offices, „empire building“ through sub-optimal investments (Jensen, 1986). While the managers would have the entire costs of refraining from such inefficiencies, they are entitled to only a portion of the gains. The increase in the manager's stake in the firm decreases these inefficiencies. Accordingly to the agency theory, the optimum financial structure of the capital results from a compromise between various funding options (equity, debts and hybrid securities) that allow the reconciliation of conflicts of interests between the capital suppliers (shareholders and creditors) and managers. In short, the agency theory, the optimum capital structure comes from settlement among several funding choices like equity, debts and other securities and that let the settlement of conflicts of interests among the capital providers (stockholders and debt providers) and managers (Nasser M.M. ,2017).

2.1.7 Modigliani and Miller Capital Structure Theory

Miller and Modigliani (1958) were the proponents of the theory. The theory assumes a perfect market and states that the value of the company is independent of its capital structure. That is, it doesn't matter how a firm finances its operations and therefore the value of the firm is not dependent on its capital structure, hence capital structure is irrelevant. The theory is based on the assumption that there are no taxes, no transaction costs, no bankruptcy costs, there is equality in borrowing costs for both the investors and companies such that investors can borrow at the same rate as corporates, companies and investors have the same information such that there is no informational asymmetry and that there are no effect on a company's earnings before interest and taxes.

The theory further states that the market value of a firm is determined the risk of it underlying assets and more so by the firm's earning power. The firm value therefore is totally independent of the way the firm finances its investment activities and pays out dividends (Oghenekohwo, Nkeiruka & Nnenna, 2015). The second proposition by Modigliani and Miller (1963) brought about the trade-off theory that incorporates bankruptcy costs. The authors argued that there is a tax benefit associated with debt financing and there was also the cost of debt that they termed the bankruptcy cost of debt. Under the new proposition otherwise called trade-off theory, it was argued that the marginal benefit of increases in debt reduces while the marginal cost increase. As such, the firm that maximized its overall value would consider to trade-off between equity and debt while financing. The assumptions of the first proposition of the Miller-Modigliani theorem doesn't grasp in the real world and has spurred the development of other theories such pecking order and agency theories that address the shortcomings of MillerModigliani theorem.

2.1.7.1 MODIGLIANI-MILLER THEORY OF CAPITAL STRUCTURE

Modigliani and Miller suggest that the composition of the capital structure is an irrelevant factor in the company's market valuation. They have really attacked the traditional position that companies have the optimal capital structure. In Modigliani and Miller (1958) The Cost of Capital, Corporation Finance and the Theory of Investment", they have strengthened the net operating income approach by adding a behavioral dimension

to it. They have been awarded the Nobel Prizes (Franco Modigliani in 1985, and Merton Miller in 1990) for their widely recognized contributions to financial theory. On other side the modern theory of capital structure primarily was developed by Modigliani and Miller (1958), with an article in The American Economic Review.

The M&M theorem is a capital structure approach named after Franco Modigliani and Merton Miller in the 1950s. Modigliani and Miller were two professors who studied capital structure theory and collaborated to develop the capital-structure irrelevance proposition. This proposition states that in perfect markets, the capital structure a company uses doesn't matter because the market value of a firm is determined by its earning power and the risk of its underlying assets. According to Modigliani and Miller, value is independent of the method of financing used and a company's investments. The M&M theorem made two propositions: Proposition I: This proposition says that the capital structure is irrelevant to the value of a firm. The value of two identical firms would remain the same, and value would not be affected by choice of finance adopted to finance the assets. The value of a firm is dependent on the expected future earnings. It is when there are no taxes. Proposition II: This proposition says that the financial leverage boosts the value of a firm and reduces WACC. It is when tax information is available.

In summary, The Modigliani and Miller Approach further states that the market value of a firm is affected by its operating income, apart from the risk involved in the investment. The theory stated that the value of the firm is not dependent on the choice of capital structure or financing decisions of the firm.

2.1.8 CAPITAL STRUCTURE IN DIFFERENT RESEARCHER

According to Islam & Nasreen (2018), capital structure of an institution is basically a mix of debt and equity which a firm deems as appropriate to enhance its operations. Capital structure issue of MFIs is one of the core financial decisions and it has become an increasingly prominent issue particularly for lending firms. Recent financial crisis required government to take bailout program and institutional restructuring program which addressed the funding structure of institutions. Optimal capital structure though not measurable within the existing framework of corporate

finance, firms always try to set their optimal capital structure because most regulated MFIs have not obtained such high leverage, due to the higher risks typically associated with a microloan portfolio.

Capital structure describes how firms finance their overall operations and growth by employing various sources of funds. Firms can use either debt or equity or both to finance their assets. Generally, firms can choose the aforesaid alternative capital structure (Abor, 2005). However, the best choice of capital structure is a mix of debt and equity (Shubita & Alsawalhah, 2012). It is averred that in the event that interest is not tax deductible, owners of firms would be indifferent regarding the options of equity and debt. On the other hand, in the event that interest is tax deductible, owners would maximize the value of their firms by employing absolute (100%) debt financing (Shubita & Alsawalhah, 2012). According to Cull et al (2007), microfinance institutions (MFIs) premise their activities on profitability and poverty alleviation. Since early 90s, these firms have indeed facilitated financial inclusion of people who have hitherto been excluded from the banking sector.

.It is noted that capital structure of microfinance institutions in Ghana is mainly composed of long-term debt as opposed to short-term debt. As such it is noted that the highly leveraged microfinance institutions are able to reach out to their clientele in a bid to alleviate poverty and achieve other goals (Kyereboah-Coleman, 2007).

The object of microfinance institutions in Kenya is to reduce and alleviate poverty through provision of credit facilities to the larger unbanked populace. In the 1980s through 2000 many microfinance institutions were supported by non-governmental organizations and multinational agencies which were abundant concerned with creating employment and alleviating poverty through the use of microfinance. It is noted that the dominant microfinance institutions in the 90s were Kenya Women Finance Trust (KWFT), Kenya Rural Enterprise Programme (K-Rep), Faulu Kenya and Family Finance. In the recent past, microfinance institutions have become more vibrant following government interventions in helping out micro-enterprises through microfinance. These institutions may be formal or informal and advance credit either to individuals groups where the later takes the form of Grameen model. However, the interest rates of these microfinance institutions remain higher than commercial banks (Kaburi, Ombasa, Omato, Mobegi & Memba, 2013).

2.1.9 PROFITABILITY AND OUTREACH OF MICROFINANCE INSTITUTIONS

The pioneering theoretical work by Copestake (2007) and Ghosh and Tassel (2008), shows that wealthier clients cost less thus pursuit of outreach should decrease MFI profitability. Empirical evidence adduced so far shows mixed results (for a recent review see Hermes and Lensink 2011). Cull, Demirgüc-Kunt and Morduch (2007) empirically investigate whether there is a trade-off between the depth of outreach and profitability of MFIs. Their results show that MFIs that mostly provide individual loans perform better in terms of profitability, but the fraction of poor borrowers and female borrowers in the loan portfolio is lower than for institutions that mainly provide group loans. They stress on the importance of institutional design in determining the existence and size of such a trade-off.

The most comprehensive study of sustainability-outreach trade-off is by Hermes, Lensink, and Meesters (2011). Using data for 435 MFIs for the period 1997-2007, they focus on the relationship between cost efficiency as a proxy for sustainability of MFIs and the depth of outreach measured by the average loan balance and percentage of women borrowers. They conclude that outreach is negatively related to sustainability of MFIs. The results remain robustly significant even after taking into account a long list of control variables. This is consistent with Cull et al (2009a) and Hoque, et al (2011), who shows evidence of such trade off from recent commercialization trend in microfinance. Although Olivares-Polanco (2005) use less rigorous techniques and/or smaller datasets, their study also confirms the existence of this trade-off. These findings are however inconsistent with Ayayi and Sene (2010) who after estimating a pooled regression model, show that outreach and the percentage of women among the clientele do not significantly influence the MFIs' financial sustainability. Their findings confirm Cull, DemirgücKunt and Morduch (2007) who shows that MFIs can increase outreach without compromising financially sustainability. Though there is no convergence among these studies, we can deduce that varying outreach has implications on MFI financial outcomes. It is important however to point that the evidence adduced here mostly relate to MFIs sustainability and not profitability. Could outreach therefore explain MFIs profitability?

2.2 EMPIRICAL LITERATURE REVIEW

2.2.1 Empirical Literature

According to Gudeta, (2013) an empirical study on the determinants of microfinance institution profitability was conducted in Ethiopia. The study investigated the internal and external factors that affected profitability in microfinance institutions in Ethiopia. The study adopted quantitative research method. A total thirteen microfinance institutions were selected for the period 2003 to 2010 obtained from the institutions. The determinants of profitability were age, size, financing structure, risk and liquidity and real gross domestic product growth. The study established that internal variables that were portfolio quality and efficiency measured by operating expense to gross loan portfolio significantly and negatively influenced profitability. The age or learning effect of MFI positively influenced profitability. As such it was noted that as MFIs become more developed, their profitability increased. Capital adequacy ratio, firm size and real gross domestic product were insignificant on profitability. Since quality of portfolio and operational efficiency were important factors in profitability, the study recommended that management of MFIs need to develop good credit management policy and reduce operating costs through the use of mobile micro banking and reducing the frequency of installment payments.

According to Jorgensen (2011) studied the profitability of microfinance institutions and produce on gross portfolio by using 879 MFIs in Denmark participated in the study. The study finds that the capital to asset ratio, operating expense and age of the MFI positively effect on the profitability. The variable the cost per borrower and number of active borrowers negatively influenced profitability. The findings on yield on gross portfolio showed that there were no general trends that MFIs charged higher yield in a bid to obtain higher profitability.

A study conducted by Abrar and Javaid, (2016) describe the impact of capital structure on profitability of microfinance institutions. The study mainly considered the sources of funding and relative profitability of microfinance institutions. Data from around 70 countries around the globe was used. The study found that deposits enhanced the levels of debt and therefore complemented the firms' overall profitability. The increase in operating costs and risks was noted to reduce profitability.

The study targeted medium sized enterprises in Ghana and South Africa. The results revealed that the effect of short-term debt was negatively and significantly influenced gross profit margin of the surveyed enterprises. It was suggested that increasing short-term debt would decrease the profitability of the firms. An earlier study on the effect of capital structure on financial performance in Ghana revealed that profitable firms relied more on debt financing due to the perceived low financial risk (Abor 2005). An investigation into debt policy and financial performance was conducted (Abor, 2007).

Wameru and Wanyolke (2016) cited in Marura and Okatch (2015) investigated the factors that affect profitability of microfinance institutions in Kenya. The study employed descriptive research design. MFIs in Nairobi central business district were considered for the study. The study findings revealed that the debt collection process in the microfinance affected credit risk management which in turn determined profitability of the institution. In addition legal policies and credit rating had an effect on profitability of the MFIs. It was recommended that MFIs ought to review their lending policies to be in line with the legal policies in order to enhance their profitability and compliance with the set laws.

