

# **Determinants of Financial Sustainability of Microfinance Institutions in Ethiopia**

*A Thesis Submitted to the School of Graduate Studies of Jimma University in  
Partial Fulfillment of the Requirements for the Award of Degree of Masters of  
Science in Accounting and Finance*

**By**

**NASREDDIN ABDULHAKIM**



**JIMMA UNIVERSITY  
COLLEGE OF BUSINESS AND ECONOMICS  
DEPARTMENT OF ACCOUNTING AND FINANCE**

**August, 2020**

**Jimma, Ethiopia**

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**By**

**NASREDDIN ABDULHAKIM**

*Under the supervision of*

**Deresse Mersha (PhD)**

*And*

**Mathewos W/Mariam (MSc)**



**MSc Program, Department of Accounting, College of Business and  
Economics, Jimma University, Jimma, Ethiopia.**

**August, 2020**

## **DECLARATION**

I declare that the Research Report entitled “**Determinants of Financial Sustainability of Microfinance Institutions in Ethiopia**”, Submitted to Research and Post graduate Studies Office of Business and Economics College is original and it has not been submitted previously in part or full to any university.

Researcher's Name

Date

Signature

**Nasreddin Abdulhakim**

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## **CERTIFICATE**

We certify that the Research Report entitled “**Determinants of Financial Sustainability of Microfinance Institutions in Ethiopia**”, submitted to Jimma University for the award of the Degree of Master of Science in Accounting and Finance is done by Mr. Nasreddin Abdulhakim Abagaro under our supervision.

Main Adviser’s Name	Date	Signature
<b>Deresse Mersha (PhD)</b>	_____	_____

Co-Advisor’s Name	Date	Signature
<b>Mr Mathewos W/Mariam</b>	_____	_____

Internal Examiner’s Name	Date	Signature
<b>Mr Abebe Shantama</b>	_____	_____

External Examiner’s Name	Date	Signature
<b>Kassahun (PhD)</b>	_____	_____

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## **ABSTRACT**

*Microfinance promises to reduce poverty through the supply of loans, savings, money transfers, insurance and other financial services to those low-income and poor self-serving people. To achieve this objective sustainably, microfinance institutions are obliged to be financially sound, sustainable and capable from long term perspective. It is tried to identify different researches regarding the determinants for financial sustainability of MFIs. However, there are insufficient studies conducted in Ethiopia. Therefore, the purpose of this study was to empirically investigate the determinants of financial sustainability of MFIs in Ethiopia, where poverty is a serious problem. Financial self-sufficiency was used as financial sustainability measure, MFIs specific and macroeconomic factors as determinant variables. To achieve this purpose, the study employed quantitative research approach with explanatory research design. The study used 15 purposely selected MFIs' audited and balanced secondary data from NBE over the period 2011-2018. The study used panel data fixed regression method to estimate the impact of explanatory variables on financial self-sufficiency, since fixed effect model is appropriate after the Hausman tests. The classical linear regression model assumptions required to be fulfilled for OLS were also tested and the model was found fit for the purpose. Regarding the explanatory variables, there are negative and significant impacts between Operating expense and financial sustainability of Ethiopian MFIs, whereas Portfolio yield, Net profit margin, capital adequacy and GDP have positive, statistically significant impacts on the financial sustainability of Ethiopian MFIs. However, leverage and inflation had a positive insignificant impact on financial sustainability. To conclude, the study found that MFIs in Ethiopia are not financially sustainable. Based on the findings, the study recommend that Ethiopian MFIs should increase their breadth of outreach with successful follow ups ,maximize their leverages to increase the loan and maintain sustainable finance and should take due attention on operating expenses that impacted financial sustainability negatively. Moreover, the impacts of macroeconomic variables should be considered while designing a strategic plan. On the other hand, since MFIs in Ethiopia are at early stage, the government and stakeholders should encourage the program by mobilizing funds to promote microfinance in remote areas to insure social impact.*

**Key Words: -Ethiopian MFIs, financial sustainability, commercialization, Poverty Reduction**

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## **LIST OF ACRONYMS**

ACCION	American for Community Cooperation in other Nations
ACSI	Amhara Credit and Saving Institution
ADCSI	Addis Credit and Saving Institutions
AEMFI	Association of Ethiopian Microfinance Institutions
CDA	Committee of Donor Agencies
CGAP	Consultative Group to Assist the Poor
CAR	Capital Adequacy Ratio
DER	Debt to Equity Ratio
DECSI	Dedebit Credit and Saving Institution
FSS	Financial Self Sufficiency
GDP	Growth Domestic Product
GLP	Gross Loan Portfolio
MFI	Microfinance institutions
MIX	Microfinance Information Exchange
MDG	Millennium Development and Growth
MO FED	Ministry of Finance and Economic Development
NBE	The National Bank of Ethiopia
NGO	Non-Governmental Organizations
NPM	Net Profit Margin
OCSSCO	Oromia Credit and Saving Share Company
OER	Operating Expense Ratio
PYR	Portfolio Yield Ratio
SFPI	Specialized Financial and Promotional Institution

# CHAPTER ONE

## 1. INTRODUCTION

This paper was intended to identify the determinants of financial sustainability of Ethiopian microfinance institutions. Accordingly, this chapter was aimed to present the introduction part through dividing in to various parts. In the first part of this chapter, background of the study was highlighted, whereas background of the Ethiopian microfinance institutions and statement of the problem were the next. Objective, hypothesis, significance, scope& limitation and organization of the study were respectively presented in the chapter.

### 1.1. Background of the Study

One of the main objectives of financial institutions is mobilizing resources, mainly domestic saving and channeling them to the would-be investors. This intermediation role of financial institutions takes different forms in different economic systems. Microfinance has become an important instrument for poverty reduction in many parts of the world. Microfinance is the supply of loans, savings, money transfers, insurance and other financial services to those low-income and poor self-serving people. Microfinance institutions which cover a wide range of financial service providers that vary in legal structure, mission and methodology offer these financial services to clients who do not have access to typical banks or other formal financial service providers. The goals of microfinance institutions as development organizations are to service the financial needs of un-served or underserved markets as a means of meeting development objectives such as to create employment, reduce poverty, help existing business grow or diversify their activities, empower women or other excluded population groups and encourage the development of new business (Ledgerwood, 1999). In short, microfinance institutions have been expected to minimize poverty, which is taken as the most important development objective (World Bank, 2000).

In Ethiopia, the commercial banking system could not address the financial needs of poor households for the very fact that they are not their ultimate target clients. On top of that, the transaction costs and risks involved in serving poor households are perceived to be too high. In addition, even if there are few private banks that are interested in providing financial services to

poor households, they have not developed yet a suitable credit methodology for micro lending activities and they do not have trained personnel for that..

Microfinance leads to more education, better health, improved diet and nutrition, and greater resilience to disasters for poor families. In addition, it lays a foundation that allows other humanitarian intervention to be effective while providing the economic engine that allows the transition from dependency to sustainability (Asmelash, 2011).

However, the positive impacts of microfinance institutions on the socio-economic welfare of the poor can only be sustained if the institutions can achieve a good financial and outreach performance. Pissarides (2004), MFI can be confirmed to be self-sustainable if, without using of subsidies, grants or other concession resources can profitably provide finance to poor on an acceptable scale. Sustainable MFIs have continuous operations, they are able to serve poor now and in future.

Chaves & Gonzales (1993), cited by Schreiner (1996), self-sufficient MFI might be financially sustainable but it is not self-financial sustainable unless it is also privately profitable. CDA (committee of Donor Agencies) defines two degrees of self-sufficiency; first is operational self-sufficiency that requires MFIs to cover all administrative costs and loan losses from operating income. The second degree is the financial self-sufficiency requires MFIs to cover all administrative costs and loan losses from operating income after adjusting inflation and subsidies and treating all funding as it had a commercial cost. In any case, MFIs must be institutionally sustainable to be sustainable. Also, MFIs should generate real social impact on poor. Thus, they should have depth growth, impact on current clients and breadth growth, outreach to other poor, in order to reach sustainability and keep its social mission (Mc Guire & Ors, 1998).

Throughout the world, financial sustainability of microfinance institutions has been one of the issues that have recently captured the attention of many researchers due to its importance in the livelihood of microfinance institutions and necessary condition for institutional sustainability (Hollis & Sweetman, 1998). As it has been argued unsustainable MFIs might help the poor now, but they will not help the poor in the future because the MFIs will be gone (Schreiner, 2000). Moreover, it has been reported that it may better not have MFIs than having unsustainable ones

(Ganka, 2010). This shows how crucial the sustainability of MFIs is, and studying factors that affect sustainability of MFIs and how MFIs can become financially sustainable.

In Ethiopia, the poverty reduction strategy is set as the operational framework to transform 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, improve input supply, increase income, reduce poverty and attain food security.

The needs for financial services were growing among the poor communities especially from those who were financially constrained and vulnerable, but have feasible and promising investment ideas. While reaching to the poor is very costly, in order to attain its full potential and further grow as a credible development tool, MFIs should be financially sound, sustainable and efficient from continuing perspectives. Financial sustainability is a high standard measure of sustainability and brings long term views for MFI operations (Meyer, 2012).

A number of studies indicated that a sustainable and efficient MFI management should cover at least all administrative costs, loan losses and financing costs from operating income within the organization. However, from the going concern perspectives scholars argued that MFIs should maintain a financial self-sufficiency ratio of 100% so that they could cover administrative costs, loan losses, and financing costs from the revenues.

In Ethiopia, improving access to financial services is taken as an important development tool, because it helps in creating job for unemployed and increase their income and consumption of the excluded population, which would in the final analysis reduce poverty and contribute to the implementation or realization of the five years transformation and development plan. Generally, financial resource flows out from the microfinance institutions help to improve living standard, productive capacity, educational level, health and financial position of the poor section of the society and reduce poverty. Consequently, microfinance helps in contributing a lot towards the overall development of the economy.

Accordingly, MFIs must struggle to have good financial and operational performance so that they can play a major role in the poverty reduction while achieving their primary objectives.

Therefore, the objective of the study was to investigate what actually determines the financial sustainability of MFIs in Ethiopia by considering some of the explanatory variables under Profitability, financing structures, macroeconomic variables and Management efficiency.

## **1.2. Overview of Microfinance Institutions in Ethiopia**

The development of MFI in Ethiopia is a recent phenomenon and known by its fast-growing according to Deribie, et al., (2013) and aggressive drive to achieve a large scale of geographic location in the country, a dominance of government-owned MFIs, an emphasis on rural households, promoting both credit and saving products, a strong focus on sustainability and in fact, it is Ethiopian owned and driven sector. After the Ethiopian government proclamation no. 40/1996 of MFI was issued, this paved the way for establishment of MFIs to provide financial service to the communities who suffered lack of financial service from the formal banks, various MFIs have legally been registered and started delivering service of microfinance like other countries and they can mobilize savings once they got registered and legally empowered to supervise the activities MFIs by the NBE (Wolday & Amha, 2000). According to Getaneh (2005) in Ethiopia MFI spread across urban and rural areas to offer deposit, withdrawal and accept a draft to the public and to manage the microfinance business funds which are allowed by law. The Ethiopian deposit-taking MFIs provide different financial services such as; savings, micro insurance, loan, remittance, and payment such as collecting taxes, pension payment, and another related service charge. Consequently, a progressive transition has been seen in Ethiopian MFIs from microcredit to microfinance and finally to financial inclusion (Wolday and Anteneh, 2015).

The Ethiopian five-year growth and transformation plan (GTP 2) and the micro and small enterprise development agency (MSEDA) strategy has given more emphasis on the saving behavior of household and saving mobilization and this is why all MFIs in Ethiopia offer both compulsory and voluntary savings. Therefore, the microfinance industry has witnessed tremendous growth for the last decade. According to recent data from the National Bank of Ethiopia by the end of Dec 2018, there were 38 micro-finance institutions (MFIs) operating in the country. They mobilized Birr 33.9 billion in saving deposit which was 19.5 percent higher than last year same period. Similarly, their outstanding credit increased by 32.2 percent to Birr

48.9 billion highlighting their rising contribution to poverty alleviation and creating wealth both in rural and urban areas. Their total asset also expanded by 26.2 percent to Birr 71 billion. The top five largest MFIs (Amhara, Dedebit, Oromia, Omo& Addis Credit and Savings Institutions) accounted for 83.9 percent of the total capital, 91 percent of the deposits, 87.7 percent of the credit and 88.4 percent of the total assets of MFIs end of 2018.

### **1.3. Statement of the problem**

MFIs provide financial services to low-income economically, active borrowers who look for relatively micro credits to finance their businesses, manage emergencies, acquire assets, or smooth consumption (CGAP, 2003).Mazlan et al.(2014)Microfinance institutions target the poor by innovative approaches which include group lending, progressive lending, regular repayment schedules and collateral substitutes. While achieving on this poverty reduction goal, MFIs should also be financially sustainable. Scholars' identified that an efficient MFIs management should promote these two objectives weather financial self-sufficiency when they are able to cover all administrative costs, loan losses and financing costs from operating income and operational self-sufficiency within the organization (Melkamu, 2012).

Many of empirical studies have led the policy makers and analysts to believe that the microfinance programs in different countries are playing significant role in changing the lives of the very poor people by smoothing their consumption.

Tilahun (2013) in stated that the primary objective of the development strategy of Africa is poverty reduction and elimination as the empirical evidence establishes that less than 15 percent of the population in developing countries has access to the conventional financial. The main factors contributing to poverty has been identified as limited access to credit by the poor.

Despite a well documented evidence of the positive impact of promoting access to finance to under-served sections of the community, many poor people in Africa still remain excluded from the mainstreaming financial systems. In Ethiopia, the potential demand for financial services, particularly micro-credits are huge. However, the existing supply of financial services to the poor is very limited (Arega, 2016).

According to the National Bank Report (2018) in Ethiopia, MFIs, which were mostly founded with the aim of fighting poverty, play a big role in addressing the financial needs of people ,who



are considered 'high risk' by commercial banks. In a country where over 77 percent of the population is unbanked, MFIs provide loans to large portion of the population with very few assets. At the end of 2016/17, the MFIs operating in the country was disbursed 27 billion birr in credit for 4.6 million active numbers of borrowers. This indicates that there is a clear need, first in establishing the viability and importance of microfinance as a poverty alleviation approach for low income groups.

The establishment of sustainable 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 component of the new development Strategy of Ethiopia (Wolday, 2000 as cited in Asmellash, 2011).

To achieve their principal objective of alleviating poverty, it is a must for MFIs to provide financial services on a sustainable way. MFIs have to generate an income sufficient to cover their financial costs, costs of administration and loan loss provisions in order to be sustainable. A MFIs working towards sustainability on market opinion is not separated from a formal bank except customers that it serves. Hence, it will face a challenge that a formal bank faces in achieving its objectives (Hartungi, 2007 cited in Yonas, 2012).

One of the major problems MFIs facing is how to attain sustainability both financially and operationally. Beside the outreach and impact measures, today many actors in the industry use sustainability as a basic measure to evaluate the financial and operational performance of MFIs. Thus, the issue of sustainability of MFIs has attracted the interest of many researchers and academicians to focus on finding its determinants for the MFIs (Yaron, 1992 cited in Sileshi ,2015).

In addition to the financial factors the sustainability of MFIs is strongly affected by national and international financial regulations, political instability, geographical coverage, reach of the microfinance institutions and other non-financial factors (Kimando. et al., 2012).

Studies conducted in the areas of microfinance institutions in Ethiopia are inadequate and mainly focused on the performance of the MFIs. Whereas, only a few studies have been conducted concerning financial sustainability of Ethiopian MFIs with limited explanatory factors.

Cull et al. (2007) & Christen et al.(1995) several studies have been conducted to determine factors affecting financial sustainability of MFIs using large and developed MFIs in many countries, but the level of significance of variables in influencing financial sustainability of MFIs still varies with studies. These scholars also argued that MFIs financing structures, institutional characteristics or scale of MFIs, outreach capacity indicators, macroeconomic variables, inflation and GDP growth rate are the strong determinant factors of sustainability of MFIs.

While studies conducted by Yenesew (2014),Ayenew (2019),Abebaw (2014),Asnakew (2012) and Tamene (2012) are worth to mention, to the best of my knowledge most of these studies focused on limited internal characteristics and some of them did not effectively consider the impact of Profitability, financing structures, macroeconomic variables and Management efficiency indicators variables which have severely been investigated in many studies in global microfinance industry. Sileshi (2015) studied on sustainability of Ethiopian microfinance institutions and found that MFIs have not achieved the level of financial self-sustainability. For instance, Kinde (2012) tried to identify factors affecting financial sustainability of MFIs in Ethiopia, but his study did not show clearly and used only five years data of selected MFIs over the period 2002-2010 and failed to consider macroeconomic variables.

Some of the recent studies such as Hossain.et.al (2016) & Tilahun (2013) reveal that OER has positive insignificant effect on FSS, these results are inconsistent with Silashi (2015) & Kirubel (2018) revealed that OER has negative significant effect on FSS of MFIs. Tilahun (2013) also found that DER has negative and significant effect on FSS which is contradictory with other researchers indicated above on significance level.

Silashi (2015) regarding macroeconomic variables made study from secondary data found that inflation has positive and insignificant effect on dependent variable FSS, his finding was contradictory with that of Kirubel (2018) & Khathomi (2017) which revealed inflation has negative and significance effect on FSS.

Study made by Hossain.et.al (2016) & Abebaw (2014) found that Capital Adequacy has negative and significant effect on FSS which is inconsistency with Kirubel (2018) & Silashi (2015) explained that CAR has positive significant effect on FSS. Sima(2013) also revealed that GDP and CAR are found to be statistically insignificant variables.

The researcher finally believe that these studies did not give such an emphasis and convincing findings for determinants of financial sustainability and fail to consider the effects of Net profit Margin and Portfolio Yield. In addition there were inconsistent findings on macroeconomic factors, Debt to Equity, Operating expense and Capital to asset variables. Therefore, determining factors of financial sustainability of Microfinance Institutions in Ethiopia has roots in the existing literature, but as far as my knowledge is concerned it needs further research and explanation especially in Ethiopian case because the empirical literature shows the problem is done with limited explanatory variables and more focused on performance of the MFIs with descriptive statistics.

Therefore, to bridge the gap in previous researches and to arrive at convincing results, this study uses recent data from the year 2011 to 2018 and is expected to identify the critical factors that determine financial sustainability of MFIs in Ethiopia by considering additional explanatory variables which are missed from most of previous empirical studies namely, Net profit Margin and Portfolio Yield in addition to Debt to equity, Operating expense, Capital to asset , Inflation and GDP growth rate variables.

## **1.4. Objective of the Study**

### **1.4.1. General Objective**

The general objective of this study is to identify the determinants of financial sustainability of Microfinance Institutions in Ethiopia.

### **1.4.2. Specific Objectives**

- To examine the performance of financial sustainability of MFIs in Ethiopia.
- To empirically test the effect of Debt to Equity on financial sustainability of MFIs in Ethiopia.
- To empirically test the effect of Operating expense on financial sustainability of MFIs in Ethiopia.
- To empirically test the effect of Capital to Asset on financial sustainability of MFIs in Ethiopia.

- To examine the effect of Portfolio Yield on financial sustainability of MFIs in Ethiopia.
- To examine the effects of GDP growth rate on financial sustainability of MFIs in Ethiopia.
- To empirically test the effect of Net profit Margin on financial sustainability of MFIs in Ethiopia.
- To empirically test whether Inflation can determine the financial sustainability of MFIs in Ethiopia.

### **1.5. Hypothesis of the Study**

In line with the objective described above, the following null hypothesis to be rejected based on the study result and alternate hypothesis statements were formulated based on the review of theories and previous related empirical findings summarized in the literature review chapter.

#### ***A) Null Hypothesis***

In line with the objective described above, the following null hypotheses are developed to be rejected based on the study result.

**H01:** There is no relationship between Debt to Equity Ratio (DER) and financial sustainability of Ethiopian MFIs.

**H02:** There is no relationship between Operating expense ratio (OER) and financial sustainability of Ethiopian MFIs.

**H03:** There is no relationship between Capital to asset ratio (CAR) and financial sustainability of Ethiopian MFIs.

**H04:** There is no relationship between Portfolio Yield Ratio (PYR) and financial sustainability of Ethiopian MFIs.

**H05:** There is no relationship between GDP growth rate and financial sustainability of Ethiopian MFIs.

**H06:** There is no relationship between Net profit Margin (NPM) and financial sustainability of Ethiopian MFIs.

**H07:** There is no relationship between Inflation (INF) and financial sustainability of Ethiopian MFIs.

### ***B) Alternate Hypothesis***

Alternate hypothesis statements were formulated based on the review of theories and previous related empirical study findings summarized in the literature review chapter.

**H1:** There is a negative significant effect of Debt to Equity Ratio (DER) on financial sustainability of Ethiopian MFIs.

**H2:** There is a negative significant effect of Operating expense ratio (OER) on financial sustainability of Ethiopian MFIs.

**H3:** There is a positive significant effect of Capital to asset ratio (CAR) on financial sustainability of Ethiopian MFIs.

