



Determinants of Financial Distress: The case of Microfinance Institutions in Ethiopia

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A thesis submitted to the Department of Accounting and Finance College of Business and Economics presented in partial fulfillment of the requirements for the degree of Master of Science in Accounting and Finance

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STATEMENT OF DECLARATION

I Haregewayin Hailemariam, have carried out independently a research work entitled "*Determinants of financial distress: The case of Microfinance Institutions in Ethiopia*" in partial fulfillment of the requirement of the M.Sc. program in Accounting and Finance with the guidance and support of the research advisor. I do hereby declare that this thesis is my original work and that it has not been submitted by any other person for an award of degree in this or any other university/institution.

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ABSTRACT

Micro-Finance Institutions (MFIs) play a vital role in the financial system by providing financial services to those who cannot access from the conventional banking service in developing countries. The main objective of this study was to examine the determinants of financial distress in the case of selected MFIs in Ethiopia. Balanced fixed effect panel regression was used for the data of ten microfinance institutions in the sample covered the period from 2006 to 2015 from the total population of thirty five microfinance institutions operating in the country. The study used the Altman's Z score of the MFIs as the proxy of financial distress to measure financial healthiness of MFIs. The study finds that capital adequacy, earning ability, liquidity and microfinance institutions age have significant negative impact on financial distress of MFIs, where as portfolio at risk greater than 30 days has significant positive influence on financial distress of MFIs. Operational efficiency of MFIs which is measured by operating expense to gross loan portfolio has negative influence on financial health of MFIs but statistically insignificant. Macro economic factors GDP and inflation have no significant influence on financial distress of MFIs in Ethiopia. Based on the findings, the study recommends that PAR>30 days which is found to negatively influencing the financial health of the MFIs need to be closely watched and taken care of. Thus, the managements of MFIs ensure strict adherence to regular loan monitoring and also credit policies of MFIs must be regularly updated. Moreover, managements of MFIs should give great emphasis in properly managing capital to asset ratio. Regulators and policy makers also need to set the minimum capital adequacy requirements for MFIs because well capitalized MFIs are more flexible in dealing with problems arising from unexpected losses.

Keywords: Financial Distress, MFIs, Altman's Z score

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LIST OF ACRONYMS AND ABBREVIATIONS

ACSI: Amhara Credit and Saving Institution

ADCSI: Addis Credit and Saving Institution

AEMFI: Association Ethiopian Micro-Finance institution

AGE: Age of Micro Finance Institution

CAR: Capital adequacy Ratio

CGAP: Consultative Group to Assist the Poor

CLRM: Classical Linear Regression Model

DECSI: Dedebit Credit and Saving Institution

DSC: Debt Service Coverage

DW: Durbin Watson

EBIT: Earnings Before Interest and Tax

FD: Financial Distress

FSS: Financial Self-Sufficiency

GDP: Gross Domestic Product

INF: Inflation

LIQ: Liquidity

LOG: Natural Logarithm

MDA: Multiple Discriminant Analysis

MENA: Middle East and North Africa

MIFs: Microfinance Institutions

MoFEC : Ministry of Finance and Economic Cooperation

NBE: National Bank of Ethiopia

OCSSCO: Oromia Credit and Saving S.Co.

OLS: Ordinary Least Square

OPEFF: Operational Efficiency of Firm

OSS: Operational Self-Sufficiency

PAR: Portfolio at Risk

PEACE: Poverty Eradication and Community Empowerment

PM: Profit Margin

ROA: Return on Asset

ROE: Return on Equity

SFPI: Specialized Financial and Promotional Institution

UA: Univariate Analysis

CHAPTER ONE

1. INTRODUCTION

This chapter deals with the introductory part of the study. It includes: background information, statement of the problem, objectives, research hypothesis, scope, limitation, significance and structure of the study.

1.1. Background of the study

One of the most stylized facts of developing economies is that formal financial institutions leave the poorest population tightly constrained in their access to financial services. It is also widely recognized that economic progress relies largely on access to financial services such as savings, insurance, and credit. Where formal financial institutions fail the large majority of the poor population, there is evidence to support the proposition that microfinance institutions & credit unions can fill some of the gap (Barham, et al., 1996 cited in Andinet A.,2011)

Micro-Finance Institutions (MFIs) can be defined as any activity that includes the provision of financial services such as credit, savings, and insurance to low income individuals which fall just above the nationally defined poverty line, and poor individuals which fall below that poverty line, with the goal of creating social value. The creation of social value includes poverty alleviation and the broader impact of improving livelihood opportunities through the provision of capital for micro enterprise, insurance and savings for risk mitigation and consumption smoothing (Smith, 2006).

Microfinance is seen as one of the most efficient instruments to promote economic development and to fight poverty in poorer countries. Numerous microfinance institutions (MFIs) all over the world have proven that financial services can be offered on a sustainable basis with high outreach (Al-Bagdadi and Brüntrup, 2002).

Generally, to meet the objectives of poverty alleviation, MFIs ought to be viable and sustainable in the provision of services. This means they must provide quality and flexible financial services that target the poor, culturally fit, subsidy free and must be profitable in all respect and also assure that the going concern of the institutions.

The issue of financial distress and bankruptcy is very important in the area of financial sector more than any other sectors. This is because of the fact that financial institutions are the back bones of a given economy. If the financial sector of a given country faces financial crises, chances are high that it would lead to general economic crises. Financial distress is surprisingly hard to define precisely. This is true partly because of the variety of events befalling firms under financial distress. Financial distress can be defined as a situation in which an institution is having operational, managerial and financial difficulties (Adeyemi, 2011). Shumway (2001) describes financial distress as a situation when a company is unable to meet its financial obligations.

Financial distress is a situation where a firm's operating cash flows are not sufficient to satisfy current obligations (such as trade credits or interest expenses) and the firm is forced to take corrective action (Wruck, 1990).

Arnold (2005) states that one of the cheapest ways to finance a company is through debt but firms tend to run into financial distress, induced by payment of interest regardless of the cash flow of the business. If the firms hit a rough patch in its business activities it may have trouble paying its bondholders, bankers and other creditors their entitlement. Firms that hit a rough patch in business fail to meet creditors' entitlement. Debt is highly emphasized as the main cause of financial distress yet with this information it's still inevitable.

However, that the firm's available cash is unable to cover the principal and interest on the bank loan, the liquidity position of the firms, which is measured by current assets to current liabilities, is below the theoretical industry average. As long as liquidity is not maintained, many highly leveraged firms are not able to renegotiate their debt agreement if they are breached contract; rather they go for reorganization, acquisition, merger or liquidation. Thus, "the very low volume of liquidity and negative cash flow combined with high leverage leads for financial distress" (Outecheva, 2007).

As soon as firms have reached a certain level of leverage but do not perform to their business plans, financial distress can happen even in a booming economic environment. High levels of leverage in the firms and increasing volatility make equity value vulnerable, so that each possible decline in the enterprise value may rapidly impair equity (Altman & Hotchkiss, 2005).

