



# Determinants of Financial Performance of Micro-Finance Institutions in Ethiopia

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A Thesis Submitted to MBA coordination office Presented in Fulfillment of the Requirements for the Degree of Master of Business Administration in Finance

Addis Ababa University

Addis Ababa, Ethiopia

Jun, 2021

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## **Statement of Declaration**

I, Ashenafi Berhanu, declare that this thesis entitled “Determinants of Financial Performance of Micro-Finance Institutions in Ethiopia” is my original work and that all sources of materials used for this thesis have been fully acknowledged. This thesis has been submitted in partial fulfillment of the requirement for the Degree of Master of Business Administration (MBA) in Finance.

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**ADDIS ABABA UNIVERSITY**  
**SCHOOL OF GRADUATE STUDIES**

**THESIS APPROVAL**

This is to certify that the thesis prepared by Ashenafi Berhanu, entitled: Determinants of Financial Performance of Micro-Finance Institutions in Ethiopia and submitted in partial fulfillment of the requirements for the degree of MBA in Finance complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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**Chair of Department or Graduate Program Coordinator**

## **Abstract**

Determinants of Financial Performance of Micro-Finance Institutions in Ethiopia

Addis Ababa University, 2021

*The study examined determinants of financial performance of 17 Ethiopian MFIs for period of 10 years (2009-2018). The study adopted a quantitative research approach and used secondary data obtained from the annual bulletin of AEMFI and mix-market database. The data collected was analyzed using descriptive and regression analysis. The findings of the study established Portfolio at Risk 90, Operating Expense Ratio and Debt-Equity Ratio insignificantly influence the financial performance of micro-finance institutions in Ethiopia. Whereas, Capital to Asset Ratio has negative significant influence on financial performance; Loan to Asset Ratio and Cost per Borrower has positive significant effect on ROA. Based on the finding of the study capital to asset ratio, asset allocation and cost per borrower are vital factors among others to determine the institutions' profitability then sustainability. Thus the study recommends that MFI's management should decrease capital-to-asset ratio up to optimum level and increase loan-to-asset ratio. Since the study found positive relationship between cost per borrower and profitability, MFIs in Ethiopia are beneficiaries if they lift up cost per borrower dispensed for the good of their institutions and in order to increase their financial performance.*

Keywords: Profitability, Return on Asset, Microfinance Institutions

## **Acknowledgement**

First is to almighty God for giving me strength, determination, understanding and patience throughout the course of my life.

I am a grateful to the staff of AEMFI for their support during the data collection process.

Special thanks to my advisor Dr. Abebaw Kassie for his guidance, advice and support which made it possible for me to accomplish this task.

Finally, I thank my dear wife, family, friends and relatives for their support and encouragement.

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## List of Acronyms

ACSI	Amhara Credit and Saving Institution
AEMFI	Association of Ethiopian Micro-Finance Institutions
CAR	Capital to Asset Ratio
CGAP	Consultative Group to Assist the Poor
CSA	Central Statistical Agency
DECSI	Dedebit Credit and Saving Institution
DER	Debt to Equity Ratio
ETB	Ethiopian Birr
FSS	financial self-sufficiency
GDP	Gross Domestic Product
GNI	Gross National Income
LCPB	Logarithm of Cost per Borrower
LAR	Loan to Asset Ratio
MFI	Micro Finance Institutions
NBE	National Bank of Ethiopia
NGI	National Gross Income
NGO	Non-Governmental Organization

OCSSCO	Oromia Credit and Saving S.C.
OER	Operating Expense Ratio
OSS	operational self-sufficiency
PAR	Portfolio at Risk
ROA	Return on Asset
ROE	Return on Equity
SFPI	Specialized Financial and Promotional Institution
SSA	Sub-Saharan Africa

## **Chapter one: Introduction**

### **1.1. Background of the study**

Microfinance basically relates to all financial intermediation services such as savings, credit, fund transfers, insurance, pension and remittances among others by financial institutions in both rural and urban areas to low income earners (Robinson, 2003 as cited on Kipkoech & Muturi, 2014). The main distinctive characteristics of MFIs in the financial market include, but are not limited to, the following: (1) they provide financial services to the poor, who are usually not considered. to be creditworthy by banks; and (2) they solve the problem of information asymmetry and ease collateral requirements by establishing strong personal relationships, which generates social collateral (Wassie, Kusakari, & Sumimoto, 2019 et.al.). Performance of the Micro financial Institutions can be judged through their institutional financial viability and their outreach to the poor people. These performances could be influenced by the technical, political and the social factors to combine traditional and modern Micro-finance approaches (Jegatheesan & S., 2011).

Ethiopia has one of the largest populations in SSA. Rate of urbanization in the country is still low. Only 19.1% of Ethiopians live in urban areas and 80.9% live in rural areas. Share of urban population is projected to reach 22% by 2019/20. Literacy rate has wide gap among rural and urban residents (45.9% rural versus 81.5% urban). Majority of economically active population 45% are engaged in formal self employment and about 30% are employed in private households. Nearly half of rural economically active population is self employed where agriculture is the main employer (Central Statistical Agency, 2018).These facts show how much micro finance can play a posi-

tive role to the economical and social growth of the community using its own characteristics.

Banks, insurance companies and micro-finance institutions are the major financial institutions operating in Ethiopia. Bank branch to population ratio stood at 1:20,286.5 people in 2017/18. About 35.3 percent of the total bank branches were located in Addis Ababa. Quasi money to broad money ratio has shown improvement in the past years 58.34%, 59.89%, 62.19% in 2014/15, 2015/16 and 2016/17 and slightly declined to 62.04% by the year 2017/18 (National Bank of Ethiopia, 2018).

The formal financial institutions have played little role in financing development efforts in the rural area because they are clustered in urban conglomerations, concentrate on funding large enterprise, inaccessible to the rural poor especially in terms of distance. In addition to this, the rural poor cannot fulfill banking requirements to obtain banks loan/credit. Besides, banking requirements for collateral/material guarantee and intrinsic banking procedure which in most cases is very difficult for the poor to deal with, the volume loan demanded by small farmers/poor is not appealing to the bank. Usually, small farmers or poor require small loan size that is known as micro-loan or micro credit and micro-finance services. Thus, processing of small or micro-loan is not financially feasible and it is difficult to manage. So as a result the formal financial institutions such as banks are reluctant to finance the demand of small farmers or lend small loan (Yirsaw, 2008). This makes Ethiopia flourishing microfinance destination with growing breadth of outreach in recent years.

One of the key measurements to assess the financial performance of MFIs is its financial sustainability (Consultative Group to Assist the Poor, 2009). They need to be financially sustainable in order to continue serving the society. The purpose of this study is to determine which of financial indicators affect financial performance of MFIs significantly.

## **1.2. Problem Statement**

The microfinance sector has grown quickly since the 1990s, paving the way for other forms of social enterprise and social investment (World Bank Group, 2017). Since MFIs are mostly founded with the aim of fighting poverty; assessment and putting benchmark for measuring their results has been interest of many academic and organizational researches. Financial sustainability or profits are one of these performance measurements.

The formal banking system in Ethiopia presents many restrictions to the lower income section of the population to access economic resources to finance their productive activities. This has led to give more attention to microfinance as financial intermediary through which the poor section of the population gets access to financial services (Kassa, 2010).

Profits are one of the most important sources to generate capital for financial institutions. Without profits institutions will not be able to attract external capital to increase deposit holders and potential investors as well as confidence and encourage the shareholders of capital, plus they are used as a measure of performance of the institution's management, where give strong indications of the regulators that the institution is moving in the right direction. It also gives an idea about the adequacy of the manage-

ment in directing projects, the effectiveness of investment, operational and financing policies followed. However banks and other financial institutions are troubling to balance between liquidity and efficiency factors. (Almazari & Alamri, 2017).

Some policy makers and practitioners would argue that institutional factors and government regulation play a bigger and more proactive role than the fundamentals of macro economy in determining the operations and performances of the financial market as well as financial institutions. Also, the relationship between the financial operations and the macro economy will depend on characteristics of financial sub-sectors (bank-like, stock and microfinance) under consideration (Annim, IMAI, Gaiha, et al, 2012). Whereas (King'ori, Kioko, & Shikumo, 2017) in their study found positive and statistically significant relationship between operational efficiency, capital adequacy, firm size and financial performance; others such as (Haile, 2016) found portfolio at risk, loan loss reserve ratio, operating expense ratio ,coverage ratio, debt-to-equity ratio and microfinance size, logarithm of total asset, have a negative effect on financial performance of MFIs.

The performance of lending institutions has become an increasingly prominent issue in the world of finance due to ever increasing competition and pressure on the state governments whenever financial organizations fail (Bogan, 2012 et.al.). There are international[e.g.(King'ori et al, 2017), (Kathomi, 2017), (Annim et al, 2012), (Esubalew, Hermes, & Meesters, 2013)] and local studies[e.g. (Yirsaw, 2008), (Alemayehu & Lemma, 2014), (Haile, 2016), (Mirani, 2015)] regarding microfinance institutions in general and the determinants in particular. In these previous studies the researcher observed some inconsistency in results. To mention some, while (King'ori et al, 2017) found positive and statistically significant result between financial per-

formance and operational efficiency ratio; other studies like (Mirani, 2015; Haile, 2016) found negative relationship. When (Wassie et al, 2019)in their paper found positive significant result for portfolio to asset and performance of MFIs; (King'ori et al, 2017) found negative insignificant relationship. Such inconsistency opens for further research on the subject area. The basic motivation of the researcher is therefore to investigate capital structure proxies, efficiency and portfolio quality as determining factors of micro-finance institutions sustainability.

### **1.3. Objective of the Study**

#### **1.3.1. General objective of the study**

The main objective of this paper is to assess determinants which affect MFIs financial performance.

#### **1.3.2. Specific objectives of the study**

Specifically, the study intends to address the following objectives.

- To determine the effect of portfolio quality proxied by portfolio at risk 90 on the financial performance, return on asset of Ethiopian MFIs.
- To assess the effect of operational expense ratio on the financial performance, return on asset of Ethiopian MFIs
- To assess the effect of cost per borrower on the financial performance, return on asset of Ethiopian MFIs
- To determine the effect of debt equity ratio on the financial performance, return on asset, of Ethiopian MFIs
- To investigate the effect of capital to asset ratio on the financial performance, return on asset, of Ethiopian MFIs

- To investigate the effect of asset allocation proxied by loan to asset ratio on the financial performance, return on asset, of Ethiopian MFIs

#### **1.4. Scope and limitation of the study**

In Ethiopia there are currently more than 35 licensed micro finance institutions. The analysis to assess financial determinants which affect MFIs performance considered those MFIs whose data was available at least for the period of 10 years (2009-2018). This approach made the number of MFIs included in the study 17. It has also disregarded the qualitative aspects which affect performance. Moreover, MFI's achievement can be evaluated in terms of social performance and financial performance. However, in this paper we are confined to financial performance. The proxy for dependent variable is Return on Asset (ROA); independent variables are Portfolio at Risk 90 days (PAR 90), Operating Expense Ratio (OER), Debt to Equity Ratio (DER), Capital to Asset Ratio (CAR), Loan to Asset Ratio (LAR), and Logarithm of Cost per Borrower (LCPB).

