Determinant factors affecting financial sustainability of micro-finance institution in Ethiopia

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List of Acronyms and abbreviations

ACSI	Amhara Credit and Saving Institution
AEMFI	Association of Ethiopian Microfinance Institutions
BOU	Breadth of Outreach

CA	Capital Adequacy
CGAP	Consultation Group to Assist the Poor
CB	Cost with Borrower
FS	Financial Sustainability
FSS	Financially self Sufficiency
GDP	Gross Domestic Product
GLP	Gross Loan Portfolio
INF	Inflation
LGE	Leverage
MFI	Microfinance Institution
MDG	Millennium Development goals
NGO	Non-Governmental Organization
SOM	Size of Micro finance

Abstract

The main purpose of microfinance fundamentally lies in offering those in the lowest income bracket a chance to become entrepreneur and be self-employed. Financial sustainability is the most significant type of sustainability as Micro Finance Institutions (MFIs) show different levels of sustainability. Although the literature has established substantial works explaining the determinant of financial viability of MFIs, the empirical research exploring this problem in Ethiopia is scarce. Consequently, this study aims to establish the factors affecting the financial sustainability of MFIs in Ethiopia. To accomplish this objective, a quantitative research approach and explanatory research design was adopted. An unbalanced panel data from all micro finance institutions of Ethiopia that have audited financial statements covering the years 2008-2023 is used for the study resulting in 16 years data for 40 micro finance institutions. This data was obtained from the National Bank of Ethiopia. Descriptive statistics, correlation analysis, and random effects multiple linear regression were used to analyze the data in line with the research objectives. The results from our study show that breadth of outreach, capital adequacy, size of MFI, leverage and age of the MFI were found to significantly affect the financial viability of MFIs in Ethiopia. On the other hand, the relationship between GDP and inflation and financial sustainability was insignificant. From these findings, the study suggests that Ethiopian MFIs should emphasize outreach, rebuilding capital adequacy, and raising the experience and size to guarantee the sustainability of MFIs.

Relevance to Development Studies

The research on the financial sustainability of MFIs in Ethiopia is very crucial to development studies. MFIs remain critical in poverty alleviation and financial inclusion, offering essential services to the low-income category of people and those that have been marginalized. Insuring of financial sustainability has the potential to foster economic growth, empower vulnerable communities, and advance gender equality. This study will be very important for policymakers in improving and advancing financial systems contributing a lot toward long-term development objectives. Eventually, it underlines some of the major economic and social factors important for sustainable economic development in Ethiopia.

Keywords: Finance, Financial Institution, Microfinance, Financial Sustainability, Ethiopia

CHAPTER ONE

1.1. INTRODUCTION

Since the late 1990s, MFIs have become a very important instrument for growth and economic development by exclusively targeting people in low-income households. As highlighted by Ledgerwood (1999), the focal objectives of MFIs seek to serve the financial needs of under-served markets by helping to achieve various development goals such as employment opportunity, poverty reduction, supporting and promoting existing businesses, empowerment of the poor together with women and other disadvantaged groups, and improving the development of new enterprises. "Poverty reduction" as the most important development goal within the World Bank report (2000), is claimed and approved by the microfinance institutions, as their mission and vision.

Sustainability of financial services gets defined as the most significant factor that determines the impacts of microfinance in poor people's lives (Hollis and Sweetman, 1998; Schreiner, 2000; Nyamsogoro, 2010). However, it has been stated that in the short-term, MFIs help to improve the immediate distress but may not sustain in the future causing the assistance provided to be short-lived (Schreiner, 2000). This implies that financial sustainability is central for MFIs.

Microfinance programs are carefully planned to help low-income people who want to improve their businesses, handle emergencies, and buy important items for their lives (CGAP, 2003). People who struggle financially often cannot get loans from regular banks because they do not have credit history or collateral. Microfinance institutions (MFIs) help these individuals by providing them with loans, which allows them to lift themselves out of poverty and create new economic opportunities (CGAP, 2003).

The topic of financial sustainability has received wide attention from world-known scholars due to its importance in the functioning of microfinance institutions. It is a key factor in the attainment of institutional sustainability (Hollis & Sweetman, 1998). This has highlighted the need to investigate what factors affect the sustainability of microfinance institutions so that they can self-rely for funds and at the same time improve the economy especially in countries like Ethiopia, where the level of poverty is high.

Microfinance services in Ethiopia, an impoverished nation with extreme poverty, is counted as a core solution to poverty alleviation. The government views microfinance as a form of policy intervention in the fight against eradicating poverty. Microfinance offers a possibility to change people's lives for better by making the transition from consumption lumping to consumption smoothing, helping to manage

risks effectively, building assets, developing microenterprises, enhancing the ability to earn income, and consequently quality of life (Cull et al. , 2007).

Recently, sustainability has gained traction as one of the "key performance indexes" with which stakeholders in the industry have come to judge the market belonging to MFIs like other project measurable outputs. According to Kimando et al. (2012), the sustainability in MFIs goes beyond just finances. Some of the determining factors are regulations, political stability and geographical coverage.

In many studies from different countries, researchers investigate the variables influencing the sustainability of MFIs based on large and strong MFIs. Nevertheless, as found in some of these research (Cull et al., 2007; Christen et al., 1995; Kinde, 2012), the importance of the factors varies from study to study. Primarily, the indicator of accountability to be used in evaluating the sustainability of the organization is financial self-sufficiency, which becomes the most common variable for profitability and sustainability (Woldeyes, M.T., 2012).

However, there is no doubt that the financial sustainability of Microfinance institutions in Ethiopia is crucial in view of the goal of lifting the people out of poverty and development of the country. Analysis of the variables that determine financial sustainability is, therefore, critical for successful continued service delivery by microfinance institutions to their low-income clients. This investigation is important and at the same time fills the lacuna in the literature regarding the factors instigating the financial sustainability of microfinance institutions in Ethiopia.

1.2. Problem Statement

According to Cull et al. (2007), many scholars working on microfinance are of the view that financial sustainability of MFIs is a matter of crucial concern. Financial sustainability, as a matter of fact, forms one of the bases on which the financial stability of a number of leading institutions in this field is measured. This is considered alongside other performance indicators, such as outreach and impact.

Woldeyes (2012) places emphasis on the determinants of financial sustainability for MFIs in Ethiopia, but the study does not consider impacts of important macroeconomic factors such as GDP and inflation. The current study is different from the specific study on microfinance institutions in Ethiopia in that it integrates these macro-economic variables. In this regard, therefore, GDP and inflation were integrated into this study as the two main macroeconomic variables because they form the foundational indicators of the economic health of a nation, thereby affecting both the demand for financial services and the operating environment of MFIs. Particularly, economic growth is measured by GDP and this may

influence clients' ability to repay loans, whereas inflation reflects the value of money and changes to the cost of living and can impact MFIs operational costs and the incentives of clients to either repay loans or manage loan repayments. These variables have been selected to examine their potential intersecting influence on MFIs financial sustainability which has been overlooked in the extant literature within the Ethiopian microfinance context.

In addition, research on the determinants of financial sustainability conducted by Adno (2007) in Amhara region, Muluken (2011) in SNNRP and Giday (2012) in Tigray region was focused on MFIs that operate on a particular region of the country. To fill this gap, the current research will examine determinants of financial sustainability by considering microfinance institution in the whole country.

Moreover, with respect to the case of Ethiopia, there is a methodological gap in the literature on the financial sustainability of microfinance institutions. Most studies are based on datasets of not more than 10 years. Works like Berhanu (2016), Abdulhakim (2020), and Mirani (2015) are based on data of between 5 and 10 years. Whereas such a period is relevant in terms of certain issues, they might not capture the long-term trends and cyclic patterns of finances that impact the sustainability of MFIs. The current research will bridge this gap by using an extended dataset covering a 16-year period. The expanded period will improve the coverage of factors affecting MFIs' financial sustainability in Ethiopia and thereby expected to give deeper insights with more conclusive results. Therefore, this study fills the gap from those few studies by providing a more explicit explanation of the factors that determine the financial sustainability of Ethiopian MFIs by extending the time frame of analysis.

Summing up, various reasons have motivated conducting the current study. First, promoting financial services is one of the major objectives of MFIs following increasing productivity, stimulating economic growth, and increasing client's income and asset position. Second, most of the existing studies relied on datasets only cover periods up to 2019 or they are focused on a particular region. Third, most of the existing studies have not tried to incorporate macroeconomic factors as a potential predictor of financial sustainability. Fourth, most prior studies used panel data covering periods less than 10 year and fail to capture the long-run trends or cyclical financial patterns trending to affect the sustainability of MFIs.

1.3. Objectives

1.3.1 General Objective

The main objective of this study is investigating the determinant factors influencing financial sustainability of MFIs in Ethiopia.

1.3.2. Specific Objectives

The specific objective of this study are:

- To examine the influences of institutional specific variables (capital adequacy, leverage, breadth of outreach, age or experience of MFIs and size of MFIs) on financial sustainability of Ethiopian MFIs.
- Identify the influence of macroeconomic variables (GDP and inflation) on FS of microfinance institutions in Ethiopia.

1.5. Study significance

For microfinance institutions that plan to enter the Ethiopia market to carry out their business, sustainability is one of the key concerns. The findings from the current study are relevant for investors, National Bank of Ethiopia, managers and shareholders of MFIs in terms of its contribution in comprehending the factors that influence the financial sustainability of the institution.

The data collected for this work can be utilized further in more detailed analysis to understand the financial environment. The understanding of the sustainability and success of the microfinance institution that supports the business owners can be derived from the potential investors of microfinance and small business owners. Results of this study will be beneficial to decision makers as they come up with new mechanisms that can be used to address loopholes and drawbacks in their efforts towards the adoption of policy change.

The study will also serve as a source of reference when further research on microfinance institutions needs to be carried out. It can also be used as reference for scholars who research on the topic of finance.

1.6. Scope of Study

The study sought to identify the determinants of financial sustainability within the Ethiopian microfinance institutions (MFIs). Specifically, it concentrated on all MFIs operating in the country. For the analysis, the paper considers data from 40 microfinance institutions, using audited financial statements over a successive period of 16 years from 2008 to 2023. Some of the variables analyzed in this paper include capital adequacy, leverage, outreach, age, and size of MFIs, and two macroeconomic factors-inflation and GDP growth. Probably, the central challenges in the study of these relationships are their interactions. Despite the comprehensiveness of the data, there can be limitations because of differences in the reporting framework across the institutions. This in turn points to the need for critical synthesis in the interpretation of the results.

1.7. Limitation of the study

In fact, this study covers a period of 16 years for the collection of secondary data from 2008-2023, which may turn out to be somewhat too short to outline clearly the secular trend. The fact is that the length of time falls short in capturing the impact of more recent structural changes in the economy. Heavy reliance on audited financial statements, which can show inconsistencies in quality, and periodicity across MFIs, affects the availability of data. The findings may be affected by this inconsistency. Therefore, we identified independent variables, GDP and inflation, as macroeconomic indicators. However, these indicators do not comprehensively catch the collection of the other economic factors that affect financial sustainability. Although the analysis includes the most important determining institutional characteristics variables such as such as age, breadth of outreach, leverage capital adequacy, and the size of MFIs, it is worth realizing that other factors such as governance, management practices, as well as technology deployment that might affect financial sustainability are not rigorously examined.