Purnanandam A. (2005) determines financial distress in terms of solvency. He develops a theoretical model of corporate risk management in the presence of financial distress costs. Financial distress is seen as an intermediate state between solvency and insolvency. A company is distressed when it misses interest payments or violates debt covenants. The transformation from a solvent to an insolvent state happens only on the date of maturity if the terminal value of the company's assets is lower than the face value of debt. Thus, this definition clearly distinguishes financial distress from default and possible bankruptcy. A company can be distressed without defaulting. However, default and bankruptcy are not possible without the preceding period of financial distress.

The model by Purnanandam (2005) is similar to the concept of financial distress by Gilbert et al. (1990). In their study Gilbert et al. (1990) show that financial distress has different financial characteristics than bankruptcy. Financial distress is characterized by negative cumulative earnings over at least a few consecutive years, losses, and poor performance. Bankruptcy is one of the possible outcomes of financial distress. A company in financial distress has the choice to restructure its debt and reach an appropriate level of solvency, to merge and, thus, disappear as an independent business entity, or to file for bankruptcy as a strategic response by the management or owners to financial problems.

Financial distress could lead a company to bankruptcy if not handled timely. In this view the main purpose of this study was to identify those factors that affect financial distress of Micro-finance Institutions (MFIs) in Ethiopia and to examine the relationship between financial distress and its determinants.

1.2. Statement of the problem

Micro-Finance Institutions (MFIs) play a vital role in the financial system by providing financial services to those who cannot access the conventional banking service, particularly the poor and the informal sector. As a key strategy for poverty reduction in the developing world, microfinance has captured the imaginations of governments and donor agencies (Parveen, 2009). Supporters have argued that microfinance institutions cannot only have a major impact in the fight against poverty but can do so on sustainable basis (Mcguire & Conroy, 2000).

In many developing countries, microfinance institutions mainly have been treated as important development instruments in the fight against poverty. Microfinance has the capacity to efficiently and effectively provide sustainable financial services to poor households who are otherwise excluded from the conventional financial systems for lack of collateral. Microfinance Institutions (MFIs) have assumed prominence as important lending institutions in the economic development process of developing countries. The issue of microfinance financial distress or failure should thus be a major concern to policy makers and implementers if the activities associated with MFIs are really deemed beneficial to the economic development.

Kruijff D. and Hartensteni S.,(2014) state that, due to the financial and ensuing global crisis, a number of emerging market and developing countries were heavily affected by declining GDP, remittances and trade balances. In several cases this reduced microfinance borrowers' repayment capacity and the MFI's refinancing options, evidence of a correlation with the crisis. However, industry wide the components of the financial crisis which were predicted to have severe negative impact on MFI's (DB Research, 2012). Furthermore, the impact of the financial crisis has differed by MFI and it is linked to the macro-economic environment, level of integration of the MFI within the formal economy, and the ability of the MFI and its management to effectively address the crisis (Kruijff D., and Hartensteni S., 2014).

When analyzing the success of MFIs, consider the ultimate goals of the MFIs: the first one is to serve as many poor people as possible and the second one is its own financial sustainability. The debate between the two approaches has not been concluded yet, although the most recent microfinance paradigm seems to favour the financial approach (Hermes & Lensink, 2007). In addition, it is difficult to establish a definition of failure/distress/ that appears as a result of a failure to achieve financial and social results at the same time. For this reason, this study and the existing studies focused on the MFIs failure by achievement of financial results (Marulanda et al., 2010, Rozas, 2011).

According to Ebisa et al. (2013) the Ethiopian microfinance sector was characterized by its rapid growth an aggressive drive to achieve scale, a broad geographic coverage, a dominance of government backed MFIs, the promotion of both credit and savings products, a strong focus on sustainability and by the fact that the sector is Ethiopian owned and driven. However, this does

not have assurance the going on concern of the institutions, and it does not necessarily mean that all companies that show rapid growth are healthy enough to fulfill their short term and long term obligations (Pranowo, et al., 2010).

In order to ascertain their going concern or sustainability, investigating the MFIs from the financial distress perspective, which would lead them to failure or bankruptcy, is of significance. In Ethiopia various studies were conducted to determine factors affecting financial sustainability and financial performance of MFIs and the level of significance of those factors in affecting the financial sustainability and financial performance of MFIs (Abebaw Y., 2014; Muhidin S., 2016; Sisay H., 2016). However, to the best knowledge of the researcher there was no single study has focused on the determinants of financial distress of MFIs in Ethiopia. Thus, this study was conducted to investigate those factors that determine the financial distress of MFIs in Ethiopia.

1.3. Objective of the study

1.3.1 General objectives

The general objective of the study was to examine the relationship between financial distress and its determinants of microfinance institutions in Ethiopia.

1.3.2 Specific objectives

- To identify the major factors that determine the financial distress of microfinance institutions in Ethiopia
- To determine the relationship between MFIs-specific (internal) factors and financial distress of MFIs in Ethiopia
- To determine the relationship between external or macroeconomic determinants such as GDP and inflation and financial distress of Ethiopian MFIs.

1.4. Hypothesis of the study

To achieve the objectives of the study, a number of hypotheses were tested regarding the determinants of financial distress of MFIs in Ethiopia based on different empirical research and theoretical review made from banks and MFIs. The reason is that there is rare theory developed in relation to MFIs financial distress. There are eight hypotheses which include:

H1: Capital adequacy ratio has significant positive impact on Z score as a proxy of financial distress of microfinance institutions in Ethiopia

H2: Portfolio quality has a significant negative impact on Z score as a proxy of financial distress of microfinance institutions in Ethiopia

H3: Operational efficiency has a negative impact on Z score as a proxy of financial distress of microfinance institutions in Ethiopia

H4: Earning ability of the firm has a significant positive impact on Z score as a proxy of financial distress of microfinance institutions in Ethiopia

H5: Liquidity has a significant positive impact on Z score as a proxy of financial distress of microfinance institutions in Ethiopia

H6: Age of the MFIs has a significant positive relationship with Z score as a proxy of financial distress of microfinance institutions in Ethiopia

H7: GDP growth rate has a significant positive impact on Z score as a proxy of financial distress of microfinance institutions in Ethiopia

H8: Inflation has a significant negative impact on Z score as a proxy of financial distress of microfinance institutions in Ethiopia

1.5. Scope and Limitation of the study

1.5.1 Scope of the study

This study was delimited only on factors that determine the financial distress of selected MFIs operating in Ethiopia. Besides, the data used secondary data covered the period from 2006 to 2015 for ten microfinance institutions. The reason for the study to be delimited only to ten MFIs and ten years data was based on the availability of audited data.