**H4:** There is a positive effect of Portfolio Yield Ratio (PYR) on financial sustainability of Ethiopian MFIs.

**H5:** There is a Positive significant effect of GDP growth rate on financial sustainability of Ethiopian MFIs.

**H6:** There is a Positive significant effect of Net profit Margin (NPM) on financial sustainability of Ethiopian MFIs.

**H7:** There is a negative significant effect of Inflation (INF) on financial sustainability of Ethiopian MFIs.

## **1.6. Significance of the Study**

Microfinance institutions have significant influence in fulfilling the financial needs of poor peoples, farmers, households and micro entrepreneurial. In general, the financial resource flows out from the microfinance institutions help to improve living standard, educational level, productive capacity, health and financial position of the poor section of the society and reduce poverty. Consequently, microfinance helps in contributing a lot towards the overall development of the economy. To achieve this stated mission continuously MFIs themselves have to be financially sustainable. Therefore, this study will help the decision makers of MFIs to identify

the deterrents for their financial sustainability in general and specific and give due attention for these determinant factors.

The financial sustainability of micro finance consistent with the objectives that is to improve the living standard of the poor and promote the mass mobilization in the nation's wealth creation as well as initiate other capable Ethiopians to participate in playing their role in the different sectors of the economy.

Based on the above facts, it is hoped that the results of this study will provide relevant information to decision makers such as investors, donors, creditors, clients, stakeholders or government about the financial sustainability of MFIs, give information to the management of the institutions, Policy makers and others stakeholders regarding the factors that determine financial sustainability and ,then suggests possible recommendations from the finding as to keep financial sustainability and improve or revise the existing financial structure of the institution. Furthermore, the result of the study is hoped to lays a foundation for further research on similar or related topics.

### **1.7. Scope and Limitation of the study**

The study is conducted to identify the determinant factors which affect the financial sustainability of MFIs in Ethiopia. When doing so the researcher is restricting himself in some selected MFIs financial data and variables as to compile the necessary information that help to make the research meaningful. Because it's very difficult to address all 38 MFIs operating in the country, the scope of the study is limited to some selected MFIs audited financial data. According to various sources, the microfinance institution and microfinance service does not have a long history in Ethiopia and hence the researcher limits the scope only to the available secondary data from 2011 G.C up to 2018 G.C for 15 selected (39 percent) of Microfinance institutions in Ethiopia. Besides, the scope of the study was covered the identification of the variables that was used in the study, employment of appropriate data as well as formulation of the appropriate model.

The limitation of the study was, the researcher fails to consider the primary data sources and recent data of 2019 due to Audited financial statements of 2019 for selected MFIs are not

available at the National Bank of Ethiopia. It may not be possible to include all the variables in one study hence, study focused on the specific number of macroeconomic and MFIs specific variables that affect the financial sustainability of Ethiopian Microfinance industry. In addition the outbreak of COVID 19 pandemic in different parts of the country is unexpected events that made difficult to collect data on time as service providing sectors like educational and transportation services are interrupted.

### **1.8. Organization of the study**

This research paper is divided into five chapters. The first chapter included introduction, statement of the problem, objectives, and hypotheses to be tested in the study, significance, scope and limitations which have already discussed above. The second chapter deals with literature review both theories and empirical studies of issues under the study. The third chapter deals with Research Methodology. The Chapter four deals with data analysis and discussions on major finding of the study. The fifth chapter contains conclusion and recommendations based on findings of the study. Lastly, list of reference materials and papers are included in the appendices.

## **CHAPTER TWO**

### **2. LITERATURE REVIEW**

Under this chapter the theoretical and empirical evidences focusing on the determinants of micro finance institution's financial sustainability are presented. Accordingly, the first section, describes overall theoretical overview of micro finance concepts. The second section presents review of empirical studies on determinants of financial sustainability of MFIs.

#### **2.1. Theoretical Overview of Microfinance**

The theoretical framework was, through a review of existing literature within the microfinance field, serve as a platform for the upcoming empirical study.

##### **2.1.1. Definition of Microfinance**

Different authors and organizations have defined Microfinance institutions in different ways. However, the concept or the meaning of the definitions is usually the same in which microfinance refers to the provision of financial services; mainly savings and credit to the poor and low-income households that don't have access to commercial banks service. Consultative Group to assist the poor CGAP (2012) defined "microfinance" the provision of formal financial services to poor and low-income people, as well as others systematically not benefited from the financial system. As noted, "Microfinance" it is not only providing a range of credit products (for consumption, smoothing for business purposes, to fund social obligations, for emergencies, etc.) only, but also savings, money transfers, and insurance.

The other researcher defined about MFIs is that, it offers financial services to poor people. The aim of Access to financial services for poor people is help to alleviate risks, build their assets, improve their income, and furthermore contribute to development of the focal community. The popularly known institution which is Microfinance information exchange (MIX) defined the microfinance institutions as a variety of financial services that target low-income clients, particularly women. Since the clients of microfinance institutions have lower incomes or poor and often have limited access to other financial services, microfinance products tend to be for smaller monetary amounts than traditional financial services. These services not only provide



micro credit service for those have lower incomes but also include loans, savings, insurance, and remittances. Micro-loans are given for a variety of purposes, frequently for micro-enterprise development. The diversity of products and services offered shows the reality that the financial needs of individuals, households and enterprises can change significantly over time, especially for those who live in poverty, which is not benefited from the formal bank. Because of these varied needs, and because of the industry's focus on the poor, microfinance institutions often use non-traditional methodologies, such as group lending or other forms of collateral not employed by the formal financial sector especially by bank.

According to Robinson (2001), Microfinance refers to small-scale financial services-primarily credit and savings-given to people who involved in farm or fish or herd; who work in small enterprises or microenterprises where goods are produced, recycled, repaired, or sold; who provide services; who work for wages or commissions; who gain income from renting out small amounts of land, vehicles, draft animals, or machinery and tools; and to other individuals and groups at the local levels of developing countries, both rural and urban (Robinson, 2001).

### **2.1.2. History of Microfinance**

The ideas and aspirations towards microfinance are not new. Small, informal savings and credit groups have worked for centuries across the world, from Ghana to Mexico to India and beyond (Helms, 2006). In Europe, as early as the 15th century, the Catholic Church founded pawn shops as an alternative to usurious moneylenders. These pawn shops spread throughout the urban areas in Europe throughout the 15th century. Formal credit and savings institutions for the poor have also been around for generations, offering financial services for customers who were traditionally neglected by commercial banks. The Irish Loan Fund system, started in the early 1700s, is an early (and long-lived) example. By the 1840s, this system had about 300 funds throughout Ireland (Helms, 2006). On the other hand, in the early 1800s a financial organization that was credit association to serve predominantly farmers in rural areas based on cooperative principles was founded by Friedrich Wilhelm Raiffeisen in Germany and expanded rapidly within Germany and later since it was successful also to the rest of Europe, North America and developing countries beyond. Ledgerwood (1999) described the focus of these cooperative financial institutions as savings mobilization in rural areas that attempt to teach poor farmers how to save money and utilize it. In the early 1900s the concept of Raiffeisen began to appear

with adaptations in parts of rural Latin America (Helms, 2006). Another milestone in the history of microfinance was the opening of the Indonesian People's Credit Bank in 1895 that became the largest microfinance system in Indonesia (Helms, 2006).

In Bangladesh, Professor Muhammad Yunus who was the Nobel Prize winner in 2006, disbursed first loans from his own pocket to a group of rural women in Jobra in 1976 and successfully developed the concept of microfinance with his Grameen Bank throughout the country and later the whole world (Ledgerwood, 1999). The Grameen bank, which is now serves more than 2.4 million clients (94 % of them women) and is a model for many countries (Ledgerwood, 1999). Other examples of early pioneers besides Grameen Bank are ACCION International in Latin America, Self-employed Women's Association Bank in India and many more (Helms, 2006).

Beginning in the mid-1980s, the subsidized, targeted credit model supported by many donors was the object of steady criticism, because most programs accumulated large loan losses and required frequent recapitalization to continue operating. It became more and more evident that market-based solutions were required. This led to a new approach that considered microfinance as an integral part of the overall financial system. Emphasis shifted from the rapid disbursement of subsidized loans to target populations toward the building up of local, sustainable institutions to serve the poor. In the early 1990s the term "microcredit" was replaced by "microfinance" which included not only credits but also other financial services for poor people (Elia, M, 2006). The introduction of the term microfinance followed the success of many microcredit programs around the world and in 1997, during the first Microcredit Summit, 2,900 delegates from 137 countries representing around 1,500 organizations gathered in Washington, D.C. During that occasion the birth of the global industry of microfinance was officially recognized. Since then the focus started to change and move from the predominant welfarist idea, where only the provision of credit was considered to be important, to the need of becoming financially sustainable through the provision of a complete range of financial products and to reach more people.

### **2.1.3. Overview of Microfinance Institutions in Ethiopia**

The development of MFI in Ethiopia is a recent phenomenon and known by its fast-growing according to Deribie, et al., (2013) and aggressive drive to achieve a large scale of geographic

location in the country, a dominance of government-owned MFIs, an emphasis on rural households, promoting both credit and saving products, a strong focus on sustainability and in fact, it is Ethiopian owned and driven sector. After the Ethiopian government proclamation no. 40/1996 of MFI was issued, this paved the way for establishment of MFIs to provide financial service to the communities who suffered lack of financial service from the formal banks, various MFIs have legally been registered and started delivering service of microfinance like other countries and they can mobilize savings once they got registered and legally empowered to supervise the activities MFIs by the NBE (Wolday & Amha, 2000). According to Getaneh (2005) in Ethiopia MFI spread across urban and rural areas to offer deposit, withdrawal and accept a draft to the public and to manage the microfinance business funds which are allowed by law. The Ethiopian deposit-taking MFIs provide different financial services such as; savings, micro insurance, loan, remittance, and payment such as collecting taxes, pension payment, and another related service charge. Consequently, a progressive transition has been seen in Ethiopian MFIs from microcredit to microfinance and finally to financial inclusion (Wolday and Anteneh, 2015).

According to recent data from the National Bank of Ethiopia by the end of Dec 2018, in Ethiopia there were 38 micro-finance institutions (MFIs) providing financial service for their ultimate target clients. They mobilized Birr 33.9 billion in saving deposit which was 19.5 percent higher than last year same period. Similarly, their outstanding credit increased by 32.2 percent to Birr 48.9 billion highlighting their rising contribution to poverty alleviation and creating wealth both in rural and urban areas. Their total asset also expanded by 26.2 percent to Birr 71 billion. The top five largest MFIs (Amhara, Dedebit, Oromia, Omo& Addis Credit and Savings Institutions) accounted for 83.9 percent of the total capital, 91 percent of the deposits, 87.7 percent of the credit and 88.4 percent of the total assets of MFIs end of 2018.

#### **2.1.4. Legal Framework for Ethiopian MFIs**

The legal framework governing microfinance Institutions (MFIs) in Ethiopia comprises the Commercial Code of Ethiopia, proclamations issued by Government of Ethiopia (GOE) (ProclamationNo.40/1996, and Proclamation No.147/1998) and directives issued by the National Bank of Ethiopia. Microfinance institutions are required to incorporate as share companies in

accordance with the provisions of Article 304 of the Commercial Code of Ethiopia. The applicable Articles of Proclamation No. 84/1994 dealing with the licensing and supervision of banking business and the Commercial Code of Ethiopia also provide the needed legal framework for incorporation and operation of MFI as well as their regulation and supervision by the National Bank of Ethiopia.

In Ethiopia, MFIs are to be established in the form of share companies as defined under article 304 of the Commercial Code (CC). The Code defines a share company as “a company whose capital is fixed in advance and divided into share and whose liabilities are met only by the assets of the company.” The NBE registers and licenses MFIs upon the latter fulfilling the requirements set by the MFI Proclamation and directives. A share company may not be established by fewer than five shareholders (Article 307 CC). An initial capital of ETB 200,000 is required to form MFI. Like in the other financial services sub-sectors, capital of MFIs must be fully owned by Ethiopian nationals and registered under the laws of and having their head office in Ethiopia (Article 2(3) Proclamation No.626/2009). Foreigners must not own MFI, fully or partially. Any foreign national or organization fully or partially owned by foreign nationals may not be allowed to establish MFI, open branches or subsidiaries of a foreign micro-financing institution in Ethiopia or acquire the shares of an Ethiopian MFI (Article 25 of Proclamation No. 626/2009). This rule is a confirmation of what is seen in the investment regulation (Investment Regulation, 2004).

In Ethiopia, the commercial banking system could not address the financial needs of poor households for the very fact that they are not their ultimate target clients. On top of that, the transaction costs and risks involved in serving poor households are perceived to be too high. In addition, even if there are few private banks that are interested in providing financial services to poor households, they have not developed yet a suitable credit methodology for micro lending activities and they do not have trained personnel for that (NB Report 2018).

## **2.2. Theoretical Review**

The theoretical framework is the structure that can hold or support a theory of a research study. It introduces and describes the theory which explains why the research problem under study exists. According to Alan (2008) asserts that theories are formulated to explain, predict and understand

phenomena and in many cases, to challenge and extend existing knowledge, within the limits of the critical bounding assumptions. The theoretical framework must determine understanding of theories and concepts that are relevant to the topic of the research and that will relate to the broader fields of knowledge in the study you are taking. The selection of a theory should depend on its appropriateness, ease of application, and explanatory power. The theoretical framework connects the researcher to existing knowledge (Orodho, 2003).

### **2.2.1. Performance of MFIs**

Performance of an institution shall be measured not only from the objectives of the organizations angel, but also from the industry average. The goal of MFIs is to reduce or eradicate poverty by giving access to the poor financial resource and by creating awareness for resource utilization. In the early days when MFI started, they were financed by donor funds that have a poverty eradication goal. As explained by Melkamu (2012) hence the performance of the MFI was measured on how much MFI reach to the poor (outreach) and impact (how far the lives of those who get financial services are changing as compared to those who don't get these services).

However, those days, the performance of microfinance institutions was being measured by different parameters. For instance, Richard Rosenberg (CGAP) has indicated Core performance indicators of microfinance institutions written for staffs who design or monitor projects that fund microfinance institutions (MFIs). He offers basic tools to measure performance of microfinance institutions in a few core areas: Breadth of Outreach: number of clients being served, Depths of Outreach: poverty level of the clients, Collection performance: performance of an MFI in collecting its loans, Financial sustainability: profitability to maintain and expand services without continued injections of subsidized donor funds, Efficiency; performance in controlling the administrative costs. These are general measures in which the performance should be considered.

### **2.2.2. Perspectives in Performance Measures**

The various views on which the MFI performance is to be measured has created two contrasting but having the same goals school of thought about the MFI industry: the Welfarist approach and the Institutionist approach. For the study purpose the researcher believed institutionist theory is appropriate and has explanatory power.

### **2.2.3. The Institutionist Approach**

Institutionists consider mainly financial sustainability of microfinance institutions. The Institutionists view *financial deepening* as the main objective of microfinance institutions. Here financial deepening refers to creating sustainable financial intermediation for the poor. Institutionists assert that the financial sustainability as measured by financial self-sufficiency (profitability) should be given higher priority by all MFIs (Woller 2010). Their argument comes from the fact that in most cases donor dependence is not certain and thus, unless an MFI is able to sustain itself financially it will not be able to serve the clients in the long run. Contrary to promoting financial sustainability, there is a potential tension that over emphasis on financial self-sustainability may lead an MFI into moving away from donor funding objective. This is known as mission drift. The Institutionists would like to see MFIs meeting all their costs from self-generated funds with a possibility of making profit without using any external funds. This is what they would call a sustainable MFI. The Institutionist approaches the sustainability of MFIs from the institution point of view. Their argument is that, institutional sustainability of an MFI will be attained when the MFI is financially self-sufficient. That is, be able to operate without subsidy. The emphasis here is that, for sustainability, MFI should be able to cover its operating and financing costs with the program revenue (Brau &Woller, 2014).

### **2.2.4. Efficient Structure Theory**

According to the efficient structure hypothesis, on the other hand posits that financial institutions earn high profits because they are more efficient than others. There are also two distinct approaches within the Efficient Structure; the X-efficiency and Scale–efficiency hypothesis. According to the X-efficiency approach, more efficient firms are more profitable because of their lower costs. Such firms inclined to gain larger market shares, which may manifest in higher levels on market concentration, but without any causal relationship from concentration to profitability (Athanasoglou et al, 2006 cited in Njerl, 2012). The scale approach emphasizes economies of scale rather than differences in management or production technology. Larger firms can gain lower unit cost and higher profits through economies of scale. This make possible to large firms to acquire market shares, which may manifest in higher concentration and then

profitability. The Efficiency structure theory assumes that MFIs performance is influenced by internal efficiencies and managerial decisions (Njerl, 2012).

### **2.2.5. Financial Performance of MFIs**

MFIs earn financial revenue from loans and other financial services in the form of interest, charges, fees, penalties and commissions. Financial revenue also includes income from other financial assets, such as investment income. MFIs financial activities also generate various expenses, from general operating expenses and the cost of borrowing to provisioning for the potential loss from defaulted loans. Profitable institutions earn a positive net income (i.e., operating income exceeds total expenses). For the purpose of this review and to account for the institutional scale of operations, financial revenue and expense indicators as well as returns are compared against the institution's assets (MIX, 2005).

Effective financial management requires periodic analysis of financial performance. Performance indicators collect and restate financial data to provide useful information about the financial performance of an MFI. By calculating performance indicators, donors, practitioners, and consultants can determine the efficiency, viability, and outreach of MFI operations.

The achievements of MFIs are examined through the lenses of standard industry performance metrics over a series of variables: Outreach (breadth and depth), financial structure, financial performance, efficiency and productivity, and portfolio quality (Lafourcade, et al., 2005). Several levels of sustainability can be applied to microfinance. In general, the first stage, operational sustainability, is referred to when a microfinance institution covers its administrative costs and loan loss expenses from its client revenues. A second level of sustainability, referred to as financial sustainability, is attained when an institution which is operationally sustainable is able to cover the cost of funds, including inflation. By borrowing from a commercial bank, the equity of the MFI is leveraged, and the institution is able to pay the additional cost of commercial borrowing from its income stream. Financially sustainable institutions can become licensed financial institutions. The implications of getting such license are considerable, since MFIs which have reached this stage can raise resources from their national financial market and are likely to have access to rediscount lines from central banks, in amounts that are five to ten times their equity (UNCDF, 1999). Zeeler & Meyer (2002) indicated, "Measuring financial sustainability requires that MFIs maintain good financial accounts and follow recognized

accounting practices that provide full transparency for income, expenses, loan recovery, and potential losses.”

➤ **Financial sustainability**

Financial sustainability indicates the ability of MFI to survive in the long- run by means of its own income generating activity, i.e. without any contributions from donors (AEMFI 2013). As per the MIX Market definition the term financial sustainability is defined as having an operational sustainability level of 110% or more, while financial sustainability is defined as having an operational self-sufficiency level of 100% or more. Financial sustainability refers that the ability of a microfinance provider to cover all of its costs on an unsubsidized basis or without accepting donation. According to the United Nations sustainability is necessary to reach a larger number of people on an ongoing basis (Elia, M.2006). If MFIs remain dependent on limited donor funding, they will be able to reach only a limited number of people.

### **2.2.6. Profitability Theory**

Not all MFIs are become sustainable, able to generate a profit, or even to break even and therefore still depend on help from donors and subsidies. The rapid growth in the industry is not due to a golden “one-way-road” to profitability since there is still big diversity or difference between the MFIs and their operations (Joergeson, 2011).

Profitability means ability to make profit from all the business activities of an organization, company, firm, or an enterprise. It shows how efficiently the management can make profit by using all the resources available in the market. According to Harward & Upton, (1961) “profitability is the „the ability of a given investment to earn a return from its use.” The term Profitability however is not synonymous or the same meaning to the term Efficiency“. Profitability is a measure of efficiency; and is regarded as a measure of efficiency and management guide to greater efficiency. Though, profitability is an important yardstick for measuring the efficiency, the degree of profitability cannot be taken as a final proof or indicator of efficiency. Sometimes satisfactory profits can mark inefficiency and conversely, a proper degree of efficiency can be accompanied by an absence of profit. The net profit figure simply indicates that a satisfactory balance between the values receive and value given. The change in operational efficiency is merely one of the factors on which profitability of an enterprise largely



depends. Moreover, there are many other factors besides efficiency, which affect the profitability (Harward & Upton, 1961)

### **2.2.7. Profit and Profitability**

Sometimes, the people used the term Profit and Profitability interchangeably. But in real sense, there is a difference between the two. Profit is an absolute term, whereas, the profitability is a relative concept or meaning. However, they are closely related and mutually interdependent, having distinct roles in business. Profit refers to the total income earned by the firm during the specified period of time, while profitability refers to the operating efficiency of the firm. It is the ability of the firm to make profit on sales. It is the ability of firm to get sufficient return on the capital and employees used in the business operation ( Harward & Upton, 1961).

According Al-Shami, (2008) there are different ways to measure profitability such as: return on asset (ROA), return on equity (ROE). Return on Asset indicates of how profitable a company is relative to its total assets. It gives us an idea as to how efficient management is in using its assets to generate earnings. On the other hand, return on equity measures a company's profitability which shows how much profit a company generates with the money shareholders have invested. This measure gives a sense of how well a company is in using its money to generate returns.