1.8. Organization of the study

The study is organized into five chapters. Chapter one introduces the study, by providing the background of the study, the statement of the problem, and the objectives of the study. Chapter two provides a literature review; it gives discussions on the theoretical, conceptual, and empirical under-pinning relating to the topic under investigation. Chapter three provides the research methodology including data and methods of data analysis. Results are presented in the discussion that features the fourth chapter, while concluding remarks and recommendations are given in the fifth chapter.

CHAPTER TWO

The concept of microfinance

2.1. Introduction

This Chapter seeks to delve into the body of literature which is concerned with issues of financial self-sustainability of microfinance institutions in Ethiopia. As a result of the analysis, the study establishes a theoretical framework by integrating essential findings from other studies. It also identifies the areas of knowledge and hence set a step forward for more research in the field for the future.

2.2. History of Microfinance

Microfinance, generally, means providing services to those who are viewed as high-risk for the formal banking system. It is essential for providing a variety of financial services including but not limited to loans, savings, insurance as well as money transfers, to low- and middle-income families and small entrepreneurs. Various scholars and bodies such as Armendáriz de Aghion et al., (2004), Blavy et al. (2004), and Nyamsogoro (2010), consider microfinance to be a tool that fosters poverty reduction through provision of economic opportunities and enhancement of access to finance. Since the focus is on micro-enterprises, this also contributes to overall economic development and social empowerment as well. This broadened viewpoint stresses the much wider social and economic effects of microfinance including its ability not only to provide an important service but also to empower people, nurture businesses and promote sustainable development among disadvantaged groups. It emphasizes how microfinance can serve as a link between formal economic systems and the marginalized, enabling them to be more economically active (De Crombrugghe et al.,2008).

Microfinance, given the nature of the activities engaged in, in most cases involves more than just the offering of financial services to its clients. For instance, the institutions assist with the management of community-based organizations, building trust and offering training in basic financial management techniques for the poor. This model highlights the importance of building people and supporting them with resources. Microfinance is rather understood to cover much more than financial intermediation in the minimalist sense (Ledgerwood, 1999).

"Microfinance institutions are seen in a very good light when looking for solutions in the fight against poverty since they tend to provide the people with more financial services and capital. Microfinance Institutions (MFIs) have made it possible for the poor to get essential banking services on a need basis

(Blavy et al., 2004)". Because of this access, lower income people engage in activities that earn them income, which is vital in meeting their development needs and getting out of poverty while also lessening the risk of shocks in the future.

Currently, the existing data indicates that the unemployed plus low-income would only benefit if they keep being the regular clients of the microfinance institutions. To balance dependency and self-sufficiency in economic growth, we expect the borrowers to be encouraged to pull away from dependency. By widening the outreach and combining it with the orthodox banking practice, microfinance institutions assist in the combat against poverty. This assistance enhances the capability of the poor to have income activities thereby reducing their exposure to risks and achieving basic levels for growth and development (Davis et al., 2004).

Microfinance has existed in many forms in the past, but the emergence of targeted microfinance organizations began in the 1980s with the setting up of Grameen Bank. This institution pioneered lending techniques which became the best practices of microfinance in the world. Muhammad Yunus who was one of the leaders in marketing micro finance in Bangladesh as a poverty reduction strategy played a great role in these institutions coming into being. The Grameen Bank which was initiated by Yunus in 1983 was the first to apply this radical new idea in the field of microfinance (The Norwegian Nobel Committee, 2006).

The concept of micro finance finds its origin in the mid-nineteenth century when a thinker named Lysander Spooner pointed out the possibility of providing small credits to farmers and businessmen for the purposes of tackling poverty. In this period, Farmers' Cooperative lending banks were set up with the objective to assist poor peasants and farmers in the rural areas (Kannan et al., 2013).

The evolution of what is referred to as micro finance began in the 1900's in rural Latin America with the aim of modernizing agriculture. These rural finance initiatives aimed at increasing commercialization by employing "idle" savings and encouraging investment through credit so as to reduce the debt and the associated exploitative feudal relationships. In a bid to increase their outreach, several of these institutions intended collaborating with formal financial institutions to borrow and lend money against their clients' deposits (Global Envision, 2006).

The concept of "microfinance" surfaced in the early 1970s to denote the innovative initiatives undertaken by institutions such as Grameen Bank in Bangladesh, spearheaded by Muhammad Yunus. Through

Grameen Bank, Yunus afforded the impoverished access to loans characterized by low interest rates, minimal capital prerequisites and the absence of collateral (Armendáriz de Aghion et al., 2004).

In the 1990s, numerous pilot projects in nations like Bangladesh and Brazil commenced the provision of microloans to collectives of low-income women, aimed at enabling them to invest in small enterprises. These initiatives employed a solidarity group lending model, whereby each participant assured the repayment of loans for her peers. The emphasis was predominantly on credit for income-generating pursuits, especially for women enduring severe poverty. Since the mid-1990s, the term "microfinance" has evolved to encompass a more extensive array of financial services, which include savings, insurance, payments and remittances largely facilitated by international NGOs and donor organizations (Global Envision, 2006). However, this expansion has raised questions about sustainability and impact, because while the intent is noble, challenges persist.

Microfinance institutions operating in Sub-Saharan Africa, like those found in other developing regions, have been the recipients of billions of U.S. dollars in subsidies and concessional funding. Global estimates suggest that this support exceeds $4 billion annually (as highlighted by CGAP, (2010) and referenced by (Hashemi et al., 2005). "A study conducted by CGAP (2010), revealed that foreign capital investment in microfinance has more than tripled since 2004, largely because of its notable growth and favorable perception of impact". However, MFIs in developing countries frequently rely on subsidized financial support (Hudon, 2008).

CGAP has delineated three fundamental principles of microfinance that emphasize the development of reliable domestic financial intermediaries, which can furnish long-term financial services to individuals with low incomes. These principles encompass the capacity to extend credit, mobilize domestic savings and provide a diverse array of services. As local financial institutions and private capital markets continue to evolve, dependence on donor and government funding is likely to decrease. Microfinance and microcredit are now acknowledged as essential instruments for economic empowerment and poverty alleviation, with over 10,000 MFIs operating worldwide. This too-while presenting its challenges-carries opportunities for innovation and change that will be better for the industry.

Microfinance started in Ethiopia in the year 1994-95. The government's licensing and supervising encouraged the development of MFIs. As per the law, the financial institutions both in rural and urban areas were allowed to mobilize public deposits, draft facilities, and undertake funds management on behalf of microfinance business enterprises. As a result, most of the microfinance service providers have

declared that their fundamental commitment is to provide tiny and accessible credits to the poor with a view to pro-poor development. The sustainability of MFIs in Ethiopia will, therefore, be of prime importance to attain MDG objectives and indicate the importance of the sector (Ramanaiah M.Venkata and Mangala C.Gowri, 2011).

2.3. Theory of Institutionalist Approach

The institutionalist approach to microfinance puts the utmost emphasis on the role of financial sustainability on the part of MFIs. Its proponents believe that MFIs should basically work toward establishing sustainable financial intermediation services that serve the needs of marginalized populations. The foundation of this perspective is that dependence on donor funding may be unstable (and unreliable), thus rendering financial self-sufficiency crucial. Institutionalists maintain that genuine sustainability implies that MFIs must generate enough revenue to cover all operational costs without external support. On the other hand, there is a strong emphasis on self-sufficiency, which has often resulted in "mission drift," where profitability becomes the main reason of an institution that had other original social goals. This poses a challenge: as important as financial performance is, it cannot take priority over the poverty alleviation and empowerment mandate that led to the creation of the MFI. Although a successful microfinance institution must balance financial independence with its dedication to social goals, it is vital to ensure both its viability and its effectiveness in combating poverty reduction (Woller, 2010).

2.4. Welfarist Approach

For welfarists, sustainability might be achieved by MFIs without necessarily attaining financial self-sufficiency, and the donor support is useful in such an attempt. In their view, donations are equity and not a shortfall, and donors are social investors, not stakeholders focused on profits. "According to Basu and Woller (2004) social investors are argued to look for a social, and intrinsic return rather than a financial profit, in contrast to private investors seeking equity returns in publicly traded companies. Consequently, the immediate social benefits of microfinance are often concentrated on by welfarists especially concentrating on poverty alleviation and improving quality of life for the most inexpensively vulnerable".

According to Basu and Woller (2004), Welfarists value "depth of outreach" over "breadth." They evaluate MFIs' performance based on social impact, rather than financial performance. Welfarists consider financial sustainability and outreach to a wide population important but should not be placed ahead of the mission to serve directly those in extreme poverty. In other words, they are less willing than Intuitionists (who prioritize financial viability and large-scale outreach) to forego meaningful poverty intervention in Favor of financial goals or institutional expansion. Instead, they gauge the performance of

MFIs in terms of improving participant well-being, along with community well-being, placing strong emphasis on vulnerable sections-which are essentially women.

The main interest of welfarists is the opportunity for increasing self-employment of the poorest layers of the economically active population, with an emphasis on women's empowerment. This empowerment is expected to have a knock-on effect, with even minor increases in income and savings helping these people and their families live better lives. They also feel that financial services should not just incorporate people into formal banking systems but provide a safety net whereby the immediate consequences of poverty in people's lives can be softened. Welfarists would understand that certain services may well require subsidies if this helps alleviate hardship in communities where poverty is rife.

Probably the most well-known manifestations of the Welfarist philosophy in operation include the Grameen Bank of Bangladesh, one of the early pioneers of microcredit, and with a very specific orientation toward poverty reduction through community-based financial services. Another such example would be FINCA, operating village banking programs first in Latin America, then into Africa and Asia. These institutions epitomize the Welfarist vision in the delivery of financial services that empower the individual and convey economic resilience to the threshold of families and societies.

2.5. Empirical Review

2.5.1. Financial Sustainability of Microfinance Institutions

The financial dimension of sustainability is arguably the most essential, particularly in terms of an MFI's ability to cover all expenses with revenue derived from its activities. financial sustainability means the absence of a need for continuous donor support to achieve microfinance objectives; this underscores the significance of self-reliance and profitability for MFIs. Financial sustainability can be divided into operational sustainability and financial self-sufficiency (Thapa et al., 1992).

Operational sustainability is present when an MFI can meet its operational expenses through income, independent of subsidies. However, financial self-sufficiency is realized when an MFI generates enough revenue to cover all operational, financing and subsidy costs at market rates. These definitions suggest that an MFI functioning at a loss is not financially viable; nor is one that asserts profitability while depending on subsidized operational costs. Thus, the distinction between these concepts is critical for understanding the dynamics of microfinance institutions (Dunford ,2003).