1.5.2 Limitation of the study

As with any other study, this study was subject to some limitations: The study was not included peer two and peer three categories of MFIs in the sample due to lack of adequate audited

financial reports and statements. Due to the fact that smaller and less mature MFIs might tend to fail more often in comparison to their peers. However, because of the lack of information or availability of data, the study not able to consider these MFIs

1.6. Significance of the study

Despite the renewed and increased interest in the issues of financial distress in the African continent, relevant empirical studies are still quite few Zulkarnain (2009). Scholars in the developed economies produced a fairly sizable literature on financial distress. But the literature of financial distress in developing nations specifically in Africa is far behind from being adequate. Studies conducted by Zulkarnain, (2009), John et al., (2010), Pranowo et al., (2010), Andualem U., (2011), Yohannes T., (2014), Ephrem G., (2015) and Kinyariro et al., (2016), investigated the determinants of financial distress of firms in developing countries. However, to the best knowledge of the researcher there was no single study that has focused on the financial distress of MFIs in Ethiopia.

Thus, this study have significant role to play in filling gap in understanding of the determinants of financial distress of MFIs in Ethiopia. This study may also equips policy makers and implementers with applied knowledge of determining their financial distress if the activities associated with MFIs are really deemed beneficial to the economic development. Finally, the outcome of this study may offer an opportunity for further study related to determinant of financial distress.

1.7. Structure of the study

This study is organized into five chapters. Chapter one presents introductions of the study. The literature review part of the study is presented in chapter two. The review of the literature includes the theoretical review in the first section which is followed by the review of the previous studies related to the area and knowledge gap finally. Chapter three presents the research methodology. The results and discussions of the study are presented in chapter four. Finally chapter five presents the conclusions and recommendations of the study.

CHAPTER TWO

2. LITERATURE REVIEW

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

2.1. Theoretical Framework

This section deals about the theoretical framework supported by different authors regarding the financial distress. It is composed of meaning of financial distress and the various theories of financial distress.

2.1.1. Meaning of Financial Distress

As a rule, the term “financial distress” is used in a negative connotation in order to describe the financial situation of a company confronted with a temporary lack of liquidity and with the difficulties that ensue in fulfilling financial obligations on schedule and to the full extent Gordon (1971). Very often, financial distress is determined in terms of failure, default, bankruptcy, or distressed restructuring, dependent on the underlying methodology and the objectives of the overall research.

Many researchers have tried to summarize different concepts of financial distress in order to present a complete picture of existing approaches, but no one has classified them. Based on a comprehensive analysis of current concepts available in the theoretical literature and in empirical research, definitions of financial distress can be grouped into three main categories (Outecheva, 2007). They are event-oriented definitions of financial distress, Process-oriented definitions of financial distress and technical definitions of financial distress

Within the scope of the first classification group, financial distress is usually applied analogously to terms such as default, failure, or bankruptcy. Financial distress is defined as *“the inability of a firm to pay its financial obligations as they mature”* Beaver (1966).

The substantial contribution of process-oriented definitions to the concept of financial distress is that they reflect the evolution in understanding this complex phenomenon, the formation of a

comprehensive theory of financial distress, and portray “*the expansion of the definition <...> from the singular bankrupt state to encompass states of distress between corporate health and bankruptcy*” Turetsky (2003).

The last group of classification of the definitions of financial distress interprets the latter through identification of the main indicators. These indicators are usually used in empirical studies predicting financial distress, analyzing the performance of distressed companies, distressed restructuring, and implications of the national and international legal proceedings on the capital structure of the firm in question. The most important signals about financial distress can be received from the analysis of financial ratios of the company. Accounting based indicators of financial distress are still very popular among researchers and widely used as selection criteria. Despite the critique that financial ratios are past oriented and cannot capture the future dynamics and prospects of the company as a going concern, they perform well in models predicting financial distress and probability of default (Outecheva, 2007).

Brown, James and Mooradian (1992) and Andrade and Kaplan (1998) interpret financial distress as a basic event whose occurrence separates the time of a company’s financial health from the period of financial illness and requires undertaking corrective actions in order to overcome the troubled situation.

Opler and Titman (1994) define financial distress more broadly as a costly event that affects the relationship to debt holders and non-financial stakeholders. As a consequence, a company gains an impaired access to new capital and bears the increasing costs of maintaining this stricken relationship.

Lubomír L., (2002) states there are three possible reasons why the firm can go bankrupt. The first one, neo-classical, is a result of a state when the allocation of assets is inappropriate. The assets are usually industry specific and the bankruptcy is a mean of their reallocation. Within the (neo) classical approach, the bankruptcy procedures are the inevitable way to allocate resources efficiently. In this case the amount and size of bankrupted firms can give a first insight on the speed of restructuring. The second reason for bankruptcy might be just financial. The firm has the right structure of assets but its financial structure is bad with liquidity constraints. This means that even if the firm is viable in the long run it has to go to bankrupt in the short run. The last

reason of bankruptcy might be that the firm has the proper asset and financial structure but a bad management.

2.1.2. Theories related to Financial Distress

According to (Aziz and Dar, 2006), the theoretical models were developed as another approach to looking at the distress conditions present in the firms. Finding symptoms of failure is the main focus of statistical and Artificial Intelligence Expert System models, but Theoretic Models focus more on the causes of failure by looking at the factors that force firms to go bankrupt. In fact, the prediction models developed under this approach are based on some theoretic arguments.

There are four techniques within the theoretic models: Cash Management Theory, Credit Risk Theory, Balance Sheet Decomposition Measure/Entropy theory, and Gambler's Ruin Theory (Aziz and Dar, 2006).

2.1.2.1. Cash Management Theory

Cash management theory is concerned with the managing of cash flows into and out of the firm; cash flows within the firm and cash balances held by the firm at a point of time by financing deficit or investment surplus cash. Short-term management of corporate cash balances is a major concern of every firm. This is so because it is difficult to predict cash flows accurately, particularly the inflows, and there is no perfect coincidence between cash outflows and inflows (Aziz and Dar, 2006). During some periods cash outflows will exceed cash inflows because payments for taxes, dividends or seasonal inventory will build up. At other times, cash inflow will be more than cash sales and debtors may realize in large amounts promptly (Pandey, 2005). An imbalance between cash inflows and outflows would mean failure of cash management function of the firm. Persistence of such an imbalance may cause financial distress to the firm and, hence, business failure (Aziz and Dar, 2006).

2.1.2.2. Credit Risk Theory

Credit is the provision of goods and services to a person or entity on agreed terms and conditions where the payments are to be made later with or without interest. During the contract period, not all debtors will repay their dues as and when they fall due. When the debtor does not pay their dues on the due date, the lender is exposed to credit risks which may in turn lead to default.

Credit risk is therefore the investor's risk of loss, financial or otherwise, arising from a borrower who does not pay his or her dues as agreed in the contractual terms (Nyunja, 2011).