### **2.2.8. Macroeconomic factors**

Understanding the linkages between overall country's macroeconomic level and MFIs sustainability can make MFI evaluation more accurate and, further, can help to locate microfinance in the broader picture of economic development. Furthermore, understanding the macroeconomic impact on MFIs may also help a growing number of investment funds that target their financial resource toward MFIs, sometimes with the dual goal of earning returns for investors and achieving social impact. Evidences arise for strong relationship between MFI performance and the broader economy. Christian, et al. (2009) has explained that, MFIs are more likely to cover costs when growth is stronger; and MFIs in financially deeper economies have lower default and operating costs, and charge lower interest rates. There is also evidence suggestive of substitutability or rivalry. For example, more manufacturing and higher workforce participation is associated with slower growth in MFI outreach.

The suggestion of most of the previous empirical studies is that macroeconomic variables are based primarily upon an economic tradition, emphasizing the importance of external market factors in determining firm's success. These typically include inflation, GDP growth rate, GDP per capita, GNI per capital, population, unemployment rate and interest rate differentials. For example, Vingo (2012) indicated that the common approach has been to study the impact of macroeconomic factors by investigating the impact of GDP growth and inflation on performance. The inflation indicator refers to a rise in the general level of prices of goods and services in an economy over a period of time. Overall, the country context appears to be an important determinant of MFI performance (Christian Ahlin, et al., 2009).

### **2.3. Determinants of Financial Sustainability**

#### **Debt to Equity**

Financial leverage is defined as the relationship between the amount of money that a company owes and the value of its shares. Financial leverage is the degree to which net operating assets are financed by borrowing with Net Financial Obligation (Stephen, 2010). While Gitman (2009) defines financial leverage as the magnification of risk and return introduced through the use of fixed-cost financing, such as debt and preferred stock. The degree is measured by taking a ratio of the debt to equity called leverage ratio. It is the simplest measure firm leverage and believed as the drivers of MFIs sustainability and efficiency.

For the purpose of this study the financial leverage meant the degree in which the MFIs are financed by debt expressed in the MFIs balance sheet liability. Myers & Majluf (1984) explained that the pecking order theory that suggests profitable firms prefers internal financing to external financing and hence profitability is expected to have negative relation with leverage. Additionally, profitable banks may have better access to external financing; the need for debt finance may possibly be lower, if new investments can be financed from accumulated reserves. Those MFIs scoring maximum DER should be cautious because theories suggest that higher DER bound to exert pressure on profit margin.

#### **Operating Expense**

The operating expense ratio is described as the ratio of total operating cost to outstanding loan portfolio and thus calculated by dividing all expenses related to the operation of the MFIs (including all the administrative and salary expenses, depreciation and board fees) by the period

average gross portfolio, interest and provision expenses (Wolday, 2013). According to the research finding of Nyamsogoro (2010), the lower the ratio, all things being constant, will imply efficiency and the ratio strongly affects the financial sustainability of microfinance institutions. This indicates that, the more MFIs are efficient in reducing operating costs at a given level of outstanding loan portfolio, the more profitable they become and, therefore, maintain financial and operational self-sufficiency and ensure financially sustainable.

### **Capital to Asset**

The capital Adequacy ratio is a simple measure of the solvency for the financial institution. It is used to assess an MFI's ability to meet its obligations and absorb unexpected losses. For the regulated MFIs, there is a minimum solvency requirement stipulated by the regulator. The requirement of minimum capital to assets ratio depends on MFIs assessment of its expected losses and its financial strength to absorb such losses. Expected losses should be covered through provisioning under the MFIs accounting policies. The capital Adequacy ratio measures the amount of capital required to cover additional unexpected losses and ensure that the MFI is well capitalized for potential shocks. Some lenders or investors may stipulate minimum capital to assets ratio for which they invest MFIs.

According to the Consultative Group to Assist the Poor (CGAP), MFI should be subject to even higher capital maintains a ratio than banks in the light of risks and vulnerability of MFI loan portfolio. They further advise MFIs to maintain a ratio up to 20 percent with subsequent performance-based relaxation to 12-15 percent. Ethiopian MFIs maintained an average capital to asset ratio of 36 percent. This is relatively higher, thanks to the contribution of donor-equity to MFIs and the policy of the government which tempts MFIs with social objectives which are not distributing dividend to shareholders from paying profit tax.

### **Profitability Ratio**

A profitability ratio is a measure of profitability, which is a way to measure a company's performance. Profitability is simply the capacity to make a profit, and a profit is what is left over from income earned after you have deducted all costs and expenses related to earning the income. The ratios examined thus far provide useful clues as to the effectiveness of a firm's operations, but the profitability ratios show the combined effects of liquidity, asset management, and debt on operating results. The Ratios we used to calculate the profitability of the MFIs were

Net profit Margin, Return on Equity and Return on asset. The Net Profit Margin shows the company's ability to generate a net profit from an increment of the additional one dollar of a total income. This ratio measures net income per total revenue; it is calculated by dividing net income by revenue.

### **Yield on Loan portfolio (Interest income)**

The portfolio yield is the initial indicator of institution's capacity to generate revenue with to cover its financial and operating expenses. Portfolio yield shows how much, on average an MFI really receives in interest payments on its loans. The group's interest rates are in this study represented by yield on gross portfolio (in nominal terms). Yield is the real gross portfolio yield, a measure of interest charges faced by customers. Because loan losses are not netted out of the revenues, this measure is intended to capture the ex-ante interest rate charged by the lender rather than the ex-post interest rate realized on the portfolio. The fact that the sustainable MFIs have lower yields implies a promising discovery; that the sustainable MFIs in this study have not become self-sufficient due to high interest rates and the exploitation of poor people. Yield on gross portfolio is calculated by dividing adjusted financial revenue from loan portfolio to adjusted average gross loan portfolio. This indicates the degree to which the largest assets of MFI, the gross loan portfolio, generate interest and fee income.

### **GDP Growth Rate and Inflation**

Gross domestic product (GDP) is the most commonly used macroeconomic indicators. It refers to the income generated by output and production on a country's economy during a period of time. GDP growth is used as proxy measure for GDP to measure the macroeconomic condition. The GDP growth is it defined as the annual change of the GDP. It reflects the state of the economic cycle. GDP growth is expected to have effect the supply and demand for loans and deposits. When economic booms, demand for credit or loan increased as well as the quality of asset. Bank can generate higher profit. As economic slows down, the GDP growth is slowing down too. The lending tends to decrease. Therefore, during boom the demand for credit is high compared to recession (Athanasoglou et al., 2005). Bourke (1989) presents evidence that economic growth, if particularly, associated with entry barriers to the banking market, would potentially lift banks' profits.

Gwas & Ngambi (2014) also tested the influence of macroeconomic indicators GDP growth and inflation on the sustainability of MFIs. Although statistically not significant, their result showed a negative impact of inflation and a positive impact of GDP growth on the sustainability of MFIs. They noted that positive result of GDP indicated that improving macroeconomic performance raises overall income level and business performance which ultimately improves client's repayment ability and hence sustainability of MFIs. They noted that the negative impact of inflation on sustainability indicated that repayment levels are usually weak and low in the presence of higher inflation rates. Various researches noted that, unless FSS ratio of 100% is reached, the long-term provision of credit services is weakened by the impact of inflation and the continued necessity to rely on donor funds.

## **2.2. Empirical Literature**

This section reviews studies previously done on determinants of financial sustainability of microfinance institutions. According to Rhyne (2012) states that through the use of a systematic approach to previous scholarly work, literature review allows a researcher to place his research work into an intellectual and historical context, that is, it enables the researcher to declare why his research matters.

### **2.4.1. Literature conducted in other countries**

Several studies have been conducted to determine the issues affecting financial and operational sustainability of MFIs in different countries. However, the level of significance of these factors in distressing the financial sustainability of MFIs varies with studies and countries. While some of the determinants are found to be significant in one country or economy or MFI, they may not be significant for others (Cull et al., 2007; Woller & Shreiner, 2002; Christian et al., 1995). Many studies undertaken around the world underlined the importance of financing structure or funding sources on sustainability. Studies made by Sekabira (2013) hypothesized that grants and debts erode sustainability whereas share capital and assets improve it and found the same result as predicted. He argued that government policy must limit MFIs access to grants and debts.

Nduba (2018) examined the financial sustainability of microfinance in Democratic Republic of Congo. The study employed descriptive research design by examining the effects of loan

performance, outreach, and financial structure in financial sustainability of MFIs in the city of Kindu, Democratic Republic of Congo. The study used quantitative and qualitative data for analysis. An analysis carried out on linear regression indicated that loan performance statistically significantly predicted the sustainability of MFIs, financial structure statistically significantly predicted the financial sustainability of MFIs and outreach statistically significantly predicted the financial sustainability of MFIs.

Dinah (2016) studied the determinants of financial sustainability of microfinance in Kenya by descriptive survey research design. The study sought to find out the influence of liquidity level, operational expense, Profitability, leverage of the institution, on financial sustainability of MFIs. The study also concluded that there is a positive relationship between liquidity and financial sustainability. This implies that financial sustainability of the MFIs in Kenya is highly dependent on the level of institutions liquidity. The study also concluded that financial performance was positively but insignificantly associated with financial sustainability. The study also concluded a positive relationship between financial performance and financial sustainability. There is also a negative relationship between capital adequacy and financial sustainability which implies that higher debt to equity ratio leads to poor financial sustainability. Leverage is also negative, significantly related to financial sustainability .Poor capitalization plan before beginning to look for new shareholders affects sustainability of MFIs. Poor management of debt funds can hence affect the sustainability of the MFIs.

Similarly, study made by Ann Kathomi (2017) in Kenya relied on primary and secondary data, This study concluded that changes in lending interest rate by the government affect sustainability of MFIs in Nairobi County. The study concluded that inflation on MFIs sustainability indicated that lending levels are usually weak and low in the presence of higher inflation rates. The study further concluded that the premium or discount in foreign exchange impacts on the foreign capital thus the sustainability of MFIs.

Anand (2012) studied factors Affecting Financial Sustainability of Microfinance Institutions in India and Bangladesh, and subsequently propose a more comprehensive and representative model for financial sustainability and create an index to observe the financial performance of microfinance sector. The research is analytical and empirical in nature and makes use of secondary data. Regression analysis is carried out for each of Indian MFIs and Bangladesh MFIs

for data of 5 years i.e. from 2005-06 to 2009-10. The study found that Number of Active Borrowers, Capital/Assets ratio, Yield and Operating Expense significantly influence the dependent variable OSS in India as their p-values are less than the level of significance (0.05) for Indian MFIs. PAR>30 days, Operating Expense and Capital Assets ratio have values less than the level of significance (0.05) for Bangladesh. Therefore, the null hypotheses are rejected and it can be concluded that these indicators significantly influence financial sustainability.

Hussein.et.al,(2016) financial sustainability of microfinance institutions of Bangladesh. The study used unbalanced panel data set of 145 observations from 29 MFIs over the period 2008-2012 in Bangladesh. Among the 29 MFIs only four MFIs have found less than 100% FSS. The study found that capital Assets Ratio has negative relationship with financial sustainability of MFIs and is statistically significant. The Capital Adequacy's negative coefficient shows that the larger MFI is, equity financed as compared to other sources of finance leads not to improvement in its sustainability. The operating expense has extremely negative and statistically significant relationship with the sustainability of MFIs. Thus, the result provides evidence that an increase (decrease) in operating expense to serve loan reduces (increases) MFIs sustainability.

Studies have been conducted to explain whether the capital structure determines the sustainability of microfinance institutions. Kyereboah (2007) found that highly leveraged microfinance institutions have higher ability to deal with moral hazards and adverse selection than their counterparts with lower leveraged ratio. This states that high leverage and profitability are positively correlated. Bogan et al. (2007) conducted a study to ascertain whether capital structure affects the financial sustainability of an MFI. They found that microfinance institutions capital structure was associated with their financial sustainability. The study by Nyamsogoro (2010) indicates that there is a positive correlation coefficient between the capital structure and financial sustainability of microfinance institutions. This study also found that lowers the operating expense ratio all things being constant, will imply efficiency and the ratio strongly affects the financial sustainability of microfinance institutions. This indicates that, the more MFIs are efficient in reducing operating costs at a given level of outstanding loan portfolio, the more profitable they become and therefore, maintain financial and operational self-sufficiency and ensure financially sustainable. Similarly, the findings of Mohdet al. (2014) made on the MFIs of Bangladesh, advocates that the operating expense ratio has negative effect on the financial self-sufficiency and operational self-sufficiency of MFIs and hence the sustainability.

Burki, A. K.et, al. (2018) study on financial sustainability and microfinance institutions from an emerging market estimate the determinants affecting financial Sustainability of Microfinance Institutions(MFIs) working in Pakistan based on data collected from 25 Microfinance Institutions annual reports from 2008-2015. The study found that financing charges, outreach and the proportion of female borrowers significantly explain the financial sustainability of MFIs. These are crucial determinants for alleviating poverty in Pakistan and attaining sound financial sustainability and survivorship of MFIs.

Gwas & Ngambi (2014) also tested the influence of macroeconomic indicators GDP growth and inflation on the sustainability of MFIs. Although statistically not significant, their result showed a negative impact of inflation and a positive impact of GDP growth on the sustainability of MFIs. They noted that the negative impact of inflation on sustainability indicated that repayment levels are usually weak and low in the presence of higher inflation rates.

### **2.2.3. Studies conducted in Ethiopia**

Empirical studies have been conducted in Ethiopian relation to the microfinance industry, although, the topics, scopes, comprehensiveness and depth are varied. As cited by Woldeyes (2012) in Silashi(2015) the study of sustainability has flourished since when more attention has been given to the long-term aspect of microfinance which can widespread around developing countries only if lending to the poor is proven to be sustainable. The sections below provide the empirical results on the determinants of financial sustainability revealed from various studies.

Melkamu (2012) on determining factors for operational and financial self-sufficiency of Ethiopian MFIs, the study considered Yield ,size ,personnel productivity ratio, debt to equity ratio, cost per borrower, average loan per borrower and age of MFIs as explanatory variables for the OSS. Yield, cost per borrower, liquidity ratio, number of active borrowers, operational expense ratio and age as the determining factors for FSS of MFIs in Ethiopia. The study found that average loan balance per borrower, size of MFI, cost per borrowers and yield on gross loan portfolio affects the operational sustainability of Ethiopian MFIs significantly and cost per borrower, number of active borrowers and yield on gross loan portfolio affect their financial sustainability.



Silashi (2015) assessed the significant determinants of financial and operational sustainability of Ethiopian microfinance institutions from secondary data of 13 selected MFIs 10 year's data which were audited for the year 2003 to year 2012; a multiple regression models have been employed. The researcher found that grant to asset ratio, GDP growth rate, cost per borrower, deposit to loan ratio and the gross loan portfolio are statistically significant variables in determining financial self-sufficiency. Similarly, the study found that return on asset, age, cost per borrower, portfolio at risk and operating expense ratio are statistically significant predictor in determining the financial self-sufficiency of Ethiopian microfinance institutions. Considering macroeconomic variables the study found that inflation has positive and insignificant effect on dependent variable FSS, this finding was contradictory with that of Kirubel (2018) and Khathomi (2017) which revealed inflation has negative and significance effect on FSS.

Kinde (2012) study based on a quantitative research approach using a balanced panel data set of 126 observations from 14 MFIs over the period 2002-2010. By applying multivariate regression model called ordinary least square, the study found that microfinance breadth of outreach, depth of outreach; dependency ratio and cost per borrower affect the financial sustainability of microfinance institutions in Ethiopia. However, the microfinance capital structure and staff productivity have insignificant impact on financial sustainability of MFIs in Ethiopia for the study periods. The study did not show detail of factors that affect financial sustainability.

Abebaw (2014) study on financial performance of microfinance institutions from nine years secondary data of 13 selected MFIs in Ethiopia. The study used OLS estimation method to measure the effect of internal and external determinants on financial performance in terms of return on asset. The study finding showed that Age of microfinance institutions has a positive but statistically insignificant effect on their financial performance. Operational efficiency, GDP and size of MFIs affect MFIs financial performance significantly. The other explanatory variables which is Portfolio at risk > 30, Gearing ratio, capital to asset ratio and Market concentration affect negatively and insignificantly.

Tilahun (2013) examined factors that determine East African MFIs including Ethiopian microfinance institutions financial sustainability. The study applied Binary probit and ordered probit regression models and using unbalanced panel data collected from 23 microfinance institutions (MFIs) in East Africa from the period 2004 to 2009, the regression results reveal that

MFI's financial sustainability is positively and significantly driven by loans intensity and size. However, management inefficiency and portfolio at risk have a negative and significant impact on financial sustainability.

Sima(2013) on his study examined internal and external factors affecting profitability of Microfinance institutions in Ethiopia by including a total of thirteen microfinance institutions covering the period of 2003-2010. The researcher uses quantitative research mainly documentary analysis. The outcome of the study indicates that Age of microfinance institutions has a positive and statistically significant effect on their profitability. However, Operational efficiency and portfolio quality have a negative and statistically significant effect. However, capital adequacy, size and GDP are found to be statistically insignificant variables.

Abiyu (2016) conducted study to examine the factors which affect the financial sustainability of MFIs in Ethiopia .The study is based on quantitative research approach with explanatory research design using panel data fixed regression as the main data analysis technique. The study based on 11 years secondary data from 2004 to 2014 for 15 selected MFIs in Ethiopia. The study found that MFIs in Ethiopia are not financially sustainable and identified breadth of outreach and deposit to loan ratio significantly affect the financial sustainability of MFIs in Ethiopia. On the other hand, inflation and operating expense ratio are significant and negative relationship with financial sustainability. Similarly, study made by Kirubel (2018) using similar methodology with the same explanatory variables reveals exactly similar finding results with that of Abiyu for all the explanatory variables.

Solomon et.al (2019) on published article investigated the performance of MFIs and its determinants by using unbalanced panel data (2000–2017) from Ethiopia. The results indicate that, based on different outreach and financial performance metrics, the MFIs in Ethiopia have good performance compared with those of the 10 biggest economies in Sub-Saharan Africa. The results show that asset holding and the yield on gross portfolio have a positive and significant effect on the social and financial performances of MFIs in Ethiopia.

Ayenew (2019) conducted study aimed to assess the financial factors (institutional, clientele, economic, legislative and regulatory frame work) affecting the performance of microfinance institution (MFI) in Debre birhan town Ethiopia. The study targeted employees working with the

Amhara credit and saving institution in Debre birhan town and sample borrowers were selected from borrowers served by these selected MFI. Both quantitative and qualitative approaches to data collection and analysis were employed in the study. The study found that MFI charge higher interest rates than commercial banks and low women participation.

### **2.3. Research Gap**

Studies conducted in the areas of microfinance institutions in Ethiopia are limited and mainly focused on the performance of the MFIs. Whereas, only a few studies have been conducted regarding financial sustainability of Ethiopian MFIs with limited explanatory factors. Similarly, several studies have been conducted to determine factors affecting financial sustainability of MFIs using large and developed MFIs in various countries. The level of significance of these factors in influencing the financial sustainability of MFIs still varies with studies (Cull et al., 2007 & Christen et al., 1995).

Some of the recent studies such as Hossain et al. (2016) and Tilahun (2013) reveal that operating expense ratio has positive, but not significant effect on FSS, these results are inconsistent with Silashi (2015) and Kirubel (2018) revealed that OER has negative significant effect on FSS of Ethiopian MFIs. A Study done by Tilahun (2013) also found that DER has negative and significant effect on FSS which is opposing with other researchers indicated above on significance level. Sima (2013) found that GDP growth rate is insignificant predictor for financial performance, this finding was inconsistent with Abebaw (2014) and Kirubel (2018).

Silashi (2015) regarding macroeconomic variables made study from secondary data found that inflation has positive, but insignificant effect on dependent variable FSS, this finding was contradictory with that of Kirubel (2018) and Khathomi (2017) which revealed inflation has negative and significance effect on FSS.

Study made by Dinah (2016) and Hossain (2016) found that CAR has negative and significant effect on FSS which is inconsistency with Kirubel (2018) explained that CAR has positive significant effect on FSS. Kinde (2012), tried to identify factors affecting financial sustainability of MFIs in Ethiopia, but his study did not display visibly and used only five years data of selected MFIs over the period 2002-2010 failed to consider macroeconomic variables.

While studies conducted by Yenesew (2014), Ayenew (2019), Abebaw (2014), Asnakew (2012), Tamene (2012) and Sima (2013) are worth to observe, to the best of my knowledge most of these studies focused on limited internal characteristics and did not sufficiently (if not at all) consider the influence of profitability, financing structures, macroeconomic variables and management efficiency indicators variables which has severely been investigated in many studies in the global microfinance industry.

The researcher finally believe that those studies did not give such an emphasis and convincing findings on the determinants of financial sustainability and fail to consider the effects of Net profit Margin, Portfolio Yield variables. In addition there were inconsistent findings on macroeconomic factors, Debt to equity Ratio, Operating expense ratio, Capital to asset ratio, variables. The determinants for financial sustainability of Microfinance Institutions has backgrounds in the existing literatures, but as far as my knowledge is concerned it needs further research and explanation especially in Ethiopian case because as the empirical literature displays the problem is done with limited explanatory variables and more focused on the performance of the MFIs with descriptive statistics.