In the words of Brambilla, Franco, and Rodriguez (2009), the financial sustainability in MFIs is said to be attained when the MFIs can sustain their operation without depending on continuous support from

donors. "Nyamsogoro, (2010), explains it as a balance between the development and operational cost and the returns or income earned by it. The general measures in this area are operating income, current ratio and return on assets". Schreiner and Woller (2003) conducted a study in the United States, which revealed a positive relationship between the depth of outreach and financial self-sustainability. This finding challenges the prevailing notion that small loans are inherently risky (and thus) lead to diminished financial sustainability. Nyamsogoro (2010), on the other hand, analyzed the determinants of financial sustainability for MFIs in Nigeria and reported that breadth of outreach is negatively correlated with financial sustainability. In other words, increasing the number of borrowers does not add to the financial viability of MFIs, although this might have seemed intuitive at first sight.

Yenesew (2014) investigated the aspects that affect the financial performance of microfinance institutions in Ethiopia, and he focused on profitability as opposed to sustainability. In this regard, he considered ROA as the dependent variable, which was a detour from the proxies considered in previous studies. Kimando et al. (2012) undertook a study on sustainability of MFIs in Murang'a Municipality. The results indicated that financial regulations, client numbers, financial coverage and credit volume became the significant predictors of performance. Their work also focused on the need for regulatory frameworks, such as the Banking Act and the Association of Microfinance Institutions Act. While in some cases, geographic reach and regulatory oversight are duly considered for sustainability in MFI, these aspects could be excluded. However, this area of regulation and financial performance is one such interface, which is to be further explored.

Indeed, from the perspective of microfinance, sustainability may be seen and analyzed as existing at three levels: the individual, the group, and the institutional, relating it to features of organization, management, and financial health. According to Rao (2001), as cited in Kimando et al. (2012), while all these dimensions are important, debate on the financial sustainability of MFIs has attracted most interest because of their implications for long-term poverty reduction. Sustainability refers to an MFI's ability to cover all its operational and additional expenses through revenue generation, with the goal of making a profit. It is considered a significant measure of an institution's capability to operate independently without resorting to external subsidies. It has reshaped the way MFIs' performance is assessed, as sustainability belongs to the new set of key criteria together with outreach and other impact measures.

As Meyer (2013) puts it, "two useful types of sustainability can be differentiated: financial self-sufficiency and operational self-sufficiency". In the case of financial self-sufficiency, income earned by an MFI can

cover its operating costs and cost of funds as well as subsidies received at market rates. All the three identify the same measure, which is that financial sustainability is the total adjusted revenue over the total adjusted expenses. This ratio has a target of minimum 100%. An MFI on the other hand, is considered operationally self-sufficient if its operating income is adequate to cover all direct operational expenses. These comprise salaried workers, supplies, loan loss provisions, and administration.

The terms of financial and operational self-sufficiency should be differentiated. Whereas operational self-sufficiency can cover the day-to-day expenses, the MFI might still rely on subsidized funding. Then again, financial self-sufficiency is a more conservative benchmark since it requires that the MFI becomes fully self-reliant, fully covering all costs, including capital costs and loan losses, without any support from outside. As Meyer (2013) explained, financial self-sufficiency represents a better proxy for sustainability because it gives MFIs a solid and durable foundation for ongoing service delivery to clients independent of subsidies. This aspect is especially critical in microfinance, since poor people's demands for financial services are continuous rather than a one-time loan or temporary relief.

Thirdly, financial sustainability enables MFIs to focus on their obligations to reach clients in rural and under-served areas where poverty alleviation is highly needed. "According to Meyer, (2012), financial self-sufficiency indicates the MFI's ability to survive and expand without recourse to episodic subsidies; this, he says, assures them of sustained community impact. The philosophy of sustainability is, therefore, pegged on the premise that microfinance should build long-term economic resiliency, as opposed to meeting temporary financial needs". Therefore, what ultimately benefits the poor is the consistent, long-term access to financial services that promote economic self-sufficiency and not dependence.

AEMFI (2014) adds, "Financial sustainability refers to all costs covered on an adjusted basis and means that the MFI is able to operate independently of on-going external assistance." Adjustments would normally include inflation, loan loss provisions, and the cost of capital. Financial sustainability, though desirable, is quite challenging. For most major stakeholders, sustainability or financial self-sufficiency has become the defining criterion of a successful MFI.

Thus, in the 21st century, microfinance has emerged as one of the primary tools in the fight against poverty, particularly in rural areas of sub-Saharan Africa where formal banking systems are at a minimal. Regarding the long-term sustenance of poverty challenges, self-sufficiency-oriented MFIs are more promising for offering long-term access to financial resources and general economic empowerment for impoverished populations (Ramanaiah & Gowri, 2011).

2.5.2 Financial Self-Sufficiency

Various indicators have been employed in previous studies; however, recent research has concentrated on Financial Self-Sufficiency (FSS), Operational Self-Sufficiency and profitability ratios, such as Return on Assets (ROA) and Return on Equity (ROE), to evaluate the financial sustainability of microfinance institutions (MFIs) (Ayele, 2014). The dependent variable, financial sustainability with is proxy variable financial self-sufficiency refers to the capacity of microfinance institutions (MFIs) to sustain their operations without depending on continuous donor support. As highlighted by Nyamsogoro (2010), this encompasses aligning development and operational expenditures with the revenue generated. The research in this aspect usually focuses on measures such as operating income, current ratio, and return on assets.

These are essential measures since they determine how independent an MFI is from any donor support. FSS is the ability of an MFI to cover all costs, inclusive of allowances for inflation and subsidies, through operational income it generates. A percentage of 100% or higher shows financial viability, but this is deflated by inflation, which in turn may raise dependence on external capital. Previous studies have identified crucial factors affecting financial sustainability primarily utilizing operational and financial self-sufficiency ratios as proxies for sustainability measures. These ratios incorporate various explanatory variables; however, they include characteristics of the financing firms, outreach indicators and macroeconomic factors. These proxies have yielded substantial evidence in relation to the factors instrumental for the financial sustainability of MFIs, in the context of Ethiopian MFIs. That is important as it shows how financial dynamics in the region are not straightforward, but others may argue that the whole ratios do not tell the whole story.

2.6. Determinants of Financial Sustainability

2.6.1. Capital Adequacy

The capital adequacy represents an important feature of financial sustainability because it reflects the overall safety and risk profile of the institution. The costs of financial distress related to well-capitalized MFIs are lower, which enhances their long-term viability. While high levels of capital may permit MFIs to undertake high-return opportunities, this also contributes to improved stability of finance. Still, this capital adequacy ratio protects depositors, promotes operational efficiency, and is focused on Tier 1 capital, which absorbs loss without disrupting operations, and Tier 2 capital, which has limited protection in case of liquidation. There is a negative relationship between capital adequacy and financial sustainability in his study, which covered 43 financial institutions in Kenya. On the other hand, Oludhe, in his 2011 study, established that although the capital adequacy variable was a weak predictor of performance,

the CAMEL elements were strong determinants of financial performance, explaining 59.4% to 94.3% variation in performance in different years through regression analysis (Nyanga ,2012).

2.6.2. Breadth of Outreach

The outreach in microfinance is very often operationalized by the number of clients reached; there is a substantial number of research underlining its significance when evaluating the sustainability. For example, Kinde, B.A., (2012) identified that the number of borrowers might impact sustainability. On the other hand, Nyamsogoro (2010) disclosed a negative correlation between outreach breadth and sustainability in Tanzanian MFIs, mainly due to the incapability of the service provided for a more significant number of borrowers.

However, several other studies still claim that the outreach programs should focus, besides the number of clients, which is essential, on trying to reach the poorest sections also. The average size of the loan as an outreach depth indicator based on the evidence of small loans given to poorer clients. However, this measurement isn't without inefficiencies; it cannot always reflect the borrowers' actual extent of poverty (Mersland and Strom, 2009; Cull et al., 2007).

The trade-off between outreach depth and sustainability is, however, not easy. For instance, Schreiner and Woller (2002) noted that smaller loans are normally more risky and less sustainable. Other scholars, such as Cull et al. (2007) have, however found that smaller loans are not necessarily less profitable. Whereas Hulme and Mosley (1996) argued that serving the low-income clients with small loans is costly and possibly threatens sustainability, the question is still open to debate.

The greater the loan volumes targeted, the lesser the operational costs and higher the chances of more sustainability (Nyamsogoro, 2010; Quayes, 2012). Most studies conducted in India, especially those conducted by Zerai and Rani, (2012) have indicated an insignificant linkage between average outstanding loan balance and FSS. Nyamsogoro (2010), however, stated that with a higher loan volume, the risk of default would be lower and operational costs would fall, thereby yielding higher sustainability.

In fact, Alain et al. (2007) depicted that increasing the number of borrowers per microfinance institution reduces average operating costs because total operating costs rise less than proportionally with the increase in borrowers. In other words, it means that the expansion in the number of clients per field officer could enhance the sustainability indicators such as FSS and OSS. Alain et al. (2007) also identified increasing the caseload per field officer as one of the feasible cost-reduction strategies, at least for group-based delivery models.

In group-based models, there may be economies of scale in servicing a larger clientele. However, several studies show that larger loans can still be more costly to manage in India. Hence, outreach versus sustainability is not an easy balancing act to perform, since breadth-depth trade-offs pose different challenges and opportunities for MFIs (Zerai and Rani, 2012). Surprisingly, it does not appear to affect repayment rates, even while it may somewhat reduce monitoring intensity. Drawing from the study, economies of scale in microfinance are easier to achieve by expanding the borrower base rather than diminishing outreach depth or a shift away from serving low-income clients. Therefore, this finding points to the number of active borrowers having a positive impact on operational and financial sustainability regarding MFIs.

Mersland et al. (2007) investigated the impact of active borrowers on the viability of MFIs. Their findings tend to indicate that there is a positive relationship between the number of active borrowers and MFIs viability, though this is merely an implication since the variables are not directly related in their analysis.

2.6.3. Leverage

Leverage is the use of long-term debt to finance an entity, which generally requires input by various forms of owners and is generally measured as the impact of leverage on the financial performance of MFIs is multifaceted (Rahman & Mazlan, 2014). While some researchers report a positive relationship between leveraging and profitability, others show a negative linkage. Kinde (2012) derives no substantial impact of capital structure on sustainability of MFI. However, Rhyne (2012) indicated that MFIs that are equity-based capital-structure stronger usually emerge more profitable. MFIs also need to be strategic in planning their capitalization as some introduce new investors or increase their debt. "Donohe (2010) reported that mature MFIs have lower levels of leverage than those of traditional banks". Contrary to this argument, Muriu (2011) asserts that the level of profitability increases at higher level of leverage during economic booms since it enhances return on equity.