2.1.2.3. Entropy Theory

According to the Entropy Theory (or Balance Sheet Decomposition Measure Theory), one way of identifying firms' financial distress could be a careful look at the changes occurring in their balance sheets (Aziz and Dar, 2006). This theory employs the Univariate Analysis (UA) and Multiple Discriminant Analysis (MDA) in examining changes in the structure of balance sheets. Univariate Analysis is the use of accounting based ratios or market indicators for the distress risk assessment (Natalia, 2007). The financial ratios of each company, therefore, are compared once at a time and the distinction of those companies through a single ratio with a cut – off value is used to classify a company as either distressed or non- distressed (Monti & Moriano, 2010).

MDA (or Multivariate Statistic or Multivariate analysis) is a statistical analysis in which more than one variable are analyzed at the same time (Slotemaker, 2008). The aim of MDA is to eliminate the weakness of univariate analysis. First, single ratios calculated by univariate analysis do not capture time variation of financial ratios. This means that accounting ratios have their predictive ability one at a time, and it is impossible to analyze, for instance, rates of change in ratios over time. Second, single ratios may give inconsistent results if different ratio classifications are applied for the same firm. Third, many accounting variables are highly correlated, so the interpretation of a single ratio in isolation may be incorrect. The single ratio is not able to capture multidimensional interrelationships within the firm (Aziz and Dar, 2006).

Finally, since the probability of failure for a sample is not the same as for the population, specific values of the cutoff points obtained for the sample will not be valid for the population (Natalia, 2007). Therefore, if a firm's financial statements reflect significant changes in the composition of assets and liabilities on its balance-sheet it is more likely that it is incapable of maintaining the equilibrium state. If these changes are likely to become uncontrollable in future, one can foresee financial distress in these firms (Aziz and Dar, 2006).

2.1.2.4. Gambler's Ruin Theory

Gambler Ruin theory was developed by Feller, Win 1968 who based it on the probability theory where a gambler wins or loses money by chance. The gambler starts out with a positive, arbitrary, amount of money where the gambler wins a dollar with probability p and loses a dollar with a probability $(1-p)$ in each period. The game continues until the gambler runs out of money (Espen, 1999). The firm can be thought of as a gambler playing repeatedly with some probability of loss, continuing to operate until its net worth goes to zero. With an assumed initial amount of cash, in any given period, there is a net positive that a firm's cash flows will be consistently negative over a run of periods, ultimately leading to bankruptcy (Aziz and Dar, 2006). The major weakness of this theory is that it assumes that a company starts with a certain amount of cash. There two main difficulties with this theory when predicting bankruptcy is that the company has no access to securities markets and the cash flows are results of independent trials and managerial action cannot affect the results (Espen, 1999).

2.2. Determinants of Financial Distress of MFIs

In financial distress study different authors point different variables as the determinants of firm financial distress. Altman and Hotchkiss, (2005) developed a model that equally applied for both nonfinancial and financial firms to determine their financial healthiness and it is called a ZETA model. Financial institutions are essentially different from other types of corporations. Their assets are longer term and less liquid than their liabilities. And their primary source of operating income is the interest that they earn through lending. Therefore, conventional accounting indicators of distress such as the interest coverage ratio cannot be applied to analyze the financial soundness of financial institutions (Carpeto, et al., 2010). As a result, when considering financial institutions, it needs to devise a special definition of distress which considers the fundamentally different characteristics of these institutions.

2.2.1 Microfinance institutions specific determinants (Internal)

The firm specific determinants of MFIs financial distress are:

Capital Adequacy

The Capital Adequacy ratio (CAR) measures the MFI's strength and stability by looking at the relationship between its capital base and asset base. Solvency refers to the availability of cash over the longer-term to meet financial commitments as they come due. The concepts of capital adequacy and solvency have both become more crucial as MFIs grow and become more sophisticated, accept deposits, and are subject to national regulation. All MFIs need to be solvent in order to weather the range of crises that can adversely affect a financial intermediary.

The capital to assets ratio is a simple measure of the solvency of MFIs. This ratio helps MFI assess its ability to meet its obligations and absorb unexpected loss. The determination of an acceptable capital to asset ratio level is generally based on a MFI's assessment of its expected losses as well as its financial strength and ability to absorb such losses. Expected losses should generally be covered through provisioning by the MFI's accounting policies, which removes expected losses from both assets and equity. Thus, the ratio measures the amount of capital required to cover additional unexpected losses to ensure that the MFI is well capitalized for potential shocks. (AEMFI 2015)

Portfolio Quality

Portfolio indicates total funds available for the MFI to use as loans to its clients. Portfolio quality is a measure of how well or how best the institution is able to protect this portfolio against all forms of risks. The loan portfolio is by far an MFI's largest asset (Nelson, 2011) and, in addition, the quality of that asset and therefore, the risk it poses for the institution can be quite difficult to measure. Portfolio quality is a critical area of performance analysis, since the largest source of risk for any financial institution resides in its loan portfolio. For microfinance institutions, whose loans are typically not backed by bankable collateral, the quality of the portfolio is absolutely crucial (American Development Bank, 2003 cited in AEMFI, 2013).

Portfolio quality is a vital area of analysis, since it is the largest source of risk for any financial institution. Therefore, as much as possible, MFI's must try to maintain the quality of their portfolios. Portfolio quality for MFIs are often measured by Portfolio at Risk (PAR), which measures the portion of the loan portfolio "contaminated" by arrears as a percentage of the total portfolio. The most widely used measure of portfolio quality in the microfinance industry is Portfolio at Risk (PAR), which is easy to understand, and does show the exact level of risk. It is comparable across institutions for necessary consideration.

As PAR is one of the important indicators used to show the health of the MFIs, failure to keep delinquency at very low level, can quickly spin out of control. This has to be computed periodically in order to keep the healthy functioning of MFIs. More than any other indicators, this one deserves special care to ensure meaningful and reliable reporting (CGAP 2009). An indicator for portfolio quality, the widely period used for PAR calculation is greater than 30 days. Therefore, PAR > 30 days is outstanding principal balance of all past due more than 30 days to outstanding principal of all loans.

Operational Efficiency

Operational Efficiency is performance measure that shows how well MFIs is streamlining its operations and takes in to account the cost of the input and/or the price of output. Efficiency in expense management should ensure a more effective use of MFIs loanable resources, which may enhance MFIs profitability. Higher ratios of operating expenses to gross loan portfolio show a less efficient management. Operational efficiency in managing the operating expenses is another dimension for management quality (Ongore and Gemechu 2013). The operating expense ratio is calculated by dividing all expenses related to the operation of MFI (including all the administrative and salary expenses, depreciation and board fees) by the gross loan portfolio. Interest and provision expenses are not included. The ratio provides the best indicator of the overall efficiency of a lending institution (CGAP 2009). The lower the ratio, the less likely that financial distress will occur.

Earning Ability

The financial performance of MFIs is reviewed based on their ability to generate sufficient revenue from their loan portfolio in order to cover their financial and operating costs (AEMFI 2013). Earning ability indicate the ability of the institution in generating revenue by using the asset, shareholders equity and using the proportion of gross income. To assess the earnings performance of financial institutions, it will be helpful to look at a variety of ratios and measures: these include return on assets (ROA), return on equity (ROE) and profit margin (PM). ROA measures how well the institutions use all its assets. It is also an overall measure of profitability, which reflects both the profit margin and the efficiency of the institutions (AEMFI, 2013).