According to Afsheen (2016) The Impact of Capital Structure on the Profitability of Microfinance Institutions. The study uses panel data for the period from 2004 to 2010 for seventy countries around the world by using the random-effect-model. The finding explain as the variable deposit-taking, deposit-to-assets ratio, CAP and women borrower have positive and statically significant impact on the MFI profitability. Similarly Efficiency, Portfolio at Risk 90 days are negative and statically significant impact on the MFI profitability. Whereas the other variable industry-regulations, firm-age, and firm-size and have an insignificant impact on MFIs' profitability. This research recommend that deposit-taking and leverage financing are wo of the most profitable sources; this information can be used by the regulatory bodies and/or policy-makers to devise policies which ease the MFIs' activities of collecting loans and issuing debt thereby enhancing their sustenance and profitability.

According to Tesfaye (2012) the study in the determinants of capital structure decisions among Ethiopian micro finance institutions by using a panel data Random Effect Multiple Regression model result display the variable MFI size has significant and positive impact

on the dependent variable and the variable of tangibility and leverage have negative and significant impact on the dependent variable. There could also be policies intended to encourage and creating conducive environment for MFIs to utilize debt as a viable source of finance in the era of increased commercialization of microfinance to meet their noble objective(Tesfaye,2012).

According to tesfaye cited in Bogan (2009) specified that the capital structure of lending institutions has become an increasingly prominent issue in the world of finance. As the paper examined the source of funding for MFIs globally using a panel data to link between the capital structure and MFI success, the study found that leverage have significant effect on the sustainability of MFIs and the increased use of grants by large MFIs decreased operational self-sufficiency.

According to Tesfaye (2017) cited in Taggart (1985) examines how US firms build their financial structures and concludes that leverage is negatively related to profitability.124 The comparative costs of available financing sources tend to make firms use internally generated funds as a first choice before raising funds. The amount of debt needed will be determined as the residual between the desired 123 investment and the supply of retained earnings (Baskin, 1989; Allen, 1993).

Abor (2005) The effect of capital structure on profitability by using a panel model on listed firms in Ghana. The results reveal a significantly positive relation between the ratio of short-term debt to total assets on the return on equity(ROE). There is a negative relationship between the ratio of long-term debt to total assets on return on equity(ROE).

According to Tesfaye,(2018) in the title the Effect of Financing Structure on Financial Performance of Micro Banks: An Empirical Analysis of Ethiopian MFIs for the period from 2008-2015 data examines the following finding. He discoveries that the ratio of debt to equity affect negatively on the performance of the firms. This is due to less use of debt coupled with poor management, reckless lending particularly to the poor and others. Age of the institution affect the profitability on MFI in Ethiopia. Capital adquecy has negative and significant effect on the profitability of MFI. Liquidity affect negatively on profitability of MFI in Ethiopia . the size of MFI affect negatively and significantly on ROA and positively and significantly on ROE.

2.3 RESEARCH GAP OF THE STUDY

In the title the impact of capital structure on profitability of micro finance institution has not been efficiently done in Ethiopia. So it is believed that this study would contribute to literature on the impact of capital structure on profitability of micro finance institution in Ethiopia while offering recommendations for future studies. It also creates the findings on MFI in the impact of capital structure in MFIs since the topic was not well researched in Ethiopia.

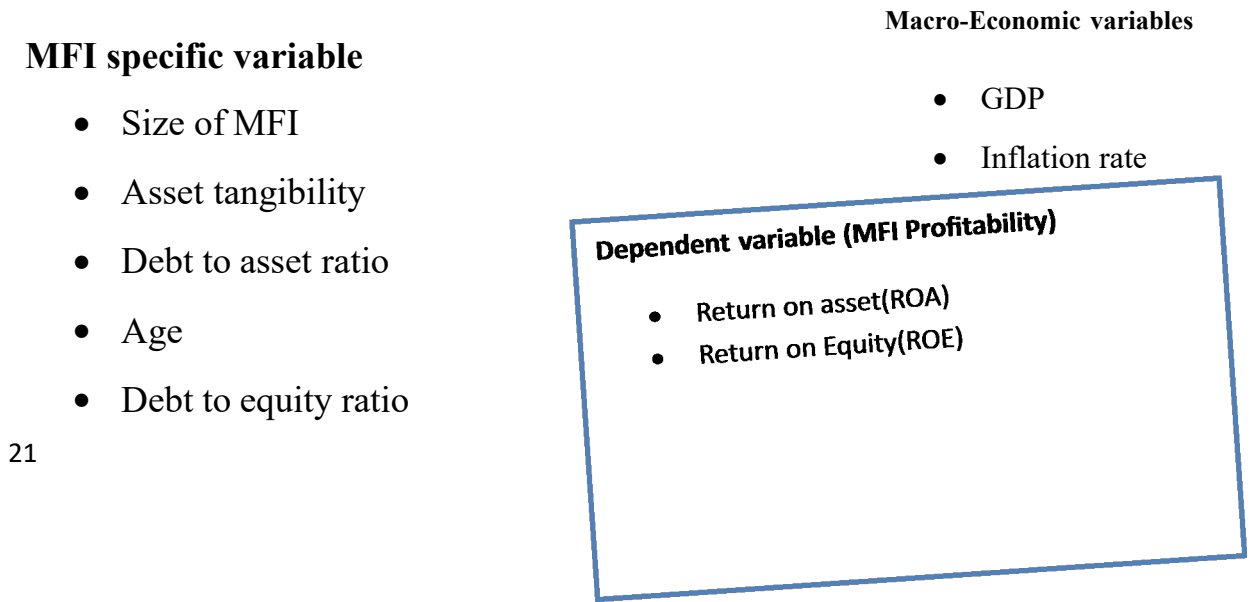
Although the literature review soundly revealed that various studies have been conducted on the The impact of capital structure on profitability of micro finance institution in Ethiopia. The researcher try to review different country on this topic. The research which has been done in Ethiopia are Tesfaye in 2012 use the variable like MFI size, tangibility and liverage and in the paper of Gudeta (2013) also use the variable like age, MFI size, liquidity, GDP, risk, efficiency and capital. The Ethiopian researcher did not use the variable asset tangebility and inflation. In addition to the variable which have been the variable used in the variable used in the previous researcher did not gain significant impact variable capital adequacy and GDP did not gain significant impact on the profitability. And also the research done on this topic before 5 years because of this to see the change need research in Ethiopia.

Therefore this research paper makes an attempt to get the significant effect of the profitability of micro finance institution in Ethiopia with a twelve years accounting period from 2010 to 2021.

2.2.3 Conceptual Framework of the study

The research conceptual framework was diagrammatic representation of study variables and their perceived relationships. As discussed above the impact of capital structure on profitability of micro finance institution, the following conceptual framework will show the most explanatory variables on profitability of MFI. This conceptual framework is designed by the researcher by using the conceptual framework done by Firdawek T/Tsadik research paper as source to do this conceptual framework. The study used both ROA and ROE as dependent variables concerning to the MFI capital structure independent variable were Debt to asset ratio and Debt to equity ratio with the control variable size of MFI, asset tangibility, age, GDP and inflation rate were the cause variable for the dependent variable profitability.

Figure 1 Conceptual frame work



CHAPTER THREE

METHODOLOGY OF THE RESEARCH

3 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.

3.1 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). Explanatory research design was used to meet the overall objective of the study and to test hypotheses under it.

3.2 DATATYPE, SOURCE AND METHOD OF COLLECTION

3.2.1 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 audited financial statement specifically balance sheet and income statement of the sample Micro finance institution and publication of NBE for the macroeconomic level data from 2010 up to 2021. The time period selected is based on the reason that is providing recent time observation.

3.3 SOURCE AND 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 NBE which has been taken from the balance sheet and income statement of MFI and the macro economic data was taken from annual report of the NBE. The criterion for MFIs to be included in the study required companies to have an twelve year audited financial statements particularly balance sheet and income statements covered a period from 2010 to 2021 inclusive, which have been collected through detail document review. Also, both descriptive and inferential statistics have been employed in order to get reliable findings.

3.4 POPULATION AND SAMPLE DESIGN

Population:- The target population is all Micro finance institution registered in Ethiopia and found in operation. Currently, as the data gained in the website of national Bank, there are 46 Micro finance institution in the Ethiopian(see nbe.gov.et).

Sampling : The frame for drawing sample included those Micro finance Institution having at least twelve years working experience data in Ethiopia (i.e. from 2010 to 2021). In Ethiopia there are 24 Micro finance Institution having twelve years' experience which include AVFS, Kendil, Metemamen, Letta, Digaf, Harar, Lefayeda, Dynamic, ACSI, OMO, DECSI, OCSSCO, Addia, SFPI, Gasha, Vision, Sidama, Bus.Gon, Peace, Meklit, Eshet, Wasasa, Harbu, and Cons.

Sample: The sampling technique used under this study was purposive or judgmental sampling because all MFI which have 12 years audited income statement and balance sheet included in the study. In this type of sampling, items for the samples are selected deliberately. In other words, under purposive or judgmental sampling the organizers of the inquiry purposively choose the particular units of the universe for constituting a sample on the basis that the small mass that they so select out of a huge one will be typical or representative of the whole (Kothari 2004). This enables to select samples which are appropriate to achieve the study objective .Hence, all 24 Micro finance Institution having 12 and above experience data in Ethiopia (i.e from 2010- 2021) in the industry is selected for this study and the data to be collected is uninterrupted for 12 consecutive years.

3.5 Econometric Model Specification

The multiple linear regression and ordinary least square (OLS analysis has been used to determine whether the group of seven variables together predicts the impact of capital structure on the profitability MFI in Ethiopia. Modeling is based on panel data techniques. Panel data comprises of both cross-sectional elements and time-series elements; the cross-sectional element is reflected by the different Ethiopian commercial banks and the time-series element is reflected in the period of study (2010-2021). The general model to be estimated is the following linear forms which, is adopted from Tesfaye, (2018). The study used a panel regression technique to analyze the MFI specific and macroeconomic specific factors of profitability of MFI in Ethiopia. The following model of the linear regression has been used:

Model one

Model two

Where

ROA:-Return on Assets: the ratio of Profit to total asset

ROE:- Return on Equity:- the ratio of profit to equity

SIZ:- Size of MFI

ATG:- Asset tangibility of MFI: the ratio of fixed asset to total asset

DAR:-Debt to asset ratio of MFI

DER:-Debt to equity ratio of MFI

Age:- Age of MFI

GDP:- Gross Domestic Product growth rate

INF:- Inflation

3.6 DESCRIPTION AND MEASUREMENT OF VARIABLES

3.6.1 Dependent Variable

Profitability:- In banks and other commercial institutions, 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.