Several studies have been conducted and highlighted whether the capital structure of MFIs determines their long-term sustainability or not. For example, Kyereboah (2007) revealed that highly leveraged MFIs are in a better position to deal with moral hazards and adverse selection than MFIs with a low level of leveraged ratio. This suggests the fact that high leverage and profitability are positively correlated. Bogan et al. (2007) analyzed whether an MFI's capital structure determines its financial sustainability or not. They observed that the capital structure of microfinance organizations was related to their financial sustainability.

2.6.4. Age of MFIs

The age of the MFI is often an indicator of its financial viability because older MFIs would always have an edge in terms of reputation, experience in operations, and customer loyalty. Indeed, research has documented the fact that longevity is typically followed by increased credibility and better access to funding, which subsequently contributes to sustainable practices. Some literature does, however, argue against a distinct nexus between age and sustainability. For example, Nyamsogoro (2010) and Nadiya and Ramanan (2011) present the case of variables such as management practices, market conditions, and regulatory environment that may be more relevant. The present study is thus an in-depth investigation of the relationship between MFI age and financial sustainability within the Ethiopian context and attempts to contribute to the growing debate on the determinants of MFI performance.

According to Nyamsogoro, 2010, there is a positive correlation coefficient between the capital structure and the financial sustainability of microfinance institutions. In other terms, the more an MFI is equity financed in comparison to the other sources of finance, the better its sustainability. This therefore means that though how capital is structured affects financial sustainability, Bogan et al, 2007, having different sources of capital does not improve the financial sustainability of microfinance institutions.

2.6.5. Size of MFIs

This is also one of the most important factors that determine the financial sustainability of MFIs, usually measured by total assets. On one hand, most of the empirical studies reported the positive relationship between the size of MFIs and their financial performance. Several studies such as Mersland and Strom (2009); Hermes et al. (2008); Bogan et al. (2007); Hartarska (2005) confirm this relationship. Kyereboah et al. (2007) confined their study to MFIs in Ghana only and reported that bigger institutions tend to achieve higher profitability. However, such a result leads to many more questions about size and operational efficiency since the results cannot be generalized. Although there was a trend discernable, the peculiarities of an individual institution also needed consideration. Furthermore, Hartarska and Nadolnyak (2007) showed that increasing size for MFI positively affects the FSS, which again confirms that size can enhance operational capacity, efficiency, and outreach potential. Larger MFIs are often better positioned to spread costs over more clients with greater profitability and financial stability. This helps in attracting larger and diverse resources and more effective risk management abilities thus, ensuring their own sustainability. This evidence further reinforces the argument that size matters in microfinance but also indicates that MFI strategies to expand may be correlated with better financial performance and sustainability in the longer term. The Collective Benefits of Size in Microfinance: An Exploration of the

Field- and Market-Level Consequences of MFI Size. As the microfinance sector continues to grow rapidly around the world, the role of size – both on how and why practitioners choose to attain it and the performance implications of these choices – remains highly relevant for practitioners and policy makers alike.

2.6.6. Inflation Rate

Precise valuation of MFIs' contribution to economic development calls for a clear understanding of the interconnection between a country's macroeconomic environment and the MFIs' sustainability. The general state of the economy largely influences MFI performance. For example, Ahlin and Maio (2011) illustrated that economic growth increases the probability of MFIs reaching cost sufficiency; conversely, MFIs operating in economies with greater financial "depth" are usually faced with lower default rates, operational costs, and interest rates. Although competition from other sectors such as manufacturing hurts the outreach efforts of MFIs, it is a very important relationship to understand because it does dictate how well MFIs can meet their goals of fostering financial inclusion.

The empirical literature indicates that the performances of a firm are considerably influenced by the macro-economic variables, especially inflation. GDP growth and inflation were two major determinant factors. In this regard, the factor that is considered most important is inflation, which is usually understood as a perpetual rise in the common level of prices over a certain period. As Fisher's theory of inflation, in the year 1930, noted that an increased money supply leads to high inflation rates and interest rates. The Fisher Effect predicts nominal rates to be equal to the sum of real rates plus expected inflation, while real rates are determined by economic factors such as productivity of capital and investor preferences (Vingo, 2012).

2.6.7. Rate of Growth of GDP

Previous literature relies on most occasions, on the backbone of macroeconomic aspects in measuring the performance of MFIs. Most of them often rely on exogenous market forces as the main determinant of the performance of a firm, such as Hansen and Wernerfelt (1989); Bogan (2009); and Vingo (2012). Most often, they tend to dwell on the level of GDP growth and inflation as the two leading determinants of performance indicators of MFIs. The average loan size in developing countries respects GNI per capita because it acts like a summary of how macroeconomic indicators contribute to the performance of MFIs.

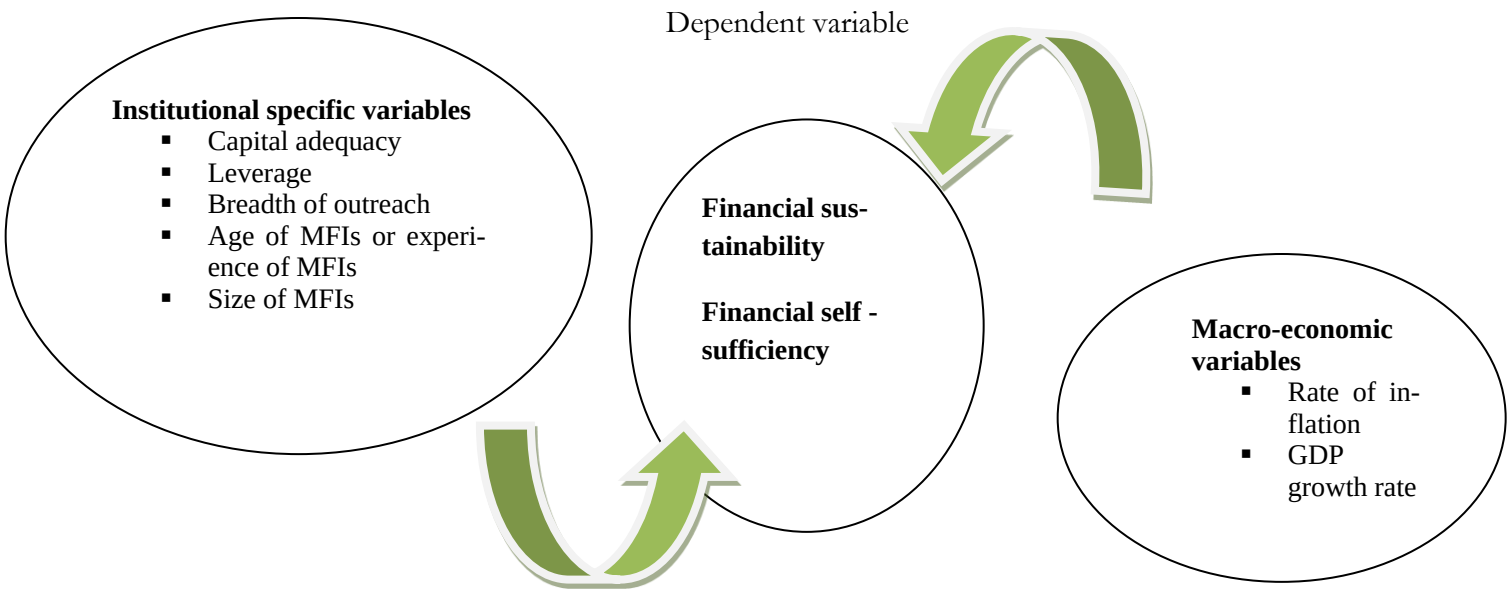
Evidence exists that GDP growth contributes positively to MFI sustainability because the general income increases, thereby increasing clients' capacity to repay. It is again thus indicative of the economic

conditions and the ability of MFIs to operate in an interrelated way, indicating a need for further understanding of such linkages between the conditions at the macro level and how they can affect MFIs (Hansen & Wernerfelt, 1989). Hence, policymakers and practitioners would have to take them into account when designing strategies since the aim is that MFIs in developing countries can grow with stability.

2.7. Conceptual Framework

As shown in Figure 1, the conceptual framework explains the relationship between the dependent variable and the explanatory/independent variables. In this study, the independent variables are financial determinants on the MFIs namely capital adequacy, leverage, breadth of outreach, age of MFI, size of MFIs, inflation and GDP whereas Dependent variable was sustainability of MFI s in Ethiopia.

FIGURE 1: CONCEPTUAL FRAMEWORK



Source: Various theoretical and empirical literature

This chapter has the potential to teach some lessons on financial sustainability for MFIs that are vital for their long-term existence other than being reliant on donor funding. Core components include FSA, OSS and profitability measures, including return on assets (ROA) and return on equity (ROE). While a better capitalization of an MFI can make it more resistant to a financial crisis, a larger outreach usually reveals a dubious relation with sustainability. The explanation behind this phenomenon rises from the fact that the recent increase in borrowers can cause a decrease in operational efficiency chiefly owing to the rise in fixed costs. Additionally, it is highly dependent on leverage and the maturity and scale of MFI. Institutions that have been operational for extended periods (and those that are larger) usually exhibit substantially greater financial stability. Additionally, macroeconomic factors such as inflation and GDP growth also influence MFI sustainability, since they contribute to creating additional repayment capacities for clients.

This paper aims to investigate the relationships proposed earlier in the Ethiopian context of MFIs (microfinance institutions) focusing on the differences in resource mobilization strategies (as well as) macroeconomic environments towards long-term sustainability. To further enhance understanding of financial sustainability, the findings will inform appropriate policy and operational decisions in the microfinance field. It is important but still a guess, because the complexities involved could lead to various

implications, since MFIs could react differently. While these dynamics are what the research tries to explain, the results are contextual.

CHAPTER THREE
RESEARCH METHODOLOGY

3. 1. Introduction

This Chapter covers the research design, research approach, target population, sampling technique, sample size, methods of data collection, data processing and analysis**,** operational definition of variables used in the analysis and measurements and model specification.

3.2. Research Design

Owing to the objectives of this study, explanatory research design, which can help to explain and understand how a certain factor influences specific outcomes, is used. The study seeks to examine what determines financial sustainability of MFIs, where financial stability is described as the ability of microfinance institutions to maximize the use of their resources.

In this regard, financial sustainability is considered as the dependent variable and institutional characteristics (including age of microfinance institution, experience of MFIs, size of MFIs, breadth of outreach, leverage, and capital adequacy) together with two important macroeconomic factors such as inflation and GDP are considered as the explanatory variables. Data was collected from the financial statements provided by the National Bank of Ethiopia from 2008 to 2023.

3.3. Approach to Research

A quantitative research approach is used in this study because it allows the measurement and testing of the relationship between the measurable factors affecting the financial sustainability of microfinance institutions in Ethiopia. Both the independent and dependent variables can be measured quantitatively. Quantitative research is usually an objective designed to create and utilize mathematical frameworks, models, and hypotheses in relation to natural processes (Kothari, 2004).