#### **1.5. Significance of the study**

Financial performance and capital structure of lending institutions has become an increasingly prominent issue in the world of finance. The main significance of this study is therefore;

- Helping Ethiopian MFI's in their strategic initiatives through pinpointing key determining financial factors of their performance.
- Encouraging Ethiopian MFIs to develop good accounting systems for financial reports and efficient ratio analysis.

- Assisting donors and investors in their financing decisions regarding Ethiopian microfinance institutions.
- Moreover, the research is important for further studies in the area as an input and reference.

## **1.6. Organization of the paper**

This paper is organized as follows: in chapter two it reproduces some of theoretical and empirical literatures previously addressed on the subject. In chapter three the methodological aspect of the paper is thoroughly expressed. The fourth one will deal with research findings and discussion. And lastly the fifth section will conclude findings and discussions of the paper then forward recommendations.

## **Chapter two: Literature review**

### **2.1. Introduction**

In this section of the paper we shall dwell on review of the related literature and establish conceptual and empirical foundations on which the study shall lean. The concept section shall cover the concept of micro-finance, microfinance in Ethiopia, performance measurement in microfinance institutions. In the empirical review section local and international empirical literatures relevant to the study are discussed. Moreover, we shall uncover the gap, discuss how this particular study would contribute to fill the same and prepare conceptual framework.

### **2.2. Conceptual Review**

#### **2.2.1. Microfinance Defined**

Microfinance is commonly defined as the provision of financial services to low-income groups who are not yet served by financial institutions (Holloh, 2001). While Steel and Addah (2004) as cited in (Alemayehu & Lemma, 2014) describe micro finance as small financial transactions with low income household and micro enterprises, using non standard methodologies such as character-based lending, group guarantees and short term loans. (Mulu, 2016), describe microfinance as an institution which provides financial services to those whose income is small and unstable including consumers and the self-employed; who traditionally lack access to banking and related services.

MFIs operate in a niche market. They cater to the needs of those clients who are considered 'high risk' by formal banks. Small households possess fluctuating income, very few assets and require very small loan size, high degree of close follow-up, busi-

ness appraisal. Financial transaction with them calls for careful appraisal and close post-disbursement follow up. MFIs offer much needed financial service mainly to the informal sector which otherwise depends on exploitive money lenders (Association of Ethiopian Micro-Finance Institutions, 2014).

Microfinance institutions' main objective is to provide a permanent access to appropriate financial services including insurance, savings, and fund transfer. It is rather an important tool for the eradication of poverty. Poor will be able to deal with emergency and also make significant investment expenditures (Jegatheesan & S., 2011).

### **2.2.2. Microfinance in Ethiopia**

The government proclamation no 40/1996 paved the way for the establishment of microfinance institutions. As defined by proc. 626/2009, a micro finance institution is a company licensed and engaged in micro financing business in rural and urban areas including accepting both voluntary and compulsory savings as well as demand and time deposits, extending credit to rural and urban farmers and people engaged in other similar activities as well as micro and small-scale rural and urban entrepreneurs ; drawing and accepting drafts payable with in Ethiopia; micro-insurance business ; purchasing income generating financial instruments ; acquiring, maintain and transferring any movable and immovable property including premises for carrying out its business; supporting income generating projects of urban and rural micro and small scale operators; rendering managerial, marketing, technical and administrative advice to customers and assisting them to obtain services in those fields; managing funds for micro and small scale businesses; providing local money transfer services; proving financial leasing services to peasant farmers, micro and small-scale urban and rural entrepreneurs (Negarit Gazeta, 2009).

The microfinance industry in Ethiopia has shown a remarkable qualitative and quantitative growth since the early 1990. It has witnessed rapid growth, has an aggressive drive to achieve scale, broad geographic coverage, dominance of government backed MFIs, focus on rural household, provision of both credit and saving services. The formal base has been laid by the issuance of Proclamation No. 40/1996 which established the licensing and supervision of MFIs as share companies in accordance with the Commercial Code of Ethiopia. Despite these major achievements of Ethiopian MFIs, in sight of the large population size the outreach of micro-finance in Ethiopia is still relatively limited (Hayder Al-Bagdadi, 2002, Muluken Alemayehu(MPM), 2014 et al).

According to (NBE, 2018) there are currently more than 35 MFIs operating in the country, which dispersed ETB 27 billion in credit in 2016/17 fiscal year. Until the end of the 2016/17, the no of active borrowers from the 1,743 MFI branches spread across the country was 4.6 million. Omo, Amhara credit and saving institution (ACSI), and Oromia credit and saving (OCSSCO) lead in no of borrowers with 1.2 million, 1.1 million and 946,577 customers respectively. During 2017/18 fiscal year, the total deposit of all MFIs reached ETB 33 billion while their assets reached ETB 67 billion. On the other hand, the total capital of MFIs reached ETB 13.7 billion (NBE, 2019). ACSI, OCSSO, and Addis credit and saving institution are the most capitalized MFIs in Ethiopia.

### **2.2.3. The Concept of Profitability**

Profit can be defined simply as a financial benefit that is realized when the amount of revenue gained from a business activity exceeds the expenses, costs and taxes needed

to sustain the activity. Obviously, it is the surplus remaining after total costs are deducted from total revenue, and the basis on which tax is computed and dividend is paid and known as measure of success in an enterprise. It is reflected in reduction in liabilities, increase in assets, and/or increase in owners' equity and furnishes resources for investing in future operations, and its absence may result in the extinction of a company. It also called earnings, gain, or income (Bedri et al, 2020).

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 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”. 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, 1961as cited on (Ayalew, 2017).

Profitability is an appropriate mechanism for achieving long term viability and sustainability of the microfinance industry. At the micro level, profitability is a prerequisite to a competitive microfinance industry and the cheapest source of capital, without

which no firm would attract external capital. MFIs profits are also an important source of equity, if profits are reinvested and this may promote financial stability. Moreover, market sources of funding are accessible only to MFIs that have demonstrated that they can turn a profit. By minimizing the probability of financial crisis, impressive profits are vital in reassuring MFI's stakeholders, including investors, borrowers, suppliers and regulators. At the macrolevel, a profitable microfinance industry is better placed to overcome negative shocks and contribute meaningfully to the stability of the overall financial system (Muriu, 2011).

#### **2.2.4. Theories of profitability**

In its modern form micro-financing the first organization to receive attention was the Grameen Bank, which was started in 1976 by Muhammad Yunus in Bangladesh; which makes it a more or less recent phenomenon. Due to this recency nature, there is no such recognized theory of profitability for MFIs. This study applied reviewing commercial banking related theories considering MFIs are micro banking institutions.

##### ***2.2.4.1. The Balanced portfolio theory***

According to the Portfolio balance model of asset diversification, the optimum holding of each asset in a wealth holder's portfolio is a function of policy decisions determined by a number of factors such as the vector of rates of return on all assets held in the portfolio, a vector of risks associated with the ownership of each financial assets and the size of the portfolio. It implies portfolio diversification and the desired portfolio composition of commercial banks are results of decisions taken by the bank management. Further, the ability to obtain maximum profits depends on the feasible set of assets and liabilities determined by the management and the per unit costs incurred by the bank for producing each component of assets (Atemkeng & Nzongang, 2006).

#### ***2.2.4.2. Risk Return Trade-off Theory***

The risk return trade off theory states that as firms increase risk through increased leverage (debt over equity), they tend to earn higher profit. The risk return trade off theory describes that as firms increase risk through increased leverage (debt over equity), they have a tendency to earn higher profit. But, signaling and bankruptcy cost hypotheses are opposite to this theory. Berger (1995) Signaling hypothesis says that high equity ratio (equity over debt) leads to high profit and bankruptcy cost hypothesis says that where bank assumes the bankruptcy costs was be high, they accumulate higher equity capital to evade financial distress (Ayalew et al, 2017).

#### ***2.2.4.3. The Market Power Theories***

The relationship of market concentration with bank efficiency and stability is widely debated but controversial among policymakers and academics. It is believed that the increase in banking market concentration is motivated by the prospective benefits of greater market power. The traditional structure-conduct-performance hypothesis (SCP) asserts that increasing concentration may result in imperfect competition in a market because of the absence of effective market supervision, which may give power to the banks for increasing their net margin on their products and services (U-Din, Tripe, & Kabir, 2018).

This hypothesis posits that the performance of bank is influenced by the market structure of the industry. There are two distinct approaches within the Market power theory; the Structure–Conduct-Performance (SCP) and the Relative Market Power hypothesis (RMP). According to the Structure –conduct - power approach, the level of concentration in the banking market gives rise to potential market power by banks, which may raise their profitability (CGAP, 2012). Banks in more concentrated mar-

kets are most likely to make abnormal profits by their ability to lower deposits rates and to charge higher loan rates as a results of collusive (explicit or tacit) or monopolistic reasons, than firms operating in less concentrated markets, irrespective of their efficiency.

Unlike the Structure-conduct-power, the Relative market power hypothesis states that bank profitability is influenced by market share. It supposes that only large banks with differentiated products can influence prices and increase profits. They are able to exercise market power and earn non-competitive profits. The above theoretical analysis shows that Market power theory supposes bank profitability is a function of external market factors (Ayalew, 2017).

#### ***2.2.4.4. Efficiency Structure Theory***

The efficient structure hypothesis, on the one hand states that banks earn high profits because they are more efficient than others. There are also two distinct approaches within the Efficient Structure (ES): 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 largermarket shares, which may manifest in higher levels on market concentration, but without any causal relationship from concentration to profitability. Athanasoglouetal, 2006 as cited on (Ayalew, 2017). The efficient-structure-hypothesis (ESX) postulates that firms with superior management or production technology may lower their costs and increase the profits of the firm (U-Din, et al 2018). Whereas 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 makes it possible for large firms to acquire market shares, which may manifest in higher con-

centration and then profitability. The efficiency structure on the other hand like the Portfolio theory largely assumes that bank performance is influenced by internal efficiencies and managerial decisions.

#### **2.2.5. Financial Performance Measurement in MFIs**

A myriad of financial ratios are available for assessing the performance of MFIs (CGAP, 2009) et al. Although it is difficult to synchronize the different interpretations of all ratios, they provide alternative perspectives in assessing the performance of MFIs for each of the four domains, namely, profitability, efficiency, leverage and risk. In essence, in interpreting the determinants of MFIs' financial performance, due cognizance should be taken of the precise focus of each ratio.

##### **Financial sustainability (profitability)**

Profitability is a key target for all financial institutions as they must keep adequate liquidity amounts so as to maintain the continuity. In the long run, few retail providers can maintain and expand the financial services they offer unless they can cover all of their costs and generate net income.

Indicators: In banks and other commercial institutions, the most common measure of profitability is *return on assets (ROA)*, which reflects that organization's ability to deploy its assets profitably, and *return on equity (ROE)*, which measures the returns produced on the owners' investment.