The equation of ROA is

3.6.2 INDEPENDENT AND CONTROL VARIABLE

SIZE of MFIs

Prior research suggest that firm's size may influence its Financial Performance, larger firms have a greater variety of capabilities and can enjoy economies of scale.

MFI size is defined broadly as the MFI net total asset. It measures its general capacity to perform its intermediary function. This variable is added to capture the economies or diseconomies of scale. There is consensus in academic literature that economies of scale and synergies arise up to a certain level of size. Beyond that level, financial institutions become too complex to manage and diseconomies of scale arise (Ezirm, 2005).When MFI size grows it will help them to reduce the risk but it should be noted that it may also leads to failure.

In this study, MFI size is measured by the natural logarithm of total asset of the FI because the balance sheet total is an indicator that is simply available for almost all MFI and total assets seem to be comparable and based on a straightforward definition: they sum up the volume of a MFI's activities. Hence, the proxy for MFI size is the natural logarithm of total assets.

: MFI size() has positive and significant effect on profitability

Asset Tangibility:

This is considered to be one of the major variable of firm's profitability. The most common argument in the literature favours a positive relationship between asset tangibility and performance. Mackie- Mason (1990) concludes that a firm with high fraction of plant and

equipment (tangible assets) in the asset base made the debt choice more likely and influences the firm performance. Akintoye (2008) argues that a firm which retains large investments in tangible assets will have smaller costs of financial distress than a firm that relies on intangible assets. The relationship between asset tangibility and firm performance is expected to be positive, which is measured by net fixed asset divided by total asset.

：Asset tangebility() has positive and significant effect on Profitabiliy

Debt-to-Assets Ratio

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.

A company can analyze its leverage by seeing what percent of its assets have been purchased using debt. A company can subtract the debt-to-assets ratio by 1 to find the equity-to-assets ratio. If the debt-to-assets ratio is high, a company has relied on leverage to finance its assets.

：Debt to asset ratio has negative and significant impact on the profitability.

Debt-to-Equity Ratio

Instead of looking at what the company owns, a company can measure leverage by looking strictly at how assets have been financed. The debt-to-equity ratio is used to compare what the company has borrowed compared to what it has raised by private investors or shareholders.

A debt-to-equity ratio greater than one means a company has more debt than equity. However, this doesn't necessarily mean a company is highly levered. Each company and industry will typically operate in a specific way that may warrant a higher or lower ratio. For example, start-up technology companies may struggle to secure financing and must often turn to private investors. Therefore, a debt-to-equity ratio of .5 may still be considered high for this industry compared.

：Debt to equity (DER) has negative and significant impact on profitability.

AGE of MFIs

The age of firms is also an important determinant of performance, where measured by the number of years since inception to the date of observation, introduced as a control variable. Older firms can gain experience-based on economy of learning and can avoid the liabilities of newness (Stinchcombe, 1965); however, with age inertia and rigidities in adaptability leading to lower performance (Marshall, 1920). A-priori, no relationship is posited and is left to be empirically determined from the data. Diversification by firms is one way for excess resources to be exploited (Penrose, 1959), and the subsequent foray into new lines of business increases the repertoire of total skills and capabilities within firms which impacts upon the total performance of the organization.

：Age() has positive and significant effect on profitability (ROA)/ROE

GDP Growth

Growth domestic product is a macroeconomic variable, and tells the total value of goods and services produced in a given nation over a specified period of time usually a year. It is expected to have a positive influence on the capital structure profitability, since economic growth improves the living standards and the levels of income, increasing the purchasing power of population.

：Gross domestic product() has positive and significant effect on profitability.

Inflation

Inflation is a general increase in the pattern of price level of goods and services. It occurs when the prices of goods and services increase over time. Inflation cannot be measured by an increase in the cost of one product or service, or even several products or services. Rather, inflation is a general increase in the overall price level of the goods and services in the economy.

：Inflation() has negative and significant effect on profitability (ROA)/ROE

Table 1:- Variables and expected sign

Variable nature	No	Variable	Measurement	Symbol	Expected sign
Dependent variable	1	Dependent variable			
	1.1	Return on asset	The ratio of after-tax profits to total asset	ROA	
	1.2	Return on Equity	The ratio of after-tax profits to total equity	ROE	
Independent variable	2	Independent variable			
	2.1	Debt to asset ratio	The ratio of debt to total asset	DAR	-
	2.2	Debt to equity ratio	The ratio of debt to equity	DER	-
	3	Control specific variable			
	3.1	Size of MFI	Total asset	SIZ	+
	3.2	Asset tangibility	The ratio of net fixed asset to total asset	ATG	+
	3.3	Age of MFI	Age sum	AGE	+
	4	Control Macroeconomic variable			
	4.1	Gross Domestic Product	GDP growth rate	GDP	+
	4.2	Inflation	Annual inflation rate	INF	-

CHAPTER FOUR

4. DATAPRESENTATIONAND ANALYSIS

4.1 INTRODUCTION

In the preceding chapters important literatures concerning to the topic review that provides enough understanding about the subject and isolated knowledge gap. To fulfill the broad research objective and to check research hypotheses the finding of the research as design in research methodology discussed in this chapter. This chapter has descriptive statistics of the dependent and independent variables are present followed by presents the test for the classical liner regression model/CLRM and then correlation analysis finally, the results of the regression analysis and discussions the results of the regression analysis.

4.2 DESCRIPTIVE STATISTICS

The descriptive statistics of the independent and dependent variables are described below. This research has two dependent variable return on equity (ROE) and return on asset(ROA) and the independent variables are MFI size, asset tangibility, Debt to equity ratio, Debt to asset ratio, Gross Domestic product, inflation and Exchange rate. The descriptive statistics explain in terms of central tendency mean and on measure of dispersion like standard deviation, range maximum and minimum observation value as shown in table 2 below.

Table 2:- Descriptive statics

Variable	Obs	Mean	Std. Dev.	Min	Max
lnROE1	288	-1.419	1.342	-6.116	2.705

lnROA	288	-2.530	1.452	-8.282	2.956
lnSiz	288	12.438	2.566	6.439	18.148
lnATG	288	-3.544	0.947	-6.262	-0.221
lnDAR	288	-0.408	0.639	-2.233	7.303
lnDER	288	0.703	0.807	-2.119	2.955
lnAge	288	2.718	0.361	1.386	3.219
lngdp	288	2.183	0.196	1.808	2.434
lnINF	288	2.473	0.619	1.030	3.529

Source:- Done from stata 2023

The table 2 demonstrates the analysis of the results of the descriptive statistic of the tested variables over the study period from 2010 to 2021. Mean is the average value of the sample. The mean value of ROE is -1.419, which means on average. The difference of mean from the maximum by the amount of 4.124 and from the minimum by the amount of 4.697. This result indicates ROE exist above the median but not that match. But the distance from the mean both side have high. This value indicates the minimum value gain less profit as compare to the highest in ROE. In addition to the difference from the mean, the maximum and minimum value of ROE is 2.705 and -6.116 respectively. Standard deviation measures how far observations are from the sample average. The ROE observation varies from the mean is the value of 1.342 from the mean. The dispersion result shows high. This happened by the reason of different profitability variation in MFI in Ethiopia.

The mean value of ROA is -2.53, which means on average. The difference of mean from the maximum by the amount of 5.486 and from the minimum by the amount of 5.752. This result indicates ROA exist above the median but not that match. But the distance from the mean both side have high. This value indicates the minimum value gain less profit as compare to the highest in ROA. In addition to the difference from the mean, the maximum and minimum value of ROA is 2.7956 and -8.282 respectively. Standard deviation measures how far observations are from the sample average. The ROA observation varies from the mean is the value of 1.452 from the mean. The dispersion result shows high. This happened by the reason of different profitability variation in MFI in Ethiopia.

The mean value of MFI size has 12.436. The mean value is near to the maximum value as compare to the minimum but not that match difference. This result shows balanced MFI

which half are below the midian and half is above to the median. The maximum and minimum values of size of MFI is 18.148 and 6.439 respectively. The maximum and minimum values are ACSI and Digaf microfinance institution in Ethiopia respectively. The size of MFI observation varies from the mean is by the value of 2.566. The dispersion result has not that match high.

Asset tangibility has the mean value of -3.544. The mean value is near to the minimum value as compare to the maximum. This result indicates that most microfinance asset is gained below the median. The fixed asset proportion to total asset in most MFI is low as explained above. The maximum and minimum value of asset tangibility is -0.221 and -6.262 respectively. The maximum is Kendil and the minimum value mostly happened in Harar Microfinance institution in Ethiopia. The standard deviation has the value 0.947 which indicates on average is not highly deviate from the mean.

The mean value of Debt to Equity ratio has 0.701. The mean value is located above the median but not that match varied from the mean. Most MFI has debt above the median that means take debt above the median. The standard deviation value is 0.807. This result indicates Debt to equity ratio far from the mean by that number. This result indicates not that match far from the mean. The maximum and minimum values are 2.955 and -2.119 respectively.

The mean value of Debt to total asset ratio has -0.408. The mean value is located above the median but not that match varied from the mean. Most MFI has debt above the median that means take debt above the median. The standard deviation value is 0.639. This result indicates Debt to total asset ratio far from the mean by that number. This result indicates not that match far from the mean. The maximum and minimum values are 1.303 and -2.233 respectively.

The age of MFI in Ethiopia has the mean value 3.718. The mean value is greater than the median which implies most of the time the age of MFI was near to the maximum. Most MFI has similar age near to the maximum implies most MFI has well experience. The maximum and minimum value of age was 3.219 and 1.386 respectively. The standard deviation has the value of 0.361 which indicates, it has not that match distance from the mean.

The Gross Domestic Product growth rate has the mean value of 2.183. The mean value is greater than the median that means near to the maximum value of economic growth rate. Most growth rate of Ethiopia for the past 12 years has almost near to the maximum value indicates more or less similar growth rate for the past most of 12 years. The maximum and minimum value is 2.438 and 1.808 respectively. The standard deviation of economic growth rate is 0.196 which indicates more or less the variation is well. This result shows the economic growth stability in the country for the past 12 years.

The inflation rate of Ethiopia has the mean value is 2.473. The mean value is greater than the median which implies most of the time in the past 12 years shows highly grow the inflation rate. This may disturb the market to reduce the value of money as compare to the other country. The maximum and minimum value is 3.529 and 1.03 respectively. The standard deviation of the inflation is 0.619 which indicates dispersed. The dispersed value may have highly impact on the current market.

4.3 TESTING ASSUMPTIONS OF CLRM

4.3.1 THE NORMALITY TEST

The normality test helps to determine how likely it is for a random variable underlying the data set to be normally distributed. There are several normality tests such as the Skewness Kurtosis test, the Jarque Bera test, the Shapiro Wilk test, the Kolmogorov-Smirnov test, and the Chen-Shapiro test. In this research Skewness Kurtosis tests is used. As indicated in table 3 the value of probability is 0.1552 which is greater than 0.05 significant at 5% level. Hence, the null hypothesis cannot be rejected. Therefore the according to skewness test for normality, the residual show normal distribution.