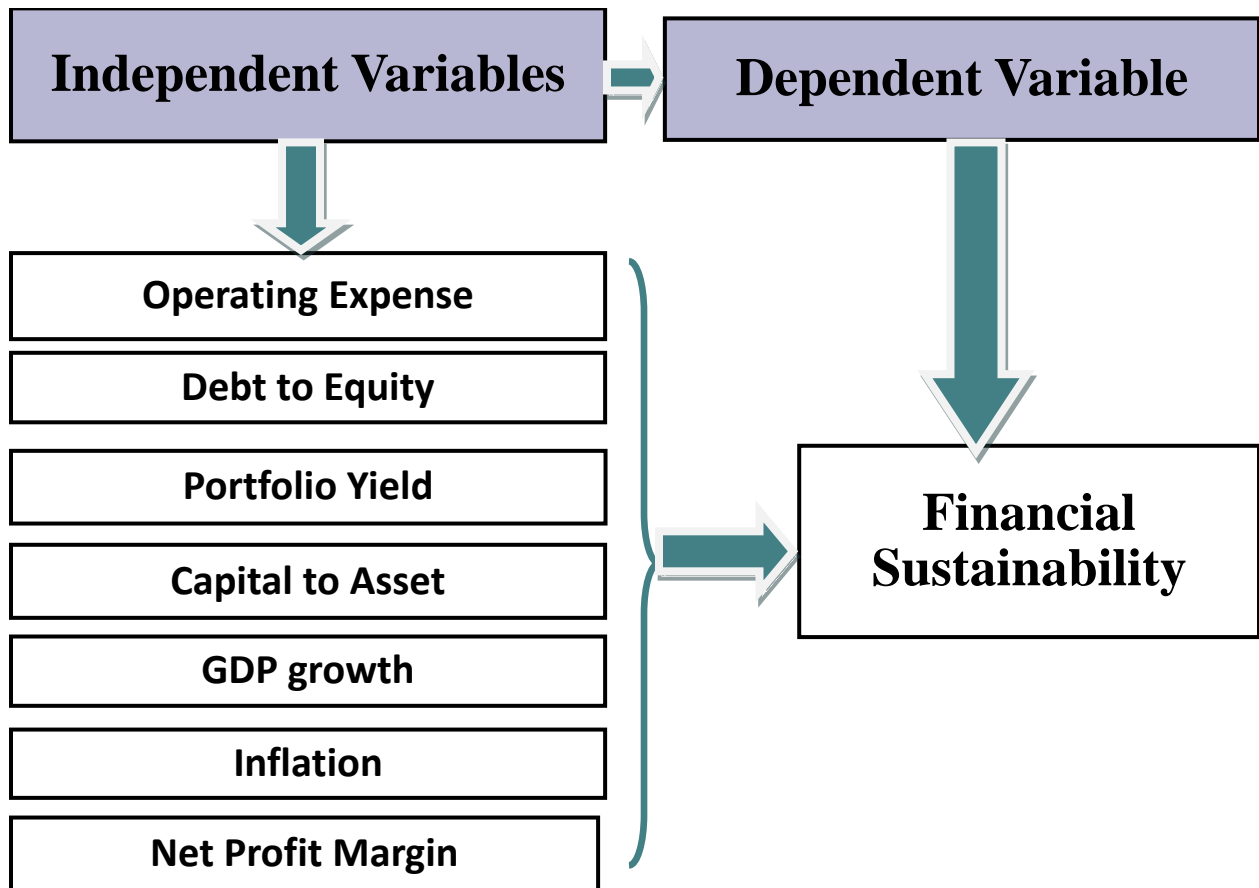
Therefore, the aim of this study is to fill the above-mentioned knowledge gaps, to bridge the previous researches gap and to arrive at convincing results by using the major firm internal variables which were not included in most of the empirical studies like Net profit Margin and Portfolio Yield variables in addition to the variables such as Debt to Equity, Operating expense, Capital to asset, GDP growth rate and inflation, thereafter the study attempts to propose a more comprehensive and representative model for financial sustainability and create an indicator to observe the financial performance of microfinance sector.

#### **2.4. Conceptual Framework of MFIs Financial sustainability**

According to Young (2009) defines conceptual framework as diagrammatical representations that shows the relationship between dependent and independent variables. It is developed from the review of literature discussed above that shows the relationship between the MFIs financial sustainability and the influences of variables used in this study. Accordingly, different empirical evidences suggested that financial sustainability of financial institutions specifically MFIs is affected by internal and external factors. This study used both internal and external determinants

of MFIs financial sustainability. The Internal determinants of MFIs financial sustainability include Debt to equity, operational expense, capital to asset, net profit margin, portfolio yield whereas the external determinants for MFIs financial sustainability include the inflation and GDP growth rate in the country. The study aimed to identify to what extent these variables can determine the financial sustainability of MFIs in Ethiopia.

**Fig 2.1 Diagram of conceptual framework**



*Source; the researcher's own Design, 2020*

# CHAPTER THREE

## RESEARCH METHODOLOGY

This specific chapter of the study started with the description of study type, approach or design and followed by describing the target population, sample size and sampling technique, source of data and methods of collection. Finally, definition of variables, model specification and data analytical tools were presented.

### 3.1. Research Design

Quantitative research defined as a means for testing objectives, theories by exploring the relationship among variables. These variables in turn, can be measured, typically on instruments; so that numerical data can be analyzed using statistical procedures (Creswell, 2009). The objective of the study mainly focuses on assessing the determinants of financial sustainability of MFIs in Ethiopia, by taking financial sustainability as dependent variable. Hence, to meet this objective, the study has adopted an explanatory research design. Further quantitative research approach employed in this study is in line with the study objective, which intends to follow a systematic and scientific investigation of quantitative properties, phenomena and their relationships (Abiy, 2009 cited by Buzayehu, 2019). From data perspectives, the study used panel data analysis approach. According to Tadesse (2015) theory noted by various scholars, a quantitative panel data gives more useful data, more variability, less linearity among variables, more degrees of freedom and more efficiency. All these could minimize the bias that might result if individuals or firms are aggregated into broad aggregates.

### 3.2. Target Population

According to the recent data from the NBE, there are 38 microfinance institutions operating in the country by the end of year 2019. Hence, the target population considered by the researcher is all the 38 microfinance institutions licensed at NBE which were providing the microfinance service to the target group by the end of year 2019.

### 3.3. Sample Design and Sample size

The researcher believes that collecting data from each MFI is cost and time consuming. The quality of wider data may affect the objectivity of the research findings. The Ethiopian MFIs are classified into three basic categories based on their portfolio size as small, medium and large (National Bank Report, 2018). Therefore, this study applied purposive sampling technique, because the study did not include all microfinance institutions to have an equal chance to be selected as a sample. Hence, the sample size is purposely selected based on institution's loan portfolio. Additionally, researcher used his own judgment to select the appropriate sample that cover larger share of microfinance institutions loan portfolio. Accordingly, 15 MFIs with gross loan portfolio greater than 47 million birr were selected for this study. Hence, the study included 15 MFIs with 8 year's balanced data which were audited for the year 2011 to 2018. Therefore, this provides a total 120 (15MFIs \*8 years) observations, which is indeed enough to do a Multiple regression in which a minimum of 95 observations which is recommended by (Brooks, 2008).

**Table 3.1 List of sample MFIs with their GLP and Total Assets as of June 30, 2018(NBE)**

No	Name of Institutions	Abbrev.name	Gross Loan portfolio	Total Assets
1	Amhara Credit and Savings Institutions	ACSI	17,689,287,600	27,062,094,200
2	Dedebit Credit and Savings Institutions	DCSI	4,341,814,700	7,969,143,600
3	Oromia Credit and Savings Institutions	OCSSCO	8,887,432,200	12,280,474,500
4	Omo Credit and Savings Institutions	OMO	5,569,759,700	8,628,254,800
5	Addis Credit & Savings Institutions	ADCSI	2,687,551,000	3,955,744,400
6	Specialized Fina. & Prom. Institution	SFPI	302,346,100	344,065,600
7	Vision Fund Microfinance	VFMFI	1,023,012,600	1,198,648,200
8	Sidama Micro-Financing Institution	SMFI	248,049,000	312,844,800
9	Bussa Gonof.Micro-Financing Ins.	BGMF	417,640,600	568,609,600
10	PEACE Micro-Financing Institutions	PEACE	157,335,000	197,406,400
11	Wassassa Micro-Financing Institutions	WMMFI	387,600,300	565,194,000
12	Ben. Gum. Micro-Financing Institu.	Ben. GGMFI	258,752,000	359,147,100
13	Eshet MFI	EMFI	47,483,500	56,936,200
14	Agar Micro-Financing Institutions	AGGAR	304,516,200	410,181,600
15	Harbu Micro-Financing Institutions	HMFI	132,789,200	182,215,500
<b>Total Gross LP and Total Asset for sample MFIs</b>			<b>42,455,369,700</b>	<b>64,090,960,500</b>
<b>Total Gross LP and Total Asset for total Population</b>			<b>48,900,000,000</b>	<b>71,000,000,000</b>
<b>Total Gross LP and Total Asset Contribution of sample MFIs</b>			<b>86%</b>	<b>90%</b>

Source secondary data from National Bank (2020)

### **3.4. Source of Data and Methods of Data Collection**

In order to carry out any research activity; information must be gathered from proper sources. The source of data for this research was almost secondary sources. To examine the determinants for financial sustainability of microfinance institutions in Ethiopia, the researcher is expected to gather and use secondary data from various sources. Accordingly, the secondary data specific to MFIs were taken from National Bank of Ethiopia. Whereas, the data related to the macroeconomic factors was also collected from the National Bank of Ethiopia (NBE), Mix Market and the website of World Bank. To enhance the quality of econometric estimates and to preserve consistency, only the most available MFIs' audited data and published or unpublished in the NBE report were collected from the fiscal years 2011 to 2018 (balanced panel data) which effectively constitutes 8 years data.

Data collection procedure is a means by which information is obtained from the selected subjects of an investigation (Creswell, 2003). For the study purpose, the main sources of data were the statement of financial position and income statements of the selected MFIs from NBE. To obtain this data, information request letter addressed to change management departments of NBE was sent out. The data were annual in nature, only audited and covered 8-year period from 2011 to 2018. A form for secondary data collection was then used to summarize relevant data on total assets, total operating expenses, total debt, total equity and net income from the financial statements in order to calculate relevant ratios, descriptive measures and regression analysis.

### **3.5. Data Analysis and Techniques**

The panel data collected from the NBE, and various websites are managed in the form of ratios and percentages. These panel data have been regressed and interpreted by using multiple regression method and descriptive statistics. To enhance the strength of the models, to minimize the cross-section effects of the intercepts the study employs a fixed effect regression technique. According to Brooks (2008) the simplest types of fixed effects models allow the intercept in the regression model to differ cross section. The fixed-effects model controls for all time-invariant differences between the individuals, so the estimated coefficients of the fixed-effects models cannot be biased because of omitted time-invariant characteristics. The study also checked whether the proposed empirical models are free from problem of heteroscedasticity,



autocorrelation, multicollinearity and normality. A violation of key assumption of OLS regression occurs if any one of those assumptions turns out to be present. Hausman test is also made to ensure that a fixed effect regression technique is appropriate. To analyze and interpret the given panel data, STATA version 15.1 Software was used as it has the ability to help researchers to analyze their research data easily and efficiently.

Accordingly, the data analysis was conducted and tested the validity of econometric model assumption and analysis of panel data. Therefore, the panel data collected from the NBE was analyzed by using descriptive statistics, correlations and multiple linear regression analysis. Descriptive statistics (Mean values and standard deviations, minimum and maximum) were analyzed the general trends of the data from 2011 to 2018 based on the sample of 15 MFIs and correlation examined the relationship between the dependent variable and independent variables.

### **3.6. Variable specification**

The study aimed to assess the significant determinants of financial sustainability of MFIs in Ethiopia. Financial Self-Sufficiency ratio is used as the dependent variables to measure the sustainability of microfinance institutions in Ethiopia. The researcher is already extracted various predictor or explanatory and independent variables from different studies to measure the financial sustainability of MFIs in Ethiopia. Accordingly, seven explanatory variables, namely; Debt to equity Ratio (DER), Operating expense ratio (OER), Capital to asset ratio (CAR), Net profit Margin (NPM), Portfolio Yield Ratio (PYR), GDP growth rate and Inflation were assessed in the model to measure and predict the financial sustainability of MFIs in Ethiopia.

#### **A. Dependent variable**

##### **Financial sustainability**

This ratio shows the ability of the MFI to cover its adjusted expenses from adjusted revenues excluding grants. Financial sustainability indicates whether or not enough revenue is earned to cover all the operating, financial and loan loss expenses. A higher ratio more than 100% is indicative of a long-term financial sustainability. The paper used financial self-sufficiency as a proxy for financial sustainability.

$$\text{Financial sustainability ratio} = \text{Adjusted financial revenue} / \text{Adjusted total expense}.$$

## **B. Explanatory variables**

### **Capital to Asset ratio:**

This ratio measures the degree to which MFI has financed its total assets from equity. The higher the equity proportion, the more the capacity of the MFI to absorb losses before the assets become inadequate to satisfy debt holders claims.

Adjusted capital to assets ratio = Adjusted total equity to Adjusted total assets

### **Debt to Equity ratio:**

It is calculated by dividing total liabilities by total equity. Total liabilities include all the MFI owes to others, including deposits, borrowings, accounts payable and other liabilities. This ratio measures the safety cushion the institution has to absorb losses before creditors are at risk.

Debt to equity = Total Debt/ Total Equity

### **Operating expense ratio:**

This ratio provides an indicator of the overall efficiency of a lending institution and it is also commonly referred to as the efficiency ratio. It measures the institutional cost of delivering loan services. It is regularly assumed that the lower operating expense ratio, the higher the efficiency of an institution.

Operating expense ratio = Adjusted operating expense / Adjusted average gross loan portfolio

### **GDP Growth**

It is defined as the annual change of the GDP (economic growth). GDP growth is expected to have effect the supply and demand for loans and deposits. In short, GDP growth can be served as an indicator of the demand for financing services.

### **Inflation rate:**

It is a sustained increase in the general price level of goods and services in economy over a period of time. When the price level rises, each unit of currency buys fewer goods and services.

### **Net Profit Margin**

The Net Profit Margin shows the company's ability to generate a net profit from an increment of the additional one dollar of a total income. This ratio measures net income per total revenue; it is calculated by dividing net income by revenue.

### **Yield on Gross Portfolio**

This ratio indicates the degree to which the largest assets of an MFI, the gross loan portfolio, generate interest and fee income.

$$\text{Yield on gross portfolio} = \text{Adjusted financial revenue from GLP} / \text{Adjusted average GLP}$$

The following table summarizes the name, description of the independent variables, the variable names, variable measurements to be used in the regression model and the researcher's expected effect of the independent variables on the dependent variable used in the research

**Table 3.2 Summary of variables in the study and their expected impact/sign**

Categories	Variables Name	Variables Symbol	Measurement ratio to be used	Expected sign	Literatures
<b>Dependent Variables</b>	Financial Self sufficiency	FSS	Adjusted Revenue / Adjusted expense		Abiyu(2016), ,Silashi(2015),Tilahun (2013) Melkamu(2012 & Kinde (2012)
<b>Independent Variables</b>	Debt to Equity ratio	DER	Adj. Total Liabilities/Adj.Total	-	Tilahun (2013),Silashi (2015),Anand (2012)& Buzayehu (2019)
	Operating expense ratio	OER	Operating expense / Gross loan	-	Hossain(2016),Tilahun(2013),Silashi (2015),Abiyu(2016) & Kirubel(2018)
	Capital to asset	CAR	Total capital /Average total asse	+	Abebaw (2014) ,Hossain (2016) ,Kirubel (2018)
	Net profit margin	NPM	Net income / Total Revenue.	+	Dinah (2016)
	Portfolio yield ratio	PYR	Total financial revenue from loan portfolio /total average	+	Melkamu(2012,Anand (2012)
	GDP growth rate	GDP	GDP growth rate of the country	+	Kirubel (2018) , Khathomi (2017) ,Abiyu (2016)
	Inflation	INF	The inflation rate of the country	-	Kirubel (2018) , Khathomi (2017) ,Abiyu (2016),Buzayehu (2019)

*Source; - The researchers own compilation from empirical literatures, 2020*

### 3.7. Model Specification

The researcher formulates econometric model which are a representation of the basic features of an economic phenomenon so as to achieve the broad research objective. It is an abstraction of the real world. The specification of a model is based on the available information relevant to the study in question. This is to say that the economic model formulation is dependent on available and accessible information on the study as supported in standard theory and other major important empirical works, or else, the models would be theoretical.

This study tried to find the determinants of financial sustainability of Ethiopian MFIs by taking financial self-sufficiency as a proxy to financial sustainability of MFIs for the period covering 2011-2018 by using balanced panel data. The paper specifies the model based on seven predictor variables leverage ratio, operating expense ratio, capital to asset, net profit margin, portfolio yield ratio, GDP growth rate and inflation. The panel data model adopted from different studies conducted on similar area as baseline model used by other researchers Gemechu (2016) and Buzayehu (2019) were used:

$$Y_{it} = \beta_0 + \beta X_{it} + \mu_{it} \text{-----} (1)$$

Where:

Y-it - dependent variable

$\beta_0$ - constant coefficient

$\beta$  – Regression coefficient

X-it- independent variable

$\mu$ -it – error term

i – The number of units

t – The number of times

Based on baseline model explained above, the researcher developed multiple linear regression models to measure the financial sustainability of MFIs. Multiple linear regressions provides a rich and flexible framework that suits the needs of many analysts and has been used in similar studies, including those carried out by Sileshi (2015), Abebaw (2014) and Buzayehu (2019). The multiple regression model adopted from different studies conducted on the same area to examine the determinants for financial sustainability of MFIs in Ethiopia is explained as follows.

$$FSS_{it} = \beta_0 i + \beta_1 * DER_{it} + \beta_2 * CAR_{it} + \beta_3 * OER_{it} + \beta_4 * NPM_{it} + \beta_5 * PYR_{it} + \beta_6 * INF_{it} + \beta_7 * GDP_{it} + \mu_{it}.$$

Where  $\beta_1$  to  $\beta_7$  are the coefficients of the variables and  $\mu_{it}$  is the random error term.

$\beta_0$ ; stands for the intercept term which varies across MFIs but constant over time

$DER_{it}$ : stands for debt to equity ratio of MFI  $i$  at time  $t$ ,

$CAR_{it}$ : stands for capital to asset ratio MFI  $i$  at time  $t$ ,

$OER_{it}$ : stands for operating expense ratio of MFI  $i$  at time  $t$ ,

$NPM_{it}$ : stands for net profit margin of MFI  $i$  at time  $t$ ,

$PYR_{it}$ : stands for Portfolio Yield ratio of MFI  $i$  at time  $t$ ,

$INF_{it}$  stands for Inflation rate assigned to MFI  $i$  at time  $t$ .

$GDP_{it}$ : stands for GDP growth rate of Ethiopia assigned to MFI  $i$  at time  $t$ .

# CHAPTER FOUR

## 4. RESULTS AND DISCUSSION

This chapter deals with the analysis and presentation of the results of the study that is concerned on the financial sustainability of Microfinance Institutions in Ethiopia. The data gathered from NBE were analyzed by using STATA Software 15.1. The descriptive statistics and the correlation analysis were discussed then followed by the diagnostic tests which were necessary to fulfill the assumptions of classical linear regression models. Then, data analysis and discussion of the main finding of the regression analysis were presented by supporting theoretical framework and empirical evidence.

### 4.1. Descriptive statistics

This section presents the descriptive statistics of dependent and independent variables used in the study of selected Microfinance Institutions. The dependent variables used in the study were FSS while the independent variables were Debt to Equity Ratio (DER), Operating expense ratio (OER), Capital to asset ratio (CAR), Net profit Margin (NPM), Portfolio Yield ratio (PYR) Inflation rate and GDP growth rate. Thus, the total observations for each dependent and explanatory variable were 120 from 8 years of 15 Microfinance Institutions balanced panel data. The table 4.1 demonstrates the mean, standard deviation, minimum and maximum values for the dependent and independent variables for sample MFIs over the year 2011 to 2018.

**Table 4.1. Descriptive Summary of Dependent and Independent Variables**

. summarize FSS OER DER CAR GDP PYR NPM INF

Variable	Obs	Mean	Std. Dev.	Min	Max
FSS	120	.8856677	.8562636	-.3288667	3.660403
OER	120	.1706034	.0865707	.0386232	.5777825
DER	120	2.181797	1.366385	.5645404	11.88495
CAR	120	.3298509	.1278139	.028	.639164
GDP	120	.0966838	.0128806	.077	.114
PYR	120	.2913539	.1907468	.0176553	.7997952
NPM	120	.3732398	.2417429	-.4900169	.7854263
INF	120	.139361	.0841048	.072	.341

Source: STATA Output from NBE Data, 2020

The study revealed the performance of dependent variable, FSS on table 4.1 which is measured by the Adjusted Revenue divided by total expense has a mean value of 88.5 percent during the study period 2011-2018. The mean values, the maximum values, the minimum values and the standard deviations MFIs' FSS observations are 88.5%, 366%, -32% and 85% respectively. This shows that the MFIs included in the sample for the study period earned on average 88.5 cents in every one-birr investment they made on their income and the profitable MFIs earned 366% cent of income after adjustment for a single birr of adjusted expense they made on income. On the contrary, not profitable MFIs lost 0.32% cents for one-birr investment expense made on income of the firm. This clearly illustrates the disparity of rates of return earned by MFIs.