Return on Assets (ROA) indicates how well an MFI is managing its assets to optimize its profitability. The ratio includes not only return on the portfolio, but also other revenue generated from investments and other operating activities. If an institution's

ROA is fairly constant, this ratio can be used to forecast earnings in future periods. Unlike ROE, this ratio measures profitability regardless of the institutions underlying funding structure; it does not discriminate against MFIs that are funded primarily through equity. Therefore, ROA is a good measurement to compare commercial and non-commercial MFIs (USAID, 2005).

$$\text{ROA} = \frac{\text{Aftertaxprofit}}{\text{Starting(orperiodaverage)assets}}$$

$$\text{ROE} = \frac{\text{Aftertaxprofits}}{\text{Starting(orperiodaverage)equity}}$$

### **Loan repayment (portfolio quality)**

Loan portfolio is the most important asset of an MFI. Portfolio quality reflects the risk of loan delinquency and determines future revenues and an institution's ability to increase outreach and serve potential and existing clients.

A retail lender's ability to collect loans is critical for its success: if delinquency is not kept to very low levels, it can quickly spin out of control. Furthermore, loan collection has proved to be a strong proxy for general management competence. Long experience with evaluating microfinance projects has shown that very few successful projects have bad repayment, and very few unsuccessful projects have good repayment. More than any other indicator, this one deserves special care to ensure meaningful and reliable reporting.

The most widely used indicator of portfolio quality in the MFI industry is Portfolio at Risk (PAR), which measures the portion of the loan portfolio contaminated by arrears as a percentage of the total portfolio (AEMFI, 2018).

**Indicators:** The standard international measure of portfolio quality in banking is *portfolio at risk (PAR)* beyond a specified number of days:

$$\text{PAR}(x \text{ days}) = \frac{\text{Outstanding principal balance of all loans past due more than } x \text{ days}}{\text{Outstanding principal balance of all loans}}$$

The number of days (x) used for this measurement varies. In microfinance, 30 days is a common breakpoint. If the repayment schedule is other than monthly, then one repayment period—e.g., week, fortnight, or quarter—could be used as an alternative. When any full or partial payment is past due, the whole outstanding balance of the loan is at higher than normal risk of non-repayment. PAR should not be confused with arrears or past due payments, which measure the value of the past due amount rather than the full loan amount that remains outstanding.

The PAR ratio should also include the outstanding value of all renegotiated loans, including rescheduled and refinanced loans, because they have higher than normal risk, especially if any payment is missed after the negotiation.

Furthermore, MFIs with seemingly similar PAR values can actually operate with very different underlying risk profiles. While their PAR<sub>30</sub> measures may be the same, a loan portfolio with a large concentration of seriously delinquent loans (loans affected by arrears of more than 90 or 180 days) will be much riskier than a delinquent portfolio where arrears are mostly in the 30 or 60 day range.

## Efficiency and Productivity

These indicators are used to know how an MFI uses its resources-assets and personnel to deliver its services. An MFI becomes efficient when it lowers the cost of delivering services. Two indicators are recommended to measure whether a retail microfinance provider is cost effective. Both ratios focus on nonfinancial operating expenses. They do not include interest paid on the MFI's liabilities or loan loss provision expenses. Any type of institution can calculate both.

Indicators: The most commonly used indicator of efficiency expresses nonfinancial expenses as a percentage of the gross loan portfolio

$$\text{Operating expense ratio (OER)} = \frac{\text{Personnel and administrative expenses}}{\text{Period average gross loan portfolio}}$$

OER is the most widely used indicator of efficiency. It allows a quick comparison between an MFI's portfolio yield with its personnel and administrative expenses—how much it earns on loans versus how much it spends to make them and monitor them. Its substantial drawback is that it will make an MFI doing small loans look worse than an MFI doing large loans, even if both are efficiently managed. Thus, a preferable alternative is a ratio that is based on clients served, not amounts loaned.

$$\text{Cost per client (or loan)} = \frac{\text{Personnel and administrative expense}}{\text{Period average number of active clients or loans (GNI per capita)}}$$

This indicator shows how much it costs the retail financial service provider to serve each client. Because it does not penalize MFIs making smaller loans, cost per client is a better efficiency ratio for comparing institutions. If one wishes to benchmark an MFI's cost per client against similar MFIs in other countries, the ratio should be expressed as a percentage of per capita GNI, which is used as a rough proxy for local labor costs.

## **Financing structure and asset allocation**

The concept generally described as the combination of debt and equity that make the total capital of firms. The successful selection and use of capital is one of the vital elements of the institutions' financial strategy. The finance decision in public companies and financial institutions in particular is very important decision that affect the future cash flows, profitability and liquidity, and this decision determining the percentage of financing requirements from short term sources, and long-term, aswell as the mix capital of debt and equity (Almazari & Alamri, 2017). Deposit financing and commercial debts are the main sources of funding for MFIs. Commercial debt; both short and long term, financing is an important tool in MFIs use (AEMFI, 2018).

(Bogan, 2012), discusses various theories that have been developed to describe under what circumstances an MFI should use a particular type of funding instrument. These ideas regarding MFI funding processes can be categorized into two main frameworks: life cycle theory and profit-incentive theory. According to the former one framework of analysis, most MFIs start out as NGOs with a social vision, funding operations with grants and concessional loans from donors and international financial institutions that effectively serve as the primary sources of risk capital for the microfinance sector. Generally the life cycle theory posits that the sources of financing are linked to the stages of MFI development. Donor grants and soft loans comprise the majority of the funding in the formative stages of the organization. As the MFI matures, private debt capital becomes available, but the debt structures have restrictive covenants or guarantees. In the last stage of MFI evolution, traditional equity financing becomes available.

The latter one in contrast to the life cycle theory, the profit-incentive theory posits that MFI use of commercial funding sources (at any stage of development) will enable MFIs to meet the “microfinance promise.” Reliance on commercial funding is beneficial along two dimensions: outreach and efficiency. Since donor funds are limited in amount, reliance on donor funding limits the ability of MFIs to expand to meet rising demand for services. There is also a question as to whether reliance on donor funds allows MFIs to avoid pressures to operate efficiently. Commercially funded MFIs respond to the profit incentive, working to increase revenues and decrease expenses so that they can have revenues sufficient to cover all operating expenses.

#### **Debt to equity ratio**

Debt to equity ratio is one of the most widely used measurements of leverage. It measures the extent to which the institution’s reliance on debt to fund its assets. The debt to equity ratio is of particular interest to lenders as it indicates how much safety cushion (in the form of equity) the institution can absorb losses. Since MFIs that are owned by NGOs have limited access to commercial lending, they tend to have had low debt to equity ratios over time. As MFIs transform in to regulated financial intermediaries or deposit taking MFIs; the DER increases (AEMFI, 2018). The formula for calculating this ratio can be represented as:

$$\text{Debt to equity ratio (DER)} = \frac{\text{Total Liabilities}}{\text{shareholders equity}}$$

#### **Capital to asset ratio**

This ratio is one of the simple indicators of the financial solvency of the financial sector and it is considered as a safety valve to protect the depositors to promote stability and efficiency in financial institutions (Almazari & Alamri, 2017). The equity capital to total assets ratio, shows the amount of equity capital available to absorb unexpected

losses (Ahmad, Ariff, & Skully, 2009). Computing this ratio helps an MFI to assess its ability to meet its obligations and absorb unexpected losses. The denominator should exclude goodwill and intangible assets for MFIs that include these line items in assets on their balance sheet. A regulated MFI will likely have an additional solvency ratio as defined by its regulator. According to Consultative Group to Assist the Poor (CGAP), microfinance institutions should be subject to even higher adequacy capital asset ratio than banks as a means to safeguard their portfolios (AEMFI, 2018). Thus this ratio measures the amount of capital required to cover additional unexpected losses to ensure that the MFI is well capitalized for potential shocks.

$$\text{Capital to asset ratio (CAR)} = \frac{\text{Total Capital}}{\text{Total Asset less intangible assets and goodwill}}$$

### **Loan to Asset ratio (LAR)**

The loan to assets ratio measures the total loans outstanding as a percentage of total assets. The higher this ratio indicates an MFI is loaned up and its liquidity is low. The higher the ratio, the more risky the MFI may be to higher defaults

$$\text{Loan to Asset ratio (LAR)} = \frac{\text{Gross Loan Portfolio}}{\text{Total Assets}}$$

### **2.3. Empirical literatures**

In the last decades, microfinance has captured the interest of academics, policy makers and donors alike. Consequently we can find many empirical literatures on different aspects of this fast growing financial industry in general and its performance determinants in particular.

(King'ori et al, 2017), studied Determinants of Financial Performance of Microfinance Banks in Kenya. The study adopted a descriptive research design and used secondary data from 7 Microfinance banks for a period of 5 years from 2011 to 2015. Return on asset was used as proxy for financial performance. They found a positive and statistically significant relationship between operational efficiency, capital adequacy, firm size and financial performance of microfinance banks in Kenya. However, they found an insignificant negative relationship between liquidity risk, credit risk and financial performance of microfinance banks in Kenya. Also (Kathomi, 2017) assessed the effects of financial determinants of microfinance institutions sustainability in Nairobi County, Kenya. The research was guided by liquidity preference theory, theory of inflation rate, and exchange rate parity theory. The study revealed that increasing the lending interest rate reduces the return thus affecting the sustainability of MFIs. In addition, the study found that high inflation rate leads to low lending power of the MFIs. The study further revealed that poor economic conditions results into high rate of foreign exchange impacting on the general investment by the MFIs.

(Annim et al, 2012), investigated the effects of institutional factors as well as fundamentals of macro economy on microfinance sector. Their study covered 97 world countries from Mix market website. In defining a dependent variable, they considered four broad categories of MFIs' performance, namely, (i) Profitability (proxy by 'Return on Assets'), (ii) Asset Management ('debt-to-equity ratio'), (iii) Loan Portfolio quality ('portfolio- at- risk' and 'write-off ratio'), and (iv) Efficiency ('operating expense ratio'). They examined the effects of institutional factors, namely, control of corruption, the rule of law, voice and accountability and political stability on the per-

formance of MFIs. The study found that institutional factors affect MFIs' financial performance, in particular, profitability, operating expense, and portfolio quality. It is also found that the macroeconomic and financial factors, such as GDP and share of domestic credit to GDP, have positive impacts on MFIs' financial performance – specifically profitability, operating expense ratio and portfolio quality.

Whereas (Esubalew, Hermes, & Meesters, 2013), examined the effect of competition among microfinance institutions (MFIs) on their performance. By constructing a Lerner index, they assess the effect of increased competition on outreach, loan repayment, efficiency and financial performance. Based on their study on data from 362 MFIs in 73 countries for the period 1995-2009, the results show intense competition is, overall, negatively associated with performance of MFIs.

There are also local literatures in these regard. (Yirsaw, 2008), looked at the performance of MFIs by taking six institutions as a case from Profitability and Sustainability; Asset and Liability management; and Efficiency and productivity perspectives. The majority of MFIs passed both operational and financial self sufficiency and fewer still requires support to survive and sustain in the industry. Most MFIs are strong performers on return on asset .in connection with liquidity, most MFIs lack strong position to effect immediate obligations. Large MFIs are more efficient and productive than small and medium ones.