ROA is a fairly straight forward measure which encompasses net income, primary portfolio yield, cost of fund and operational efficiency. Return on Asset (ROA) was applied because the Microfinance Financial Reporting Standards recommends the use of ROA and ROE as measures of profitability rather than financial self-sufficiency (FSS) and operational self-sufficiency (OSS) (Muriu, 2011). The ROA reflects the ability of MFI's management to generate profits from the MFI's assets. It shows the profits earned per birr of assets and indicates how effectively the MFIs assets are managed to generate revenues. In Banks and other financial institutions, the most common measure of profitability is return on asset (ROA) (Sima, 2013).

Liquidity

Firm's liquidity is the ability of an asset to be converted to cash quickly at low cost. Liquid assets can be converted into cash quickly and cheaply Brealey and Meyers, (2000). The liquidity of a firm is measured by its ability to satisfy its short-term obligations as they come due. Liquidity refers to the solvency of the firm's overall financial position the ease with which it can pay its bills. Because a common precursor to financial distress and bankruptcy is low or declining liquidity, these ratios are viewed as good leading indicators of cash flow problems Gitman (1991). Firms with low levels of liquidity are more likely to experience financial distress, because cash constrained firms are more vulnerable to exogenous negative shocks to cash flow Altman (1968).

Theoretically, the causes of financial distress are problems of liquidity, which is the inability of current assets to cover current liabilities: which is the measure of current ratio. The lower this ratio indicates that the firm has lower amount of current funds to cover the current obligation. The firm unable to meet its current obligation may have high probability of financial distress. Therefore, liquidity is an important determinant of financial distress. Yonas, et al., (2015) Liquidity position determines how well the financial institutions are liquid in order to cover an immediate disturbance to the financial health of the financial institutions. Liquid Asset to deposit ratio also indicates how well the financial institutions liquid assets have the ability to cover immediate disturbance made to the deposit. Deposit is an obligation of the financial institutions to pay for the depositor during request. The higher the ratio is the more liquidity position of the financial institutions.

Microfinance Institutions Age

The age of MFIs tells about the experiences acquired by the institution with operations, resource mobilization as well as market experience. The evidences provided by (Coleman , 2007) reported a positive impact on MFIs performance, as age increases the institutions expands and reaches more poor clients. The increase in the poor clients raises the repayment problems, which in turn results into higher default rates. There is a thought that as MFIs mature, and thus acquire experience in their sector; they increase their likelihood of attaining financial sustainability. This can be explained by the fact that MFIs gradually improve their control over all operations related to issuance of microcredit. In other case, MFIs that have considerable experience in the microfinance sector have diligently applied credit risk management and general efficient management techniques to attain financial sustainability (Ayayi, 2010).

2.2.2 Macroeconomic Variable (External Factor)

Economic Growth (GDP)

GDP is defined as the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products (World Bank, 2014). The study used real GDP growth as a proxy of the macroeconomic environment. Arguably, this is the most informative single indicator of progress in economic development. Poor economic conditions can worsen the quality of the loan portfolio, thereby reducing

profitability. In contrast, an improvement in economic conditions has positive effect on the profitability of MFIs, (Muriu, 2011). According to the study undertaken by Imal et al., (2012) working paper entitled financial performance of microfinance institutions a macroeconomic and institutional perspective drawing up on the Microfinance information exchange data and cross-country data on macro economy, finance institutions and use hausman-taylor to take account of endogeneity and they found GDP have positive impact on MFIs financial performance. An increase in the real GDP growth rate is negatively related to the probability of failure.

Inflation

It is a persistent tendency for prices and money wages to increase. The dictionary of economics said “inflation is measured by the proportional changes over time in some appropriate price index, commonly a consumer price index or a GDP deflator” inflation occurs when the general price level is rising.

As it is defined in world development indicator (World Bank, 2014) the calculation of inflation is measured by the consumer price index which indicates the annual percentage change of the average consumer cost in acquiring a basket of goods and services over the interval time.

2.3 Empirical Literature Review

This part deals with the empirical framework supported by different researchers regarding the financial distress determinants.

A comprehensive analysis of the empirical work on the reasons for financial distress provides evidence that companies can fail for different reasons. The results of empirical investigations depend on the chosen time frame and the sample of the companies in question; they vary in the cross-section compared to the evaluations on the industry level Outecheva, (2007).

2.3.1 Countries Study on Determinants of Financial Distress

According to Florence M & Abuga N (2013) the study was undertaken with the purpose of analyzing the causes of financial distress and its effect in firms funded by industrial and commercial development corporation in Kenya. The study analyzed the causes of financial distress using weighted mean score and factor analysis. The period of study consider information

from companies that was operated during the years 2009 to 2012. In addition, the researcher decided not to include any financial information from companies during the years 2007 and 2008 because of economic crisis that affect the normal operation of the companies.

They found that the main causes of financial distress are endogenous variables which had the highest weighted mean score as compared to exogenous variables. Similarly, they noted that the most significant causes of distress were improper capital decision, inadequacy of capital, access to credit, shortage of skilled manpower, poor accounting records and poor internal management. Through Factor Analysis, finance factor was the main cause of financial distress in comparison with management, accounting system, policy changes and liquidity factors.

Kinyariro et al., (2016) the study aimed at examining the relationship between adherence to Basel III accord and financial distress status of commercial banks in Kenya. The study adopted a descriptive research design and the population of the study consisted of all the 43 commercial banks in Kenya. The study used secondary data, which was obtained from the listed companies financial statements from 2013-2014. The study used descriptive and inferential statistics to analyze the data. The dependent variable in the model was measured by Altman Z- score of financial distress. The independent variables for the study included Capital Requirements, Leverage Requirements and Liquidity Requirements. The study findings revealed that capital requirements, leverage requirements and liquidity requirements have a positive relationship with Altman Z- score which measures financial distress status of commercial banks in Kenya.

Pranowo et al. (2010) empirically examines the dynamics of corporate financial distress of public companies (non financial companies) in Indonesia for the period of 2004-2008. Using panel data regression, they analyze internal and external factors affecting corporate financial distress. To distinguish the status of financial condition, the process of integral corporate financial distress is classified into four steps: good, early impairment, deterioration and cash flow problem companies.

The results show that current ratio, efficiency, equity and dummy variable of the status good financial condition have positive and significant influences to Debt Service Coverage as a proxy of financial distress. On the other hand, leverage has a negative and significant relation with Debt Service Coverage. Other variables such as profit, retained earnings, good corporate

governance and macroeconomic factor have no significant impact on the status of corporate financial distress. Furthermore, the analysis indicated that profitable companies should not be a guarantee that the companies can survive to fulfill its liabilities. Liquidity of companies which can be a prominent point can be recognized by evaluating cash flow performance.