Given the international requirement of an FSS ratio of 100%, the mean score of 88.5% indicated that most of Ethiopian MFIs are not financially self-sufficient. It is difficult for these MFIs, with FSS ratio below 100%, to cover all costs and to operate without ongoing subsidy. In this case, equity will be reduced by losses, forced them to rely on grants or concessional loans from external sources.

During the study period from the sample MFIs the most successful MFIs attained FSS are SPFI scoring an average self-sufficiency level of 247% followed by PEACE MFI scoring an average self-sufficiency level of 226% the next is WASASA scoring 168% followed by Busa Gonofa scoring 118% and ACSI also successful MFIs by scoring 112%. However, the remaining ten MFIs are still failed to attain financial sustainability.

On the other hand, the most successful MFIs with maximum score of 366 % is SFPI Microfinance which could minimize the need for subsidies and concessional loans of low interest rates from donors. The worst MFIs with minimum score of -0.32 % is Harbu Microfinance Institution.

The standard deviation (85%) revealed in this study was very high as compared to related findings around the world and related studies in Ethiopia. For example, in Bogan (2009) study FSS ratios of MFIs had standard deviation of just above 45%. Lower standard deviation is a good indication that most of the observations are concentrated around the mean. This higher standard deviation indicates that there are great variations among the Ethiopian MFIs in terms of attaining financial sustainability.

Comparison of Ethiopian MFIs' FSS ratio with the FSS ratio of MFIs in the entire continent of Africa indicated, as revealed by Mix Market (2011), that the mean FSS score of the African MFIs was 98% which is marginally higher than the mean score of Ethiopian MFIs.

The same source indicated that MFIs operating in eastern African and southern African regions had a mean score of an FSS ratio of 99.1% and 97.6% respectively and indicating that they are out-performing Ethiopian MFIs. However, on the average none of the MFIs in these regions are financially self-sufficient as their mean score was marginally below 100%.

Additionally table 4.1 indicated the descriptive statistics of independent variables that affects the financial sustainability level of Ethiopian Microfinance Institutions. The first one is Operating expense ratio which is measured by operating expense over gross loan portfolio of MFIs. The average operating efficiency of selected MFIs was 17% indicating that on average they are incurring 0.17 cents in operating expense for each birr in the gross loan portfolio. Some highly efficient institutions DECSI incur operating expense of 0.03 cent for each birr in the gross loan portfolio. On the other hand, inefficient institutions in the industry which is Benishangul Gumuz Microfinance incur an operating expense of 0.57 cents for each birr on their gross loan portfolio. The standard deviation showed 8.06% implying the large variation in terms of operational efficiency (operating expense management). Here, the result indicated that the most efficient MFIs have a low operating expense ratio. According to the Micro rate (2014), leading MFIs in Africa have efficiency ratio below 10% these days. Therefore, the operational expense of Ethiopian MFIs affirms that the institutions are inefficient.

The Net Profit Margin shows the company's ability to generate a net profit from an increment of the additional one dollar of a total income. The average NPM of Ethiopian MFIs is 37.3% for the study period which means that they generate 0.37 cents of profits from additional one dollar of income. The maximum mean is 78.5% which is located in SFPI and the worst mean is in Harbu -49% which means that they loss 0.049cents for each dollar of their income. There is great variation in NPM among Ethiopian MFIs as the standard deviation result shows 24 percent below the mean value.

Portfolio yield shows how much, on average an MFI really receives in interest payments on its loans. The average portfolio yield for Ethiopian MFIs is 29 percent, Maximum mean is 79 percent in SEPI and Minimum mean is 1.7 percent which is in ADCSI. There is also great



variation in PYR among Ethiopian MFIs as the standard deviation result shows 19 percent below the mean value. According to the Micro rate (2014), globally MFIs achieved an average PYR of 27.6%. Thus, it proves the Ethiopian MFIs are in good state in this regard.

In regard to Debt to equity ratio implies that the average value of 2.18 and maximum value of 11.8 and 0.56 minimum value. Meaning as per the mean value of this variable (2.18) indicates, MFIs in Ethiopia are leveraged on average than financed through equity capital because the AEMFIs suggested standard of debt to equity is 1.5. On the other side, the minimum gearing ratio (debt to equity) is 0.56 indicating few MFIs are financed more through debt capital than equity. However, the maximum value for this variable is 11.8 which indicate that debt financing is more considered instead of having proportional financing structure, therefore highly leveraged. The Standard deviation of gearing ratio is 1.64 this clearly illustrates the disparity of this ratio by MFIs.

In relation to the Capital to asset ratio variable the mean is 32.9 % and maximum value shows 63.9 %. This result indicates that above the minimum requirement which is set by CGAP, micro finance institutions should be subject to even higher adequacy capital to asset ratio to safeguard their portfolio and advises to maintain ratios approaching 20%, AEMFI. The capital asset ratio average value results suggest that about 32.9 % of the total assets of the sample MFIs were financed by shareholders funds while the remaining 67.1 % was financed by deposit liabilities.

The mean value of GDP is found to be 9 %. Throughout the period this study covered from the year as of 2011 to 2018, Ethiopia recorded double digit of 11.4% the maximum growth rate of real GDP whereas a minimum was a negative 7.7%. Mean value and standard deviation of 9 and 1.2% were also recorded in the country respectively. This indicates that there was a variation on the real GDP growth rate towards its mean.

The other variable was inflation rate which recorded 34.10% and 7.2% of maximum and minimum respectively whereas its mean value and standard deviation of inflation rate was 13.9% and 8.4% respectively which indicating the average inflation rate of the country during the study period. The maximum score 34.1% in 2012 were create negative effect on financial sustainability of MFIs in Ethiopia. The 8.4% % of standard deviation was high variation and this show that inflation rate was not stable during the study period in Ethiopia. The mean values for each variable in the study for the study period summarized in the table below.

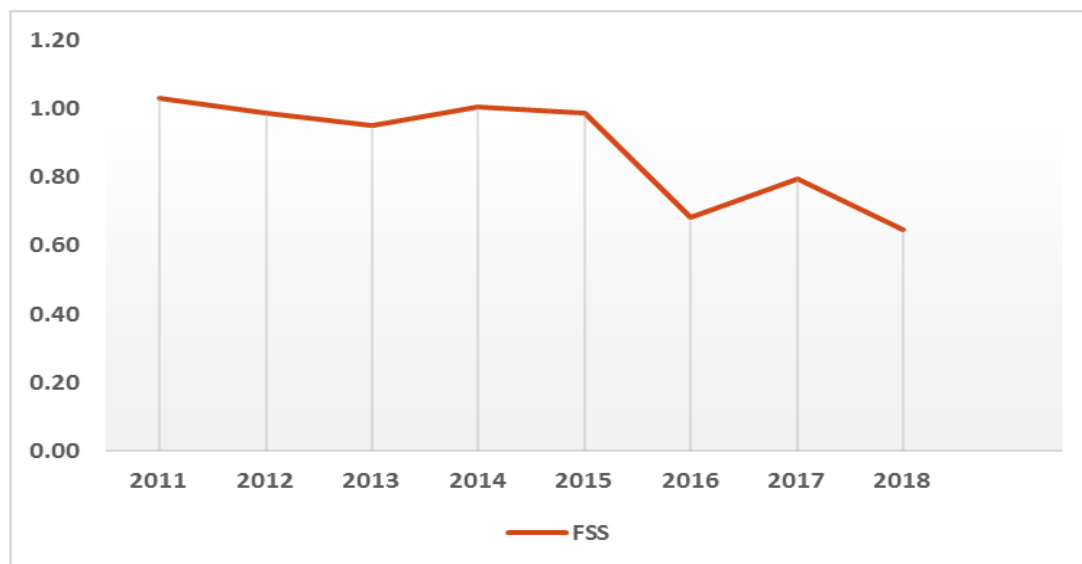
**Table 4.2 Annual mean values for all variables in the study**

Year	OER	DER	CAR	GDP	PYR	NPM	INF	FSS
2011	0.18	1.65	0.43	0.11	0.28	0.37	0.18	1.03
2012	0.16	2.00	0.38	0.09	0.31	0.37	0.34	0.99
2013	0.16	2.17	0.23	0.10	0.30	0.39	0.14	0.95
2014	0.16	2.20	0.34	0.10	0.29	0.41	0.08	1.01
2015	0.17	2.11	0.34	0.10	0.30	0.39	0.08	0.99
2016	0.21	2.48	0.32	0.08	0.30	0.34	0.10	0.68
2017	0.17	2.77	0.31	0.11	0.28	0.35	0.07	0.79
2018	0.17	2.09	0.29	0.08	0.27	0.36	0.13	0.65

*Source: Own computation from secondary data (2020)*

As shown from the above table, on average the Ethiopian MFIs fulfilled the financial sustainability level in the year 2011 and 2014 by registering the mean FSS value of 103 % and 101% respectively. The graphical representation of yearly financial sustainability mean values are looks the following.

**Figure 4.1:** Financial self-sufficiency of MFIs in Ethiopia (Annual Average)



*Source, Own design, 2020*

## 4.2. Correlation Analysis

Correlation coefficient is a way to index the degree to which two or more variables are associated with or related to each other (Brooks, 2008). Thus, it does not imply that changes in  $x$  cause changes in  $y$ , or vice versa. Rather, it is simply stated that there is evidence for a linear relationship between the two variables and that movements in the two are on average related to an extent given by the correlation coefficient. Correlation coefficient between two variables ranges from negative 1 to positive 1. A correlation coefficient of 0, on the other hand indicates that there is no linear relationship between the two variables.

From the table 4.3, the study found coefficient correlation among independent and dependent the variables used for this particular research. The result of OER and DER had negative correlation with FSS which indicate that the more exposing to expense and debt the MFIs are, the lower will be their financial sustainability. This result for DER supports the pecking order theory which deals the most profitable institutions will have internal source of fund hence no need of searching further loanable fund from external part. The NPM and PYR have strong relation with FSS. The others GDP growth rate and CAR have positive relation with FSS. Inflation rate had a very weak relation with financial sustainability. As far as FSS is concerned, NPM, PYR, GDP growth, Inflation and CAR have positive relation with FSS, while OER and DER has negative relation with Financial sustainability.

**Table 4.3. Correlation Matrix for Ethiopian MFIs**

```
. cor FSS OER DER CAR GDP PYR NPM INF
(obs=120)
```

	FSS	OER	DER	CAR	GDP	PYR	NPM	INF
FSS	1.0000							
OER	-0.2302	1.0000						
DER	-0.2361	-0.3320	1.0000					
CAR	0.2786	0.3383	-0.6638	1.0000				
GDP	0.1170	-0.0633	-0.0259	0.1329	1.0000			
PYR	0.7368	0.3514	-0.3638	0.3668	-0.0088	1.0000		
NPM	0.8860	-0.3806	-0.1866	0.2318	0.0466	0.5700	1.0000	
INF	0.0518	-0.0443	-0.1179	0.1718	-0.2387	0.0167	-0.0054	1.0000

Source: STATA Output from NBE Data, 2020

### **4.3. Results of Diagnostic Tests**

The researcher conducted diagnostic tests to guard against the possibility of obtaining and interpreting spurious regression results. Every estimator of the model should have to meet the OLS assumptions before the estimation is carried out. If the estimators of the model satisfy the OLS assumptions it is possible to say the estimators are BLUE (Best Linear Unbiased Estimators). The estimators of a model should satisfy all OLS assumptions (Brooks, 2008). Accordingly, appropriate diagnostic tests for each OLS assumptions were conducted.

#### **4.3.1. Linear relationship**

The model is a roughly linear one. This is slightly different from simple linear regression as we have multiple explanatory variables. This time we want the outcome variable to have a roughly linear relationship with each of the explanatory variables, taking into account the other explanatory variables in the model.

Multiple regressions can accurately estimate the relationship between dependent and independent variables when the relationship is linear in nature. The chance of non-linear relationships is high in the social sciences; therefore, it's essential to examine analyses for linearity. If the relationship between independent variables and the dependent variable is not linear, the results of the regression analysis will under-estimate the true relationship.

#### **4.3.2. Mean Values of Errors**

The other assumption required to test in the linear regression model is the mean value of the errors which expected to become zero. The mean value of errors was tested through including a constant term in the regression model. In fact, if a constant term was included in the equation of the regression model, this assumption will not be violated. Therefore, the study included a constant term in the regression equation (Brooks, 2008 & Gujarati, 2003). Since the constant term (i.e.  $\beta$ ) was included in the regression equation, the average value of the error term in this study is expected to be zero.

### 4.3.3. Heteroscedasticity test

According to Brooks (2008) heteroscedasticity means that error terms do not have a constant variance. If heteroscedasticity occur, the estimators of the ordinary least square method are inefficient and hypothesis testing is no longer reliable or valid as it will underestimate the variances and standard errors. There are several tests to detect the Heteroscedasticity problem, which are Park Test, Gletjer Test, Breusch-Pagan/ Cook-Weisberg test, Godfrey Test, White's Test and Autoregressive Conditional Heteroscedasticity (ARCH) test. In this case, the study chose to use Breusch-Pagan/ Cook-Weisberg test for heteroskedasticity.

H0= There is no Heteroscedasticity (the error terms are Homoscedastic)

H1=There is Heteroscedasticity

#### **Table 4.4.Heteroscedasticity test for the Model**

```
. hettest  
  
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity  
Ho: Constant variance  
Variables: fitted values of FSS  
  
chi2(1)      =      0.46  
Prob > chi2  =      0.4991
```

*Source: STATA Output from NBE Data, 2020*

According to the table 4.4above, the results of heteroscedasticitytest in the model result, the Breusch-Pegan test statistic provide the p-values were greater than 0.05. Therefore, the absence of heteroscedasticity was confirmed. And there is no evidence to reject the null hypothesis.

### 4.3.4. Normality test

Normality Test used to check the distribution pattern of the data (Holland & Campbell, 2005). Practically, non-normal data affects particular parameter estimates which could turn out to be statistically significantly different from zero when in fact this is not the case (type 1 error). In case of this study the researcher used Shapiro-Wilk W tests for normal data and the normality distribution of the residual of dependent variable. Another test available is the skewness-kurtosis test which performs the Sktest for normality. The p-value is based on the assumption that the distribution is normal. The hypothesis for the test is,

Ho: Normally Distributed residuals

H1: Non-Normal Distribution of residuals.

**Table 4.5. Normality test for the Model**

```
. predict r,residual
```

```
. swilk r
```

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
r	120	0.98621	1.327	0.633	0.26334

```
. sktest r
```

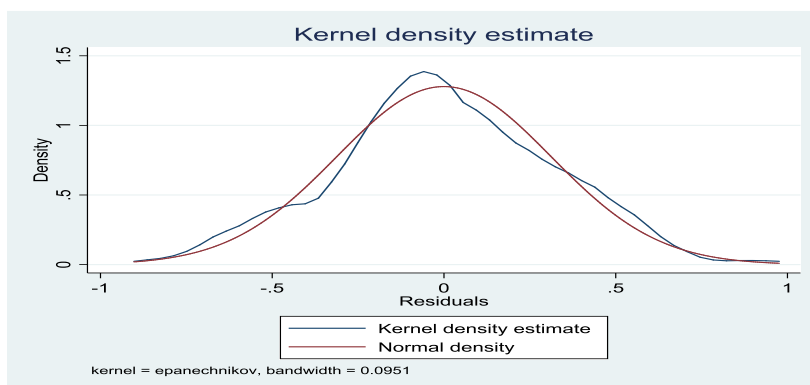
Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
r	120	0.0930	0.4193	3.55	0.1693

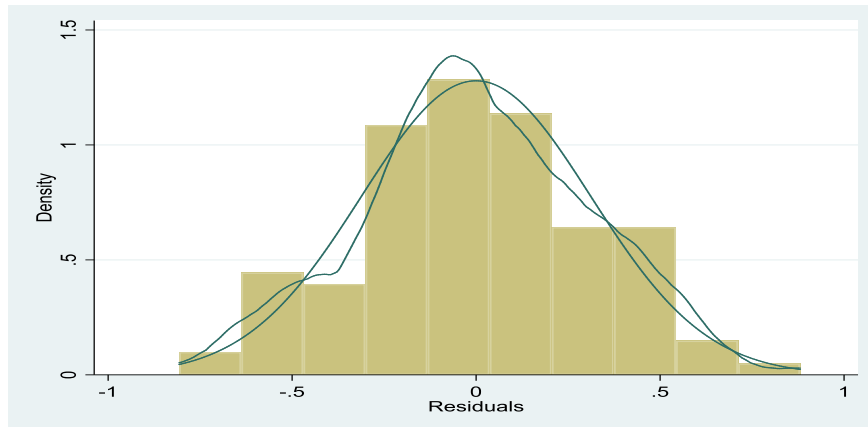
Source: STATA Output from NBE Data, 2020

In the test table 4.5, p-value of the model is 26.33 percent and 16.93 percent for Swilk test and Sktest respectively, indicating that it is greater than p-value of 5% and hence, we failed to reject the null hypothesis that residuals are normally distributed. The normality of the residuals can also be shown by graphs will help us check for normality in the residuals: kdensity and qnorm. Here residuals seem to follow a normal distribution. Below is an example using histogram.

**Figure 4.2 Kdensity r, normal**



**Figure 4.3 Histogramr ,kdensity normal**



*Source; STATA Output, 2020*

Quintile-normal plots (qnorm) check for non-normality in the extremes of the data (tails). It plots quintiles of residuals versus quintiles of a normal distribution. Tails are a bit off the normal.

#### **4.3.5. Multicollinearity test**

An important assumption for the multiple regression models is that independent variables are not perfectly multicollinear. One regressor should not be a linear function of another. When multicollinearity is present standard errors may be inflated. Stata will drop one of the variables to avoid a division by zero in the OLS procedure (see Stock and Watson, 2003, chapter 5).

The study tested for multicollinearity in the between independent variables. Multicollinearity exists when one or more explanatory variables are highly linearly related to each other. When multicollinearity exists in a linear functional relationship between two or more independent variables, it can significantly affect estimation of the coefficients of the variables. Multicollinearity may cause the variances and standard errors of the estimates to increase and the t-scores to decrease. However, multicollinearity does not cause bias in the estimate and the overall fit of the equation (Studenmund, 2011). If the R is high in absolute value, then the two variables are quite correlated and multicollinearity is a potential problem.

The study tested for multicollinearity using the Variance Inflation Factor (VIF) which quantifies the severity of multicollinearity in OLS. It provides an index that measures how much the variance (the square of the estimate's standard deviation) of an estimated coefficient of regression is increased due to collinearity. According to Myers (1990) VIF less than 1 and

greater than 10 is a cause of concern. If the VIF value was lies between 1-10, then there is no multicollinearity. If the  $VIF < 1$  or  $> 10$ , then there is multicollinearity.

**Table 4.6. Multicollinearity Test using Variance Inflation Factor**

. vif

Variable	VIF	1/VIF
NPM	4.03	0.248233
PYR	3.46	0.288746
OER	3.40	0.293716
CAR	2.19	0.457118
DER	1.88	0.532017
INF	1.18	0.849434
GDP	1.14	0.879616
Mean VIF	2.47	

*Source: STATA Output from NBE Data, 2020*

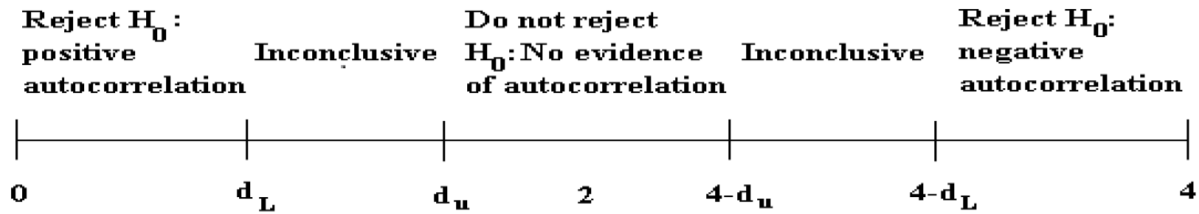
Based on Table 4.3.4. depicted the outcome of the test and shows that there is no multicollinearity problem since VIF less than 10 and 1/VIF(Tolerance) is greater than 0.1. Their coefficients output, collinearity statistics, obtained VIF values of NPM, PYR ,OER, DER, CAR, INF and GDP are 4.03, 3.46, 3.40, 1.88, 2.19, 1.18 and 1.14 respectively, which implies that the mean values of VIF obtained are 2.47 which found between 1 and 10. It was therefore, concluded that there were no multicollinearity symptoms.