Table 3:- Test of normality distribution

Test	Name	Name of test	Test statics	P-value
Normalty	Skewness kurtosis test	ADJ chi2	3.73	0.1552

Source:- own estimation of research Stata (2023)

4.3.2 THE MULTICOLLINEARITY TEST

This assumption is concerned with the relationship exist between independent variable. If

an independent variable is an exact linear combination of the other independent variables, then we say that the model suffers from perfect co linearity, and it cannot be estimated by OLS (Brooks ,2008). Multi-colinearity condition exists where there is high, but not perfect, correlation between two or more explanatory variables (Cameron and Trivedi, 2009; Wooldridge, 2006). According to (Churchill and Iacobucci ,2005), when there is multi-co linearity, the amount of information about the effect of explanatory variables on dependent variables decreases. As a result, many of the explanatory variables could be judged as not related to the dependent variables when in fact they are. This assumption allows the independent variables to be correlated; they just cannot be perfectly correlated. If we did not allow for any correlation among the independent variables, then multiple regressions would not be very useful for econometric analysis.

Perfect multicollinearity will usually be observed only when the same explanatory variable is inadvertently 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 eight of the independent variables shown below in the table had been estimated. The results in the following correlation matrix show that the highest correlation 0.65 which is between loan size and capital adquecy of MFI. There is no the problem of multicolinearity problem.

There is multicolinarity problem when the variance inflation factor (VIF) of the predictor variable is greater than 10 (Assfaw, 2019a). As presented in the Table 3 and 4, there is no the problem of multicollinearity in both cases

Table 4:- multicolinearity

	lnSiz	lnATG	lnDAR	lnDER	lnAge	lngdp	lnINF
lnSiz	1						
lnATG	-0.3458	1					
lnDAR	0.1642	-0.0764	1				
lnDER	0.3242	-0.2328	0.6607	1			
lnAge	0.6549	-0.2543	0.3429	0.4431	1		
lngdp	-0.2152	0.0883	-0.2466	-0.3212	-0.4955	1	
lnINF	0.0834	-0.0132	0.1447	0.1906	0.2091	-0.499	1

Source: Financial statement of MFI and own computation through Stata (2023)

Table 5:- Variance inflated factor

Variable	VIF	1/VIF
lnAge	2.45	0.407591
lnDER	2.08	0.481643
lnSiz	1.94	0.514548
lnDAR	1.84	0.544081
lngdp	1.75	0.571827
lnINF	1.34	0.745646
lnATG	1.17	0.855676
Mean VIF	1.8	

Source:own computation through Stata (2023)

4.3.3 THE HETEROSCEDASTICITY TEST

The assumption of homoscedasticity is that the residuals are approximately equal for all predicted dependent variable scores the variance of errors is constant, if the assumption are met the pattern of the residuals will have about the same spread on either side of a horizontal line drawn through the average residual (Wooldridge,2005 cited in Tesfaye,2018). Otherwise if the errors do not have a constant variance, they are said to be heteroscedastic. Data are homoscedastic if the residuals plot is the same width for all values of the predicted.

There are several tests to detect the Heteroscedasticity problem, which are Park Test, Glesjer test, Breusch-Pagan-Goldfrey test, White's test and Autoregressive Conditional Heteroscedasticity (ARCH) test, modified Wald test. In this study, the modified Wald test employed to test for the presence of Heteroscedasticity.

As Table 5 reveals, the Heteroscedasticity issue was checked with the the Modified Wald test. The test result signposted that there was an issue of Heteroscedasticity since the p-values were less than five percent level of significance (chi2 (24) = 580, Prob> chi2 = 0.000). There is strong evidence for the presence of heteroskedasticity at less than five percent level of significance and also wald chi square for ROE was 197.34 with significance at 1% and 106.06 for ROA with significance at 1% level of significance.

Table 6:- Heteroskedasticity Tests for ROE

Test		Ethiopian MFI	
		For model ROE	Model ROA
Hetroscedasticity	Sigma(i)^2	500	580
	Prob>chi2	0.00	0

Source:- Output from the stata(2023)

4.3.4 AUTOCORRELATION

The "Durbin-Watson statistics". It is the classic test statistics for serial correlation or autocorrelation. A Durbin-Watson close to 2.0 is consistent with no serial correlation, while a number closer to 0 means there is probably serial correlation Brooks (2008). Hence, as explained by eview above, the value of Durbin-Watson statistics model one when the dependent variable is ROE the result 1.783692 which is close to 2.0 and it is consistent with no serial correlation in this model. As explained by eview9, the value of Durbin-Watson statistics the dependent variable is ROA the result 1.740737 which is close to 2.0 and it is consistent with no serial correlation in this model.

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 Torres 2007).

The Durbin Watson (DW) statistic is a test for autocorrelation in the residuals from a statistical model or regression analysis. The Durbin-Watson statistic will 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).

To detect the autocorrelation problem of the study, the Durbin and Watson (d) tests were undertaken whose value starts from 0 and ends with 4. The value more approaching to 0 indicates positive autocorrelation. According to Kassa (2013) cited in the study of Assfaw (2019b), the autocorrelation problem decision rules stated that there is no positive or negative autocorrelation when the value is $1.765 < d < 2.235$ and positive autocorrelation will not be an issue when the value lies $1.335 \leq d \leq 1.765$. The result of the test exhibited the presence of positive autocorrelation in the model. Hence as indicated in table 6 the value of Durbin-Watson statistics model result 1.603 free from autocorrelation in ROE and

1.01 has the problem of autocorrelation of autocorrelation.

Table 7:-Test of autocorrelation

Test		ROE	ROA
Autocorrelation	Durbin Watson test	1.603	1.01
	Border	2	2

Source:- own computation

4.4 CORRELATION ANALYSIS

Correlation is a statistical measure that indicates the extent to which two or more variables fluctuate in relation to each other. 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 8:- Correlation matrix (with dependent variable)

	ROE	ROA	SIZ	ATG	DAR	DER	GDP	INF	AGE
ROE	1	0.9061	-0.2269	0.2347	-0.01	0.0251	0.0562	0.0440	-0.038
ROA	0.9061	1	-0.3176	0.3127	0.0639	-0.2415	0.1219	-0.0015	-0.1307

Source: Own estimation of research data Stata (2023)

As shown in table 8, ROE has significant and positive relationship with ROA. This implies that return on equity and return on asset has highly correlated relationship implies that both dependent variable can explain the independent variable similarly. The size of microfinance institution in Ethiopia has negative and significant relationship with return on Equity and similarly with ROA. This happen may be the managing way creates high wast of asset in MFI. This may leads to reduce to compete of the institution from the market. Asset

tangibility has positive and significant relationship with both ROE and ROA. When profitability increase leads to increase asset tangibility that is fixed asset is indicate very important indicator for microfinance to be better on their economy. Debt to equity ratio has negative and significant relationship with ROA. This relationship is indicate that, when debt is not managed well may cause decline profit when increase debt. Debt to asset ratio and macroeconomic factor variables did not have significant relation with the profitability of MFI in Ethiopia.

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)

The effect of capital structure on profitability(ROE and ROA) in Ethiopia is specified and the model is as formulated in chapter three. The organized data's are estimated based on the panel model, which includes cross sectional and time series dimensions for 24 MFI in 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).

Hausman Test:- The hausman test is used to select either fixed effect or Random effect in

the model. The measurement of hasman test is as Ho: Random effect model is appropriate. If P-value>5%, we fail to reject the null and the alternative Ha: Fixed effect model is appropriate. If P-value<5%, we reject the null. When ROE is a dependant variable in this research, the Hausman test result shows the p value 0.0005 is less than 0.05 and when ROA is dependant variable which indicate that p value is 0.3172 is greater than 0.05 which indicates fixed effect model is appropriate for ROE and random is appropriate for ROA.

Table 9:- ROE and ROA Hausman test result

Test		**For ROE**	**For ROA**
Hausman	**Chi squer**	**25.98**	**8.18**
	Pro>chi squer	**0.0005**	**0.3172**

The profitability of MFI model Hausman test result of ROE is 0.0005 which is less than 0.05 or 5% indicates Fixed effect is appropriate and for model ROA is 0.3172 which indicates greater than 0.05 or 5% Hence, we accept the null hypothesis random effect model is more appropriate.

4.6 RESULT OF REGRESSION ANALYSIS

Under this section the empirical findings from the econometric results on the impact of capital structure on profitability of MFI in Ethiopia were presented. The section covers the random effect model empirical regression and the results of the regression analysis. Accordingly, the regression result is done by 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 impact of capital structure on profitability. The Model equation is:-

Where: “”: - Y-intercept. “”: Coefficient of variable, “”: Return on asset, “”: Return on equity “”: Size of MFI, “”: Asset tangibility MFI, “” Debt to asset ratio, “” Debt to equity ratio, , Age of MFI,, Gross domestic product growth rate ““: Inflation rate and “” Error

term.

The coefficients of explanatory variable estimated by the use of ordinary least square (OLS) technique, the regression result the table below.

Table 10:- Fixed Effect Regression Model on profitability(ROA and ROE)

	Random effect model				Fixed effect model			
	ROA				ROE			
lnROA	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	t	P>t
lnSiz	-0.2251	0.075395	-2.99	0.003	-0.85208	0.132952	-6.41	0
lnATG	0.165704	0.087471	1.89	0.058	0.110231	0.094552	1.17	0.245
lnDAR	0.947061	0.146371	6.47	0	-1.13714	0.176025	-6.46	0
lnDER	-0.69886	0.126996	-5.5	0	1.652434	0.132519	12.47	0
lngdp	1.032935	0.448809	2.3	0.021	-0.99938	0.475574	-2.1	0.037
lnINF	0.176846	0.10934	1.62	0.106	0.050297	0.10915	0.46	0.645
lnAge	0.785784	0.418885	1.88	0.061	0.789522	0.530681	1.49	0.138
_cons	-3.09355	1.773869	-1.74	0.081	9.884808	2.009096	4.92	0
Observation	288				288			
F test	14.58				29.56			
Pro	0				0			
overall r-squer	0.2447				0.3477			
R-Squer within	0.2819				0.446			
Wald chi-squar	106.06				197.34			
pro-chi squar	0				0			

Source: Researcher's computation with Stata software, 2023

As described earlier, the data above in table 10 result has the problems with hetroscedasticity and autocorrelation in model ROA and use cluster robust standard error to reduse or remove the problem of hetroscedasticity and autocorrelation in model . The second model has the problem of Hetrosedasticity to alleviate these issues robust standard error estimations have been used on fixed effect model described in table 11.