According to the study Nimal Sanderatne, (2003) cited by Dissanayake, (2012) a study on determinants of financial viability, defined that the operational efficiency and low administration costs have an important bearing. Besides, a study on financial performances, the study declared that, many MFIs are not considered sustainable. By stating the fact, the researcher confirmed that the operational efficiency is inevitable to attract funds. Dissanayake (2012), Operating efficiency is proxies by operating expense ratio which is adjusted operating expense divided by adjusted average gross loan portfolio and concludes that Operating Expense Ratio, are statistically significant predictor variables in determining Return on Assets Ratio. In line with this idea Muriu, (2011) concluded that inefficiency in the management of operating expenses to significantly decrease MFI profitability and it leads to failure or distress.

2.3.2 Cross Country Studies on Determinants of Financial Distress

Dorfleitner et al., (2014) they empirically studied the determinants of failures of microfinance institutions based on the CAMELS rating components and microfinance-specific factors measured by applying probit regression techniques. For their analysis, they used annual balance sheet and income statement data on 1,797 MFIs in 117 countries from 1995 until 2011, which replenish with information regarding financial distress derived from extensive online investigations. To detect failed MFIs, they examine breaks in the data history. They identify documented failures, i.e. MFIs that have been closed by a legal authority due to bankruptcy, defaulted on a loan, undergone a restructuring process, or were forced to merge with another MFI due to financial distress.

Their findings confirm the capital adequacy (C), the asset quality (A), the management capability (M), the earnings (E), and the sensitivity to market risk (S) as explaining factors of failures of microfinance institutions. The results of their findings also confirm that the factors driving failures of MFIs are similar to traditional banks. The significant negative relationship between the capital asset ratio and the likelihood of failure is consistent with studies examining financial

distress (Koetter et al., 2007; Arena, 2008). Additionally, their results show a significant positive effect of (bad) asset quality, already detected in several previous studies on the failures of traditional banks Wheelock and Wilson, (2000), Kerstein and Kozberg, (2013). Their findings on the measure for earnings significantly show the negative sign. This relationship has also been determined for traditional banks. While they are not able to identify a significant relationship between the liquidity and the probability of failure, previous studies on commercial banks show mixed results for this CAMELS component. Koetter et al. (2007) find a significant positive relationship (for distressed targets). However, the respective findings of Arena (2008) are not significant for the sample of Latin American banks. Similarly, Koetter et al. (2007) obtain insignificant results concerning liquidity for distressed acquirers.

Regarding the described varying previous findings for commercial banks, they conclude that, although insignificant, their finding for the liquidity as a predictor for failure is in accordance with the results of studies on traditional banks' failures. For microfinance-specific effects, there is a positive influence of the percentage of female borrowers on the likelihood of failure. Moreover, they find evidence that regulation, the presence of donations, and the rapid growth of an MFI affect the probability of failure. In addition their findings also confirm that many results from standard banking studies are also applicable to MFIs, with the main result in this regard being that of the CAMELS components the capital adequacy (C), the asset quality (A), the management capability (M), the earnings (E), and the sensitivity to market risk (S) can be confirmed as being explanatory factors of the probability of failure of MFI.

Sainz-Fernandez et al. (2015) empirically analyses the reasons for crises in microfinance institutions (MFIs), using a sample of 832 MFIs from 74 countries for the period 2003–2011. The methodology used is logit analysis with panel data. The main results show that both internal and external factors influence the probability of a crisis. They found different factors that reduce the likelihood of a crisis such as company's performance, country's economic growth, political stability, and existence of a private credit bureau. On the other hand, excessive liquidity, a higher proportion of deposits over loans and more loans per employee all increase the probability of a crisis.

Shaut and Mill (2011) undertaken a study with the aim of determinants of banking distress with merger as strategy policy to resolve distress in MENA countries and addresses the question of whether mergers are commonly considered as a solution for resolving individual bank distress. The study investigated the distressed and subsequent merger decisions for 330 banks from Mena region during the period 2000-2007. They measure by applying Logit model both specific bank variables such as capital adequacy, asset quality, management efficiency, earning ability and macro variables are deployed to predict banking distress.

The result of the study showed that bank specific factors have a significant impact on the probability of bank distress. Regarding liquidity, distressed banks appear less liquid as they have a higher deposit to total asset ratio, which makes them less able to withstand unexpected deposit withdrawal. Capital adequacy implying that higher capitalization has a negative impact on the probability of distress as the bank will be better able to absorb losses. Asset quality shows that higher loan growth trends to increase the probability of distress.

However, from the macro factors used, only GDP growth significantly increased individual bank distress. Rising CPI indicates inflation, which often works in a financial institutions favor, their assets are re-priced faster than their liabilities, and inflation reduces the real value of nonperforming loans their findings also confirm the expectation but Inflation measured by consumer price index as shown does not appear to significantly increase banking distress in MENA countries.

2.3.3 Empirical Literature on Determinants of Financial Distress in Ethiopia

Andualem, U., (2011) has undertaken a study with the purpose of identifying the determinants of financial distress in selected beverage and metal manufacturing firms in Ethiopia. The study was including eight beverage and three metal manufacturing firms in Ethiopia for the period of 1999-2005. The researcher used Debt Service Coverage (DSC) as a proxy of financial distress and he also used liquidity, firm age, profitability, firm size, efficiency, leverage, corporate governance and operational viability as factors affecting firm's financial distress of selected beverage and metal manufacturing firms in Ethiopia.

The results of the study indicate that profitability, firm age, liquidity and efficiency have positive and significant influences to Debt Service Coverage (DSC) as a proxy of financial distress. On

the other hand, leverage has a negative and significant relation with DSC as a proxy of financial distress. Other variables such as operational viability and good corporate governance have no significant impact on the status of firm's financial distress. Furthermore, the analysis indicated that operationally viable companies in some period of time should not be a guarantee that the companies going concern to fulfill its liabilities. Liquidity of companies which can be a prominent point can be recognized by evaluating cash flow performance.

In addition, the finding of the study indicates that firm's liquidity, leverage, profitability, firm efficiency; firm size and low debt service coverage are the main causes of financial distress at highest degree. The variable operational viability causes firm's financial distress at higher level. On the other hand, the variable such as macroeconomic factors, industrial relations, good corporate governance implementation problems and firm age causes financial distress at lower level.

Yohannes, T., (2014) empirically studied the determinants of financial distress in the case of manufacturing share companies in Addis Ababa-Ethiopia. The study was including twelve manufacturing share companies in the sample and data collected from 2009 to 2013 from annual reports. The study used Debt Service Coverage (DSC) as a proxy of financial distress and the study also used liquidity, leverage, profitability, solvability, firm size, efficiency, economic growth and inflation as an independent variables. He used quantitative method of research approaches to test the hypothesis and applied panel data model. The collected data then analyzed using descriptive statistics and panel data regression analysis.