(Alemayehu & Lemma, 2014), assessed the factors which affect the performance of microfinance institutions in Hawassa city. Based on their study the identified factors related to clients includes: problems related to the repayment, diversion of loan into

non income generating activities, business condition of the borrowers and soon. On the other hand, institutional factors such as shortage of human resource, lack of cost effective technologies, and shortage of loan capital were also identified.

A research by (Haile, 2016) investigated the determinants of performance of MFIs in Ethiopia over a period of twelve years (2003-2015) in the twenty-two selected institutions. In his study he employed seven microfinance indicators as independent variables: portfolio at risk (PAR), loan loss reserve ratio (LLR), operating expense ratio (OER), operational self-sufficiency (OSS), financial self-sufficiency (FSS), debt equity ratio (DER) and logarithm of total assets (SIZE) in determining their effect on dependent variable performance of microfinance institutions, return on assets (ROA). The results of the analysis showed that financial self-sufficiency and operational self sufficiency ratios have positive relationship with explanatory variable return on assets while the remaining independent variables: portfolio at risk, loan loss reserve ratio, operating expense ratio coverage ratio, debt-to-equity ratio and microfinance size, legalism of total asset, have a negative effect on return on assets of MFIs.

(Mirani, 2015), conducted a research on 13 selected MFIs in Ethiopia using multiple regression models. Operational Self-Sufficiency and Financial Self-Sufficiency ratios were used as the dependent variables to measure the self-sufficiency (sustainability) of microfinance institutions. The study used eight predictor /independent or explanatory variables, namely; grant to asset ratio (GAR), debt to equity ratio (DER), operational expense ratio (OER), cost per borrower (CPB), GDP growth rate, inflation rate, deposit to loan ratio (DLR) of MFI, and gross loan portfolio (GLP) of MFIs have been used in the model to measure and predict the financial self-sufficiency of MFIs in

Ethiopia. On the other hand to measure the predictor variables of operational self-sufficiency, seven independent explanatory variables namely: return on asset (ROA), experience/age of MFI, cost per borrower (CPB), number of active borrowers (NAB), portfolio at risk (PAR), operating expense ratio (OER), and debt to equity ratio (DER) of an MFI were considered.

The study found that grant to asset ratio, cost per borrower, GDP growth rate, deposit to loan ratio and gross loan portfolio, affects the financial self-sufficiency and sustainability of Ethiopian MFIs significantly. Similarly, return on asset, experience of MFIs, cost per borrower, portfolio at risk and operating expense ratio affect their operational sustainability. The Study also found that MFIs in Ethiopia are operationally self-sufficient while they are not financially self-sufficient.

#### **2.4. Summary from literature review**

The conceptual literature review showed the main idea of microfinance theme is providing financial services to low- income households and micro businesses that had been ‘unbanked’ by the formal sector. The importance of these services to countries like Ethiopia is massive where poverty is multi-faced and the economy is dependent on small scale farms and businesses. Due to this great impact on societal welfare and growth the sector has captured the attention of state governments, international institutions, NGO, researchers and others.

Profitability is a key target for all financial institutions as they must keep adequate liquidity amounts so as to maintain the continuity. Efficiency and productivity indicators are performance measures showing how well an MFI is streamlining its operations. Financial management which increases the skills of the MFIs to manage liquidi-

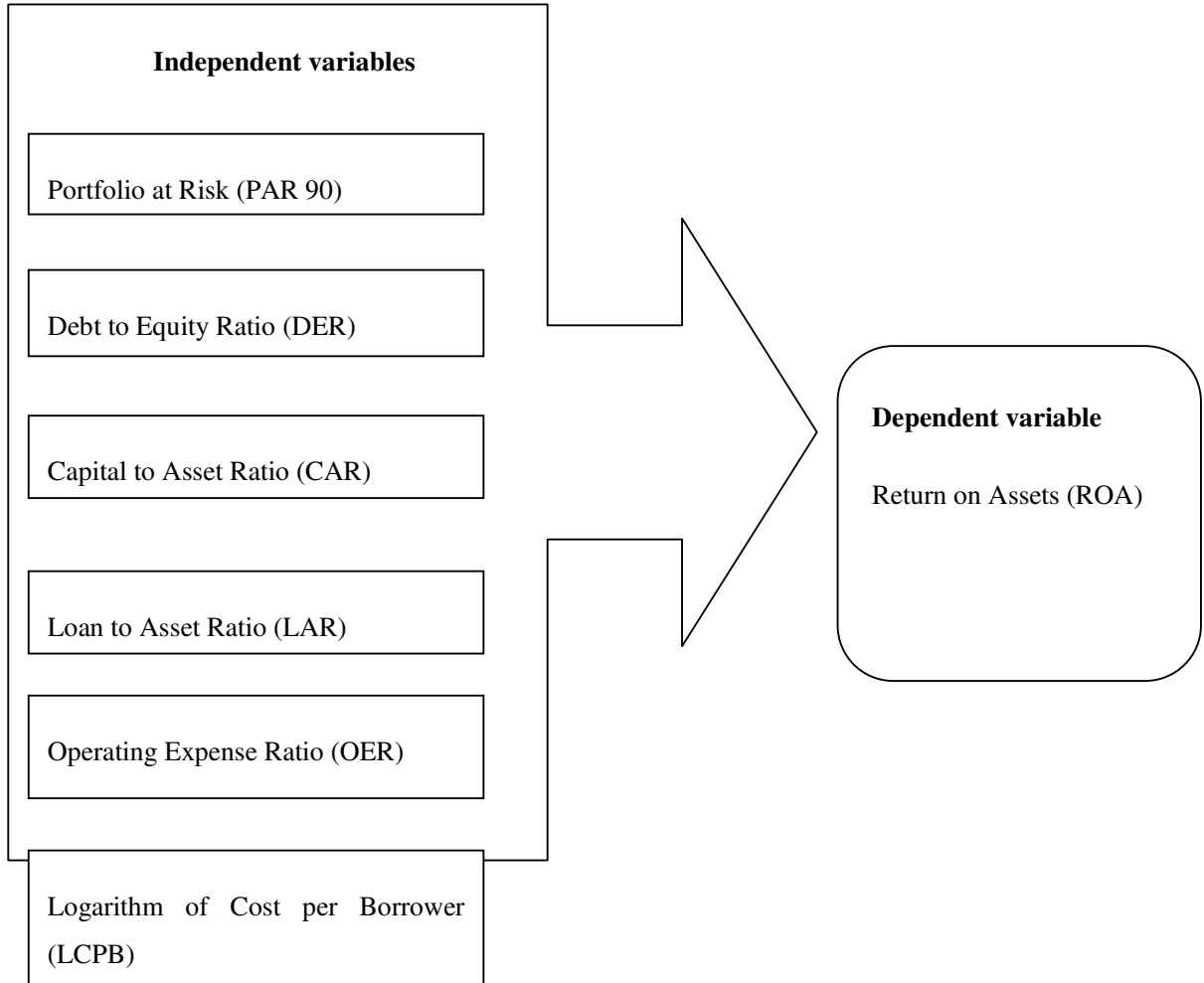
ty and solvency can also play a decisive role for profitability and sustainability. Portfolio quality is the other indicator to maintain future revenues.

Some of empirical researches quoted are King'ori et al, 2017 on Determinants of Financial Performance of Microfinance Banks in Kenya ; Annim et.al. 2012 Performance of Microfinance Institutions a macro economic and institutional perspectives ; Haile, 2016 on Determinants of Financial Performance of Microfinance Institutions in Ethiopia; Wassie et al, 2019 on Performance of Microfinance Institutions in Ethiopia: Integrating Financial and Social Metrics and others. The models were chosen since they were related to the general objective of study assessing financial determinants of MFIs' performance. As to the researcher assessment previous studies in Ethiopia and internationally lack consistency as briefed in the problem statement and used limited number of years which required the present study. This study unlike these former empirical studies gives emphasis on capital structure by incorporating three proxies, embraces new variables such as cost per borrower as indicator of efficiency of the institutions, increasing the number of observations and testing the model in new scope, MFIs in Ethiopia.

## **2.5. Research Gap**

Ample research has been carried out locally and internationally reviewing Micro finance institutions. Most of these researches gave emphasis to credit risk and efficiency perspectives. They also concentrate on their study areas based on their own objectives. There is scarcity of literature emphasizing on financial management and capital structure variables. But this study works on these variables. Therefore, the proposed study will build on the local literature on factors affecting performance of micro finance institutions in Ethiopia.

## 2.6. Conceptual Framework



Source: Author's own construct

## **Chapter Three: Research Methodology**

In this chapter the research design, target population, sampling technique and data sources, model specification and hypotheses are presented.

### **3.1. Research Design**

In order to reach out its very objective the study used panel research design employing secondary quantitative data. Panel design has the following advantages among others. Since it usually contains more degrees of freedom and more sample variability; it improves the efficiency of economic estimates and more accurate inference of model parameters. It also simplifies computation and statistical inference by involving at least two dimensions; a cross sectional and a time series dimensions. The effects unobserved heterogeneity can either be assumed as random variables, referred to as random effects model, as fixed parameters, referred to as the fixed effects model, or a mixture of both referred to as the mixed effects model (Hsiao, 2007).

In order to choose between fixed and random effect models Hausman's specification test was run. The null and alternative hypotheses for the test are: Ho: Random effects model is consistent; Ha: Fixed effect model is consistent. The p value of the test is 0.0171. Since the P value is less than 0.05; we reject the null and conclude fixed effect model is appropriate for our data.

Most statistical tests rely upon certain assumptions about the variables used in the analysis. When these assumptions are not met the results may not be trustworthy, resulting in Type I or Type II error, or over or under estimation of significance or effect size(s) (Osborne & Waters, 2002). The researcher checked whether the proposed model is free from the assumptions of autocorrelation, multicollinearity, heteroskedasticity and normality.

The data collected was analyzed using descriptive and inferential statistics with the help of the STATA Statistical Package.

### **3.2. Target Population**

The total population of the research encompasses alllegally established (according to Government proclamation No. 40/1996) micro-finance institutions in Ethiopia. According to (NBE, 2018) there are currently more than 35 MFIs operating in the country.

### **3.3. Sampling Technique and Data Sources**

From the target population of all legally registered MFIs, those who have established before 10 years and whose audited financial data was accessible through AEMFI and MIX market database were purposively included in the sample. According to this criterion, the number of MFIs included in the sample is 17. This makes the total number of observation for the study 170. Meklit, Harbu, Shashemene, Eshet, Gasha, ACSI, ADCSI, AGGAR, Buusa Gonfa, DECSI, Metemamen, OCSSCO, OMO, Peace, SFPI, Wasasa and Sidama are the MFIs taken as a sample from the total target population.

The study make use of secondary data. All the data will be collected from annual bulletin of AEMFI and mix-market database for 17 selected MFIs in Ethiopia for the period (2009-2018).

### **3.4. Hypothesis**

A hypothesis is a tentative statement about the relationship between two or more variables. It is a clear statement of what is intended to be investigated. Hypotheses are originated from essentially the same background that serves to reveal problem. These

sources can be theoretical background, knowledge, insight and imagination that come from instructional program and wide reading experiences, familiarity with existing practices (Kabir, 2016).