Table 11:- Summary result of cluster Robust Fixed and Random Effect regression model

		Random effect for lnROA			Fixed effect for ROE			
lnROA	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	t	P>t
lnSiz	-0.2251	0.117056	-1.92	0.054*	-0.85208	0.175073	-4.87	0***
lnATG	0.165704	0.155079	1.07	0.285	0.110231	0.165671	0.67	0.512
lnDAR	0.947061	0.176595	5.36	0***	-1.13714	0.282092	-4.03	0.001***
lnDER	-0.69886	0.251723	-2.78	0.005***	1.652434	0.421665	3.92	0.001***
lnAge	0.785784	0.690937	1.14	0.255	0.789522	0.722083	1.09	0.286
lngdp	1.032935	0.403181	2.56	0.01**	-0.99938	0.603537	-1.66	0.111
lnINF	0.176846	0.107358	1.65	0.1*	0.050297	0.090815	0.55	0.585
_cons	-3.09355	2.292518	-1.35	0.177	9.884808	3.906004	2.53	0.019
Observation	288				288			
F test	14.58				7.22			
Pro	0				0			
overall r-squer	0.2442				0.3473			
R-Squer within	0.2819				0.441			

Note: ***, **, * indicate significant at 1%, 5% and 10% significance level respectively. Source: Researcher's computation with Stata software, 2023

The regression result and discussion for model return on Asset(ROA)

Table 11 shows that when ROA is the dependent variable, the explanatory power of the models was measured using the R-square within whose value was 28.42%. The F statics value is 14.58 and its probability value is significant even in at a 1% level of significance, this result suggesting that all predictor variables can jointly influence the rate of 28.42% variation in the Return on asset. The intercept of the model is -3.094 which indicates that the return on asset of sampled microfinance institution becomes loss in the absence of changes in predictor variables of return on asset of MFI.

As explained with the expectation of the study, the Debt to asset ratio of MFI has a highly significant positive impact on the return on asset at less than 1% level of significance. This result of clustered robust random effect regression model indicate that as an increase in Debt to asset ratio by 100% being other factors held constant, results in a 94.7% increase in return on asset of MFI. This positive relationship also reflected in the study of other scholars,(Afsheen (2016), Bogan (2009). However the finding is contradict with the empirical evidence of other authors(Supa Tongkong,2012)

The size of MFI has a significant negative impact on the return on asset level of MFI at

less than 10% level of significance. The results of clustered robust random effect regression model indicate that an increase in a size of MFI by 100%, being other factors held constant, results in a 22.51% decrease in MFI return on asset. This finding indicates the rise size have negative relation with profitability. This negative relationship also reflected in the study of other scholars (Tesfaye (2018). However the finding is contradict with the empirical evidence of other authors(Gudeta (2013), Afsheen (2016) found insignificant).

The Debt to equity ratio has a significant negative impact on the return on asset level of MFI 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 of MFI by 1 birr, being other factors held constant, results in a 0.7 birr or 70 cents decrease in return on asset of MFI. This negative relationship also reflected in the study of other scholars (Tesfaye (2018), Supa Tongkong,(2012), Abor (2007).

As explained with the expectation of the study, the GDP has a high significant positive impact on the return on asset at less than 5% level of significance. This result of clustered robust random effect regression model indicate that as an increase in GDP of the country by 1 birr being other factors held constant, results in a 1.03 birr increase in return on asset of MFI. This positive relationship also reflected in the study of other scholars couldn't get, however Gudeta (2013 found insignificant result

Inflation rate of MFI has a significant positive impact on the return on asset at10% level of significance. This result of clustered robust random effect regression model indicate that as an increase in inflation rate by 100% being other factors held constant, results in a 17.7% increase in return on asset of MFI. This result is not the expected result that affects the profitability positively. The rise of inflation affects profitability by inflation that is by reducing the value of money in the market. The government may take action to reduce the rise of inflation in the market.

Regression result and interpretation of model return on equity (ROE)

As described earlier, there were also the problems with heteroscedasticity . To alleviate these issues, robust standard error estimations on the fixed effect model on ROE were functional. Therefore the estimation results of the linear regression model on the capital structure on the profitability(ROE) of MFI in Ethiopia were presented as follows.

When ROE is the dependent variable, the explanatory power of the models was measured using the R-square within whose value was 44.60%. The F statics value is 29.56 and its probability value is significant even in at a 1% level of significance, this result suggesting that all predictor variables can jointly influence the rate of 44.60% variation in the Return on equity. The intercept of the model is 9.88 which indicates that the return on equity of sampled microfinance institution becomes it capital in the absence of changes in predictor variables of return on equity of MFI.

The size of MFI has a significant negative impact on the return on equity level of MFI at less than 1% level of significance. The results of robust fixed effect regression model indicate that an increase in a size of MFI by 100%, being other factors held constant, results in a 85.2% decrease in MFI return on equity. This finding indicates the rise size have negative relation with profitability. This negative relationship also reflected in the study of other scholars (Tesfaye (2018). However the finding is contradict with the empirical evidence of other authors(Gudeta (2013), Afsheen (2016) found insignificant).

The Debt to equity ratio has a significant positive impact on the return on equity level of MFI at less than 1% level of significance. The results of robust fixed effect regression model indicate that an increase in a Debt to equity ratio of MFI by 1 birr, being other factors held constant, results in a 1.65 birr increase in return on equity of MFI. This positive relationship also contradict with reflected in the study of scholars (Tesfaye (2018), Supa Tongkong,(2012), Abor (2007).

The Debt to asset ratio has a significant negative impact on the return on equity level of MFI at less than 1% level of significance. The results of robust fixed effect regression model indicate that an increase in a Debt to asset ratio of MFI by 1 birr, being other factors held constant, results in a 1.14 birr decrease in return on equity of MFI. This negative relationship reflected in the study of scholars (Supa Tongkong,2012, (Abor, 2007).

Table 12;- The expected and actual sign of the study

No	Variable	Dependent variavle	Symbol	Expected sign	Actual sign	result
1	Size of MFI	ROE	SIZ	+	-	Significant

		ROA	SIZ	+	-	Significant
1	Asset tangibility	ROE	ATG	+	+	insignificant
		ROA	ATG	+	+	insignificant
3	Debt to asset ratio	ROE	DAR	-	-	Significant
		ROA	DAR	-	+	Significant
4	Debt to equity ratio	ROE	DER	-	-	Significant
		ROA	DER	-	+	Significant
5	Age if MFI	ROE	AGE	+	+	Not Significant
		ROA	AGE	+	+	InSignificant
7	Gross Domestic Product	ROE	GDP	+	-	Insignificant
		ROA	GDP	+	+	significant
8	Inflation	ROE	INF	-	+	Insignificant
		ROA	INF	-	+	significant

CHAPTER FIVE

5. SUMMARY,CONCLUSION AND RECOMMENDATION

5.1. Summary

The study finds the impact of capital structure on profitability of micro finance institution in Ethiopia. The regression result shown that the size of MFI has negative and significant impact on the profitability of MFI in Ethiopia at 5% significance level. This implies that when increase the asset of MFI can't properly managed the resource. This unable, leads to have negative relationship between size of MFI and profitability. This result indicates that.

MFI need to improve the administrative system need radical change in technology use, training of human resource etc.

Debt to asset ratio has a positive and significant relationship with ROA. This relationship indicates positive relationship but the size of MFI size has negative also indicate unable to manage. In contrast to this Debt to asset ratio has negative impact on ROE. Similarly Debt to equity ratio has negative relationship with ROA. In contrast to this, Debt to equity ratio has positive and significant impact on ROE.

Economic growth rate has significant impact on return on asset (ROA). This result indicates that GDP has positive relationship with ROA. Similarly inflation has a positive significant effect on return on asset(ROA). This result is not the expected. This may disturb the economy by making the reduction of purchasing power of money in the market.

5.2 Conclusion

The objective of this study was to find out the impact of capital structure on profitability of micro finance institution in Ethiopia. The study used explanatory research design to find out the relationship between independent variables and dependent variables of the study. The population of this study was all the 24 MFI in Ethiopia currently licensed to operate among forty six that generates financial statement from 2010 up to 2021. Secondary data was drawn from the financial statements of sampled 24 MFI of Ethiopia from 2010-2021. The data was analyzed using descriptive and regression analysis.

The impact of MFI profitability factors were size of MFI and Debt to equity ratio has significant negative relationship with ROA. Debt to asset ratio, GDP and Inflation has significant and positive relationship with ROA. When we come to ROE, size of MFI and Debt to asset ratio has significant negative relationship with ROE and Debt to equity ratio has significant positive relationship with ROE. The rest Variable asset tangibility and age have positive insignificant on ROA and asset tangibility, age, and inflation has positive

insignificant relationship with return of equity. GDP has negative and insignificant relationship with ROE.

5.3 RECOMMENDATION OF THE STUDY

Based on the above result the following recommendation are formulated

According to the finding of the study shows that the size of MFI and profitability has negative relationship with profitability. We suggested that the rise of asset leads to reduction of profitability. This may happen by the unable to manage the resource. Therefore the Institution takes radical change on their managing system by using updated technology and also giving training for their human resource.

The Debt to asset ratio of MFI has a positive relationship with return on asset. The institution unable to manage high amount of asset size also indicates to unable high debt to asset ratio to get better profitability but we can't say increase debt to asset ratio to increase profitability because the MFI can't manage increased asset as profit increase. After improve managing style of MFI can rise Debt to asset ratio improve profitability. The ratio of Debt to equity ratio has similar result.

Economic growth rate has positive impact on the MFI profitability. The government work

to rise the economy of Ethiopia like industry, agriculture through expansion of production to raise the profitability of MFI. But as shown in the finding that inflation has positive relation with profitability may have disadvantage for their profitability. In the current economy, income and inflation has direct relationship is not the plan of government but happen. Therefore the government takes care in this situation through making balance of both.