The results indicate that solvability, firm size, economic growth and liquidity have positive and significant influences to Debt Service Coverage (DSC) as a proxy of financial distress. On the other hand, leverage has a negative and significant relation with DSC. Other variables such as profitability, efficiency and inflation have no significant impact on the status of firm's financial distress in manufacturing share companies in Addis Ababa-Ethiopia.

Ephrem, G., (2015) studied the determinants of financial distress conditions of commercial banks in Ethiopia a case study of selected private commercial banks by using Altman Z score model and estimated determinants of financial distress using panel data. The study includes six private commercial banks in Ethiopia in the sample and data collected from 2002/03 to 2011/12. The

researcher used only bank specific factors that affect firm's financial distress. In the study Altmans' Z score of the banks is used as the proxy for financial distress as it measures the financial distress conditions of banks and the study also used non performing loan, the ratio of interest income to total revenue, capital adequacy, firm efficiency and firm size as an independent variables.

The findings of the study confirms that capital to loan ratio, net interest income to total revenue ratio have statistically significant positive influence on the financial health of banks where as the non performing loan ratio has statically significant negative influence on the financial health of the banks.

2.4 Identification of Knowledge gap

The review of the literature reveals the existence of knowledge gap in respect to the determinant of financial distress, particularly in the context of Ethiopia. Even though the renewed and increased interest in the issues of financial distress in the African continent, relevant empirical studies are still quite few. Scholars in the developed economies produced comparatively sizable literature on financial distress. But the literature of financial distress in developing nations and specifically on Africa is far behind from being adequate. Studies conducted by Pranowo et al (2010), Andualem (2011), Florence M & Abuga N (2013), Yohannes (2014) , Ephrem (2015) and Kinyariro et al., (2016), investigated the determinants of financial distress of firms in developing countries.

However, to the best knowledge of the researcher there is no study has been focusing on the financial distress of MFIs in Ethiopia. Thus, this study is conducted to fill the knowledge gap by checking the consistency of the result of the above empirical studies and by examining the determinants of financial distress of MFIs. In general, the lack of sufficient research on the determinants of financial distress of MFIs, in the context of Ethiopia and the existence of knowledge gap in the area begin this study.

2.5. Conceptual Framework of the Study

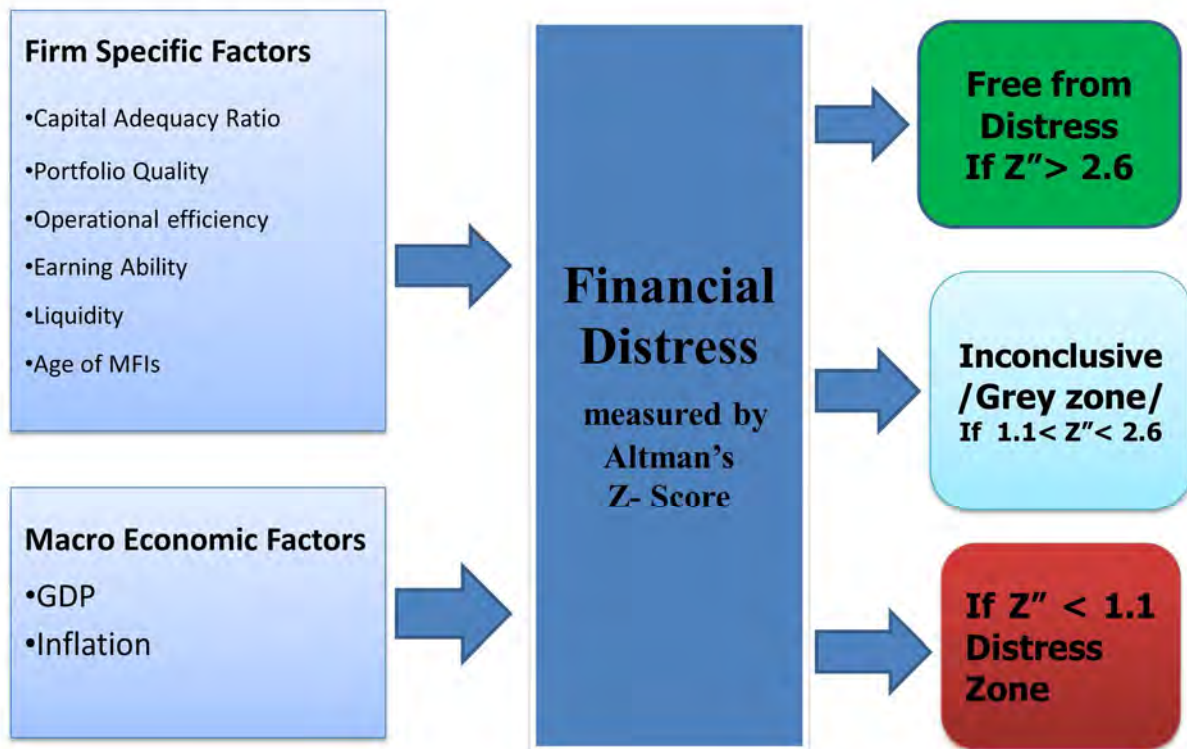


Figure 2.1. Self constructed conceptual framework

CHAPTER THREE

3. RESEARCH DESIGN AND METHODOLOGY

This chapter sets to explain the research design, target population, sampling size and sampling method, methods of data collection and data source, data analysis and techniques and also operational definition of variables and model specifications were presented.

3.1. Research Design

The study with the aims of examining determinants of financial distress of microfinance institutions in Ethiopia used the quantitative research approach by using panel research design to realize stated objectives. The advantage of using panel data is that, it controls for individual heterogeneity, less co-linearity variables and tracks trends in the data something which simple time-series and cross-sectional data cannot provide (Brooks,2008). By studying the repeated cross section of observations, panel data are better suited to study the dynamics of change, panel data can better detect and measure effects that simply cannot be observed in pure cross-section or pure time series data, by making data available for several thousand units, panel data can minimize the bias that might result if we aggregate individuals or firms into broad aggregates.

The study employed quantitative research approach which tends to assume that there is a cause and effect relationship between known variables of interest. In line with this, quantitative research tests the theoretically established relationship between variables using sample data with the intention of statistically generalizing for the population under investigation. Therefore Ordinary least square (OLS) method particularly multiple regression models were used to examine the significant determinants of financial distress of MFIs in Ethiopia. To measure the financial distress of MFIs in Ethiopia, Altman's Z score was applied as the dependent variable.

3.2. Target Population

The research was focused on the population of all MFIs' registered by NBE. As per NBE (2014/15) annual report 35 microfinance institutions are operating in Ethiopia.

3.3. Sample size and Sampling method

A sample of a subject is taken from the total population to make inference about the population, because it is time consuming and expensive to collect data about every individual institutions in the population. However, where the selected sample can reliably represent the population, the sample can still be use to make inferences about the population (Collis and Hossey, 2003 cited in Yonas, 2012). The study was used purposive sampling method to select a sample of ten MFIs, which are ACSI, DECSI, OCSSCO, OMO ADCSI, SFPI, Vision, Buussagonfa, PEACE and Wasasa from the total population of 35 MFIs in the country.