3.4. Study Population

The study population for this research comprises of all microfinance institutions that are currently operating in Ethiopia. Currently, there are about 40 active microfinance institutions that provide microfinance services to the poor society in Ethiopia. In this study, a census method was adopted to include all micro-finance institutions operating in Ethiopia. For this reason, the analysis covers all the 40 microfinance institutions whose data was gathered over a period of 16 years from 2008 to 2023, thereby yielding a total of 640 observations. It is, therefore, the assurance that this approach does provide a

comprehensive and relevant survey of financial sustainability determinants among the mentioned institutions. Below is Table A1 in the appendix has a list of 40 MFIs in Ethiopia, indicating the year of establishment.

3.5. Data source and type

To examine the factors that determine the financial sustainability of MFIs, the researcher utilized unbalanced panel data on MFIs in Ethiopia for the years 2008 through 2023 because some institutions have incomplete data for certain years due to factors such as differences in establishment dates and some other factors.

3.6. Methods of Data Analysis and presentation

The study uses descriptive statistics and regression analysis to test the hypotheses developed for the study, besides investigating the relationship of the explanatory variables with the financial sustainability of MFIs in Ethiopia. The cleaning and analysis of data, based on variables and objectives of the study, are done using STATA version 18. This is a multiple regression analysis that determines the strength of the relationship between dependent and independent variables.

3.7. Model specification

To achieve the objectives of this study, the following multiple regression model was formulated.

$$FS_{it} = \beta_0 + \beta_1 CA_{it} + \beta_2 LGE_{it} + \beta_3 BOU_{it} + \beta_4 AGE_{it} + \beta_5 SOM_{it} + \beta_6 INF_{it} + \beta_7 GDP_{it} + \varepsilon_{it}$$

Where FS = Financial Sustainability

CA = Capital adequacy

LGE = Leverage

BOU = Breadth of outreach

AGE = Age or experience of MFI

SOM = Size of MFIs

INF = Inflation

GDP =Gross domestic product and

ε_{it} is the error term,

β_1 to β_7 are coefficients which show the impact of each explanatory variables on the outcome variables.

In this study, a key challenge encountered was the potential for sample selection bias, particularly due to the use of unbalanced panel data. This means not all MFIs may have complete data across the study period. To minimize this bias, one could apply Heckman's two-step correction method or adopt fixed and random effects models to control for unobserved heterogeneity across MFIs.

Additionally, multicollinearity among independent variables could distort the regression results, particularly if some of the variables, like size and leverage, are highly correlated. A variance inflation factor (VIF) test could help identify and address this issue by removing or adjusting for variables that exhibit high collinearity.

To ensure accuracy and robustness, the study has also implemented a series of checks. Robust standard errors are applied to account for heteroskedasticity, as previous tests indicated its presence. Furthermore, fixed or random effects models are employed to control for any time-invariant characteristics of the MFIs, ensuring that unobserved individual effects do not bias the results.

3.8. Techniques to Check Robustness

3.8.1. Sensitivity Analysis

A sensitivity analysis was conducted to assess the robustness of the study's findings by evaluating how changes in model specification affect the results. This process involved systematically altering the model by excluding specific variables to observe how their absence influenced the overall outcomes. By comparing the performance of different model specifications, the analysis aimed to identify whether the key relationships between variables, particularly the explanatory variables, remained consistent. This approach helps to ensure that the study's conclusions are not overly reliant on the inclusion of certain variables and provides a more comprehensive understanding of the factors influencing the dependent variable.

3.9. Definition of Variables and their Measurement

3.9.1. The Dependent Variable and its Measurement

Financial sustainability refers to the ability of a microfinance provider to cover all its costs on an unsubsidized basis or without accepting donation. According to the United Nations, sustainability is necessary to reach a larger number of people on an on-going basis (Elia, 2006). If MFIs remain dependent on limited donor funding, they will be able to reach only a limited number of people.

The dependent variable, financial sustainability can be measured with its proxy variable, financial self-sufficiency which can be measured as follows:

$$\text{Financial Self-Sufficiency (FSS)} = \frac{\text{Adjusted Financial Revenue}}{\text{Financial Expense} + \text{Loan Loss Provision} + \text{Operating Expenses}}$$

3.9.2. Explanatory Variables and their Measurement

The choice of predictor variables is based on their theoretical relationship with the outcome variable. The chosen predictor variables are expected to partly explain the variation of the outcome variable. These explanatory variables and their measurement are as follows.

a) Capital adequacy (CA): refers to the amount of capital that financial institutions maintain to reduce risks and absorb losses. So, it can be measured as

CA = Total equity/Total asset.

b) Leverage (Lge): refers to the use of borrowed funds to increase the value of return to investment. It is measured as:

LGE = Total Debt/Total Asset.

c) Breadth of outreach (BOU): refers to the number of clients served by an organization. It is also operationalized as the natural logarithm of active borrowers and refers to the number of clients served by the MFI.

BOU =log (active borrowers)

d) Age of MFIs (AOM): refers to the number of years that a microfinance institution has been in operation since its establishment. So, it can be measured as number of years from establishment to years of investigation.

e) Size of MFIs (SOM): this variable shows the scope of the MFI it covers and was measured as the natural logarithm of total assets of respective MFIs. Experience of microfinance institution also refers to how many years each of the microfinance institutions has been in service, with each observation starting from the very first year of service. SOM =log (total asset)

f) Rate of inflation (INF): the rate of inflation formula measures the percentage change in purchasing power of a particular currency, was measured as average annual general inflation rate.

g) Real GDP growth rate (GDP): I measure how much more the economy produced than the previous quarter. It was measured as the rate of changes in real GDP at the country level.

3.10. Hypothesis Testing

To address the objectives of this study, the following hypotheses were formulated based on the relationship between dependent variable (proxied by financial self-sufficiency) and independent variables (capital adequacy (CA), Leverage (LGE), breadth of outreach (BOU), age of MFIs (AGE), size of MFIs (SOM), inflation (INF) and GDP). Accordingly, for each of the variables in the model the following seven null and alternative hypotheses were formulated.

1) H_0: There is no significant relationship between capital adequacy and financial sustainability.

   H_1: There is a significant relationship between capital adequacy and financial sustainability.

2) H_0: The relationship between leverage and financial sustainability is not significant.

   H_1: There is significant relationship between leverage and financial sustainability.

3) H_0: There is no significant relationship between breadth of outreach and financial sustainability.

   H_1: The relationship between breadth of outreach and financial sustainability is significant.

4) H_0: The experience of MFIs and its relation to financial sustainability are not significant.

   H_1: There is a significant relationship between experience of MFIs and financial sustainability.

5) H_0: There is no significant relationship between size of MFIs and financial sustainability.

   H_1: There is significant relationship between size of MFIs and financial sustainability.

6) H_0 There is no significant relationship between inflation and financial sustainability.

   H_1: There is significant relationship between inflation and financial sustainability

7) H_0: There is relationship between GDP and financial sustainability is not significant.

   H_1: There is significant relationship between GDP and financial sustainability.

Table 3.1 below provides a summary of the description of variables, with their measurements and symbols and the direction of the relationship between the dependent variable and each of the explanatory variables.

TABLE 3. 1:SUMMARY OF VARIABLE DEFINITIONS AND DIRECTION OF RELATIONSHIP

No	Variables	Measurements	Symbol	Expected impacts
1)	Dependent variable			
	Financial self sufficiency	Total Revenue/Total expense	FSS	
2	**Independent variables**			
	Capital adequacy	Equity/total asset	CA	+
	Leverage	Total debt/ equity	LGE	-
	Breadth of outreach	Log of no of active borrowers	BOU	- +
	Age or experience of MFIs	The Number of years from establishment to the year of investigation.	Age	+
	Size of MFIs	Natural log of total asset	SOM	+
	Inflation	Measured as average annual general inflation rate.	INF	-
	Gross domestic product	measured as the rate of changes in real GDP at the country level	GDP	+

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

While the previous Chapter outlined a description of the research methodology which was designed to achieve the research objectives, this Chapter presents the results from the analysis and discussion of findings. We will first present descriptive statistics, followed by a random effects panel data regression results, and finally discusses and summarizes the findings. Before deciding the estimated model, we carried out some test procedures including a correlation matrix, a normality test, a heteroskedasticity test, a multicollinearity test, model selection test - Random Effects versus Fixed Effects Models or Hausman test. All these tests are presented in the Appendix.

4.2. Descriptive statistics

Table 2 provides the descriptive statistics of both the dependent and independent variables. That is the means and standard deviations with their corresponding observations

TABLE 4. 1: DESCRIPTIVE STATISTICS

	(1)	(2)	(3)	(4)	(5)
VARIABLES	N	mean	sd	min	max
Financial self sufficiency	513	1.89	0.68	0.09	3.73
Capital Adequacy	513	0.43	0.15	0.12	0.95
Leverage	513	0.42	0.20	0.04	0.97
Breadth of outreach	513	4.94	1.67	0	9.61
Age of MFI	513	13.12	6.75	1	29
Size of MFI	513	7.98	1.10	4.82	10.96
Inflation	513	19.02	10.35	2.80	36.40
Gross Domestic product	513	8.30	1.94	5.30	11.40

Source: Own computation using data from NBE, 2023

From the descriptive statistics shown in Table 4.1, the mean, maximum and minimum values and standard deviations of MFIs FSS are 1.89, 3.73, 0.9 and 0.68 respectively. The mean of FSS (1.89), indicates that on average the MFIs, are generating revenues that are 1.89 times what is needed in order to cover their costs. This suggests that they are financially sustainable, and they are operating at a surplus. Typically, a value above one, indicates financial sustainability, which means they are earning enough to cover

their costs without loan, grant and external support (Mirani,2015). The standard deviation of FSS (0.68), indicates how much FSS values deviate from the average. Thus, a standard deviation of 0.68 identified from this study is considerably higher as compared to similar findings from other studies both globally (Bogan, 2009) and within Ethiopia (Mirani, 2015).

Capital adequacy ratio has a mean of 0.42 in the study period with a standard deviation of 0.15, a minimum of 0.12 and maximum of 0.95. Microfinance Institutions tend to hold almost 42% of adequate capital; as shown by an average capital adequacy of 0.43. Capital adequacy has a SD of 0.15 which indicates a significant variability in capital adequacy across institutions in the data set. The mean of capital adequacy is relatively higher than the MFI average capital adequacy scores recorded for Central Africa, Eastern Africa, Western Africa, and the whole continent of Africa that were estimated at 0.26, 0.39, 0.9, and 0.78 respectively (Bogan, 2012).

On leverage, during the study period, that is from 2008 to 2023, Ethiopian MFIs had a mean, standard deviation, minimum and maximum of 0.42, 0.20, 0.04, and 0.97, respectively. In addition, according to AEMFI (2014), capacity to borrow from commercial lenders has traditionally been somewhat limited for Ethiopian MFIs. According to AEMFI, if the average leverage is below 1.5, the financial institutions are considered to have low leverage position. Whereas if the leverage is above 1.5, it indicates that the financial institution is reliant on borrowed funds, leading to financial risk. Meanwhile, the average leverage ratios of MFIs for Central Africa, Eastern Africa, Western Africa, and the entire African continent were 4, 3.14, 2.15, and 2.41, respectively (Bogan, 2012). From the above regional averages, Ethiopian MFIs appear to be at a low leverage position, even below the threshold value of 1.50 (Hasan, 2018).