Based on research objectives, existing theories and previous literatures the following directional hypotheses are formed.

**Portfolio at Risk (90)** – Portfolio quality is a crucial area of performance analysis, since the largest source of risk for any financial institution resides in its loan portfolio. Portfolio quality reflects the risk of loan delinquency and determines future revenues and an institution’s ability to increase outreach and serve potential and existing clients. (AEMFI, 2014)

*H1: There is a negative and significant relationship between portfolio at risk 90 days ratio and profitability.*

**Debt to Equity Ratio (DER)** - also known as gearing ratio; which frequently used to gauge the extent to which a company is taking on debts as a means of leveraging. Firms can finance their operations through debt or equity. This ratio is a measure of the financial leverage, or the degree to which financial companies finance their activities out of their equity. The more debt financing a firm uses, the higher interest payments and the greater the risk for institutions’ creditors and investors; therefore, high corporate leverage increases the vulnerability of financial corporations to shocks and may impair their repayment capacity.

Higher debt can result in volatile earnings due to additional interest expense as well as increased vulnerability to business downturns. However, debt is not necessarily a bad

thing; it can be positive, provided it is used for productive purposes such as purchasing assets and improving processes to increase net profits (Organization for Economic Co-operation and Development, 2014).

*H2: There is a positive and significant relationship between debt to equity ratio and profitability.*

### **Capital to Asset ratio (CAR)**

This ratio is an important indicator of a micro-finance's ability to meet obligations and absorb losses. (King'ori et al, 2017), in their study establish significant and positive relationship between Capital to asset ratio (as a proxy for capital adequacy) and performance of micro-finance banks in Kenya. The expected sign in this study is also positive.

*H3: There is a positive and significant relationship between Capital to asset ratio and profitability.*

### **Loan to Asset ratio (LAR)**

The loan to asset ratio is a simple ratio that looks at how much of the MFIs asset base is invested in a high performing loan portfolio. MFI's primary business is to provide loans and other financial services to micro entrepreneurs. This is also the MFIs most profitable activity and use of assets. This ratio can also signal excess liquidity or demand for additional funding. An increasing trend in this ratio is positive. (Ruth Dueck Mbeba, 2008). (USAID, 2005) lay down a positive correlation between ROA and portfolio to assets; the ratio is higher for institutions that maintain a large percentage of the assets in the Gross Loan Portfolio.

*H4: There is a positive and significant relationship between loan to asset ratio and profitability.*

#### **Operating expense to loan portfolio ratio (OER)**

The operating expense ratio measure the MFI operating expenses (not including the cost of funds or the provision for loan losses) as compared to the average loan portfolio. A decreasing operating expense ratio is considered desirable since it will generally be an indication of increased efficiencies as the portfolio grows. However an increase in average loan size will also create decreasing trend, but not necessarily signal increased efficiencies. By same token (King'ori et al, 2017) (Annim et al, 2012) found direct relationship between operational efficiency and financial performance.

*H5: There is a negative and significant relationship between operating expense to loan portfolio ratio and profitability.*

#### **Cost per Borrower**

This ratio measures the operating expenses (not including of cost of funds or provision) that the MFI requires to serve a single active client. It is then also the amount of revenue that the MFI needs to generate from every single client in order to breakeven. The largest expense there in most MFIs is its labor costs. By examining the trends in the ratio's numerator and denominator and the ratio itself, one can determine whether a reduced cost per borrower is the result of reduced labor costs or the more efficient use of labor ('Ruth Dueck Mbeba, 2008). (Mirani, 2015), also found significant relationship between cost per borrower and performance indicators i.e. FSS and OSS

*H6: There is a negative and significant relationship between natural log of cost per borrower ratio and profitability*

### 3.5. Model specification

This study measures the relationship of portfolio at risk 90 days (PAR), Debt to Equity ratio (DER), Capital to Asset ratio (CAR), Loan to Asset ratio (LAR), Operating Expense ratio (OER), natural Logarithm of Cost per Borrower (LCPB) as independent variables on Return on Assets (ROA) as dependent variable.

The model can be mathematically expressed as:

$$ROA = \beta_0 + \sum \beta_i \chi_{it} + \varepsilon$$

Where:

ROA = the measure of profitability which is return on assets;

$\beta_0$  = the regression constant (i.e. intercept of equation);

$\beta_i$  = the change coefficient for  $\chi_{it}$  variables;

$\chi_{it}$  = the different independent variables for profitability of the MFI's  $i$  and  $t$  ;

$t$  = is the time period for the series;

$\varepsilon$  = the random error term which captures other explanatory variables;

The model can further be restated as:

$$ROA = f(\text{PAR, DER, CAR, LAR, OER, LCPB})$$

Where:

ROA = Return on Assets;

PAR = Portfolio at Risk 90 days;

DER = Debt to Equity Ratio;

CAR = Capital to Asset Ratio;

LAR = Loan to Asset Ratio;

OER = Operating Expense Ratio;

LCPB = Natural log of Cost per Borrower;

The final estimation equation derived from the above equation is:

$$ROA = \beta_0 - \beta_1PAR - \beta_2DER + \beta_3CAR + \beta_4LAR - \beta_5OER - \beta_6LCPB + \varepsilon$$

### **3.6. Model Validation**

Regression models are powerful tools frequently used to predict a dependent variable from a set of predictors. Methods to determine the validity of regression models include comparison of model predictions and coefficients with theory, collection of new data to check model predictions. The use of independent data to fit and test the model is preferable when we are interested in demonstrating the generalizability of the model in order to use it to predict outcomes for future subjects. This type of assessment often called model validation.

Literatures divide model validation into external validation and internal validation. While the former uses new sample of data from the same population or from a similar population; the latter uses already collected or main sample to validate the model. The most accredited methods for obtaining a good internal validation of a model's performance are data-splitting, repeated data splitting, jack knife technique and bootstrapping (Giancristofaro & L.Salmaso, 2003) et al.

In this study the researcher divided the sample in to two third and one third; run the regression individually and compared the results. The signs of the coefficients and significance of same found to be similar. The value of coefficients, r square and standard error showed slight difference. This result added to comparable pre-existing theories and below mentioned check points will help us ensure the validity of our model.

- The model contains those variables (main effects as well as interactions) that should be in the model and those variables have entered in the correct functional form. The correlation between dependent and independent variables is checked from pre-existing theories, literatures and correlation matrix.
- R squared - r square and adjusted r squared effectively quantifies how much variability in the dependent variable is explained by the independent parameters. It's understandable that the regressors in the model specified are not the whole story of variability in the performance of MFIs. Therefore, the researcher expects the model to explain some of variability.
- The t statistics and F statistics will not be truly applicable if unless the error term is normally distributed. We therefore check if the error terms are normally distributed.

## Chapter Four: Data analysis and interpretation

This chapter presents the results of the data analyses and findings from the study in relation to research objectives and compares findings with the literature reviewed in chapter two. The analyses are based on secondary data obtained from annual financial reports of the subject companies under study. The first subsection presents descriptive statistics of the survey data then the relationship between the variables was ascertained by econometric methods. Finally, the findings were interpreted in relation to the research objectives.

### 4.1. Descriptive statistics

Descriptive statistics are used to briefly summarize the sample data set of the study. These analyses are used to describe patterns of behavior or relevant aspects of phenomena and detailed information about each variable. Thus, it showed the mean, standard deviation, minimum and maximum of the variables in the study among the various descriptive statistics methods. The following table presents some for each variable.

Table 1: Descriptive stats for both Dependent and Independent variables

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	166	.0689988	.1274017	-.15	1.28
PARN	162	.0318623	.0389716	0	.22
OER	166	.1128193	.0636909	.0188	.31
DER	166	2.247151	1.754122	.25	11.88
CAR	166	.3816867	.2380441	.08	2.75
LAR	166	.8177108	.4281513	.52	4.67
LCPB	166	2.407566	.3841374	1.556303	3.343034

Source: Author's STATA output

#### **4.1.1. Dependent variable-Return on Assets (ROA)**

Return on Assets (ROA) is one of performance indicators of an organization which reflects that organization's ability to deploy its assets profitably. It is used to measure the company capability to create profits using total owned assets by a company in the future, higher ROA of a company performance will lead to more effective company. ROA is able to measure the company ability to generate profits in the past to then be projected in the future (Rosikah, Prananingrum, Muthalib, Azis, & Rohansyah, 2018). (MicroRate & Inter-American Development Bank, 2003), define it as an overall measure of profitability that reflects both the profit margin and the efficiency of the institution.

As can be referred from Table 1 above; ROA has an approximate mean value of 0.07 for the period; standard deviation and range of 0.13 and 1.43 respectively. The mean value indicate subject MFIs gainby average 7 cents of return for every 1 birr valueof asset. The standard deviation greater than respective mean and wide range indicate considerable dispersion between institutions.(MIX) 2017-2018, benchmark indicates ROA of 2.0% for these institutions for the period across the globe and 1.5% for subject countries across Africa. This indicates relatively the Ethiopian MFIs are more profitable. An institution can arrive at high ROA either by boosting its profit margin or by squeezing its assets more efficiently. The result perhaps indicates the industry in Ethiopia is in growing stage prior to saturation and/or the MFIs are more efficient for the study period.

#### **4.1.2. Independent variables**

Repayment of an MFI's loans is a crucial indicator of performance. Loans are MFIs' largest assets and the largest source of risk resides in their loan portfolio (Esubalew,

Hermes, & Meesters, 2013). The most widely used measure of portfolio quality in the microfinance industry is Portfolio at Risk (PAR); which measures the portion of the loan portfolio affected by delinquency as a percentage of total portfolios. Although various other measures are regularly used, PAR has emerged as the leading indicator because it is easily understandable, does not understate risk, and is comparable across institutions (MicroRate, 2014).

Portfolio at risk (90) measures institutions' portfolio quality. A higher ratio indicates higher risk to the portfolio. (CGAP, 2009), recommends when dealing with uncollateralized loans (PAR) above 10 percent must be reduced quickly or they will spin out of control. In our case it scores an approximate mean value of 0.03 and standard deviation of 0.04. The maximum for this variable is 0.22. Compared to (MIX) 2017-2018, benchmark 4.7% and 6.6% for the globe and Africa respectively; it indicates low risk to the portfolio of Ethiopian MFIs. This perhaps is due to growing industry and low competition. Intense competition is considered among the root causes where it lowers borrower selection standards, weakens relationships with customers, leads to multiple loan-taking and high defaults (Esubalew, Hermes, & Meesters, 2013). Another perspective is lending methodology-use of village banking loans where a group of borrowers collectively borrows and guarantees each loan in an act of solidarity. Should any group member default on a portion of their loan payment, the rest of the group is expected to make up the balance. Because of this village banking loans would naturally have lower PAR levels. (MicroRate, 2014) Further states in regions where group lending is more common, PAR is very low compared to regions where individual lending is most common.