#### **4.3.6. Test for Autocorrelation**

It is assumed that the errors term is uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are auto correlated. This is an assumption that the errors are linearly independent of one another (uncorrelated with one another). The simplest test is due to Durbin and Watson (Brook, 2008). To test this assumption, the DW stat value in the main regression table should be considered.



**Figure 4.4 Durbin-Watson test of autocorrelation**



The regression output of this test indicates that,

Model	Durbin-Watson
1	2.07

*Source: STATA Output from NBE Data, 2020*

Hence as the above figure indicates and the Durbin-Watson test result is above 1.5 and below 2.5, there are no autocorrelation issues because the result of Durbin-Watson test is 2.07.

#### **4.3.7. Hausman test**

The other point is choosing whether the individual effect is considered to be fixed or random. The objective of carrying out the Hausman test was to determine the appropriate model to be used. A common practice in finance is to make choice between both approaches by running a Hausman test. This test performed through STATA 15.1 version running Hausman specification test at 5% level of significance enable to choose the researcher between fixed effect and Random effect. Brooks (2008) according to this test:

H0: Random effect model is appropriate

H1: Fixed effect model is appropriate

If the test statistic is significant or less than 0.05 then reject the null hypothesis; otherwise accept alternative hypothesis. Accordingly, the study performed Hausman test as shown in the table

**Table 4.7. Hausman Test- Fixed or Random Effect Model**

```
. qui xtreg FSS OER DER CAR GDP PYR NPM INF, fe
. estimates store fe
. qui xtreg FSS OER DER CAR GDP PYR NPM INF, re
. estimates store re
. hausman fe re
```

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fe	(B) re		
OER	-3.750651	-3.474708	-.2759423	.1622499
DER	.0149396	.0121984	.0027412	.0053384
CAR	.4786586	.4351758	.0434828	.0344199
GDP	5.749415	5.819136	-.0697209	.
PYR	3.720255	3.34594	.3743152	.1776069
NPM	.9922587	1.114265	-.1220061	.054488
INF	.3444907	.3818516	-.0373609	.

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

Test: Ho: difference in coefficients not systematic

```
chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 19.56
Prob>chi2 = 0.0066
(V_b-V_B is not positive definite)
```

*Source: STATA Output from NBE Data, 2020*

From the reported outcome above, we can conclude that, the p-values associated with the test statistics is very close to zero, which is less than 0.05. It's convincing that there is enough evidence for rejection of the null hypothesis and concluded the appropriate regression model to be employed in the study is the fixed effect regression model. Fixed-effects models are designed to study the causes of changes within entity. The fixed effects model for some variable  $y_{it}$  may be written as

$$y_{it} = \alpha + \beta x_{it} + \mu_i + v_{it} \text{-----} (2)$$

Where  $\alpha$  (i=1...n) is the unknown intercept for each entity (n entity-specific intercepts).

$y_{it}$  is the dependent variable (DV) where i= entity and t= time.

$x_{it}$  represents one independent variable (IV),

$\beta_1$  is the coefficient for that IV,  $u$  is the error term

#### 4.4. Results of Regression Analysis

This section presents the result of the fixed effect regression output. The regression results have their own implications and hence beta indicates each variables level of influence on the dependent variables which may have coefficient of negative or positive. P-Value indicates at what percentage each variable is significant and R-squared value indicates the explanatory power of the model. The empirical model to identify the determinants of financial sustainability of Microfinance Institutions in Ethiopia was estimated as follows.

$$FSS_{it} = \beta_0 i + \beta_1(OER)_{it} + \beta_2(CAR)_{it} + \beta_3(DER)_{it} + \beta_4(NPM)_{it} + \beta_5(PYR)_{it} + \beta_6(GDP)_{it} + \beta_7(INF)_{it} + \mu_{it}.$$

Where  $\beta_1$  to  $\beta_7$  are the coefficients of the variables and  $\mu_{it}$  is the fixed error term.

$\beta_0$ ; stands for the intercept term which varies across MFIs but constant over time

$DER_{it}$ : stands for debt to equity ratio of a MFI  $i$  at time  $t$ ,

$CAR_{it}$ : stands for capital to asset ratio a MFI  $i$  at time  $t$ ,

$OER_{it}$ : stands for operating expense ratio of a MFI  $i$  at time  $t$ ,

$NPM_{it}$ : stands for net profit margin of a MFI  $i$  at time  $t$ ,

$PYR_{it}$ : stands for Portfolio Yield ratio of a MFI  $i$  at time  $t$ ,

$INF_{it}$  stands for inflation rate of Ethiopia assigned to MFI  $i$  at time  $t$ .

$GDP_{it}$ : stands for GDP growth rate of Ethiopia assigned to MFI  $i$  at time  $t$ .

**Table 4.8 Regression result between FSS and explanatory variables for the model**

```
. xtreg FSS OER DER CAR GDP PYR NPM INF , fe

Fixed-effects (within) regression      Number of obs   =      120
Group variable: MFIS                  Number of groups =      15

R-sq:                                 Obs per group:
  within = 0.8644                      min =           8
  between = 0.8877                     avg =          8.0
  overall = 0.8775                      max =           8

corr(u_i, Xb) = -0.3329                 F(7,98)         =      89.28
                                           Prob > F        =      0.0000
```

FSS	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
OER	-3.750651	.5327391	-7.04	0.000	-4.807854 -2.693447
DER	.0149396	.0220693	0.68	0.500	-.0288562 .0587354
CAR	.4786586	.2265402	2.11	0.037	.0290969 .9282204
GDP	5.749415	1.459295	3.94	0.000	2.853492 8.645339
PYR	3.720255	.354706	10.49	0.000	3.016353 4.424158
NPM	.9922587	.2007026	4.94	0.000	.593971 1.390546
INF	.3444907	.2307111	1.49	0.139	-.1133481 .8023294
_cons	-.723085	.2028024	-3.57	0.001	-1.12554 -.3206302
sigma_u	.26811392				
sigma_e	.18973239				
rho	.66632158	(fraction of variance due to u_i)			

F test that all u\_i=0: F(14, 98) = 10.97 Prob > F = 0.0000

Source: STATA Output from NBE Data, 2020

Accordingly, the estimation results of the panel regression model used in this study is presented in table 4.8 above. The R- square for the regression output is 86.44 percent. R square is a measure that denotes how analyzed data are near to a best line of fit. It is also referred as coefficient of determination (Kothari, 2004).

The value of the R-square implies that there is a good relationship between dependent and independent variables, where all selected independent variables Debt to equity Ratio, Operating expense ratio , Capital to asset ratio , Net profit Margin , Portfolio Yield ratio , Real GDP growth rate and Inflation can explain about 86.44 percent of the MFI’s financial sustainability as measured by FSS. The remaining 13.56 percent of the changes in the FSS model is explained by other factors that are not included and considered in the study. For panel data, R-squared greater

than 20 percent is still large enough for reliable conclusions (Hsiao, 2003 cited in Buzayehu, 2019). The regression result shows that the estimated result of the regression analysis is good.

Thus, collectively these variables are best enough in explaining the changes in the financial sustainability of the Ethiopian Microfinance institutions measured by FSS as the R-square is about 86.44 percent. The null hypothesis of F-statistic (the overall test of significance) that the R-squared is equal to zero was rejected at 1 percent as the p-value is quite low. P value of 0.0000 indicates strong statistical significance, which enhanced the reliability and validity of the model.

### **A. Operating expense**

The regression result for operating expense ratio indicates negative correlation but significant for determining the financial self-sufficiency of an MFI in Ethiopia. The ratio showed up a negative coefficient (-3.750) and it is statistically significant variable at 1 percent (P-value 0.000). The response of financial self-sufficiency to operating expense ratio is very elastic, which is a 1 unit increase in operating expense leads to a 3.75 unit decrease in financial self-sufficiency. This indicates that, the more MFIs are efficient in reducing operating costs at a given level of outstanding loan portfolio, the more profitable they become and therefore, maintain financial self-sufficiency and ensure financially sustainable. This finding is consistent with Kirubel (2018), Abiyu (2016) and Sileshi (2015) that shows operational expense ratio has negative significant relationship with FSS of MFIs. However, the finding for this variable is against with study made by (Tilahun, 2013). Based on the regression result, therefore, we reject the null hypothesis that there is no significant relationship between the operating expense ratio of a microfinance institution and its financial self-sufficiency. This indicates that, the more MFIs are efficient in reducing operating costs at a given level of outstanding loan portfolio, the more profitable they become and, therefore, maintain financial self-sufficiency and ensure financially sustainable. The finding for this variable by another study also indicated that there is strong significant negative correlation to financial self-sufficiency.

### **B. Debt to Equity**

The debt to equity ratio is a common measure used to assess a firm's leverage, or in other words the extent to which it relies on debt as a source of financing. Debt to equity ratio (Leverage) is insignificant positive predictor variable in determining financial self-sufficiency. The ratio

showed up a positive coefficient (0.0149) and it is statistically insignificant variable (P-value 0.500). This implies that for the study period (2011-2018) there is insignificant correlation between financial sustainability and debt to equity ratio. This positive result implies that for financial institutions like MFIs ,the importance of saving mobilized in the form of institutions liability is very significant for the supply of loanable fund to expand their loan volume which makes them to collect large volume of interest income to their financial performance .This result is consistent with Dissanayake (2012) and Muriu (2011) that leveraged MFI are more sustainable that is perhaps more debt relative to equity is used to finance microfinance activities and that long-term borrowings impact positively on financial performance by accelerating MFIs growth than it would have been without debt financing. The result by Kirubel (2018) and Sileshi (2015) showed contradicted results indicated that less leveraged MFIs have better financial self-sufficiency. Therefore, based on the regression result from the study, there is no reason to reject the null hypothesis which was formulated to show the positive relationship between debt to equity and financial self-sufficiency of Ethiopian MFIs.

### **C. Capital to Asset**

The coefficient of the capital to asset ratio (CAR) is positive (0.478) and statistically significant at 5percent. This confirms that for the study period capital strength of Ethiopian MFIs do have a positive relationship with their financial sustainability or holding constant all other variables, increasing CAR by one unit causes to increase the FSS nearly 0.478 birr. Therefore, there is a rejection of the null hypothesis indicating capital adequacy ratio has strong positive relationship with financial sustainability of MFIs in Ethiopia. Result of the study supports the theory, well capitalized MFIs is more flexible in dealing with problems arising from unexpected losses and against credit risks and results in a better chance for financial performance. Abebaw (2014) results found insignificant negative relation between financial performance and Capital to asset ratio. Hussein.et.al (2016) posted a negative relationship with financial sustainability of MFIs and capital to asset ratio which is statistically significant. This negative coefficient shows that the larger an MFI is, equity financed as compared to other sources of finance leads not to improvement in its sustainability. The result of this study is similar to the findings of Sima (2013) but inconsistent with the finding of Muriu(2011), perhaps this can be attributed to external factors which are responsible for such variations.

#### **D. GDP growth**

It is generally believed that a stable macroeconomic environment is necessary for the viability of MFIs. This study tested the influence of macroeconomic variable (GDP growth rate) on the sustainability of MFIs. The result shows a positive impact of GDP growth on the sustainability of MFIs with coefficient level of 5.74 and statistically significant at 1% significance level (P-value 0.000). Thus, the null hypothesis that GDP growth rate in Ethiopia negatively and significantly affect sustainability of Ethiopian MFIs be rejected. This is due to, as theoretically believed, improving macroeconomic performance raises overall income level and business performance which ultimately improves client's repayment ability, enjoy sufficient supply of loan able fund deposits and hence leading to enhance MFIs' viability. Therefore, the null hypothesis is rejected as GDP growth has positive relationship with financial sustainability of Ethiopian MFI.

The study result is consistent with Sileshi (2015) and Buzayehu(2019). However ,Abebaw (2014) shows highly contradictory results that a negative coefficient of -0.005 but it was statistically insignificant at 5 percent (P-value 0.09) indicating that growth in economic condition measured in terms of real GDP growth did not affect financial performance of Ethiopian MFIs for the study period., despite the country's continuous economic growth, MFIs in Ethiopia were not profitable because they are established for minimizing poverty as the main goal or social orientation than profit Maximization.

#### **E. Portfolio Yield**

It is the initial indicator of institution's ability to generate revenue to cover its financial and operating expenses. Portfolio yield shows how much, on average a MFI really receives an interest payments on its loans. The result shows a positive impact of Portfolio yield ratio on the sustainability of MFIs with coefficient level of 3.720 and statistically significant at 1% significance level (P-value 0.000) and thus, the null hypothesis that Portfolio yield ratio in Ethiopia has no effect on financial sustainability of Ethiopian MFIs be rejected and conclude that Portfolio yield ratio highly influence the financial sustainability of MFIs. The yield on gross portfolio measures the firm's ability to generate cash, which could increase the loan able fund and hence the social performance. According to the findings, the non-self-sufficient MFIs have a slightly lower yield on their gross portfolio and higher operating expenses than their self-

sufficient MFIs. The study result was supported by (Melkamu, 2012 and Solomon. et al, 2019).In fact; previous studies have also found similar results (Assefa.et al, .2013; Cull et al., 2007).

#### **F. The Net Profit Margin**

It shows the company's ability to generate a net profit from an increment of the additional one dollar of a total income. This ratio measures net income per total revenue; it is calculated by dividing net income by revenue. Accordingly, the study result shows the coefficient net profit margin is positive (0.992) indicates that when MFIs earn 1cents on their net profit margin, it causes the FSS of an MFI to increase by 99 percent and statistically significant at even 1percent as the (P-value 0.000). Therefore, the null hypothesis is rejected.

#### **G. Inflation (INF)**

The regression results above revealed that coefficient of inflation variable is 0.344 which indicates even though, inflation has positive relationship with financial self-sufficiency, it is not statistically significant in the model and does not have a clear influence on MFIs financial sustainability in Ethiopia. The positive result implies that increasing in inflation in Ethiopia would support the financial performance of institutions because of the ability and skill of MFIs managers to exactly predict the levels of inflation. Therefore; we failed to reject the null hypothesis indicating inflation has positive influence on FSS of Ethiopian MFIs. MFIs' clients who took loan for business purpose may easily pass-on rising prices to their customers so that their repayment rate remains unchanged. The study result was supported by Sileshi (2015) and contradicts with Kirubel (2018) and Kathomi (2017). This study further believed that the insignificant effect of inflation may point to the fact that MFIs' regulations and policies adopted by the government may play an important part in creating a favorable environment for the sector to resist the influence of inflation. Finally, based on the regression result shown in table 4.8 above, we can produce the optimal regression model for financial sustainability of MFIs in Ethiopia.

$$\text{FSSit} = -0.72 - 0.01(\text{DER}) + 0.47(\text{CAR}) - 3.75(\text{OER}) + 0.99(\text{NPM}) + 3.72(\text{PYR}) + 0.34(\text{INF}) + 5.74(\text{GDP}) + \mu\text{it}$$

These variables explained up to 86.44 percent of the changes in financial sustainability. The remaining percentage is determined by other variables not included in the model. The following



table summarizes the impact of explanatory variables on financial sustainability from FSS regression model for the study.

**Table 4.9 Summary of regression results from the FSS regression model**

Explanatory Variables	Symbol	Null Hyph.	Alternat Hyph.	Actual Reg. Result	Statistical significancy test	Status of Null Hyphotesis	Status of Alternate Hyphotesis
Operating expense	OER	+	-	-	significant at 1%	<b>Rejected</b>	Accepted
Debt to equity	DER	+	-	+	insignificant	<b>Failed to reject</b>	Rejected
Capital to Asset	CAR	-	+	+	significant at 5%	<b>Rejected</b>	Accepted
Portfolio yield	PYR	-	+	+	significant at 1%	<b>Rejected</b>	Accepted
Net profit margin	NPM	-	+	+	significant at 1%	<b>Rejected</b>	Accepted
Gross Domestic Product	GDP	-	+	+	significant at 1%	<b>Rejected</b>	Accepted
Inflation	INF	+	-	+	insignificant	<b>Failed to reject</b>	Rejected

*Source; -The researcher's own compilation, 2020*

As it is shown in table 4.9 above, Operating expense ratio has negative significant effect at 1% level. However, Portfolio yield ratio, Net profit margin and GDP growth rate have a positive significant impact at 1%, whereas Capital to asset has a positive impact on FSS at 5percent, but debt to equity has positive insignificant effect on FSS. Similarly, Inflation has a positive insignificant impact on financial sustainability of Ethiopian microfinance institutions.

## **CHAPTER FIVE**

### **5. SUMMARY, CONCLUSION AND RECOMMENDATIONS**

This chapter deals with the summary of the main findings, conclusions, recommendations and further research direction provided based on the findings of the study. Hence, this chapter is organized into four subsections. The first section presented the summary; the second and third section presented the conclusion and recommendations whereas the last section suggested further research direction

#### **5.1. Summary**

The importance of MFIs financial sustainability might be appraised at institution's specific variables and macroeconomic levels of the economy. The study is aimed to identify the determinant factors for the financial sustainability of Ethiopian microfinance institutions. It determines the impact of Debt to Equity Ratio (DER), Operating expense ratio (OER), Capital to Asset ratio (CAR), Net profit Margin (NPM), Portfolio Yield ratio (PYR) Inflation rate and GDP growth rates on financial sustainability of Ethiopian microfinance institutions.

In doing so, this study used 15 Ethiopian microfinance institution's data gathered from National Banks of Ethiopia for the period 2011-2018. In order to achieve the intended purpose, the study used fixed effect regression model for seven variables which were both macroeconomic and microfinance specific variables using STATA 15.1 software.

Data was analyzed by using descriptive statistic, correlation matrix analysis, inferential statistics and multiple regression models. In order to present the OLS regression model results, assumption of classical linear regression model (CLRM) were tested/employed; the data was found to be normally distributed, free of Multicollinearity problem and heteroscedastic for model. Hausman test, autocorrelations were also tested to select appropriate model .Finally; the fixed effect model regression results were discussed.

The finding of the study showed that Capital to assets Ratio (CAR), Net profit Margin (NPM), Portfolio Yield ratio (PYR), Debt to Equity ratio, Inflation and GDP growth rate have showed positive coefficient whereas only operating expense ratio has showed negative coefficient.

Except Inflation and Debt to Equity ratio, all variables had statistically significant impacts on the financial sustainability of Ethiopian microfinance institutions. The general finding within the period covered by this study was Ethiopian MFIs scored an average financial self-sufficiency (FSS) ratio of 88.5%. Accordingly, as already indicated in analysis section, Ethiopian MFIs are not financially sustainable in reference to the international requirement of an FSS of 100% benchmark. The result below 100% means that it is difficult for MFIs to cover all costs and their obligations without ongoing donation, concessional loan or government subsidy.

Finally, the coefficient of determination R-square is 86.44% and Adjusted R-square is 83.36% which indicates that the explanatory variables were able to account 83.36% of the total variations of the financial sustainability. To confirm statistical validity of fixed effect model specification, the study has tested, normality, multicollinearity and Hausman test to identify appropriate model between fixed and random effect regressions, then the study found that the model has passed the entire diagnostic test.

## **5.2. Conclusion**

This study aimed to examine the main factors that affect financial sustainability of Ethiopian microfinance institutions and measure the extent to which these factors affect MFIs' financial sustainability. In doing so, various local and global previous studies on MFIs' financial sustainability have been reviewed. Macroeconomic and MFIs specific factors effect on financial sustainability on were identified. Therefore, the study specified an empirical framework to examine the determinants of Ethiopian MFIs financial sustainability considering 8 years data of 15 Ethiopian microfinance institutions over the period 2011 to 2018. The explanatory variables for financial sustainability included in the study were Debt to Equity Ratio, Operating expense ratio, Capital to asset ratio, Net profit Margin, Portfolio yield ratio, and inflation and GDP growth of the country.

Based on the descriptive statistic result, during the study period covered by this thesis, Ethiopian MFIs scored an average financial sustainability ratio of 88.5%. Accordingly, as indicated in analysis section of the study Ethiopian MFIs are not financially self-sufficient (financially sustainable) in reference to the international requirement of an FSS of 100% benchmark. The result below 100% means that it is difficult for MFIs to cover all costs and their obligations

without ongoing donation, concessional loan or government subsidy. During the study period from the sample MFIs the most successful MFIs attained FSS are SPFI scoring an average self-sufficiency level of 2.47% followed by PEACE MFI scoring an average self-sufficiency level of 2.26% the next is WASASA scoring 1.68% followed by Busa Gonofa scoring 1.18% and ACSI also successful MFIs by scoring 1.12%. However, the remaining ten MFIs are still failed to attain financial sustainability. In general, it can be inferred from this research that MFIs in Ethiopia are not financially sustainable. Ethiopia MFIs maintained donated equity of 3.36% in their total assets. Even though there are MFIs who do not maintain donated equity in their assets.

In addition to the descriptive statistics result the study has used econometrics analysis using panel data of 120 observations (15 MFIs \* 8years) with fixed-effect estimation technique. In order to evaluate the significant determinant variables for financial sustainability of MFIs, the researcher hypothesized Debt to Equity Ratio, Operating expense ratio, Capital to asset ratio, Net profit Margin, Portfolio Yield ratio, Inflation and GDP growth of the country as statistically significant predictor variables in determining financial self-sufficiency.