The mean value of breadth of outreach is 4.94 with a standard deviation of 1.67, and it reaches a minimum of 0 and maximum value of 9.6 value. The common perception is that the wider the outreach (that is, the higher the number of borrowing clients, the greater the outreach, and consequently, the sustainability of the microfinance institution (MFI). The average breadth of outreach shows that microfinance institutions typically maintain log transformed value of 140 of active borrowers. This is because breadth of outreach is measured by natural logarithm of active borrowers, which is suggesting that microfinance institutions can serve an average of around 140 active borrowers. The standard deviation of 1.66 for the breadth of outreach indicates how much variation there is in the number of clients across the microfinance institutions in the data set.

Regarding experience of microfinance institutions in Ethiopia, the average year of operation (captured by age) is 13 years. We define life cycle benchmarks proposed by Bogan (2009), where MFIs are characterized as new (0-4 years), young (5-8 years), and mature (greater than 8 years). Using these benchmarks, an average Ethiopian MFI will be considered mature since the average operation time stands at 13 years. The maximum experience for mature MFIs is 29 years while the minimum age for young MFIs is 1 year. The average operation period is comparable to that of Central, Eastern, and Western Africa that showed an average operation period of 13, 11 and 12 years respectively (CGAP, 2003).

Turning to size of MFIS, the mean size is 7.98 (log scale), while the standard deviation, minimum, and maximum values are 1.10, 4.82, and 10.96 respectively.

Furthermore, the mean values of GDP growth and inflation values for Ethiopia for the 16 years were found to be 8.3 and 19 respectively.

4.3. Model Selection (Hausman Test)

Hausman test is applied in panel data analysis to decide whether to apply random effect or fixed effect model. The econometric model applied to investigate the factors that affect financial sustainability in Ethiopian microfinance institutions can be estimated as panel data regression using either a fixed-effects or a random-effects approach. According to Brooks, (2019), this study considered the Hausman specification test with a view to selecting the appropriate approach. Therefore, the hypothesis to test model selection was stated as follows:

H0: random effect model is appropriate.

Ha: fixed effect model is appropriate $\alpha = 0.05$

TABLE 4. 2: HAUSMAN SPECIFICATION TEST

variables	Fixed Coeff. (b)	Random Coeff. (B)	Difference (b-B)	Std. Error
Capital Adequacy	0.258	0.278	-0.019	
leverage	-0.094	-0.357	0.263	0.099
Breadth of out-reach	0.021	0.023	-0.003	
Age of MFI	0.044	0.038	0.006	0.005
Size of MFI	0.351	0.315	0.035	0.015
Inflation	-0.018	-0.013	-0.004	
Gross Do-mestic Product	0.002	0.002	-0.004	

Source: Own computation using data from NBE, 2023

TABLE 4. 3: HAUSMAN SPECIFICATION TEST

	Coef.
Chi-square test value	11.836
P-value	0.106

Source: Own computation using data from NBE, 2023

As it observed from the Table 4.2 above, the Hausman specification test of the model has a value of p = 0.106. This result shows that random effect model is more appropriate than fixed effect model, because the null hypothesis is not rejected.

4.4. Panel Data Regression Result and its Discussion

4.4.1. Random effect regression results

TABLE 4. 4: REGRESSION RESULTS

VARIABLES	(1) Financial Self Suffi-ciency
Capital Adequacy	0.280***
	(0.106)
Leverage	-0.358**
	(0.172)
Breadth of Outreach	0.0234**
	(0.0108)
Age of MFI	0.0379***
	(0.00751)
Size of MFIs	0.315***
	(0.0337)
Gross Domestic Product	-0.0137
	(0.0117)
Inflation	0.00156
	(0.00129)
Constant	-1.157***
	(0.266)
Overall R-squared	0.316
Adjusted R-squ	0.43
Observations	513
Number of Microfinance	40

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Own computation using data from NBE, 2023

In fact, the multiple regression of this study produces reasonably satisfactory results: R-square equated to 32% and the Adjusted R-square was 43%. The Adjusted R-square shows that about 43% of variation in financial self-sufficiency is explained by the independent variables. The remaining portion, amounting to 57%, is determined by factors outside of the model. In addition, the R-squared and Adjusted R-squared in this study are also well above that obtained from previous studies carried out in Ethiopia and other regions for similar topics. Furthermore, for the panel data, an R-square value greater than 20% is generally good enough to make reliable inferences (Wooldridge, J. M. 2010).

For determining financial sustainability, an analysis of each of the explanatory variable and its importance is provided in detail. Furthermore, the study's statistical findings will be compared with previous empirical evidence in the discussion. Relationships between the explanatory variables and financial sustainability will be examined in the following sections.

4.4.2. Capital adequacy

Capital adequacy significantly influences financial sustainability with a coefficient of 0.28 and the effect is statistically significant at the 5% significance level. From this, we can come to the conclusion that a one-unit increase in the level of capital adequacy-that is, the sum of total assets in relation to total equity-will raise the level of financial sustainability by 0.28 units. The finding confirms a positive relationship of capital adequacy and financial sustainability also expressed in earlier studies by Bogan, (2009), and Magali, (2013). However, the result was at variance with the findings of the study conducted by Deribie, (2013), Kyereboah Coleman, (2007), and Tilahun, (2013), who concluded there was no significant relationship between capital adequacy and financial sustainability. However, there are a number of empirical studies such as Dunford 2009, Fama and French 2001, Davis et al. 2004, Ahlin and Jiang 2008, Kania and Bacon 2005, Robinson 2001 and Gill et al. 2010 that report capital adequacy has a positive impact on financial sustainability.

Besides the direct implications on financial sustainability, capital adequacy enhances the loss-absorbing capacity and credibility of MFIs, which may attract funds to feed growth sustainably and reinforce long-term viability. On the other hand, too much focus on capital adequacy could restrict credit expansion in favor of outreach and impact.

While these findings are well supported, with a positive relationship between capital adequacy and financial sustainability, they do need to be put into a broader operational and regulatory context of Ethiopian MFIs. The balanced approach will view not only the strengths brought about by strong capital adequacy but also the need for strategic growth that will ensure their long-term sustainability.

4.4.3. Leverage

The study found that leverage affects FSS negatively with $\beta = -0.358$, and $p < 0.05$, which is significant. More precisely, in the case of a 1 unit increase in leverage, or in other words, in the case of increasing total debt relative to total equity, financial sustainability will be reduced by 0.36 units. This result is consistent with the study findings of Beg (2016) and Abdur Rahman and Mazlan (2014), who noted that leverage is a negative significant predictor of financial sustainability. On the other hand, the finding of this study contradicts with the study result of Dissanayake (2012), which showed that the higher the

leverage, the higher the sustainability. Our finding confirms the finding from Nadolnyak and Hartarska (2007) who concluded that a financial institution with low leverage as an indicator of financial healthiness.

The results show that, although a lot of leverage can get you some capital to expand, leverage in MFIs has large negative effects that threaten their (and their clients') long-term development. By leverage, we mean borrowed money and debt instruments; by "large negative effects," we specifically mean that they hit operational self-sufficiency hard and are likely to hit financial self-sufficiency. But the most important finding might be that it has substantial negative effects when MFIs work in very risky environments, as many do that we studied (especially in Ethiopia).

4.4.4. Breadth of outreach

As shown in Table 4.4 he coefficient for breadth of outreach is positive and statistically significant at the 5% level of significance. The analysis carried out indicated that outreach positively predicts the financial sustainability of MFIs, as shown by a coefficient of determination which was $\beta = 0.0234$, $p < 0.05$. This means that for every additional active borrower, financial sustainability goes up by 0.023 units. This finding is supported by a similar finding of Tilahun (2013), where the relationship between outreach and financial sustainability is also found to be positive and significant. This, on the other hand, contradicts the findings of Deribie et al. (2013), Kyereboah-Coleman (2007), and Tilahun (2013), who found that negative and insignificant relationship between outreach and financial sustainability.

In critically interpreting this argument, one must take into consideration that, though broader outreach may lead to financial sustainability, it can also be managed with care. The rapid growth of its outreach could affect the financial health of the institution, leaving it vulnerable to either insufficient resources or inadequate risk management. While this research certainly affirms the positive role of pro-poor outreach, it also suggests that microfinance institutions must couple their ambitious plans for outreach with steady financial governance if they are to achieve long-term survival.

4.4.5. Experience or Age of MFIs

Age has a positive and significant impact on financial sustainability at the 5% level of significance as indicated from Table 4.4 above, the regressions coefficient indicates that age predicted the financial sustainability of MFIs ($\beta = 0.0379$, $p < .05$). This means that for each added year of age, there is a corresponding increase of 0.038 units in FSS. This confirms the works of Cull et al. (2007), Bogan et al. (2007), and Robinson (2001) on the positive and significant relationship between age of MFIs and FSS.

The result contradicts with findings of Nadiya (2011) and Nyamsogoro (2010), since their findings indicated that age of MFIs does not significantly influence FSS.

Even though there is a positive relationship between age and financial sustainability, this does not necessarily imply that it would result in better financial sustainability because of market conditions, competitive pressures, and strategic decisions playing their role. Some of the older MFIs can be found burdened with outdated practices or greater operational complexity respecting such aspects, hence affecting their financial performance. Therefore, though age may help in explaining the reason behind financial sustainability, it is one of the various variables that fix the position of MFI concerning financial sustainability.

4.4.6. Size of MFIs

The size of MFIs, with its coefficient of 0.315 and significant at the 5% percent level, had a positive effect on FSS. This implies that a unit increase in the total asset of MFIs increases FSS by 0.315 units. Therefore, the size of MFI has a positive effect on financial sustainability. This coherently agrees with the findings of Bogan (2009) and Magali (2013) in pointing out a positive relationship between the size of MFIs and their financial sustainability. The positive coefficient shows that increasing asset size positively impacts FSS of microfinance institutions. The results also coincided with the findings of Beg 2016; Abdur Rahman and Mazlan 2014, which established the positive influence of the size of MFI on FSS.

Size increase alone, however, does not guarantee financial sustainability. Larger size will more likely confront MFIs with the high challenges of managing increased complexity, operational quality, and good governance. Larger size, therefore, overall, reinforces financial sustainability, but for reaping full benefits from this, it needs to be complemented with strategic management practices and strong risk management.

4.4.7. Inflation

Our results do not bear out the significant impact of inflation on financial sustainability in Ethiopian MFIs. The estimated coefficient on inflation is 0.0016, which implies a marginally positive relationship, though this influence, with its p-value is greater than 0.05, is not statistically significant enough to reject the null hypothesis. This result raises questions about the inclusion of inflation as a crucial macroeconomic variable, hitherto considered a key factor affecting operational costs as well as repayment capabilities. The positive correlation that is insignificant statistically obtained in this study contradicts the results of an earlier study by Randhawa and Gallardo (2003). In their study, they found a negative

influence of inflation on financial sustainability. Conversely, our result agrees with that from Vingo (2012) and Nawaz (2010). They both did not find a significant relationship.