CGAP recommends OER and CPB to measure MFIs' efficiency parameter. Operating Expense ratio had a mean value of 11.3% among MFIs for the study period. It scored Standard of deviation 0.06 and range of 0.29. CGAP states, only a few extremely efficient MFIs have an OER below 10 percent. The mean OER of MFIs reporting to MIX Market 2017-2018 was 11.2% globally; and 14.5% for African continent. This implies subject MFIs in our study are performing relatively efficiently compared to African continent but behind the global score and CGAP's threshold. On the basis of literature notably micro banking bulletin (Balkenhol, 2007) explain the level of efficiency of a given MFI in relation to similar MFIs five factors were important that position it on the spectrum between poverty focus and financial performance: location, legal form, delivery technique, subsidies and staff issues.

The other explanatory variable which stipulates efficiency constituted in the study is Logarithm of cost per borrower. It had mean value of 2.41 standard deviations 0.38 and min 1.56 and max of 3.34. The respective antilog values are Br 257.04; 2.4; 36.31 and 2,187.76. If one wishes to benchmark an MFI's cost per client against similar MFIs in other countries, the ratio should be expressed as a percentage of per capita GNI, which is used as a rough proxy for local labor costs or at least change local currencies to common currency. In doing so the average exchange rate from 2009-2018 according to NBE annual reports was 19.19. Accordingly, the mean, minimum and maximum scores of MFI's cost per borrower of MFIs in Ethiopian which were Br 257.04, Br 36.31 and Br 2,187.76 are changed to their dollar values of \$13.4, \$1.89 and \$114 respectively. Other empirical evidences show Ethiopian MFIs look more efficient. Bogan (2009), run panel data on MFIs in Africa, East Asia, Eastern Europe, Latin America, the Middle East and South Asia during the year 2003 through 2006 and revealed that the mean score of cost per borrower of MFIs in these regions was

\$159.97 indicating that Ethiopian MFIs on the average are more efficient than MFIs in these regions. On the other hand the mean cost per borrower of MFIs reporting to MIX Market 2017-2018 was \$198.1 and \$87.2 from African continent and the globe respectively. There are perhaps many factors such as location and delivery technique for such geographical differences. It's also prudent to note that clients of MFIs in countries of better economies may require better quality and additional services which could increase operating expenses. Another local aspect probably is MFIs in Ethiopia operate mostly in rural areas (Darge, 2016), costs like office rent is low besides the major cost of MFIs is salary and it is lower compared to other countries.

The other important aspect of institution's financial management is capital structure. Apparently, capital structure has many sophisticated indicators. However debt to equity ratio, Capital to asset ratio and Loan to Asset are used in this study as rough indicators.

(Kharti, 2014),remarks MFIs can increase their lending, either through debt or accepting larger deposits from their customers. This result leaves to a further increase of the scope of their work, and their financial sustainability. (Bogan, 2012), claim DER and ROA as standard measures for the long-term health of an institution. Debt-to-equity ratios are used to provide an indication of the long-term solvency of a firm. In our case, debt to equity ratio scored mean value of 2.25. This indicates debt level is 2.25 times equity or 225% of equity. Comparing this result to (MIX) 2017-2018 of 4.6x globally and 5.2x for African continent; it implies the subject MFIs are less debt focused; perhaps not utilized their debt capacity.(USAID, 2005), states DER levels may be limited by local regulations or indirectly controlled through borrowing restrictions. Thus,the finding might be due to inadequate potential sources of debt, limits imposed

by NBE or strategy of subject MFIs. On one hand fear of commercial sources of capital or negligence on the part of MFI managers might be the cause. This ratio had standard deviation and range of 1.75 and 11.63 respectively. This variable has the highest standard deviation and range compared to other variables indicating greater dispersion among the dataset.

The other capital structure variable is capital to asset ratio (CAR). It scored mean value, standard deviation and range of 0.38, 0.24 and 2.67 respectively. From reporting MFIs to (MIX) market 2017-2018 its found CAR value of 0.16 for Africa and 0.17 globally. Whereas, the study from Kenya (King'ori et al, 2017) found mean value CAR of 0.43. A study by(Ahmad et al, 2009) establish in an unregulated environment (no government guarantees or capital regulation), financial institutions would still hold capital because markets require them to do so. This capital, among other things, acts as a cushion or buffer to absorb unexpected losses. When losses exceed this buffer institutions failure occurs. Since financial institutions failure becomes may prove contagious, capital should not be allowed to erode, thus it becomes a regulated item. NBE directive No. MFI/27/2015 stipulates MFIs to maintain minimum capital adequacy ratio of 12%. Thus it can be put subject MFIs had adequate capital for the study period. Demstev et al, 1996 as cited on (Ahmad et al, 2009) also states a profitable financial institution will choose high equity capital ratio, all else being equal, to protect its charter value; which refers to the present value of the future profits that an institution is expected to earn as a going concern.

The result further indicates Loan to asset ratio (LAR) mean value of 0.82, standard deviation 0.43 and range of 4.15. This ratio measures the MFI's allocation of assets to

its lending activity. It indicates management's ability to allocate resources to the MFI's primary and most profitable activity – making microloans (USAID, 2005).

According to the theories of financial intermediation, the two most crucial reasons for the existence of financial institutions, especially banks and MFIs, are their provision of liquidity and financial services. Regarding the provision of liquidity, banks and MFIs accept funds from depositors and extend such funds to the sector while providing liquidity for any withdrawal of deposits. MFIs role in transforming short-term deposits into long-term loans makes them inherently vulnerable to liquidity risk. This risk usually arises from management's inability to adequately anticipate and plan for changes in funding sources and cash needs. Efficient liquidity management requires maintaining sufficient cash reserves on hand while also investing as much funds as possible to maximize earnings (Ogol, 2011). For the study period; the MFIs performed well in asset allocation.

However, high loan to asset ratio may impact MFIs liquidity position. To alleviate such problems liquidity requirement in Ethiopia is rather conservative. All MFIs that have mobilized savings more than one million birr are subject to minimum liquidity requirement of 20% which is higher than liquidity requirement prescribed for commercial banks 15%.

## **4.2. Econometric analysis**

### **4.2.1. Diagnostic Tests**

Theoretically, an econometric model should pass pre and post estimation tests or diagnostic tests to make sure the model is valid, consistent and reliable. In this paper the researcher applied the following tests.

#### ***4.2.1.1. Robustness checks***

When performing a statistical hypothesis test an issue that must be considered is the accuracy of the test. There are two properties that define the accuracy of a hypothesis test: its size and power. The size is the probability of rejecting the null hypothesis, when it is the correct one and in social sciences tests are usually run at significance level 5%, which guarantees that if the null hypothesis is correct and a number of tests are made based on different samples of the same population, in 95% of the cases the null hypothesis won't be rejected. The power represents the probability of correctly rejecting the null hypothesis (Sheytanova, 2014).

Several considerations affect the choice between a fixed effect and random effects model. Hausman test is used for choosing between these models in panel data studies. This test examines the presence of endogeneity in the panel model. Endogeneity is broadly defined as a situation in which an explanatory variable is correlated with the error term.

(Williams, 2018), posits in a fixed effects model, the unobserved variables are allowed to have any associations whatsoever with the observed variables. Fixed effect models control for, or partial out, the effects of time-invariant variables with time invariant effects. This is true whether the variable is explicitly measured or not.

In random effects model, the unobserved variables are assumed to be uncorrelated with (or, more strongly, statistically independent of) all observed variables. This assumption will often be wrong but, for the reasons for e.g. standard errors may be very high with fixed effects and RE lets you estimate effects for time invariant variables; it may still be desirable.

The specification of the model to be used is of great importance for obtaining consistent results. One of the tests used to determine an appropriate model is Hausman test, which specifies whether fixed or random effects panel model should be used. This test checks a more efficient model against a less efficient but consistent model to make sure that the more efficient model also gives consistent results. As one of the most used tests in panel data analysis, this paper will use of same. The null and alternative hypotheses for the test are:

Ho: Random effects model is consistent;

Ha: Fixed effect model is consistent.

Table 2, presents test result of the Hausman test which suggests fixed effect model is the appropriate. The p value of the test is 0.00. Since the P value is less than 0.05; we reject the null and conclude fixed effect model is appropriate for our data.

**Table 2: Hausman's Test for Robustness**

```
. hausman fe re
```

	Coefficients		(b-B) Difference	sqrt (diag (V_b-V_B)) S.E.
	(b) fe	(B) re		
PARN	.0198601	-.3917223	.4115824	.1267403
OER	-.2360591	-.3829391	.14688	.0770036
DER	-.0246972	-.0255911	.0008939	.0040854
CAR	-.4344783	-.3538432	-.0806351	.0146027
LAR	.2975153	.2731694	.0243459	.0070814
LCPB	.1438615	.1230061	.0208554	.0082926

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

Test: Ho: difference in coefficients not systematic

```
chi2(6) = (b-B)' [(V_b-V_B)^(-1)] (b-B)  
= 42.09  
Prob>chi2 = 0.0000  
(V_b-V_B is not positive definite)
```

Source: Author's STATA output

#### **4.2.1.2. Multicolliniarity**

In any practical context, the correlation between explanatory variables will be non-zero, although this will generally be relatively being in the sense that a small degree of association between explanatory variables will almost always occur but will not cause too much loss of precision. However, a problem occurs when the explanatory variables are very highly correlated with each other, and this problem is known as multicollinearity (Brooks, 2008).

(Brooks, 2008), further discusses problems arise if near multicollinearity exists and ignored. First,  $R^2$  will be high but the individual coefficients will have high standard errors, so that the regression looks good as a whole, but the individual variables are not significant. Second, the regression becomes very sensitive to small changes in the specification, so that adding or removing an explanatory variable leads to large changes in the coefficient values or significances of the other variables. Finally, near multicollinearity will thus make confidence intervals for the parameters very wide, and significance tests might therefore give inappropriate conclusions, and so make it difficult to draw sharp inferences.

A natural measure of the association between two random variables is the correlation coefficient (Wooldridge, 2009). For our purpose we use correlation matrix and VIF to test for multicollinearity. The former method involves looking at the matrix of Pearson's bivariate correlations among individual independent variables. The magnitude of the correlation coefficients should be less than 0.8. The latter method - various inflation factor (VIF) indicate the degree that the variances in the regression estimates are increased due to multicollinearity. VIF values greater than 10 indicate that multicollinearity is a problem.

**Table 3: Pearson's Correlation Matrix**

```
. correlate PARN OER DER CAR LAR LCPB  
(obs=162)
```

	PARN	OER	DER	CAR	LAR	LCPB
PARN	1.0000					
OER	0.1265	1.0000				
DER	0.0576	-0.3277	1.0000			
CAR	-0.0624	0.2363	-0.4831	1.0000		
LAR	-0.0277	0.0630	-0.0594	0.6267	1.0000	
LCPB	-0.1780	0.4617	-0.1318	0.0760	0.0322	1.0000

Source: Author's STATA output

**Table 4: VIF score**

```
. estat vif
```

Variable	VIF	1/VIF
CAR	2.49	0.402325
LAR	1.89	0.528807
DER	1.58	0.631850
OER	1.52	0.655748
LCPB	1.38	0.725148
PARN	1.12	0.896418
Mean VIF	1.66	

Source: Author's STATA output

Table 3 and Table 4 present Pearson's correlation matrix output and VIF output respectively. Looking at the tables above, the result of the test implies that there is no problem of multicollinearity in the model being the highest correlation coefficient

0.63 or 63% between Capital to Asset Ratio (CAR) and Loan to Asset Ratio (LAR). VIF also confirms being the highest score 2.49.