Accordingly, Consistent with theories and most empirical evidences, the result of fixed effect regression shows that Operating expense ratio, Capital to asset ratio, Net profit Margin, Portfolio Yield ratio and GDP growth rate are statistically significant predictor variables at even 1% critical value except for Capital to asset 5% in determining financial self-sufficiency. Similarly, the study found that Debt to Equity Ratio and Inflation are statistically insignificant predictor variables in determining the financial self-sufficiency of Ethiopian microfinance institutions.

From the STATA regression result R square for FSS model is 86.44% and the Adjusted R square for the model is 83.3%. Therefore, it can be concluded that all the above-mentioned independent variables of jointly explain the dependent variables of financial self-sufficiency of Ethiopian MFIs. The researcher's test result has proved that the models for dependent (FSS) variable meet all the assumptions of classical linear regression model (CLRM). It has been proved that there was no evidence of the problems of multicollinearity, heteroscedasticity, autocorrelation and non-normality.

### 5.3. Recommendations

- The operating expense ratio in the study appeared as essential determinant. The lower ratio indicates more efficiency and the higher ratio means weak management efficiency, as it has been expected the regression result shows a negative coefficient, it means that as the ratio decreases the financial sustainability of MFI will rise up and vice versa. Therefore, the Institutions management should give great consideration to a good expense management policy or reduce operating costs and credit risk management by encouraging innovations, by investing in technologies and by creating economies of scale. Example, IS, Core banking, mobile banking (M-Birr).
- Macroeconomic factors, economic growth and presence of inflations are an important key driver of financial sustainability in Ethiopian MFIs. MFIs should utilize the opportunities of macroeconomic environment by considering the impacts macroeconomic factors during designing their strategic plan because improved macroeconomic performance raises overall income level which ultimately improves clients repayment ability improve their profitability and hence sustainability of MFIs.
- In the study leverage ratio has found a positive influence on the financial sustainability. This indicates that increasing the debt to equity ratio enables MFI's wealth to be more profitable. Therefore, MFIs have to attempt more to enhance their liability and they should develop a strategy that enables them to enhance deposit amount through mobilizing funds by promoting saving behavior and enhance credit purchases.
- The MFIs were also advised to increase number of borrowers, breadth of outreach through both retaining the existing and recruiting new clients, so that they could increase the volume of sell or loan disbursement. However, selling high volume of loan alone may not guarantee financial sustainability. It should be accompanied by effective follow ups to ensure higher repayment rate, maximize the realized interest income to raise their profit margins and do their best to operate at relatively lower operating cost per borrower.
- MFIs have to make their activity with comprising the two motives together. Meaning the government and policy makers should give due attention for both poverty reduction and financial sustainability of MFIs by enhancing commercialization of their operation rather than relying on subsidies through promoting differentiated and diversified saving and loan

products in addition to the existing products. Example; - Business loans, Graduate loan, General-purpose loans, Housing loans, etc.

- Government and Stakeholders should encourage the microfinance program by mobilization of extra funds, availing different facilities or infrastructures, mobilizing resources and creating safe environments. That is they can promote microfinance in remote areas in Ethiopia to insure social impact where required initial start-up costs are high, and private firms are hesitant to enter the market. If these projects are not supported in their early years, they will be forced to charge high interest rates that clients could not pay.

#### **5.4. Further Research Directions**

The study is limited to only quantitative aspect; it doesn't include the qualitative factors for the determinants of MFIs financial sustainability in Ethiopia. Therefore, the researcher recommends future researchers to do detailed study by considering other determining factors like Political factors, Geographical factors, client's dropout ratio, Human resource sustainability and even other economic factors for the sustainability of Ethiopian MFIs.

Furthermore, as far as the researcher knowledge there is no a study that examines and consider other aspects of sustainability problems such as Institutional sustainability, Operational sustainability, Human Resource sustainability and customers sustainability. Hence, future studies should address the effect of these problems on financial institutions.

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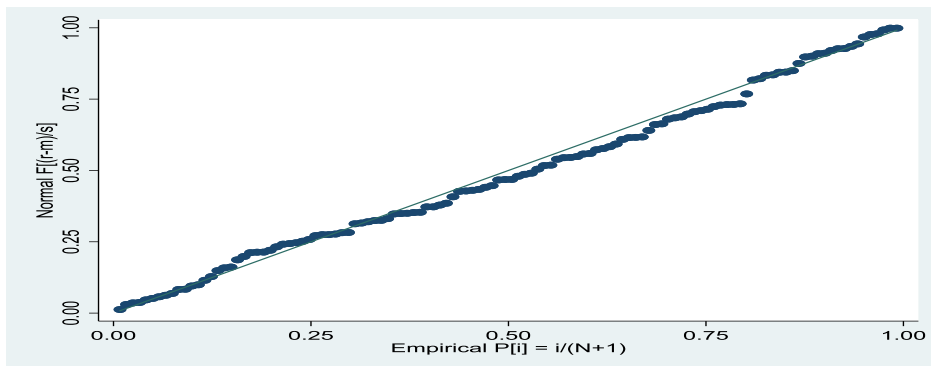
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## APPENDIX 1 DIFFERENTDATA ANALYSIS TOOLS USED

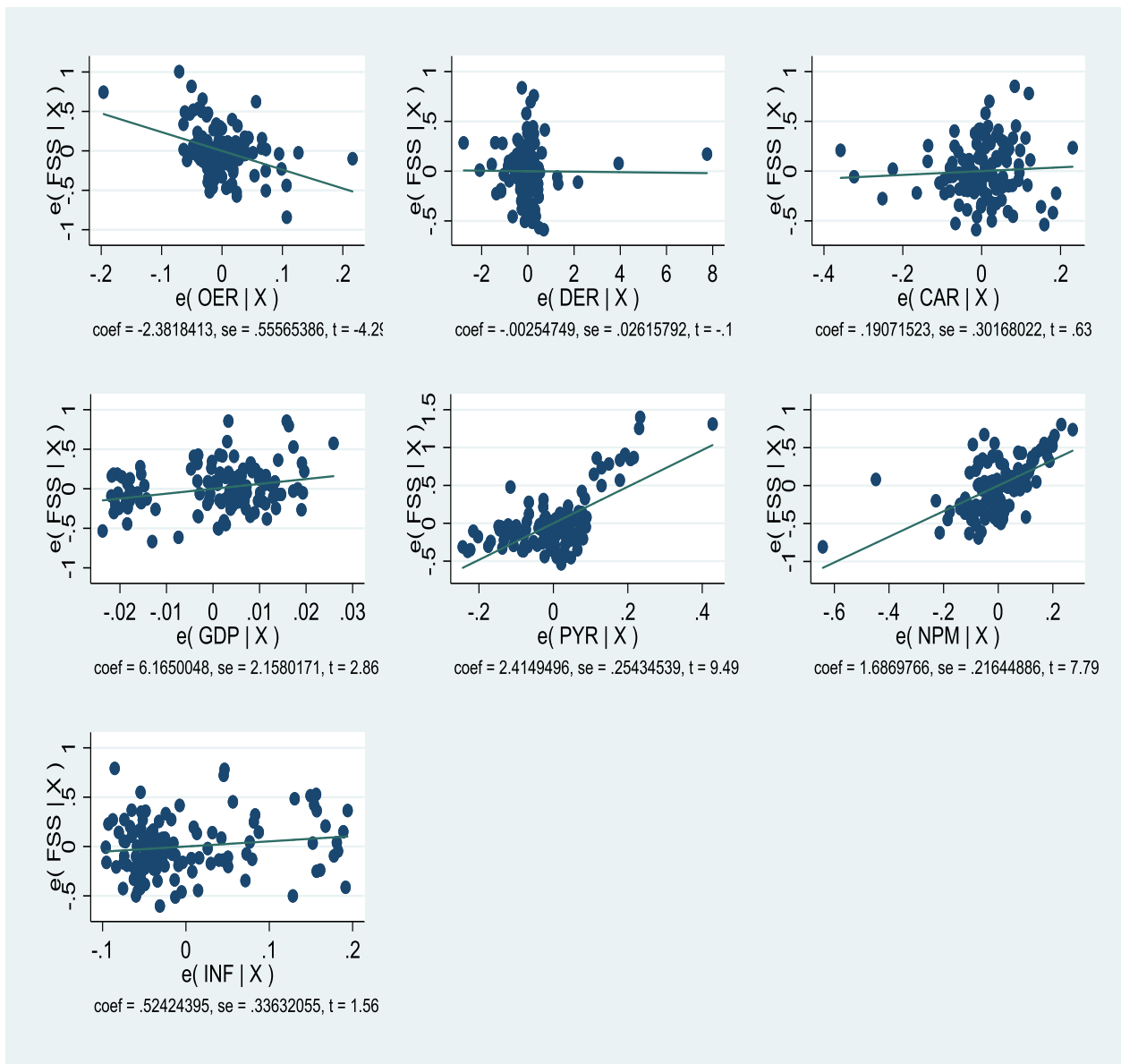


Figure 4.4 qnorm r



SourceStataOutput, 2020

## avplots



SourceStataOutput



## Fixed effect Regression (within MFIS)

```
. xtreg FSS OER DER CAR GDP PYR NPM INF , fe
```

```
Fixed-effects (within) regression      Number of obs   =      120
Group variable: MFIS                  Number of groups =      15
```

```
R-sq:                                  Obs per group:
  within = 0.8644                       min =          8
  between = 0.8877                       avg =         8.0
  overall = 0.8775                       max =          8
```

```
corr(u_i, Xb) = -0.3329                  F(7,98)         =      89.28
                                          Prob > F         =      0.0000
```

FSS	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
OER	-3.750651	.5327391	-7.04	0.000	-4.807854	-2.693447
DER	.0149396	.0220693	0.68	0.500	-.0288562	.0587354
CAR	.4786586	.2265402	2.11	0.037	.0290969	.9282204
GDP	5.749415	1.459295	3.94	0.000	2.853492	8.645339
PYR	3.720255	.354706	10.49	0.000	3.016353	4.424158
NPM	.9922587	.2007026	4.94	0.000	.593971	1.390546
INF	.3444907	.2307111	1.49	0.139	-.1133481	.8023294
_cons	-.723085	.2028024	-3.57	0.001	-1.12554	-.3206302
sigma_u	.26811392					
sigma_e	.18973239					
rho	.66632158	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(14, 98) = 10.97      Prob > F = 0.0000
```

## SourceStataOutput

**Fixed effect, OLS Regression, absorbing dummy variables**

```
. areg FSS OER DER CAR GDP PYR NPM INF , absorb(MFIS)
```

```
Linear regression, absorbing indicators      Number of obs   =      120
Absorbed variable: MFIS                  No. of categories =      15
                                           F( 7, 98)      =      89.28
                                           Prob > F       =      0.0000
                                           R-squared     =      0.9596
                                           Adj R-squared =      0.9509
                                           Root MSE     =      0.1897
```

FSS	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
OER	-3.750651	.5327391	-7.04	0.000	-4.807854	-2.693447
DER	.0149396	.0220693	0.68	0.500	-.0288562	.0587354
CAR	.4786586	.2265402	2.11	0.037	.0290969	.9282204
GDP	5.749415	1.459295	3.94	0.000	2.853492	8.645339
PYR	3.720255	.354706	10.49	0.000	3.016353	4.424158
NPM	.9922587	.2007026	4.94	0.000	.593971	1.390546
INF	.3444907	.2307111	1.49	0.139	-.1133481	.8023294
_cons	-.723085	.2028024	-3.57	0.001	-1.12554	-.3206302

F test of absorbed indicators: F(14, 98) = 10.973                      Prob > F = 0.000

*SourceStataOutput*

**Fixed effect, OLS Regression with dummy variables, (the one that used in the study)**

```
. regress FSS OER DER CAR GDP PYR NPM INF i.MFIS
```

Source	SS	df	MS	Number of obs	=	120
				F(21, 98)	=	110.75
Model	83.7214528	21	3.98673585	Prob > F	=	0.0000
Residual	3.52784127	98	.03599838	R-squared	=	0.9596
				Adj R-squared	=	0.9509
Total	87.2492941	119	.733187345	Root MSE	=	.18973

FSS	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
OER	-3.750651	.5327391	-7.04	0.000	-4.807854	-2.693447
DER	.0149396	.0220693	0.68	0.500	-.0288562	.0587354
CAR	.4786586	.2265402	2.11	0.037	.0290969	.9282204
GDP	5.749415	1.459295	3.94	0.000	2.853492	8.645339
PYR	3.720255	.354706	10.49	0.000	3.016353	4.424158
NPM	.9922587	.2007026	4.94	0.000	.593971	1.390546
INF	.3444907	.2307111	1.49	0.139	-.1133481	.8023294
<b>MFIS</b>						
2	-.2754055	.1082691	-2.54	0.013	-.4902621	-.0605489
3	-.2792049	.0976758	-2.86	0.005	-.4730393	-.0853704
4	-.1567709	.1144447	-1.37	0.174	-.3838827	.0703409
5	.1555245	.1105397	1.41	0.163	-.0638378	.3748869
6	-.0776625	.1473837	-0.53	0.599	-.3701406	.2148156
7	.3041422	.1226338	2.48	0.015	.0607793	.5475051
8	-.4998842	.1097924	-4.55	0.000	-.7177636	-.2820047
9	-.4191853	.1177265	-3.56	0.001	-.6528097	-.1855608
10	-.4116619	.1657341	-2.48	0.015	-.7405558	-.0827681
11	-.6570277	.1351773	-4.86	0.000	-.9252827	-.3887728
12	-.1704245	.1134341	-1.50	0.136	-.3955308	.0546819
13	.0356282	.1124542	0.32	0.752	-.1875334	.2587898
14	-.525326	.1143735	-4.59	0.000	-.7522964	-.2983555
15	-.1365724	.1158592	-1.18	0.241	-.3664913	.0933465
_cons	-.5154963	.212158	-2.43	0.017	-.936517	-.0944756

SourceStataOutput,2020

## Comparison of the three fixed effect models

```

. qui xtreg FSS OER DER CAR GDP PYR NPM INF , fe

. estimates store fixed

. qui xi: regress FSS OER DER CAR GDP PYR NPM INF i.MFIS

. estimates store ols

. qui areg FSS OER DER CAR GDP PYR NPM INF , absorb(MFIS)

. estimates store areg

. estimates table fixed ols areg, star stats(N r2 r2_a)

```

Variable	fixed	ols	areg
OER	-3.7506505***	-3.7506505***	-3.7506505***
DER	.01493958	.01493958	.01493958
CAR	.47865862*	.47865862*	.47865862*
GDP	5.7494154***	5.7494154***	5.7494154***
PYR	3.7202552***	3.7202552***	3.7202552***
NPM	.99225871***	.99225871***	.99225871***
INF	.34449067	.34449067	.34449067
_IMFIS_2		-.2754055*	
_IMFIS_3		-.27920485**	
_IMFIS_4		-.15677089	
_IMFIS_5		.15552452	
_IMFIS_6		-.0776625	
_IMFIS_7		.30414217*	
_IMFIS_8		-.49988415***	
_IMFIS_9		-.41918526***	
_IMFIS_10		-.41166193*	
_IMFIS_11		-.65702775***	
_IMFIS_12		-.17042445	
_IMFIS_13		.03562821	
_IMFIS_14		-.52532595***	
_IMFIS_15		-.13657239	
_cons	-.72308499***	-.51549628*	-.72308499***
N	120	120	120
r2	.86443969	.95956596	.95956596
r2_a	.83539105	.95090153	.95090153

legend: \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

*SourceStataOutput*

## Autocorrelation Based on Durbin Watson test

```
. xtregar FSS OER DER CAR GDP PYR NPM INF, fe rhotype(dw)
```

```
FE (within) regression with AR(1) disturbances Number of obs = 105
Group variable: MFIS Number of groups = 15
```

```
R-sq: Obs per group:
  within = 0.8417 min = 7
  between = 0.8971 avg = 7.0
  overall = 0.8840 max = 7
```

```
corr(u_i, Xb) = -0.2449 F(7,83) = 63.03
Prob > F = 0.0000
```

FSS	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
OER	-4.373976	.5435283	-8.05	0.000	-5.455032	-3.29292
DER	.0059124	.0164051	0.36	0.719	-.0267167	.0385415
CAR	.3661666	.1886554	1.94	0.056	-.0090614	.7413945
GDP	1.943941	1.373832	1.41	0.161	-.7885562	4.676438
PYR	3.512877	.4111376	8.54	0.000	2.695141	4.330613
NPM	.9612051	.1868172	5.15	0.000	.5896332	1.332777
INF	-.2817203	.2691627	-1.05	0.298	-.817074	.2536335
_cons	-.0978499	.0950786	-1.03	0.306	-.2869573	.0912575
rho_ar	.52347486					
sigma_u	.23430738					
sigma_e	.16045994					
rho_fov	.68074096	(fraction of variance because of u_i)				