Such a conflicting result indicates that the operational peculiarities of Ethiopian MFIs have a great impact. Such organizations may pursue practices that can help them offset the inflationary pressures; for instance, their ability to adjust the conditions of loans or interest rates means that they can pass on the increased expenses to the cli-ents without sacrificing their financial viability. This is a manifestation of the conclusions reached by Ahlin and Lin (2006), who noted that microfinance institutions can navigate through inflationary environments with greater ease simply by adjusting the loan structures. The findings also agree with observations by Cull, Demirgüç-Kunt, and Morduch (2009) that the nature of inflation is complex and its effects on MFI performance can differ depending on the context and relationships of the borrowers. Many MFIs operate in high-inflation and volatile economic environments serving people who are acclimatized to those conditions. Because of that, their operating frameworks are designed to bear such shocks, which could, in turn, loosen the direct nexus between inflation and financial sustainability. In the light of this, there would be a great basis for future research to identify other macro-economic or contextual variables which could give better insight into the performance of MFIs in Ethiopia. Specific variables that could present local market conditions, for example, interest rate, unemployment rate and clientele behavior might offer a more realistic representation of the determinants of MFI sustainability under economic change.

4.5.8. GDP growth rate

Like inflation, GDP growth rate did not show a significant effect on the financial sustainability of MFIs in Ethiopia. This brings about some crucial questions as to what justification there is for having GDP as one of the macroeconomic variables. Although GDP is generally considered an imperative measure of economic welfare, a lack of a meaningful relationship here suggests that MFIs work within niche markets dominated by marginalized people who may not benefit from national economic growth and progress. Ahlin, Lin and Maio (2011) contended that the microeconomic conditions based on clients' poverty level and the institutional efficiencies matter more than the broader measure of economic performance captured by GDP to determine the sustainability of MFIs. Alongside this, Bogan (2012) found governance and operational efficiency to be more influencing factors than the ones emanating from the external environment or the economy at large. However, many MFIs focus their activities in under-served areas where, as a matter of fact, the national growth does not trickle down to improve the economic conditions of their clients. The estimated coefficient of GDP was -0.014, which, though negative, was insignificantly

statistical at p-value 0.241. Though this may not be a precise effect, the negative coefficient suggests that policies targeting those specific issues in each sector, including governance and operational challenges, should be implemented rather than simply targeting macroeconomic indicators.

Excluding some specific features that the Ethiopian economy is facing, such as a high level of poverty and limited access to financial facilities, the strength of influence of GDP on the MFI's financial sustainability may be weakened. However, further studies could be focused more on local economic conditions or any other variables which might better capture the underlying features affecting microfinance sustainability in Ethiopia. This would ensure more subtlety within the understanding of how microfinance works within contexts, though it needs cautious attention to the complex factors involved.

4.5. Robustness check

Some robustness checks have been done in order to test the sensitivity of our results when including and excluding the under-study variables. The results are provided in Tables 4.5 and table 4.6. In the first instance, Table 4.5 we exclude the age of MFI variable and in the second instance, Table 4.6, we exclude the macroeconomic indicators (inflation and GDP growth rate).

First Sensitivity Analysis - Removing Age: Running another model without the age of MFI among the predictors, the coefficient on capital adequacy goes up to 0.47 and is still significant at the 1%-with a p-value of (0.002)-the level of significance. That means, if the age of MFIs is not controlled for, capital adequacy can play a more important role in explaining financial sustainability. Relatedly, the coefficient on borrower per Staff Member (bou) increases to 0.085 and becomes highly significant ($p = 0.000$), showing a stronger positive effect on financial sustainability (FSS) when age is excluded.

On the other hand, the coefficient on leverage becomes much more negative (-1.91) and strongly significant at 1% level of significance ($p = 0.000$). This indicates that when age is removed, the negative effect of leverage becomes even stronger.

However, the coefficient on size of MFI is reduced to 0.102 when we exclude age from the equation, although still strongly significant at the 1% level of significance ($p=0.000$). This suggests that the effect of some other aspect of MFI structure or staffing impacts sustainability.

Both macroeconomic indicators, inflation and GDP growth rate remained insignificant. This again indicates that the variables did not have a bearing in explaining financial sustainability.

Second Sensitivity Analysis: The exclusion of the Macroeconomic indicators which were GDP growth rate and Inflation

As in Table 4.5, the coefficient on capital adequacy (CA) increases to 0.55 and remains highly significant. This tends to suggest that cleaning of macroeconomic factors like inflation and GDP increases the role of capital adequacy in explaining financial sustainability. Moreover, the negative effect of leverage is still very strong and significant, with a coefficient of -1.54. Likewise, the positive relationship between borrower per staff member and FSS remains significant, although the size is reduced to 0.054.

Looking at the coefficient on age of MFI, the size is reduced to 0.014. However, the effect become strongly significant at the 1% level of significance (p=0.015). This indicates that age remains a positive predictor even when macroeconomic variables are excluded. Similarly, the effect of size of microfinance remains positive and significant showing consistency across models.

In sum, leverage consistently has a negative impact on financial sustainability across all models and its impact becomes stronger when other variables like age and macroeconomic factors are removed while capital adequacy shows a consistently positive and significant relationship with financial sustainability. The importance of capital adequacy grows when certain other variables are excluded.

Turning to the variable indicating borrower per staff member, it shows a positive effect across all models, with a slight change of magnitude. This indicates that MFIs with higher staff efficiency (handling more borrowers per staff member) are more sustainable.

Moreover, age of MFI has a significant positive effect in the original and the second model that we used for robustness check. This shows that that more experienced MFIs tend to be more financially sustainable.

However, macroeconomic indicator variables, inflation and GDP growth rate, do not seem to play a significant role in our models. This may suggest that internal characteristics of MFIs (like capital adequacy and leverage) are more important than external economic conditions for sustainability.

Furthermore, the robustness checks show consistency in the significance and direction of the key variables (capital adequacy, leverage, breadth of outreach), which indicates the stability of the results.

Such analyses and discussions of results will therefore be able to establish how internal characteristics, such as capital adequacy, leverage, age of MFIS, experience of MFIS and breadth of outreach of MFIs,

are the determinants of financial sustainability, while such external factors as inflation and GDP appear to have lesser significance in your context.

TABLE 4. 5: ROBUSTNESS CHECK 1

VARIABLES	(1) Financial Self Suffi-ciency
Capital Adequacy	0.467***
	(0.152)
Leverage	-1.912**
	(0.172)
Breadth of Outreach	0.085**
	(0.011)
Size of MFIs	0.102***
	(0.024)
Gross Domestic Product	-0.034
	(0.012)
Inflation	0.041
	(0.0012)
Constant	0.921***
	(0.272)
Overall r-squared	0.316
Adjusted R-squ	0.43
F-test	64.65
Prob > F	0.000
Observations	513
Number of Microfinance	40

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Own computation using data from NBE, 2023

TABLE 4. 6: ROBUSTNESS CHECK 2

VARIABLES	(1) Financial Self Suffi-ciency
Capital Adequacy	0.552***
	(0.153)
Leverage	-1.535**
	(0.144)
Breadth of Outreach	0.053**
	(0.019)
Size of MFIs	0.078***
	(0.025)
Inflation	0.041
	(0.0012)
Constant	1.225***
	(0.210)
Overall r-squared	0.316
Adjusted R-squ	0.43
F-test	78.8
Prob > F	0.000
Observations	513
Number of Microfinance	40

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Own computation using data from NBE, 2023

SUMMARY OF TESTED HYPOTHESIS AND REGRESSION RESULTS

Table 4.6 provides a summary of the findings which is extracted from both the formulated hypotheses and the results from the original model on each of the independent variable and the dependent variable including the sign, size and significance of the effects.

TABLE 4. 7: SUMMARY OF TESTED HYPOTHESIS AND REGRESSION RESULTS

Relationships between dependent and independent variables	**Hypotheses**	**Coefficient**	**P Values**	**Impacts**	Reject Ho in favor of H1	Sign & Significance: Actual results
CA -> FSS	H0 H1	0.28	0.009< 0.05	Significant	Failed to reject H1 and reject Ho	Positive significant
LGE -> FSS	H0 H1	-0.38	0.038 < 0.05	significant	failed to reject H1 and Reject H0	Negative significant
BOU -> FSS	H0 H1	0.023	0.031< 0.05	significant	failed to reject H1 and reject H0	positive significant
AGE -> FSS	H0 H1	0.38	0.000 > 0.05	significant	Failed to reject H0 and reject H1	positive insignificant
SOM -> FSS	H0 H1	0.32	0.000 > 0.05	significant	failed to reject H1 and reject H0	Positive Significant
INF -> FSS	H0 H1	-0.014	0.227 < 0.05	insignificant	failed to reject H0 and reject H1	positive insignificant
GDP -> FSS	H0 H1	0.002	0.241 < 0.05	insignificant	failed to reject H0 and reject H1	negative insignificant

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

The present analysis focused on some critical variables that affect the financial sustainability of MFIs in Ethiopia and contributes to empirical evidence as well as conceptual contributions to the growing debate about sustainability of microfinance institutions. While some of the bottom-line technical components of the analysis such as significance levels, regression coefficients-are crucial to validate the robustness of the results, the core value of this study lies in how those findings engage and challenge prior theoretical and empirical frameworks related to microfinance.

The results of the study confirmed that among the factors, capital adequacy, leverage, outreach, experience, and the size of MFI's have significant impact on the MFI's financial sustainability. The results correlating leverage ratio and return on asset support theories asserting the growing significance of capital as means of securing protection against economic shocks and means of attracting more investment proposed by studies such as Bogan (2009) and Magali (2013). It, however, also creates some worries of possible trade off between financial stability and outreach satisfactory, a challenging act that MFIs have to deal with.

Inconsistencies in the research of leverage ratios and financial sustainability were also observed. It was discovered that leverage ratios are negatively associated with financial sustainability, thus creating difficulties in the discourse on financial risk. While Leverage does foster fast growth, the research findings are in agreement with Beg (2016) and Abdur Rahman and Mazlan (2014) arguments that over reliance on debt ruins financial health especially in volatile economies like Ethiopia.This result would mean that there is, therefore, a trade-off between growth and risk management. It could also be said from this result that the sustainability of MFIs depends not only on access to credit but also on appropriate strategic financial governance.

The findings on the breadth of outreach and MFI experience reaffirm earlier discussions about the role of outreach in fostering financial sustainability. As Cull et al. As pointed out by Armendariz & Szafarz (2007) and Robinson (2001), larger and older MFIs tend to be better performers in the financial sense, but this is only possible when organizational growth does not exceed organizational efficiency. More specifically, although MFIs with greater experience and size tend to be more sustainable, older ones

could experience positive shocks (out-dated practices and competitive pressures) that might require some adaptive management effect to sustain their financial health over the long term.