#### **4.2.1.3.Hetroskedacsity**

Another important assumption for linear regression model is that the disturbances appearing in the population regression are homoscedastic that means the variance of the error term is consistent. If errors do not have a constant variance (not homoscedastic), they are said to be Hetroskedastic. OLS estimators under Hetroskedasticity found but ignored will still give unbiased (and also consistent) coefficient estimates, but they are no longer BLUE -- that is, they no longer have the minimum variance among the class of unbiased estimators (Brooks, 2008).

(Brooks, 2008) further recommends, to challenge this problem using heteroscedasticity-consistent standard error estimates (robust error estimates) as one option; if the cause couldn't be determined. This method allows the researcher to employ standard error estimates that have been modified to account for the heteroscedasticity following White (1980). The effect of using the correction is that, if the variance of the errors is positively related to the square of an explanatory variable, the standard errors for the slope coefficients are increased relative to the usual OLS standard errors, which would make hypothesis testing more 'conservative', so that more evidence would be required against the null hypothesis before it would be rejected.

In this study we used Modified Wald test for group wise heteroskedasticity in fixed effect regression model. The null hypothesis for the test is:

Ho:  $\sigma(i)^2 = \sigma^2$  for all  $i$  (homoskedasticity)

The test results showed heteroskedasticity. Thus the model moved to robust error estimates corrected for this problem.

#### ***4.2.1.4. Autocorrelation***

The term autocorrelation may be defined as correlation between members of series of observations ordered in time [as in time series data] or space [as in cross-sectional data]. Put simply this assumption states the disturbance term relating to any observation is not influenced by the disturbance term relating to any other observation. In other words, it is assumed that the errors are uncorrelated with one another.

If the errors are not uncorrelated with one another, it would be stated that they are autocorrelated or that they are serially correlated. A test of this assumption is therefore required (Gujarati, 2003).

(Brooks, 2008), states the consequences of ignoring autocorrelation when it is present are similar to those of ignoring heteroscedasticity. The coefficient estimates derived using OLS are still unbiased, but they are inefficient, i.e. they are not BLUE, even at large sample sizes, so that the standard error estimates could be wrong. There thus exists the possibility that the wrong inferences could be made about whether a variable is or is not an important determinant of variations in  $y$ . In the case of positive serial correlation in the residuals, the OLS standard error estimates will be biased downwards relative to the true standard errors. That is, OLS will understate their true variability. This would lead to an increase in the probability of type I error -- that is, a tendency to reject the null hypothesis sometimes when it is correct. Furthermore,  $R^2$  is likely to be inflated relative to its 'correct' value if autocorrelation is present but ignored, since residual autocorrelation will lead to an underestimate of the true error variance (for positive autocorrelation).

In this study we use Wooldridge test for autocorrelation in panel data. The null hypothesis for the test is:

H0: no first-order autocorrelation

Table 5 presents results for the above test. It implies no autocorrelation since it fails to reject the null hypothesis.

**Table 5:Wooldridge Test for Autocorrelation**

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F( 1, 16) = 2.197

Prob > F = 0.1577

Source: Author's STATA output

**4.2.1.5. Cross sectional dependence**

One major issue that inherently arises in every panel data study with potential implications on parameter estimation and inference is the possibility that the individual units are interdependent. The data involved violate two important conditions of sound application of correlation and sample taken of the units of which the traits of unit are measured, and the homogeneity of distribution of the traits within a given area (Sarafidis, Wansbeek, & Tom, 2012).

Cross sectional dependence in the errors may arise because of the presence of common shocks and unobserved components that ultimately become part of the error term, spatial dependence, and idiosyncratic pair wise dependence in the disturbances with no particular pattern of common components or spatial dependence.

The impact of cross sectional dependence in estimation naturally depends on a variety of factors, such as the magnitude of the correlations across cross sections and the nature of cross sectional dependence itself. If we assume that cross sectional dependence is caused by the presence of common factors, which are unobserved (and the effect of these components is therefore felt through the disturbance term) but uncorrelated with the included regressors, the standard fixed-effects (FE) and random-effects (RE) estimators are consistent, although not efficient, and the estimated standard errors are biased (Hoyos & Sarafidis, 2006).

Ignoring cross sectional dependence may affect the first order properties (unbiasedness, consistency) of standard panel estimators. In addition, even if the first-order properties of these estimators remain unaffected, the presence of error cross sectional dependence may largely reduce the extent to which they can provide efficiency gains over estimating using, say, OLS for each individual  $i$  in a sense, if all individuals behave similarly there is little gain to be obtained by looking at more than one of them (Sarafidis et al, 2010).

The null hypothesis is

$H_0: \text{Cov}(v_{it}, v_{jt}) = 0$  for all  $t$  and all  $i \neq j$ ,

Using Pesaran's test result from Stata we can observe that p value is 0.39 implying no problem of cross sectional dependence in our model.

**Table 6: Pesaran's test of Cross sectional dependence**

Pesaran's test of cross sectional independence = 0.847, Pr = 0.3969

Average absolute value of the off-diagonal elements = 0.345

Source: Author's STATA output

#### 4.2.2. Regression model results

In the subsequent section we cover the results of regression output and interpretation of each coefficient.

The overall goal of regression analysis is to produce an equation that will predict a dependent variable using one or more independent variables. Based on table 7 below which portrays our regressing output, the intercept is -0.27 the coefficient value for PARN 0.02, OER -0.24, DER -0.02, CAR -0.43, LAR 0.3 and LCPB 0.14. The model equation can mathematically be written as follows:

$$\text{ROA} = -0.27 + 0.02\text{PARN}_t - 0.24\text{OER}_t - 0.02\text{DER}_t - 0.43\text{CAR}_t + 0.3\text{LAR}_t + 0.14\text{LCPB} + \varepsilon_t$$

(0.3)    (0.16)        (0.01)        (0.01)        (0.13)        (0.05)        (0.04)

Based on regression result below R-sq within is 64.52%. As per stata 13.1 xtreg, fe obtains its estimates by performing OLS on  $(y_{it} - \bar{Y}_i) = (x_{it} - \bar{x}_i)\beta + (E_{it} - E_i)$ , so its reported R sq within is an ordinary R sq. The other R-sqs are correlations squared.

The R-sq value 0.64 is fairly satisfactory implying 64% of the variation in the dependent variable is explained by our model; the remaining 36% is explained by other factors not constituted in our model.

**Table 7:FE ROBUST regression output**

```
. xtreg ROA PARN OER DER CAR LAR LCPB, fe vce(robust)

Fixed-effects (within) regression           Number of obs   =       162
Group variable: MF11                       Number of groups =        17

R-sq:  within = 0.6452                      Obs per group:  min =         8
        between = 0.2152                      avg =           9.5
        overall = 0.5583                      max =          10

                                F(6,16)       =       491.80
corr(u_i, Xb) = -0.2388                    Prob > F        =       0.0000

                                (Std. Err. adjusted for 17 clusters in MF11)
```

ROA	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
PARN	.0198601	.2973596	0.07	0.948	-.6105142	.6502343
OER	-.2360591	.1601707	-1.47	0.160	-.5756058	.1034876
DER	-.0246972	.0142129	-1.74	0.101	-.0548272	.0054329
CAR	-.4344783	.1255166	-3.46	0.003	-.7005616	-.168395
LAR	.2975153	.0492493	6.04	0.000	.1931115	.4019191
LCPB	.1438615	.0351202	4.10	0.001	.0694101	.218313
_cons	-.2722599	.0848749	-3.21	0.005	-.4521867	-.092333
sigma_u	.05158378					
sigma_e	.07612689					
rho	.31466734	(fraction of variance due to u_i)				

Source: Authors STATA output

Overall reliability and validity of the model was further enhanced by the P value (F-statistic) (0.00000) which provides sufficient evidence to conclude that the regression model fits the data better than the model with no independent variables. Thus the null hypothesis of the overall test of significance that all coefficients are equal to zero was rejected as the p-value was sufficiently low (less than 0.05).

The sign of regression coefficient tells us whether there is positive or negative correlation between each independent variable and the dependent variable, holding other variables in the model constant. A positive coefficient indicates that as the value of independent variable increases, the mean of the dependent variable also tends to increase. A negative coefficient suggests that as the independent variable increases, the dependent variable tends to decrease. In addition the size of a coefficient for each in-

dependent variable gives us the size of the effect that variable is having on our dependent variable.

If the p value for the variable is less than our significant level i.e.0.05 that means our sample data provide enough evidence to reject the null hypothesis for the entire population. In other words, our data favor the hypothesis that there is a non-zero correlation i.e. changes in the independent variable are associated with changes in the dependent variable in the population level. On the contrary, if the p value for the variable is greater than our significant level that means we fail to reject the null hypothesis which claims zero correlation exists between the independent variable and response variable.

On the section follows we interpret and compare intercept and coefficient values with theoretical and empirical literatures.

### **The intercept**

The intercept also called constant term predicts the mean value of the dependent variable if all independent variables in the model take the value of zero (Wooldridge, 2009 et. al). Thus in our case its value is -0.27.

### **Portfolio at Risk (90)**

As per the regression result the coefficient for Portfolio at risk (90) is positive but not statistically significant even at 10% with p value (0.948). Therefore, we fail to reject the null hypothesis that portfolio at risk 90 days (PARN) has no significant effect on the Return on Asset (ROA) of MFIs in Ethiopia. This result aligns with previous papers like (King'ori et al, 2017) who found insignificant value and contradicts (Haile, 2016) who found negative significant relationship. The descriptive analysis section above showed Ethiopian MFIs on average hold low risk portfolio compared to other

empirical evidences. As such the results perhaps indicate the casual relationship between PAR 90 and returns is random. Thus according to the result there found to be no significant evidence supporting the influence of PAR 90 on financial performance of MFIs in Ethiopia. There are possibly many factors (such as concentration of economic activity and lending methodology) contributing to this result. A good PAR level can become a bad PAR level when the economic activity that sustains the institutional portfolio suffers (MicroRate, 2014). A higher PAR value might not necessarily be translated into a loss. In this regard (Darge, 2016) in her performance review study of Ethiopian MFIs indicated large and small MFIs need to give attention to manage their PAR values as they scored above industry average while financial performance wise large MFIs took the higher mean value.