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Annex I

The research Data

MFI	ID	ROE1	LNSIZ	LNATG	LNDAR	LNDER	LNAGE	LNGDP	LNINF	LNROA	LNROE1
ACSI	1	0.235	14.898	-3.375	-0.327	0.950	2.639	2.358	1.030	-2.725	-1.449
	1	0.235	15.003	-3.375	-0.327	0.950	2.708	2.434	2.896	-2.725	-1.449
	1	0.254	15.293	-2.881	-0.328	0.947	2.773	2.163	3.529	-2.645	-1.370
	1	0.235	15.586	-2.803	-0.310	1.011	2.833	2.293	2.603	-2.770	-1.448
	1	0.230	15.951	-3.489	-0.274	1.153	2.890	2.332	2.092	-2.898	-1.471
	1	0.231	16.276	-3.746	-0.262	1.207	2.944	2.342	2.041	-2.936	-1.467
	1	0.226	16.541	-3.963	-0.258	1.223	2.996	2.079	2.272	-2.969	-1.487
	1	0.232	16.776	-3.483	-0.266	1.187	3.045	2.313	2.001	-2.915	-1.462
	1	0.211	17.114	-3.801	-0.242	1.295	3.091	2.041	2.681	-3.091	-1.554
	1	0.178	17.300	-3.938	-0.242	1.295	3.135	2.197	2.534	-3.266	-1.729
	1	0.145	17.328	-3.276	-0.277	1.142	3.178	1.808	2.991	-3.352	-1.933

	1	0.147	17.476	-3.064	-0.280	1.130	3.219	1.841	3.006	-3.327	-1.918
DECSI	2	0.078	14.705	-3.107	0.921	2.293	2.639	2.358	1.030	-3.927	-2.555
	2	0.078	14.810	-3.107	-0.275	1.151	2.708	2.434	2.896	-3.981	-2.555
	2	0.103	14.911	-3.022	-0.282	1.120	2.773	2.163	3.529	-3.680	-2.278
	2	0.070	15.086	-3.021	-0.251	1.255	2.833	2.293	2.603	-4.164	-2.658
	2	0.121	15.250	-2.837	-0.242	1.295	2.890	2.332	2.092	-3.649	-2.112
	2	0.118	15.340	-2.807	-0.254	1.239	2.944	2.342	2.041	-3.630	-2.136
	2	0.004	15.388	-2.851	-0.242	1.294	2.996	2.079	2.272	-7.023	-5.487
	2	0.141	15.770	-3.306	-0.136	1.927	3.045	2.313	2.001	-4.018	-1.956
	2	0.226	15.891	-3.380	-0.157	1.774	3.091	2.041	2.681	-3.415	-1.485
	2	0.226	13.471	-2.880	3.371	2.862	3.135	2.197	2.534	-0.976	-1.485
	2	0.226	13.491	-2.880	3.371	2.862	3.178	1.808	2.991	-0.976	-1.485
	2	0.226	9.579	-2.880	7.303	2.862	3.219	1.841	3.006	2.956	-1.485
OCSSCO	3	0.415	14.144	-3.515	-0.276	1.144	2.639	2.358	1.030	-2.300	-0.879
	3	0.499	14.341	-3.130	-0.306	1.028	2.708	2.434	2.896	-2.030	-0.696
	3	0.554	14.564	-3.094	-0.316	0.989	2.773	2.163	3.529	-1.895	-0.590
	3	0.591	14.881	-3.208	-0.289	1.095	2.833	2.293	2.603	-1.909	-0.526
	3	0.661	15.334	-3.480	-0.218	1.414	2.890	2.332	2.092	-2.045	-0.414
	3	0.722	15.368	-3.586	-0.295	1.071	2.944	2.342	2.041	-1.692	-0.326
	3	0.762	15.458	-3.752	-0.347	0.880	2.996	2.079	2.272	-1.499	-0.272
	3	0.809	15.971	-4.263	-0.248	1.269	3.045	2.313	2.001	-1.729	-0.212
	3	0.850	16.324	-4.600	-0.218	1.412	3.091	2.041	2.681	-1.793	-0.163
	3	0.248	16.428	-4.412	-0.202	1.497	3.135	2.197	2.534	-3.094	-1.395
	3	0.132	16.48	-4.50	-0.220	1.402	3.178	1.808	2.991	-3.647	-2.025

			2	7							
	3	0.073	16.590	-4.244	-0.657	0.074	3.219	1.841	3.006	-3.353	-2.622
OMO	4	0.011	13.358	-4.882	-0.319	0.978	2.639	2.358	1.030	-5.806	-4.509
	4	0.059	13.510	-4.567	-0.281	1.127	2.708	2.434	2.896	-4.240	-2.832
	4	0.144	14.097	-4.308	-0.196	1.529	2.773	2.163	3.529	-3.660	-1.935
	4	0.167	14.437	-4.184	-0.189	1.571	2.833	2.293	2.603	-3.549	-1.790
	4	0.169	14.813	-4.305	-0.158	1.764	2.890	2.332	2.092	-3.701	-1.779
	4	0.217	15.092	-4.297	-0.158	1.767	2.944	2.342	2.041	-3.455	-1.530
	4	0.215	15.273	-4.109	-0.123	2.034	2.996	2.079	2.272	-3.693	-1.536
	4	0.274	15.572	-3.524	-0.081	2.475	3.045	2.313	2.001	-3.850	-1.294
	4	0.166	15.971	-4.985	-0.113	2.128	3.091	2.041	2.681	-4.035	-1.795
	4	0.183	16.009	-4.842	-0.214	1.435	3.135	2.197	2.534	-3.344	-1.696
	4	0.137	16.023	-4.673	-0.186	1.587	3.178	1.808	2.991	-3.758	-1.985
	4	0.052	15.978	-3.398	-0.200	1.507	3.219	1.841	3.006	-4.654	-2.948
ADDIS	5	0.051	13.179	-4.313	-1.045	-0.612	2.565	2.358	1.030	-3.416	-2.982
	5	0.060	13.547	-4.111	-0.675	0.036	2.639	2.434	2.896	-3.531	-2.820
	5	0.079	14.008	-4.028	-0.482	0.480	2.708	2.163	3.529	-3.494	-2.532
	5	0.190	14.237	-3.086	-0.521	0.380	2.773	2.293	2.603	-2.561	-1.659
	5	0.211	14.599	-3.268	-0.481	0.481	2.833	2.332	2.092	-2.516	-1.554
	5	0.253	14.818	-3.522	-0.485	0.470	2.890	2.342	2.041	-2.331	-1.375
	5	0.354	14.918	-3.693	-0.497	0.440	2.944	2.079	2.272	-1.975	-1.038
	5	0.500	15.075	-3.908	-0.403	0.701	2.996	2.313	2.001	-1.798	-0.694
	5	0.538	15.191	-4.013	-0.430	0.621	3.045	2.041	2.681	-1.671	-0.619
	5	0.538	15.286	-4.013	-0.430	0.621	3.091	2.197	2.534	-1.671	-0.619

	5	0.538	15.381	-4.013	-0.476	0.621	3.135	1.808	2.991	-1.717	-0.619
	5	0.538	15.521	-4.013	-0.476	0.621	3.178	1.841	3.006	-1.717	-0.619
CONS A	6	0.186	14.752	-3.870	-0.406	0.691	2.565	2.358	1.030	-2.778	-1.681
	6	0.203	16.032	-3.334	-0.328	0.946	2.639	2.434	2.896	-2.870	-1.595
	6	0.240	16.302	-3.128	-0.313	1.000	2.708	2.163	3.529	-2.741	-1.428
	6	0.255	16.571	-3.050	-0.296	1.067	2.773	2.293	2.603	-2.731	-1.368
	6	0.279	16.912	-3.365	-0.260	1.216	2.833	2.332	2.092	-2.753	-1.278
	6	0.306	17.124	-3.514	-0.272	1.164	2.890	2.342	2.041	-2.619	-1.184
	6	0.320	17.298	-3.663	-0.270	1.172	2.944	2.079	2.272	-2.580	-1.138
	6	0.354	17.607	-3.597	-0.225	1.378	2.996	2.313	2.001	-2.641	-1.038
	6	0.380	17.908	-4.883	-0.217	1.418	3.045	2.041	2.681	-2.603	-0.969
	6	0.380	17.957	-4.883	-0.217	1.418	3.091	2.197	2.534	-2.603	-0.969
	6	0.380	18.052	-4.883	-0.217	1.418	3.135	1.808	2.991	-2.603	-0.969
	6	0.380	18.148	-4.883	-0.217	1.418	3.178	1.841	3.006	-2.603	-0.969
SFPI	7	0.982	11.024	-3.986	-0.594	0.208	2.639	2.358	1.030	-0.821	-0.018
	7	0.985	11.155	-4.176	-0.619	0.154	2.708	2.434	2.896	-0.789	-0.015
	7	0.988	11.440	-3.521	-0.556	0.295	2.773	2.163	3.529	-0.864	-0.012
	7	0.985	11.856	-4.043	-0.446	0.575	2.833	2.293	2.603	-1.036	-0.015
	7	0.988	12.010	-4.291	-0.486	0.470	2.890	2.332	2.092	-0.967	-0.012
	7	0.990	12.319	-4.439	-0.410	0.680	2.944	2.342	2.041	-1.100	-0.010
	7	0.972	12.433	-3.963	-0.419	0.653	2.996	2.079	2.272	-1.100	-0.028
	7	0.976	12.580	-4.033	-0.416	0.661	3.045	2.313	2.001	-1.102	-0.025
	7	0.112	12.749	-3.693	-0.392	0.734	3.091	2.041	2.681	-3.314	-2.188
	7	0.148	12.93	-3.85	-0.216	1.421	3.135	2.197	2.534	-3.547	-1.910

			2	7							
	7	0.216	13.189	-4.064	-0.240	1.304	3.178	1.808	2.991	-3.075	-1.530
	7	0.240	13.550	-4.331	-0.225	1.379	3.219	1.841	3.006	-3.031	-1.428
GASHA	8	0.038	9.811	-2.987	-0.536	0.343	2.565	2.358	1.030	-4.139	-3.260
	8	0.171	9.949	-2.935	-0.559	0.290	2.639	2.434	2.896	-2.615	-1.767
	8	0.023	10.054	-3.131	-0.501	0.430	2.708	2.163	3.529	-4.723	-3.792
	8	0.023	10.064	-3.131	-0.491	0.430	2.773	2.293	2.603	-4.713	-3.792
	8	0.025	10.390	-2.852	-0.348	0.876	2.833	2.332	2.092	-4.920	-3.696
	8	0.112	10.567	-3.019	-0.331	0.936	2.890	2.342	2.041	-3.453	-2.187
	8	0.178	10.712	-3.196	-0.349	0.874	2.944	2.079	2.272	-2.951	-1.728
	8	0.122	10.865	-3.340	-0.364	0.823	2.996	2.313	2.001	-3.289	-2.102
	8	0.099	11.022	-3.402	-0.343	0.895	3.045	2.041	2.681	-3.547	-2.309
	8	0.127	11.163	-3.523	-0.338	0.912	3.091	2.197	2.534	-3.316	-2.066
	8	0.039	11.446	-2.613	-0.237	1.320	3.135	1.808	2.991	-4.809	-3.253
	8	0.191	11.761	-2.986	-0.211	1.448	3.178	1.841	3.006	-3.313	-1.654
Vision	9	0.049	11.700	-2.891	-0.639	0.111	2.565	2.358	1.030	-3.771	-3.021
	9	0.095	11.840	-2.903	-0.656	0.076	2.639	2.434	2.896	-3.089	-2.357
	9	0.025	12.446	-2.752	-0.647	0.094	2.708	2.163	3.529	-4.423	-3.681
	9	0.113	12.857	-2.931	-0.663	0.061	2.773	2.293	2.603	-2.905	-2.181
	9	0.161	12.985	-3.383	-0.734	-0.081	2.833	2.332	2.092	-2.479	-1.825
	9	0.268	13.119	-3.902	-0.788	-0.181	2.890	2.342	2.041	-1.924	-1.318
	9	0.391	13.329	-4.102	-0.769	-0.146	2.944	2.079	2.272	-1.562	-0.939
	9	0.495	13.562	-4.105	-0.719	-0.051	2.996	2.313	2.001	-1.371	-0.702
	9	0.578	13.997	-4.311	-0.505	0.419	3.045	2.041	2.681	-1.473	-0.549