```
F test that all u_i=0: F(14,83) = 2.07 Prob > F = 0.0215
```

*Source* STATAOutput

## APPENDIX2. RAW DATA USED IN THE STUDY

MFIS	Year	FSS	OER	DER	CAR	GDP	PYR	NPM	INF
ACSI	2011	1.40	0.08	2.59	0.28	0.11	0.18	0.58	0.18
ACSI	2012	1.56	0.06	2.58	0.28	0.09	0.18	0.61	0.34
ACSI	2013	1.27	0.07	2.75	0.25	0.10	0.17	0.56	0.14
ACSI	2014	1.18	0.07	3.17	0.24	0.10	0.17	0.54	0.08
ACSI	2015	1.07	0.07	3.34	0.23	0.10	0.16	0.52	0.08
ACSI	2016	0.85	0.09	3.40	0.23	0.08	0.19	0.46	0.10
ACSI	2017	0.88	0.09	3.28	0.23	0.11	0.18	0.47	0.07
ACSI	2018	0.75	0.09	2.65	0.22	0.08	0.18	0.43	0.13
DECSI	2011	0.72	0.04	3.16	0.24	0.11	0.06	0.42	0.18
DECSI	2012	0.47	0.08	3.06	0.25	0.09	0.13	0.32	0.34
DECSI	2013	0.28	0.09	3.51	0.19	0.10	0.14	0.22	0.14
DECSI	2014	0.41	0.10	3.65	0.22	0.10	0.14	0.29	0.08
DECSI	2015	0.41	0.10	3.45	0.22	0.10	0.17	0.29	0.08
DECSI	2016	0.01	0.17	3.65	0.22	0.08	0.17	0.01	0.10
DECSI	2017	-0.27	0.13	2.87	0.13	0.11	0.18	-0.37	0.07
DECSI	2018	0.39	0.15	2.89	0.15	0.08	0.23	0.28	0.13
OCSSCO	2011	0.61	0.10	2.80	0.26	0.11	0.13	0.38	0.18
OCSSCO	2012	0.58	0.10	2.69	0.27	0.09	0.14	0.37	0.34
OCSSCO	2013	0.41	0.11	2.99	0.21	0.10	0.15	0.29	0.14
OCSSCO	2014	0.39	0.11	2.11	0.20	0.10	0.19	0.28	0.08
OCSSCO	2015	0.57	0.13	2.92	0.26	0.10	0.22	0.36	0.08
OCSSCO	2016	0.58	0.13	2.41	0.29	0.08	0.21	0.37	0.10
OCSSCO	2017	0.68	0.09	3.56	0.22	0.11	0.18	0.41	0.07
OCSSCO	2018	0.62	0.09	2.10	0.20	0.08	0.18	0.38	0.13
OMO	2011	0.11	0.09	3.09	0.24	0.11	0.10	0.10	0.18
OMO	2012	0.10	0.12	4.62	0.18	0.09	0.13	0.09	0.34
OMO	2013	0.41	0.10	4.81	0.16	0.10	0.14	0.29	0.14
OMO	2014	0.39	0.09	5.84	0.15	0.10	0.12	0.28	0.08
OMO	2015	0.49	0.08	2.85	0.15	0.10	0.12	0.33	0.08
OMO	2016	0.34	0.10	7.65	0.12	0.08	0.12	0.25	0.10
OMO	2017	0.31	0.11	11.88	0.08	0.11	0.02	0.23	0.07
OMO	2018	0.26	0.10	2.40	0.11	0.08	0.04	0.21	0.13
ADCSI	2011	0.60	0.07	1.04	0.49	0.11	0.02	0.37	0.18
ADCSI	2012	0.72	0.08	1.62	0.38	0.09	0.03	0.42	0.34
ADCSI	2013	0.38	0.09	1.46	0.37	0.10	0.02	0.28	0.14
ADCSI	2014	0.46	0.08	1.62	0.38	0.10	0.02	0.31	0.08

ADCSI	2015	0.45	0.09	1.60	0.38	0.10	0.02	0.31	0.08
ADCSI	2016	0.72	0.09	1.55	0.39	0.08	0.03	0.42	0.10
ADCSI	2017	0.68	0.10	2.02	0.33	0.11	0.03	0.40	0.07
ADCSI	2018	0.63	0.09	1.86	0.35	0.08	0.03	0.39	0.13
SFPI	2011	3.66	0.17	1.17	0.46	0.11	0.80	0.79	0.18
SFPI	2012	3.06	0.14	1.34	0.43	0.09	0.73	0.75	0.34
SFPI	2013	2.79	0.14	1.78	0.36	0.10	0.61	0.74	0.14
SFPI	2014	2.93	0.14	1.60	0.38	0.10	0.60	0.75	0.08
SFPI	2015	2.65	0.14	1.97	0.34	0.10	0.58	0.73	0.08
SFPI	2016	2.18	0.17	1.92	0.34	0.08	0.56	0.69	0.10
SFPI	2017	2.31	0.16	1.94	0.34	0.11	0.58	0.70	0.07
SFPI	2018	0.24	0.17	2.08	0.32	0.08	0.23	0.20	0.13
VISN	2011	-0.17	0.37	0.91	0.57	0.11	0.07	-0.21	0.18
VISN	2012	-0.06	0.27	1.05	0.50	0.09	0.09	-0.07	0.34
VISN	2013	0.33	0.24	1.06	0.06	0.10	0.11	0.25	0.14
VISN	2014	0.47	0.29	0.92	0.52	0.10	0.17	0.32	0.08
VISN	2015	0.87	0.21	0.83	0.55	0.10	0.16	0.47	0.08
VISN	2016	1.14	0.23	0.86	0.54	0.08	0.25	0.53	0.10
VISN	2017	1.63	0.18	0.95	0.51	0.11	0.32	0.62	0.07
VISN	2018	1.46	0.18	1.52	0.40	0.08	0.32	0.59	0.13
SIDMA	2011	0.11	0.21	1.24	0.58	0.11	0.23	0.10	0.18
SIDMA	2012	0.28	0.19	1.83	0.40	0.09	0.28	0.22	0.34
SIDMA	2013	0.23	0.19	2.75	0.03	0.10	0.28	0.19	0.14
SIDMA	2014	0.31	0.19	2.02	0.33	0.10	0.28	0.24	0.08
SIDMA	2015	0.28	0.20	1.94	0.34	0.10	0.27	0.22	0.08
SIDMA	2016	0.38	0.17	2.39	0.30	0.08	0.26	0.27	0.10
SIDMA	2017	0.51	0.17	2.04	0.33	0.11	0.29	0.34	0.07
SIDMA	2018	0.59	0.15	1.83	0.35	0.08	0.27	0.37	0.13
BUS G	2011	1.57	0.16	0.90	0.53	0.11	0.39	0.61	0.18
BUS G	2012	1.52	0.17	1.15	0.46	0.09	0.50	0.60	0.34
BUS G	2013	1.59	0.16	1.55	0.22	0.10	0.49	0.61	0.14
BUS G	2014	1.81	0.15	1.69	0.37	0.10	0.47	0.64	0.08
BUS G	2015	1.88	0.17	1.81	0.36	0.10	0.50	0.65	0.08
BUS G	2016	0.35	0.19	1.43	0.41	0.08	0.26	0.26	0.10
BUS G	2017	0.48	0.19	1.35	0.43	0.11	0.28	0.33	0.07
BUS G	2018	0.32	0.21	1.87	0.35	0.08	0.29	0.24	0.13
PEACE	2011	3.09	0.17	1.28	0.44	0.11	0.70	0.76	0.18
PEACE	2012	3.19	0.17	1.21	0.45	0.09	0.76	0.76	0.34
PEACE	2013	2.99	0.16	1.36	0.42	0.10	0.73	0.75	0.14

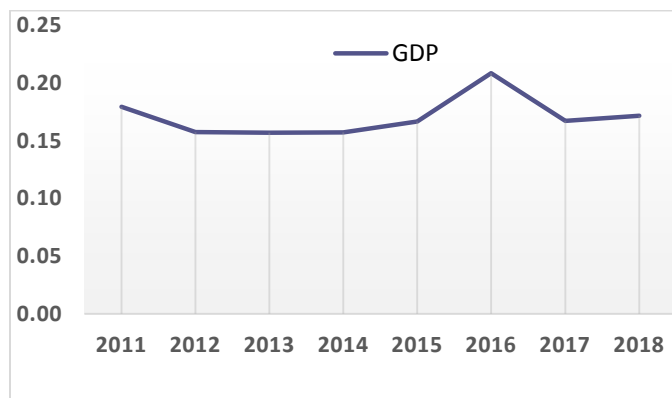
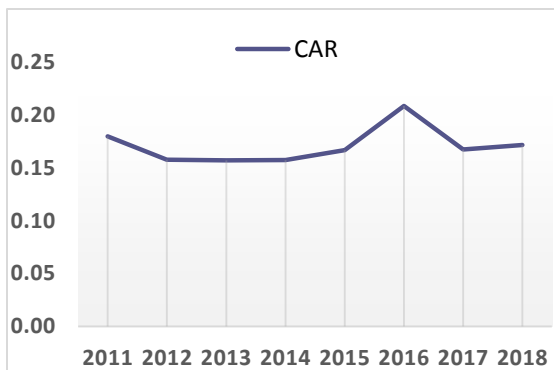
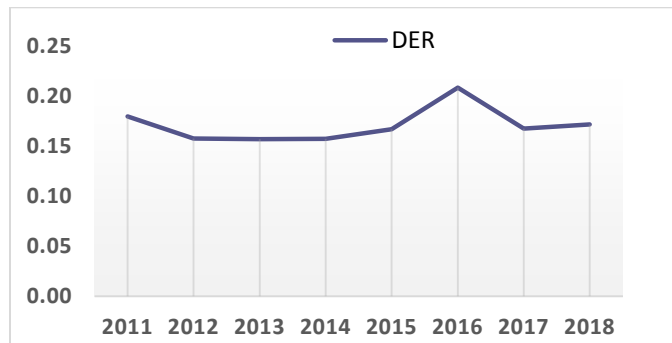
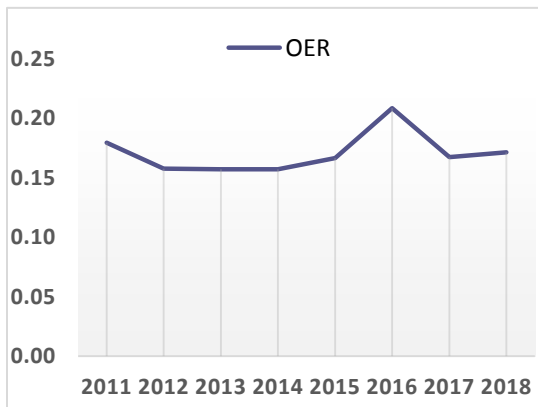
PEACE	2014	2.94	0.17	1.29	0.44	0.10	0.70	0.75	0.08
PEACE	2015	2.63	0.19	1.29	0.44	0.10	0.71	0.72	0.08
PEACE	2016	0.61	0.47	1.27	0.44	0.08	0.75	0.38	0.10
PEACE	2017	1.47	0.19	1.34	0.43	0.11	0.54	0.59	0.07
PEACE	2018	1.24	0.21	2.00	0.33	0.08	0.54	0.55	0.13
ESHET	2011	0.37	0.24	0.56	0.64	0.11	0.32	0.27	0.18
ESHET	2012	0.63	0.22	0.62	0.62	0.09	0.42	0.39	0.34
ESHET	2013	0.72	0.23	0.84	0.41	0.10	0.42	0.42	0.14
ESHET	2014	0.80	0.25	1.06	0.49	0.10	0.44	0.45	0.08
ESHET	2015	0.80	0.28	0.92	0.52	0.10	0.49	0.44	0.08
ESHET	2016	0.29	0.42	1.82	0.35	0.08	0.52	0.22	0.10
ESHET	2017	0.26	0.35	1.94	0.34	0.11	0.45	0.21	0.07
ESHET	2018	0.19	0.37	1.89	0.35	0.08	0.44	0.16	0.13
WASA	2011	1.86	0.12	1.88	0.35	0.11	0.31	0.65	0.18
WASA	2012	2.16	0.12	1.41	0.48	0.09	0.40	0.68	0.34
WASA	2013	1.88	0.14	2.15	0.22	0.10	0.43	0.65	0.14
WASA	2014	1.58	0.16	2.37	0.30	0.10	0.43	0.61	0.08
WASA	2015	1.62	0.14	3.26	0.23	0.10	0.40	0.62	0.08
WASA	2016	1.35	0.18	2.37	0.23	0.08	0.43	0.57	0.10
WASA	2017	1.40	0.20	2.72	0.27	0.11	0.45	0.58	0.07
WASA	2018	1.64	0.21	2.41	0.29	0.08	0.50	0.62	0.13
BENG	2011	-0.10	0.58	1.36	0.47	0.11	0.38	-0.11	0.18
BENG	2012	0.04	0.27	2.38	0.32	0.09	0.23	0.04	0.34
BENG	2013	0.35	0.24	1.76	0.05	0.10	0.23	0.26	0.14
BENG	2014	0.14	0.20	2.20	0.31	0.10	0.14	0.12	0.08
BENG	2015	0.10	0.22	2.40	0.29	0.10	0.15	0.09	0.08
BENG	2016	0.03	0.27	2.76	0.27	0.08	0.17	0.03	0.10
BENG	2017	0.25	0.23	2.25	0.31	0.11	0.15	0.20	0.07
BENG	2018	0.53	0.10	2.78	0.26	0.08	0.12	0.35	0.13
AGGR	2011	0.52	0.18	1.86	0.35	0.11	0.28	0.34	0.18
AGGR	2012	0.49	0.21	2.36	0.30	0.09	0.40	0.33	0.34
AGGR	2013	0.61	0.21	1.52	0.40	0.10	0.41	0.38	0.14
AGGR	2014	1.20	0.12	1.56	0.39	0.10	0.31	0.54	0.08
AGGR	2015	1.32	0.12	1.37	0.42	0.10	0.33	0.57	0.08
AGGR	2016	1.39	0.11	1.32	0.43	0.08	0.32	0.58	0.10
AGGR	2017	1.28	0.12	0.96	0.51	0.11	0.31	0.56	0.07
AGGR	2018	0.63	0.25	0.86	0.54	0.08	0.45	0.39	0.13
HRBU	2011	1.11	0.13	0.93	0.52	0.11	0.23	0.53	0.18
HRBU	2012	0.05	0.16	2.02	0.33	0.09	0.16	0.05	0.34

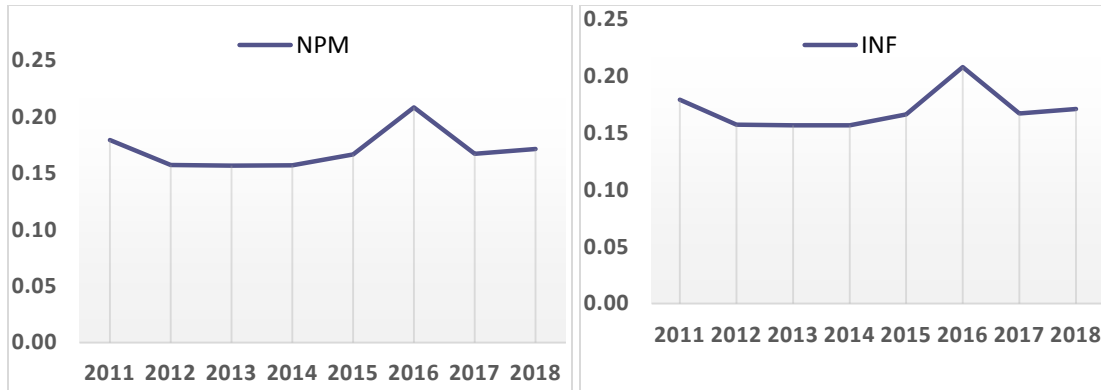


<b>HRBU</b>	<b>2013</b>	<b>0.05</b>	<b>0.23</b>	<b>2.22</b>	<b>0.08</b>	<b>0.10</b>	<b>0.22</b>	<b>0.05</b>	<b>0.14</b>
<b>HRBU</b>	<b>2014</b>	<b>0.06</b>	<b>0.25</b>	<b>1.90</b>	<b>0.34</b>	<b>0.10</b>	<b>0.23</b>	<b>0.05</b>	<b>0.08</b>
<b>HRBU</b>	<b>2015</b>	<b>-0.33</b>	<b>0.36</b>	<b>1.64</b>	<b>0.38</b>	<b>0.10</b>	<b>0.22</b>	<b>-0.49</b>	<b>0.08</b>
<b>HRBU</b>	<b>2016</b>	<b>0.02</b>	<b>0.34</b>	<b>2.34</b>	<b>0.30</b>	<b>0.08</b>	<b>0.34</b>	<b>0.02</b>	<b>0.10</b>
<b>HRBU</b>	<b>2017</b>	<b>0.06</b>	<b>0.19</b>	<b>2.50</b>	<b>0.22</b>	<b>0.11</b>	<b>0.19</b>	<b>0.06</b>	<b>0.07</b>
<b>HRBU</b>	<b>2018</b>	<b>0.20</b>	<b>0.19</b>	<b>2.16</b>	<b>0.19</b>	<b>0.08</b>	<b>0.21</b>	<b>0.17</b>	<b>0.13</b>

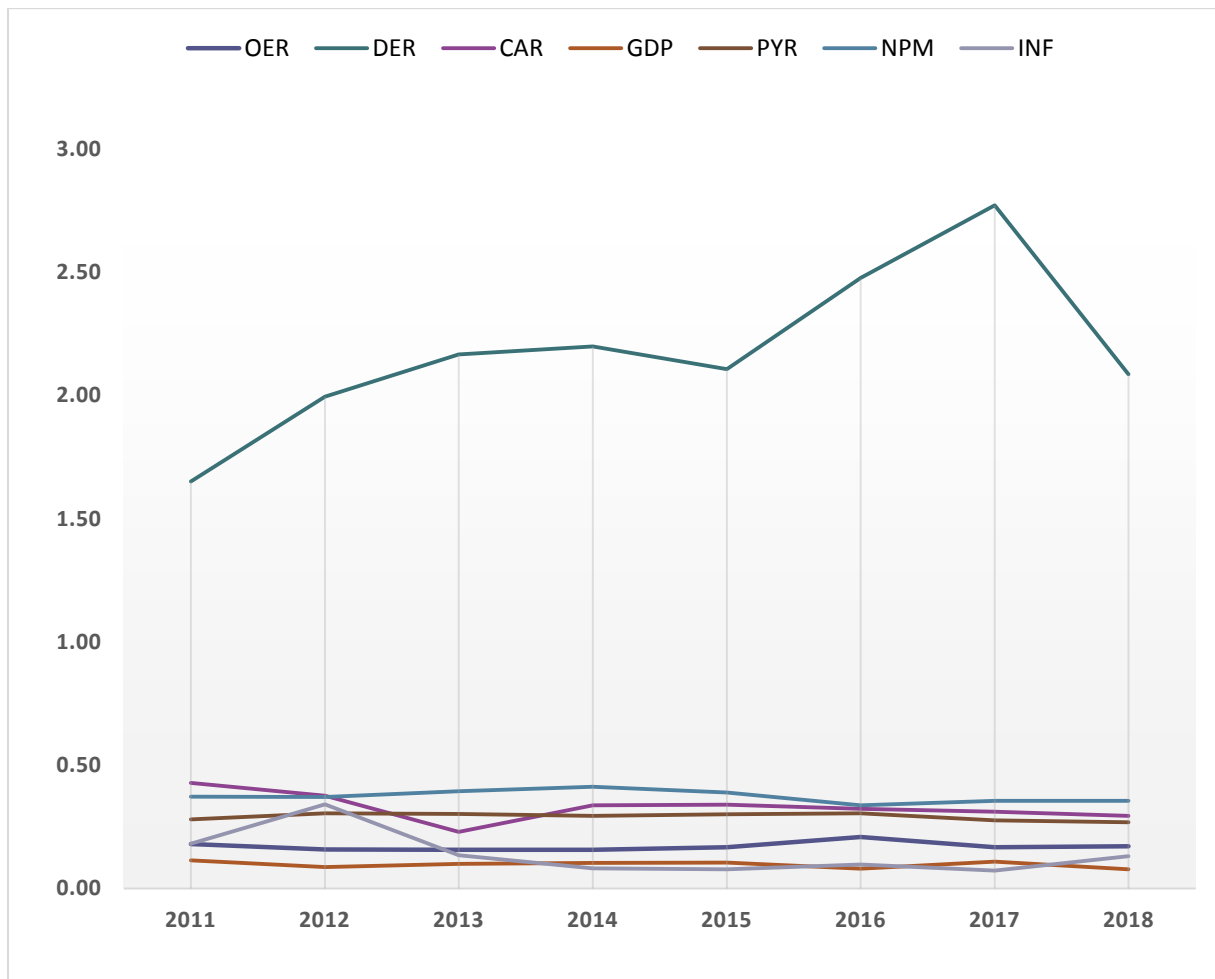
**SECONDAR DATA RESULTS (Mean Value)**

<b>Year</b>	<b>OER</b>	<b>DER</b>	<b>CAR</b>	<b>GDP</b>	<b>PYR</b>	<b>NPM</b>	<b>INF</b>	<b>FSS</b>
<b>2011</b>	<b>0.18</b>	<b>1.65</b>	<b>0.43</b>	<b>0.11</b>	<b>0.28</b>	<b>0.37</b>	<b>0.18</b>	<b>1.03</b>
<b>2012</b>	<b>0.16</b>	<b>2.00</b>	<b>0.38</b>	<b>0.09</b>	<b>0.31</b>	<b>0.37</b>	<b>0.34</b>	<b>0.99</b>
<b>2013</b>	<b>0.16</b>	<b>2.17</b>	<b>0.23</b>	<b>0.10</b>	<b>0.30</b>	<b>0.39</b>	<b>0.14</b>	<b>0.95</b>
<b>2014</b>	<b>0.16</b>	<b>2.20</b>	<b>0.34</b>	<b>0.10</b>	<b>0.29</b>	<b>0.41</b>	<b>0.08</b>	<b>1.01</b>
<b>2015</b>	<b>0.17</b>	<b>2.11</b>	<b>0.34</b>	<b>0.10</b>	<b>0.30</b>	<b>0.39</b>	<b>0.08</b>	<b>0.99</b>
<b>2016</b>	<b>0.21</b>	<b>2.48</b>	<b>0.32</b>	<b>0.08</b>	<b>0.30</b>	<b>0.34</b>	<b>0.10</b>	<b>0.68</b>
<b>2017</b>	<b>0.17</b>	<b>2.77</b>	<b>0.31</b>	<b>0.11</b>	<b>0.28</b>	<b>0.35</b>	<b>0.07</b>	<b>0.79</b>
2018	0.17	2.09	0.29	0.08	0.27	0.36	0.13	0.65





Source National Bank secondary Data



Source National Bank secondary Data, 2020

### APPENDIX3 .LIST OF MICROFINANCE INSTITUTIONS IN ETHIOPIA

No	Name of Microfinance Institutions	Year of Establishment in GC	Remark
<b>Category A</b>			
1	Amhara Credit and Savings Institutions	9/4/1997	
2	Dedebit Credit and Savings Institutions	28/04/1997	
3	Oromia Credit and Savings Institutions	4/8/1997	
4	Omo Credit and Savings Institutions	1/10/1997	
5	Addis Credit & Savings Institutions	9/4/1997	
<b>Category B</b>			
1	Meklit MFI	9/4/1997	
2	Specialized Fina. & Prom. Institution	25/11/1997	
3	Vision Fund Microfinance	17/06/1998	
4	Sidama Micro-Financing Institution	17/06/1998	
5	Buussa Gonof. Micro-Financing Ins.	17/06/1998	
6	Gasha MFI	15/05/1998	
7	Wisdom MFI	17/06/1998	
8	PEACE Micro-Financing Institutions	18/11/1999	
9	Wassassa Micro-Financing Institutions	9/4/1997	
10	Ben. Gum. Micro-Financing Institutions	9/4/1997	
11	Eshet MFI	9/4/1997	
12	Dire Microfinance Institutions	2/5/2003	
13	Agar Micro-Financing Instituions	18/03/2004	
14	Harbu Micro-Financing Institutions	17/02/2005	
<b>Category C</b>			
1	African village financial serv.	16/11/1998	
2	Shashamane MFI	9/4/1997	
3	Metemamen Microfinancing Institution	9/4/1997	
4	Kendil MFI	7/2/2001	
5	Leta micro-financing ins.	29/10/2004	
6	Digaf Microfinancing Service	18/07/2005	
7	Harar Microfinance service	17/08/2006	
8	Lefayida credit & saving institution	17/08/2006	
9	Tesfa micro-financing ins.	3/1/2008	
10	Gambella Micro-financing ins	18/12/2008	
11	Dynamic MFS micro-financing ins	12/5/2009	
12	Somali Micro-financing ins	31/01/2011	
13	Lideta micro-financing ins.	17/04/2012	
14	Afar Micro-financing ins.	18/08/2014	
15	Nisir Micro-financing ins.	7/5/2014	
16	Rays Micro-financing ins.	7/7/2014	
17	Kershi M Micro-financing ins.	5/6/2017	
18	Shager Micro-financing ins.	10/7/2018	
19	Yemisrach Micro-financing ins.	23/07/2018	

Source National Bank secondary Data, 2020