In fact, inflation and GDP growth had little impact on financial sustainability (surprisingly, as opposed to results documented by some other studies, including the Randhawa and Gallar-do (2003) study). This means that, though macroeconomic stability is important, Ethiopian MFIs could be more responsive to the internal factors of capital structure, operational efficiency and governance than to external shocks such as economic variables. It reflects the inherent distinctive operating environment of MFIs in Ethiopia where the microeconomic factors seem to outweigh the generalized macroeconomic environment.

The last contribution that this study provides is identifying that the financial sustainability in Ethiopian MFIs is explained essentially by the internal governance factors such as capital adequacy, leverage, outreach, and institutional experience rather than by external macroeconomic conditions. These findings particularly highlight the relevance of agency theory in the microfinance sector and provide an insight into understanding the mixed results from the vast literature on MFIs' sustainability by confirming the limits of few macroeconomic theories. Further studies of how internal governance interacts with external economic conditions could provide additional support for the dynamic forces guiding financial sustainability in MFIs.

5.2. Recommendations

The main findings of our study call for the following recommendations corresponding to each factor.

Improvement in Capital Adequacy: Ethiopian MFIs must work towards capital adequacy through equity capital accretion and through retention of earnings. In fact, this could be attained with a broader investor base, issue of equity shares, and improvement in profitability. The sizeable capital buffer will absorb various financial shocks, which in turn will lead to long-term sustainability.

Increase Outreach Strategically: MFIs will have to strike a balance between their outreach expansion and prudent growth strategy. In so doing, by expanding their services to more customers in rural areas, the demand for microfinance services is increasing. On its part, the MFIs stand to create more revenue streams. However, such outreach expansion needs to be carefully managed to avoid over-expansion with a corresponding loss of quality in service.

Optimizing leverage level: Since high leverage impairs financial sustainability, MFIs should be working towards optimizing debt levels. That means a thorough weighing of borrowing costs while ensuring that

debt finances effectively generate returns above the cost of capital. MFIs are also called upon to try and identify alternative funding sources, like grants and concessional loans, to reduce dependence on high-cost debt.

Learning from Experience/Age: Given that the relationship between MFI age and financial sustainability is positive, the more sustainable institution is thus an older one, hence more experienced. Some young MFIs would need to participate in industry networks, partnerships, or even mentorship programs to learn from the more seasoned MFIs. Again, there should be retention of organizational memory within the organizations through staff development and succession planning.

Increase in the MFI Size: The scale of MFIs as indicated by their total assets shows a correlation with financial sustainability. Hence a potential approach to establishing a varied range of financial products and services could involve growing assets through effective management. This may also involve exploring other sources of income. Favorable Regulations Consideration should be made for support from the regulatory bodies for merger or merger alliances to create bigger and more viable organizations.

5.3. Further Research Directions

This research focused only on the quantitative aspects of sustainability of MFIs and has not considered qualitative factors. The researcher, therefore, based on this aspect recommends further research work incorporating a holistic approach, considering the other determinants which might have influenced microfinance sustainability in Ethiopia like, but not limited to political influence and geographic influences.

Other information that may be included includes the geographical setting where such MFIs exist, whether they are in their infant or growing-up stages of ownership structure, age, and forms of product delivery. While this study has focused only on financial sustainability, other dimensions of sustainability, such as mission sustainability and human resource sustainability, focusing on MFIs in Ethiopia, could be investigated in future studies.

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Appendices

TABLE A 1: LIST OF MFIS IN ETHIOPIA

NO	Name of micro finance institution	Year of establishment
1	Dedebit credit and saving institutions S.C	1994
2	Sidama MFI S.C	1994
3	Amhara CS institution S.C	1995
4	OMO MFI S.C	1997
5	Specialized financial and promotional institution S.c	1997
6	OCS institution	1997
7	Vision fund MFI S.c	1998
8	African village financial services S.c	1998
9	Gasha MFS.c	1998
10	Bussaa Gonofa MFI	1999
11	Poverty eradication &community empowerment MFI S.c	2000
12	Wasasa MFI S.c	2000
13	Addis CS institution S.c	2000
14	Eshet MFI S.c	2000
15	Meklit MFI	2000
16	Benshangulgumz MFI S.c	2001
17	Kendil MFI S.c	2001
18	Metemamen MFI S.c	2002
19	Dire MFI S.c	2003
20	Letta MFI S.c	2004
21	Agar MFI S.c	2004
22	Harbu MFI S.c	2005
23	Digaf MFI S.c	2005
24	Harar MFI S.c	2006

25	Lefayeda MFI S.c	2007
26	Dynamic MFI S.c	2009
27	Lideta MFI S.c	2012
28	Nisir MFI S.c	2014
29	Adeday MFI S.c	2014
30	Afar MFI S.c	2015
31	Raya MFI S.c	2017
32	Kershi MFI S.c	2016
33	Debo MFI S.c	2017
34	Sheger MFI S.c	2016
35	Yemisrach MFI S.c	2019
36	Grand MFI S.c	2019
37	KAAFI MFI S.c	2021
38	Sahal MFI S.c	2022
39	Gogiba MFI S.c	2022
40	Yegna MFI S.c	2022
41	Walet MFI S.c	Not started operation
42	Elsabe MFI S.c	Not started operation
43	Tana MFI S.c	Not started operation

Source (national bank of Ethiopia,2024)

Regression Results

Tests for the Classical Linear Regression Model (CLRM) Assumptions

Assumption one: The errors have zero mean ($E(\epsilon) = 0$)

As Brooks (2008) indicates, this assumption is met automatically when the constant term is included in the regression equation. Since the error term is included the model of this study, this assumption one does not violated.

Assumption two: Homoscedasticity

In this current research, the test developed by Breusch-Pagan/Cook-Weisberg was applied to test for the presence of heteroscedasticity along the range of the explanatory variable.

chi2(1) = 1.57
Prob > chi2 = 0.2106

According to the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity, the problem of heteroskedasticity does not exist when the p-value is greater than 0.05. However, in this study, the p-value is 0.21, which upholds the fact that the null hypothesis of homoskedasticity cannot be violated. Hence, in this analysis, heteroskedasticity is not a problem.

Assumption three: Test for Multicollinearity

TABLE A 2: MULTICOLLINEARITY TEST

Variance inflation factor

Variables	VIF	1/VIF
gdp	2.98	.34
age	2.82	.35
lge	2.73	.37
bou	2.03	.49
inf	1.58	.64
som	1.48	.68
Ca	1.01	.92
Mean VIF	2.10	.

Table A2 above shows assumption of multicollinearity, a situation in which two or more explanatory variables in a regression model are highly correlated. One way of measuring multicollinearity is VIF, which measures how much the variance on an estimated regression coefficients are increased due to multicollinearity. If the VIF factor is greater than 10, that means there is multicollinearity. On the other hand, if VIF is less than 10, then there is no problem related to multicollinearity. Hence, assumption 3 regarding multicollinearity problem is rejected based on the VIF measurement of the study which is 2.10.

Assumption four: Model is correctly specified

Test of Model Specification:

This test is conducted to check the correctness of the specified model using Linktest, which assesses if there are any omitted variables in the model or not. As shown in Table A3, the -hat coefficient is 1.307, and the p-value for the 1.307 coefficient is less than 0.05, which is statistically significant.

In contrast, _hatsq coefficient is −0.082 and p-value is greater than 0.05 exhibits some evidence of no extra explanatory power. The extremely low value of _hatsq suggests that no relevant variables are missed, thus confirming the appropriateness of specification of the model and its freedom from mis-specification error about the relationship between independent variables and the dependent variable.

TABLE A 3: MODEL SPECIFICATION TEST BY LINK TEST

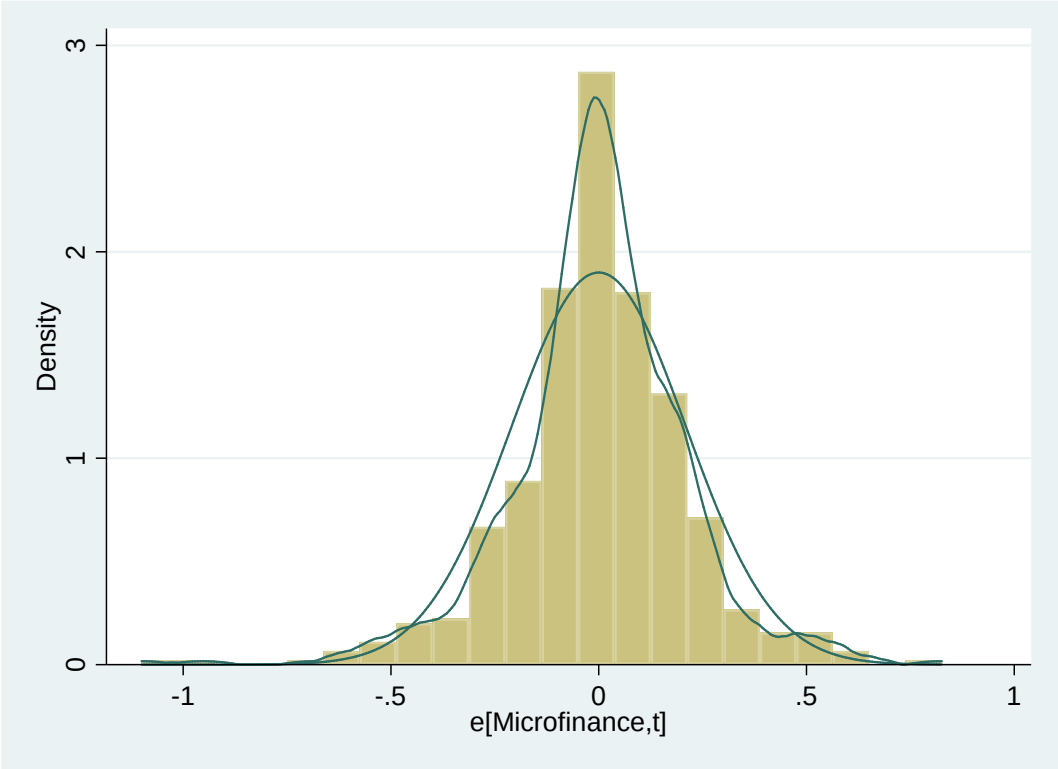
VARIABLES	(1) Financial Self Suffi-ciency
_hat	1.307***
	(0.374)
_hatsq	-0.082
	(0.099)
Constant	-0.270
	(0.340)
Overall r-squared	0.43
Adjusted R-squ	0.43
Observations	513
Number of Microfinance	40

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Assumption five: The error term is normally distributed

Test for Normality

FIGURE A1: NORMALITY TEST GRAPH



As it is observed in Figure A1, the graph for the distribution of the error term is perfectly bell shaped. So, it suggests the data are approximately normally distributed.