	9	0.198	14.404	-2.536	-0.442	0.587	3.091	2.197	2.534	-2.649	-1.620
	9	0.188	14.643	-2.789	-0.421	0.646	3.135	1.808	2.991	-2.739	-1.671
	9	0.283	15.041	-4.708	-0.391	0.736	3.178	1.841	3.006	-2.388	-1.261
SIDAMA	10	0.019	10.503	-3.078	-0.372	0.797	2.565	2.358	1.030	-5.108	-3.939
	10	0.066	10.789	-3.279	-0.335	0.920	2.639	2.434	2.896	-3.980	-2.724
	10	0.167	11.046	-3.599	-0.307	1.024	2.708	2.163	3.529	-3.121	-1.790
	10	0.171	11.534	-3.932	-0.225	1.377	2.773	2.293	2.603	-3.369	-1.768
	10	0.153	11.696	-3.804	-0.403	0.702	2.833	2.332	2.092	-2.981	-1.877
	10	0.140	11.822	-4.044	-0.415	0.665	2.890	2.342	2.041	-3.045	-1.965
	10	0.163	12.140	-4.352	-0.350	0.871	2.944	2.079	2.272	-3.034	-1.813
	10	0.214	12.343	-4.653	-0.399	0.714	2.996	2.313	2.001	-2.655	-1.543
	10	0.197	12.653	-4.762	-0.435	0.606	3.045	2.041	2.681	-2.664	-1.622
	10	0.145	12.853	-4.822	-0.493	0.450	3.091	2.197	2.534	-2.872	-1.929
	10	0.109	12.904	-4.778	-0.536	0.343	3.135	1.808	2.991	-3.095	-2.216
	10	0.210	13.171	-4.949	-0.514	0.398	3.178	1.841	3.006	-2.473	-1.561
Bus.Gon	11	0.396	11.004	-2.826	-0.682	0.022	2.485	2.358	1.030	-1.630	-0.926
	11	0.505	11.334	-3.075	-0.747	-0.105	2.565	2.434	2.896	-1.325	-0.683
	11	0.494	11.729	-3.139	-0.625	0.140	2.639	2.163	3.529	-1.472	-0.706
	11	0.583	12.160	-3.606	-0.498	0.438	2.708	2.293	2.603	-1.475	-0.539
	11	0.645	12.474	-3.466	-0.464	0.527	2.773	2.332	2.092	-1.429	-0.438
	11	0.689	12.732	-3.691	-0.440	0.593	2.833	2.342	2.041	-1.406	-0.373
	11	0.688	12.763	-5.658	-0.530	0.357	2.890	2.079	2.272	-1.261	-0.374
	11	0.160	12.904	-4.037	-0.555	0.299	2.944	2.313	2.001	-2.686	-1.833
	1	0.137	13.25	-3.98	-0.429	0.624	2.996	2.041	2.681	-3.038	-1.985

	1		1	7							
	11	0.152	13.561	-3.575	-0.345	0.888	3.045	2.197	2.534	-3.117	-1.884
	11	0.119	13.628	-3.593	-0.369	0.807	3.091	1.808	2.991	-3.303	-2.127
	11	0.084	13.691	-3.496	-0.396	0.721	3.135	1.841	3.006	-3.597	-2.480
	12	0.934	10.877	-3.486	-0.463	0.529	2.485	2.358	1.030	-1.060	-0.068
	12	0.948	10.948	-3.682	-0.576	0.250	2.565	2.434	2.896	-0.879	-0.053
	12	0.956	11.073	-3.823	-0.601	0.194	2.639	2.163	3.529	-0.840	-0.045
	12	0.964	11.336	-4.093	-0.551	0.307	2.708	2.293	2.603	-0.895	-0.037
	12	0.969	11.474	-3.983	-0.573	0.256	2.773	2.332	2.092	-0.860	-0.031
	12	0.972	11.565	-4.302	-0.573	0.258	2.833	2.342	2.041	-0.859	-0.028
Peace	12	0.507	11.655	-4.527	-0.580	0.241	2.890	2.079	2.272	-1.500	-0.679
	12	0.572	11.827	-4.479	-0.556	0.295	2.944	2.313	2.001	-1.410	-0.559
	12	0.620	12.193	-4.794	-0.406	0.692	2.996	2.041	2.681	-1.575	-0.477
	12	0.193	12.521	-3.409	-0.359	0.841	3.045	2.197	2.534	-2.845	-1.646
	12	0.140	12.826	-3.674	-0.299	1.056	3.091	1.808	2.991	-3.323	-1.968
	12	0.082	13.089	-3.675	-0.263	1.202	3.135	1.841	3.006	-3.967	-2.502
	13	0.571	10.116	-2.941	-0.256	1.230	2.398	2.358	1.030	-2.046	-0.560
	13	0.674	10.228	-3.156	-0.323	0.966	2.485	2.434	2.896	-1.682	-0.394
	13	0.283	10.388	-3.433	-0.408	0.685	2.565	2.163	3.529	-2.357	-1.264
	13	0.838	10.709	-3.725	-0.421	0.647	2.639	2.293	2.603	-1.245	-0.177
Meklit	13	1.061	10.804	-3.725	-0.421	0.647	2.708	2.332	2.092	-1.009	0.059
	13	0.855	11.065	-3.846	-0.530	0.359	2.773	2.342	2.041	-1.046	-0.157
	13	0.873	11.238	-3.906	-0.539	0.337	2.833	2.079	2.272	-1.012	-0.136
	13	0.711	11.431	-3.170	-0.550	0.311	2.890	2.313	2.001	-1.202	-0.342

	13	0.645	11.722	-3.629	-0.550	0.310	2.944	2.041	2.681	-1.299	-0.438
	13	0.158	12.143	-2.653	-0.532	0.354	2.996	2.197	2.534	-2.730	-1.845
	13	0.177	12.397	-2.866	-0.501	0.431	3.045	1.808	2.991	-2.661	-1.729
	13	0.182	12.733	-2.756	-0.424	0.639	3.091	1.841	3.006	-2.768	-1.705
Eshet	14	0.108	10.720	-3.826	-1.063	-0.639	2.398	2.358	1.030	-2.648	-2.224
	14	0.104	10.741	-3.787	-1.019	-0.572	2.485	2.434	2.896	-2.710	-2.262
	14	0.200	10.915	-3.214	-0.963	-0.483	2.565	2.163	3.529	-2.088	-1.607
	14	0.261	11.091	-3.572	-0.786	-0.178	2.639	2.293	2.603	-1.950	-1.342
	14	0.341	11.101	-3.552	-0.666	0.055	2.708	2.332	2.092	-1.796	-1.075
	14	0.372	11.008	-3.710	-0.734	-0.080	2.773	2.342	2.041	-1.644	-0.990
	14	0.286	10.954	-3.925	-0.438	0.599	2.833	2.079	2.272	-2.289	-1.252
	14	0.228	10.968	-4.115	-0.416	0.663	2.890	2.313	2.001	-2.559	-1.480
	14	0.169	10.950	-4.159	-0.425	0.636	2.944	2.041	2.681	-2.836	-1.776
	14	0.005	11.185	-4.345	-0.314	0.996	2.996	2.197	2.534	-6.579	-5.268
	14	0.042	11.351	-2.787	-0.299	1.055	3.045	1.808	2.991	-4.531	-3.177
	14	0.060	11.634	-2.842	-0.271	1.166	3.091	1.841	3.006	-4.255	-2.818
Wasasa	15	0.533	11.463	-3.697	-0.376	0.783	2.398	2.358	1.030	-1.789	-0.630
	15	0.544	11.757	-3.009	-0.426	0.634	2.485	2.434	2.896	-1.668	-0.609
	15	0.419	12.165	-3.399	-0.394	0.344	2.565	2.163	3.529	-1.608	-0.870
	15	0.683	12.383	-3.307	-0.382	0.764	2.639	2.293	2.603	-1.527	-0.381
	15	0.698	12.642	-3.175	-0.352	0.864	2.708	2.332	2.092	-1.575	-0.359
	15	0.722	13.045	-3.624	-0.268	1.181	2.773	2.342	2.041	-1.774	-0.325
	15	0.743	13.228	-3.839	-0.260	1.216	2.833	2.079	2.272	-1.772	-0.297
	1	0.767	13.21	-3.15	-0.313	1.000	2.890	2.313	2.001	-1.578	-0.265

	5		4	2							
	15	0.786	13.245	-2.921	-0.347	0.879	2.944	2.041	2.681	-1.467	-0.240
	15	0.093	13.594	-3.311	-0.312	1.004	2.996	2.197	2.534	-3.696	-2.380
	15	0.054	13.704	-3.326	-0.298	1.059	3.045	1.808	2.991	-4.280	-2.923
	15	0.109	13.817	-3.258	-0.303	1.037	3.091	1.841	3.006	-3.553	-2.212
Harbu	16	0.010	9.807	-3.211	-1.462	-1.198	1.792	2.358	1.030	-4.844	-4.580
	16	0.224	10.311	-3.587	-0.730	-0.073	1.946	2.434	2.896	-2.153	-1.496
	16	0.019	10.849	-4.128	-0.403	0.702	2.079	2.163	3.529	-5.088	-3.984
	16	0.025	11.021	-3.340	-0.372	0.798	2.197	2.293	2.603	-4.858	-3.689
	16	0.027	11.050	-3.208	-0.423	0.642	2.303	2.332	2.092	-4.680	-3.616
	16	0.027	11.139	-3.392	-0.477	0.493	2.398	2.342	2.041	-4.588	-3.619
	16	0.017	11.386	-3.378	-0.355	0.852	2.485	2.079	2.272	-5.310	-4.103
	16	0.034	11.778	-3.576	-0.252	1.252	2.565	2.313	2.001	-4.871	-3.368
	16	0.144	12.113	-5.639	-0.216	1.425	2.639	2.041	2.681	-3.579	-1.938
	16	0.140	12.336	-3.194	-0.184	0.012	2.708	2.197	2.534	-2.160	-1.964
	16	0.105	12.567	-3.380	-0.248	-0.018	2.773	1.808	2.991	-2.488	-2.258
	16	0.083	13.141	-3.354	-0.197	0.231	2.833	1.841	3.006	-2.912	-2.484
Cons B	17	0.334	13.186	-3.234	-0.570	0.263	2.565	2.358	1.030	-1.931	-1.098
	17	0.330	13.552	-3.296	-0.561	0.285	2.639	2.434	2.896	-1.954	-1.108
	17	0.296	13.984	-3.347	-0.557	0.293	2.708	2.163	3.529	-2.069	-1.219
	17	0.386	14.263	-3.490	-0.506	0.416	2.773	2.293	2.603	-1.875	-0.952
	17	0.423	14.451	-3.596	-0.508	0.413	2.833	2.332	2.092	-1.781	-0.861
	17	0.461	14.700	-3.968	-0.480	0.484	2.890	2.342	2.041	-1.738	-0.773
	17	0.465	14.891	-4.591	-0.471	0.507	2.944	2.079	2.272	-1.744	-0.765