### **Operating Expense Ratio (OER)**

The coefficient for Operating Expense Ratio (OER) is negative but not statistically significant even at 10% significance level with p value 0.16. Therefore, we fail to reject our null hypothesis that Operating Expense Ratio (OER) has no significant effect on the Return on Asset (ROA) of MFIs in Ethiopia. This might be due the fact that as (CGAP, 2009) put OER's substantial drawback is that it will make an MFI doing small loans look worse than an MFI doing large loans, even if both are efficiently managed; thus, making finding statistical strong correlation between OER and ROA difficult. An article by (Balkenhol, 2007) note this incident puzzling; that financial performance does not necessarily coincide with efficiency or, put differently: some MFIs operate efficiently but fail to breakeven, due to contextual factors in local market that may keep costs at comparatively high levels. This remark perhaps - requiring further studies - indicate contextual and local factors matter in relating OER and ROA. In

our case the regression coefficient though not statistically strong-it is negative; signaling negative relationship.

### **Debt to Equity Ratio (DER)**

The findings indicate Debt to equity ratio (Leverage) is also insignificant negative predictor variable in determining Return on Asset (ROA) of MFIs in Ethiopia. The result affirm (Mirani, 2015) and (Haile, 2016); who both found negative insignificant result. Thus we fail to reject the null hypothesis which states there is no association between debt to equity ratio and financial performance. This might be perhaps due to subject MFIs are less debt centered / not utilizing debt capacity/as presented in descriptive statistics section of this paper.

### **Capital to Asset Ratio (CAR)**

Capital to Asset Ratio (CAR) is statistically significant at 5% with p value 0.003. The coefficient for this variable is negative (-0.43); implying one unit change in capital to asset ratio bring about 43 percent negative change in our dependent variable Return on Asset; holding other factors constant. The result supports the more the assets are financed through equity the less profitability which suggests a preference for debt-based financing at the time of capital structure decision. This might be due to Ethiopian MFIs are holding above average and also above the requirement of NBE (stipulated in descriptive statistics above); which caused them not to utilize their debt potential during the study period. One reason might be since most of the MFIs are government backed they are hesitant to use commercial debt. (Asefa, 2018), in his article got the following result from interview proceedings on Ethiopian MFIs. One reason is regulatory constraint imposed by NBE; eligible MFI can't borrow more than 5% of their equity. Second factor is collateral provision required by the creditors-less tangi-

bility asset structure dominated by the current portion of MFI affected leverage of institutions negatively.

### **Loan to Asset Ratio (LAR)**

The coefficient for this variable is positive and statistically significant at 5%. The approximate value for the coefficient is 0.3. Implying, holding other variables constant, one unit increase in Loan to Asset ratio bring about 0.3 increases in the dependent variable-Return on Asset. This justifies the discussion of (USAID, 2005) which states the MFIs primary business is making loans and providing other financial services and, in most cases, it's most profitable activity-making loans. This indicates as they productively using their assets to generate more interest income and a higher proportion of loan portfolios in the total asset; it is good for financial sustainability as interest are earned from loans.

### **Logarithm of Cost per Borrower (LCPB)**

The cost per borrower measures the MFI effectiveness in cost reduction given the number of borrowers they are serving. This variable's coefficient is 0.144. It is positive and significant at 5%. Since it is log transformed variable to interpret the result, we divide the coefficient by 100 which gives as a value of 0.001. That means one Br increase in cost per borrower causes 0.001 increases in our productivity proxy return on Asset; holding other variables in the model constant. The result perhaps can be justified by the growth stage of the industry. Expansion makes personnel and administrative costs increase; correspondingly returns also increase due to untapped market for loans and uncompetitive interest rates. One reason might be perhaps institutions that operate in urban and semi-urban areas (where personnel and administrative expense are higher) are large and experienced institutions with relatively higher ROA.

(Wooldridge, 2009), mentions the statistical significance of a variable is determined entirely by the size of  $t$  value, whereas the economic significance or practical significance of a variable is related to the size (and sign) of its coefficient. Even though the coefficient for LCPB is highly significant the value of its coefficient is not; thus its effect is of minor importance.

## **Chapter Five: Conclusion and Recommendation**

This chapter presents conclusions and draws recommendation from the findings discussed in the previous chapters in relation to the objective of the study which was to assess determinants which affect MFIs financial performance in Ethiopia.

### **5.1. Conclusion**

The study examined determinants of financial performance of 17 Ethiopian MFIs for period of 10 years (2009-2018). Among various indicators for the purpose of this study the researcher used proxy for dependent variable - Return on Asset (ROA); independent variables: Portfolio at Risk 90 days (PAR 90), Operating Expense Ratio (OER), Debt to Equity Ratio (DER), Capital to Asset Ratio (CAR), Loan to Asset Ratio (LAR), and Logarithm of Cost per Borrower (LCPB).a

The result from descriptive statistics shows that in the study period Ethiopian MFIs performed well in financial performance (ROA); though greater dispersion was observed. The results indicate that the average PAR (90) for MFIs is was fairly good. The results also indicate low taste for debt by the microfinance institutions from 2009 to 2018. This ratio also indicated greater dispersion among data set. On the other hand CAR averaged above the requirement of NBE. Finally, the results show that the average loan to asset ratio of the microfinance institutions indicated good asset allocation.

The findings of the inferential statistics also established PAR90, OER and DER insignificantly influence the financial performance of microfinance institutions in Ethiopia. Whereas, CAR has negative significant influence on financial performance; LAR and LCPB has positive significant effect on ROA. This imply Ethiopian MFIs can im-

prove their financial performance by lowering Capital asset ratio; increasing loan/portfolio to asset ratio; and increasing cost per borrower which enable them to provide better services and facilities to clients.

## **5.2. Recommendations**

Based on the findings of the study the following recommendations are given.

Although the mean ROA score was above regional and world reference; there was higher dispersion between institutions. Therefore institutions with low ROA should be under caution since higher or positive returns ensure institutions' going concern.

Repayment of an MFI's loans is a crucial indicator of performance as it is the largest assets and largest source of risk for the institutions. Even though average Ethiopian MFIs performed well for the study period; the maximum for this variable (PAR 90) was as high as 22% which calls for alert.

CGAP recommends OER and CPB to measure MFIs' efficiency parameter. Based on these parameters subject MFIs achieved well.

Debt-to-equity ratios are used to provide an indication of the long-term solvency of a firm. On the other hand debt or accepting larger deposits from their customers leaves to a further increase of the scope of their work, and their financial sustainability. It is also observed this ratio had higher dispersion with a maximum value as high as 11.88. Institutions with very high DER ratio should be cautious since it makes them vulnerable to financial shocks.

It can be put subject MFIs had adequate capital for the study period. Theories suggest that the higher capital to asset ratio the better; since it acts as among other things as a

cushion or buffer to absorb unexpected losses. NBE had stipulated minimum capital adequacy ratio of 12%. Since the mean value for the study period was 38%; this study suggests MFIs to hold sufficient CAR ratio but also consider the other source of financing assets i.e. liability which is almost always cheaper than equity financing.

The result further indicates good average score of loan to asset ratio for the study period. Accordingly, Ethiopian MFIs should keep adequate liquidity level and maintain the momentum of good asset allocation.

Based on the finding of the study capital structure, asset allocation and cost per borrower are vital factors among others to determine the institutions' profitability then sustainability. Beside the primary social mission of financial inclusion, MFIs also seek to remain financially sustainable. Thus, in order to ensure their long run funding requirement and sustain their key role in the provision of credit facilities to the poor society, institutions' have to follow profit-making investment practices by implementing a sound financial management and good management on the internal factors that affect their performance.

The study findings indicate negative and statistically significant relationship between CAR and ROA. The result supports the more the assets are financed through equity the less profitability which suggests a preference for debt/liability based financing at the time of capital structure decision. On the other hand the coefficient for LAR is positive and statistically significant; suggesting subject MFIs should keep good asset allocation practices.

The study found positive correlation between cost per borrower and performance. Hypothetically it is not expected relationship as this ratio measure efficiency. As the industry in Ethiopia is growing the study suggest MFIs to scale up expansion, inclu-

siveness, better facilities and services to clients; though these techniques might increase cost per borrower ratio they are multi-purpose-it attracts more clients, more deposit then finally more returns. But institutions always should watch for unplanned and unnecessary operational and administrative costs. Still future researches are recommended to be undertaken to affirm this result.

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## **Annex 1: Formulas used for analysis**

ROA = Adjusted Net Operating Income, net of taxes/Adjusted Average Total Assets

PAR90 = Outstanding principal balance of all loans past due more than 90 days/Outstanding Principal balance of all loans

DER = Adjusted Total Liabilities/Adjusted Total Equity

CAR = Adjusted Total Equity/Adjusted Total Assets

LAR = Adjusted Gross Loan Portfolio/Adjusted total Assets

OER = Personnel and Administrative expenses/Period Average Gross Loan Portfolio

LCPB = Personnel and Administrative Expense/Period Average Number of Active Borrowers or Loans(GNI per capital)

NB: The financial information used is adjusted for inflation, cost of fund and in kind subsidy and standardized loan loss provisioning.

## Annex 2: STATA outputs

**Table 8: FE regression output**

```

Fixed-effects (within) regression              Number of obs   =       162
Group variable: MFII                          Number of groups =        17

R-sq:  within = 0.6452                        Obs per group:  min =         8
          between = 0.2152                      avg =          9.5
          overall = 0.5583                      max =          10

corr(u_i, Xb) = -0.2388                       F(6,139)        =       42.13
                                                Prob > F         =       0.0000
  
```

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
PARN	.0198601	.2209606	0.09	0.929	-.4170183	.4567385
OER	-.2360591	.1501485	-1.57	0.118	-.5329294	.0608112
DER	-.0246972	.0062966	-3.92	0.000	-.0371466	-.0122478
CAR	-.4344783	.0453086	-9.59	0.000	-.5240615	-.3448952
LAR	.2975153	.021951	13.55	0.000	.2541142	.3409164
LCPB	.1438615	.0217748	6.61	0.000	.1008089	.1869142
_cons	-.2722599	.0555255	-4.90	0.000	-.3820436	-.1624761
sigma_u	.05158378					
sigma_e	.07612689					
rho	.31466734	(fraction of variance due to u_i)				

```

F test that all u_i=0:      F(16, 139) =      2.67      Prob > F = 0.0011
  
```

Source: Author's STATA output

**Table 9: RE regression output**

```

Random-effects GLS regression                Number of obs   =    162
Group variable: MF11                       Number of groups =    17

R-sq:  within = 0.6249                    Obs per group:  min =     8
        between = 0.4920                    avg   =    9.5
        overall = 0.6013                    max   =   10

Wald chi2(6) = 238.10
corr(u_i, X) = 0 (assumed)                 Prob > chi2     =  0.0000

```

ROA	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
PARN	-.3917223	.1809986	-2.16	0.030	-.746473 -.0369716
OER	-.3829391	.1288993	-2.97	0.003	-.635577 -.1303011
DER	-.0255911	.0047912	-5.34	0.000	-.0349818 -.0162005
CAR	-.3538432	.0428909	-8.25	0.000	-.4379079 -.2697786
LAR	.2731694	.0207774	13.15	0.000	.2324464 .3138923
LCPB	.1230061	.0201339	6.11	0.000	.0835444 .1624679
_cons	-.2015471	.0498845	-4.04	0.000	-.2993188 -.1037753
sigma_u	.01411227				
sigma_e	.07612689				
rho	.03322336	(fraction of variance due to u_i)			

Source: Author's STATA output