	17	0.415	15.099	-3.958	-0.484	0.475	2.996	2.313	2.001	-1.839	-0.880
	17	0.377	15.383	-4.056	-0.429	0.625	3.045	2.041	2.681	-2.029	-0.975
	17	0.377	15.478	-4.056	-0.429	0.625	3.091	2.197	2.534	-2.029	-0.975
	17	0.377	15.573	-4.056	-0.429	0.625	3.135	1.808	2.991	-2.029	-0.975
	17	0.377	15.668	-4.056	-0.429	0.625	3.178	1.841	3.006	-2.029	-0.975
kendil	18	0.207	9.496	-1.994	-1.259	-0.925	1.386	2.358	1.030	-1.910	-1.576
	18	0.291	9.650	-1.487	-1.050	-0.619	1.609	2.434	2.896	-1.664	-1.233
	18	0.351	9.655	-1.388	-1.037	-0.599	1.792	2.163	3.529	-1.485	-1.047
	18	0.361	9.908	-1.419	-1.110	-0.711	1.946	2.293	2.603	-1.420	-1.020
	18	0.287	10.153	-1.561	-1.156	-0.778	2.079	2.332	2.092	-1.628	-1.250
	18	0.367	10.258	-1.337	-1.158	-0.781	2.197	2.342	2.041	-1.380	-1.003
	18	0.379	10.471	-1.517	-1.262	-0.929	2.303	2.079	2.272	-1.302	-0.970
	18	0.125	10.472	-1.549	-1.287	-0.964	2.398	2.313	2.001	-2.402	-2.080
	18	0.163	10.999	-1.848	-1.065	-0.642	2.485	2.041	2.681	-2.235	-1.812
	18	0.209	11.287	-1.612	-0.590	0.218	2.565	2.197	2.534	-2.373	-1.565
	18	0.243	11.380	-1.691	-0.548	0.160	2.639	1.808	2.991	-2.124	-1.416
	18	0.211	11.897	-2.229	-0.462	0.533	2.708	1.841	3.006	-2.551	-1.556
Metemamen	19	0.283	9.697	-3.906	-1.557	-1.321	2.197	2.358	1.030	-1.499	-1.263
	19	0.256	9.755	-3.615	-1.620	-1.399	2.303	2.434	2.896	-1.583	-1.363
	19	0.243	10.038	-3.882	-0.947	-0.457	2.398	2.163	3.529	-1.904	-1.413
	19	0.039	10.668	-4.381	-0.631	0.128	2.485	2.293	2.603	-4.015	-3.256
	19	0.095	11.076	-4.131	-1.049	-0.618	2.565	2.332	2.092	-2.783	-2.352
	19	0.188	11.670	-4.409	-0.712	-0.037	2.639	2.342	2.041	-2.347	-1.673
	1	0.237	11.98	-4.56	-0.695	-0.00	2.708	2.079	2.272	-2.131	-1.440

	9		8	4		4					
	19	0.343	12.068	-3.649	-0.701	-0.016	2.773	2.313	2.001	-1.755	-1.069
	19	0.402	12.350	-3.996	-0.655	0.078	2.833	2.041	2.681	-1.645	-0.912
	19	0.598	12.719	-6.262	-0.398	0.717	2.890	2.197	2.534	-1.628	-0.514
	19	0.203	12.919	-4.110	-0.397	0.717	2.944	1.808	2.991	-2.707	-1.593
	19	0.220	13.451	-2.880	-0.290	1.091	2.996	1.841	3.006	-2.896	-1.515
Leta	20	0.832	8.323	-3.350	-1.283	-0.959	1.946	2.358	1.030	-0.508	-0.184
	20	0.881	8.759	-3.240	-1.075	-0.657	2.079	2.434	2.896	-0.544	-0.127
	20	0.908	9.534	-2.253	-0.498	0.439	2.197	2.163	3.529	-1.033	-0.097
	20	1.826	9.746	-2.669	-0.409	0.683	2.303	2.293	2.603	-0.490	0.602
	20	1.499	9.692	-2.652	-0.572	0.259	2.398	2.332	2.092	-0.426	0.405
	20	1.450	9.473	-2.682	-0.682	0.022	2.485	2.342	2.041	-0.332	0.372
	20	0.632	9.326	-2.927	-0.558	0.292	2.565	2.079	2.272	-1.309	-0.460
	20	0.343	9.083	-3.329	-0.365	0.821	2.639	2.313	2.001	-2.255	-1.070
	20	7.099	8.571	-3.178	0.053	2.955	2.708	2.041	2.681	-0.941	1.960
	20	7.099	8.666	-3.178	0.053	2.955	2.773	2.197	2.534	-0.941	1.960
	20	7.099	8.761	-3.178	0.053	2.955	2.833	1.808	2.991	-0.941	1.960
	20	7.099	8.901	-3.178	0.053	2.955	2.890	1.841	3.006	-0.941	1.960
Digaf	21	0.003	7.399	-5.179	-0.802	-0.207	1.792	2.358	1.030	-6.566	-5.971
	21	0.822	6.888	-4.942	-0.705	-0.024	1.946	2.434	2.896	-0.878	-0.197
	21	1.098	6.670	-4.983	-0.791	-0.186	2.079	2.163	3.529	-0.511	0.093
	21	2.140	6.445	-5.034	-0.611	0.172	2.197	2.293	2.603	-0.022	0.761
	21	2.290	6.704	-0.987	-0.595	0.206	2.303	2.332	2.092	0.027	0.828
	21	0.648	6.439	-0.945	-0.352	0.863	2.398	2.342	2.041	-1.649	-0.434

	21	0.509	8.043	-0.273	-2.233	-2.119	2.485	2.079	2.272	-0.789	-0.675
	21	3.979	7.522	-0.695	-0.358	0.844	2.565	2.313	2.001	0.179	1.381
	21	2.516	7.823	-1.219	-0.709	-0.032	2.639	2.041	2.681	0.245	0.922
	21	3.132	7.512	-0.768	-0.216	1.423	2.708	2.197	2.534	-0.497	1.142
	21	13.591	7.105	-0.221	0.091	2.445	2.773	1.808	2.991	0.255	2.609
	21	2.828	7.353	-0.915	-0.433	0.613	2.833	1.841	3.006	-0.007	1.039
Harer	22	0.226	9.809	-4.384	-0.697	-0.007	1.609	2.358	1.030	-2.177	-1.488
	22	0.213	10.217	-4.892	-0.413	0.670	1.792	2.434	2.896	-2.629	-1.546
	22	0.213	10.312	-4.892	-0.413	0.670	1.946	2.163	3.529	-2.629	-1.546
	22	0.213	10.407	-4.892	-0.413	0.670	2.079	2.293	2.603	-2.629	-1.546
	22	0.043	11.043	-4.151	-0.218	1.414	2.197	2.332	2.092	-4.789	-3.157
	22	0.040	11.216	-4.409	-0.198	1.520	2.303	2.342	2.041	-4.949	-3.231
	22	0.222	11.265	-4.318	-0.144	1.864	2.398	2.079	2.272	-3.512	-1.504
	22	0.056	11.433	-4.753	-0.289	1.092	2.485	2.313	2.001	-4.268	-2.886
	22	0.129	11.700	-5.147	-0.235	1.327	2.565	2.041	2.681	-3.613	-2.050
	22	0.002	12.313	-5.621	-0.122	2.044	2.639	2.197	2.534	-8.282	-6.116
	22	0.005	12.887	-6.055	-0.067	2.669	2.708	1.808	2.991	-8.093	-5.357
	22	0.005	13.027	-6.055	-0.067	2.669	2.773	1.841	3.006	-8.093	-5.357
Lefayeda	23	0.929	6.729	-2.473	-1.249	-0.911	1.386	2.358	1.030	-0.411	-0.073
	23	1.965	6.888	-2.838	-0.506	0.418	1.609	2.434	2.896	-0.249	0.675
	23	14.951	7.227	-3.292	-0.054	2.896	1.792	2.163	3.529	-0.245	2.705
	23	5.571	7.059	-3.353	-0.235	1.329	1.946	2.293	2.603	0.153	1.718
	23	0.501	7.349	-1.530	-1.190	-0.828	2.079	2.332	2.092	-1.054	-0.692
	2	2.617	7.484	-1.89	-0.185	1.592	2.197	2.342	2.041	-0.815	0.962

	3			1							
	23	0.007	10.213	-3.975	-0.603	0.190	2.303	2.079	2.272	-5.714	-4.922
	23	0.717	8.755	-3.097	-1.754	-1.564	2.398	2.313	2.001	-0.523	-0.333
	23	0.333	10.374	-4.658	-0.237	1.320	2.485	2.041	2.681	-2.655	-1.098
	23	0.068	10.693	-4.837	-0.153	1.802	2.565	2.197	2.534	-4.650	-2.695
	23	0.758	10.608	-3.907	-0.177	1.642	2.639	1.808	2.991	-2.097	-0.278
	23	0.758	10.703	-3.907	-0.132	1.642	2.708	1.841	3.006	-2.052	-0.278
Cons C	24	0.050	10.942	-2.983	-1.055	-0.627	1.946	2.358	1.030	-3.415	-2.988
	24	0.043	11.414	-2.439	-0.812	-0.225	2.079	2.434	2.896	-3.730	-3.142
	24	0.122	11.249	-2.086	-0.793	-0.191	2.197	2.163	3.529	-2.704	-2.102
	24	0.142	12.616	-2.920	-0.377	0.782	2.303	2.293	2.603	-3.109	-1.951
	24	0.139	13.077	-3.205	-0.462	0.533	2.398	2.332	2.092	-2.966	-1.972
	24	0.163	13.455	-3.315	-0.437	0.602	2.485	2.342	2.041	-2.856	-1.817
	24	0.175	13.791	-3.389	-0.441	0.591	2.565	2.079	2.272	-2.772	-1.741
	24	0.139	14.115	-3.563	-0.346	0.882	2.639	2.313	2.001	-3.200	-1.972
	24	0.185	14.659	-3.700	-0.281	1.127	2.708	2.041	2.681	-3.094	-1.686
	24	0.174	15.150	-4.402	-0.218	1.414	2.773	2.197	2.534	-3.379	-1.747
	24	0.047	15.336	-4.014	-0.334	0.926	2.833	1.808	2.991	-4.324	-3.065
	24	0.047	15.476	-4.014	-0.334	0.926	2.890	1.841	3.006	-4.324	-3.065