The criteria for choosing among the MFIs were based on the availability of full year audited data for the time period of 10 years (2006-2015). Therefore, based on the sample size and the time coverage, the sample consists of 100 observations. The study was collected secondary data of the respective MFIs from Association of Ethiopian Micro finance Institutions (AEMFI), National Bank of Ethiopia (NBE) and Ministry of Finance and Economic Cooperation (MoFEC).

3.4. Methods of Data collection and Data source

To comply with the research objectives, the researcher mainly uses secondary sources of data. The secondary data of the respective MFIs' was collected from Association of Ethiopian Micro finance Institutions (AEMFI), NBE and MoFEC. The method adopted to collect the necessary data consists of structured document reviews. Accordingly, the data related to a documentary analysis which is necessary to undertake this study is gathered from the financial statements of ten MFIs' for ten consecutive years (2006-2015) and the data was the audited financial statements particularly balance sheet and income statement.

3.5. Data Analysis and Technique

The collected panel data were analyzed and interpreted by using descriptive statistic, correlation analysis and multiple regression estimation method. To enhance the robustness of the models and to control the cross section effects of the intercepts the study employed fixed effect regression techniques. The simplest types of fixed effects models allow the intercept in the regression model to differ cross- sectionally (Brooks, 2008). The fixed-effects model controls for all time-invariant differences between the individuals, so the estimated coefficients of the fixed-effects models cannot be biased because of omitted time-invariant characteristics. The study checked

whether the proposed empirical model is free from autocorrelation, multicollinearity, heteroskedasticity and normality. If any one of those phenomenon turns out to be present, this would be a violation of a key assumption of OLS regression. Hausman test is also made to ensure that a fixed effect regression technique is appropriate. The results of all assumptions tests and robustness checks ensured that they are not violated. To conduct this, the researcher used Eviews 8 software as recommended by Brooks (2008) due to its ability to help researchers to analyze research easily and efficiently.

3.6. Description and Measurement of Variables

This section explains the variables used as dependent and independent (explanatory) variables in the study. The definitions or measurements used for these variables also described.

3.6.1 Dependent Variable

In the literature, there are various alternatives to measures financial distress of the firms; which includes Moody's financial ratio, standard and Poor's financial ratio, Vaziri's financial ratio, logit model and Altman's Z-score. According to Vaziri et al., (2012), study the comparative predictability of failure of financial institutions using multiple models, of all the models Z-score model gives the best prediction. Its prediction percentage of failed financial institutions is 80% and shows 75% correct prediction before two years.

The predictive accuracies of different models seem to be generally comparable, although artificially intelligent expert system models perform marginally better than statistical and theoretical models Vaziri et al., (2012). Individually, the Altman Z score and logit model dominates the research. Given that financial ratios have been dominant in most research to date, it may be worthwhile increasing the variety of explanatory variables and management practices while developing the research model (Aziz and Dar, 2006). This study applies Altman's Z- score to determine the financial distress of MFIs in Ethiopia. Thus, Z score is taken as a proxy for financial distress as modeled by Altman and Hotchkiss, (2005) applied by (Ramili 2010), (Ephrem, 2015) and (Kinyariro et al., 2016).

$$\text{Altman's } Z'' = 6.56X1 + 3.26X2 + 6.72X3 + 1.05X4,$$

Where Z'' = financial distress measure of MFIs

$X1$ = Working Capital/Total Assets

$X2$ = Retained Earning /Total Assets

$X3$ = Earnings before Interest and Taxes/Total Assets

$X4$ = Book Value Equity/Book Value of Total Liabilities

A financial institution was considered bankrupt if value is

- ✓ Less than 1.1. Zone of ignorance /**Distress Zone**/
- ✓ If values fall between 1.1- 2.6, defined **Grey zone** and
- ✓ If values are greater than 2.6, it is considered **Non-Distress zone**

3.6.2 Independent Variable

To measure the predictor variables of financial distress of MFIs in Ethiopia, eight variables used as independent variables which are extracted from different studies. The independent variables or determinants of financial distress were capital adequacy, portfolio quality, Operational efficiency, earning ability, liquidity, firm age, GDP and inflation. These variables can be measured by the following formulas:

- **Capital Adequacy Ratio (CAR):** is an important indicator of an MFI's ability to meet its obligations and absorb losses. Capital adequacy refers to the amount of capital a MFI have relative to its assets. It measures the amount of capital relative to assets that MFI should have. As a proxy for the MFIs capital, this study used the ratio of equity to assets. MFI with higher capital to asset ratios are considered relatively safer compared to institutions with lower ratios. Given that MFI with low capital ratios are also riskier in comparison with better capitalized financial institutions
- **Portfolio quality:** measured by portfolio at risk greater than thirty days (PAR > 30 days) which means outstanding principal balance of all past due more than 30 days to outstanding principal of all loans. It is computed by dividing the outstanding balance of all loans with arrears over 30 days and all refinanced (restructured) loans, by the outstanding gross portfolio as of a certain date (AEMFI, Bulletin, 8, 2012).

- **Operational Efficiency:** measured by dividing all expenses related to the operation of the MFI (including all the administrative and salary expenses, depreciation and board fees) by the gross loan portfolio but interest and provision expenses are not included
- **Earning Ability:** Return on Asset (ROA) was applied because the Microfinance Financial Reporting Standards recommends the use of ROA and ROE as measures of profitability rather than financial self-sufficiency (FSS) and operational self-sufficiency (OSS) (Muriu, 2011). The ROA reflects the ability of MFI's management to generate profits from the MFI's assets. It shows the profits earned per birr of assets and indicates how effectively the MFIs assets are managed to generate revenues. For financial institutions, the most common measure of profitability is return on asset (ROA) (Sima, 2013).
- **Liquidity:** Firms with low levels of liquidity are more likely to experience financial distress, because cash constrained firms are more vulnerable to exogenous negative shocks to cash flow Altman (1968). Theoretically, the causes of financial distress are problems of liquidity, which is the inability of current assets to cover current liabilities: which is the measure of current ratio. The lower this ratio indicates that the firm has lower amount of current funds to cover the current obligation. This study measured liquidity by current ratio which means current asset to current liabilities.
- **Age of Microfinance:** the study used the natural logarithm of age of MFIs since their operation
- **GDP:** stands for growth domestic product of the country
- **Inflation:** measured by the consumer price index

Table 3.1: Summary of explanatory variables for MFIs' financial distress

Variable	Definition	Expected Result	
		Altman Z'' score	Financial distress
CAR	Capital Adequacy Ratio	+	-
PAR>30 days	Portfolio at Risk	-	+
OPEFF	Operational Efficiency	-	+
EAR	Earning Ability	+	-
LIQ	Liquidity	+	-
AGE	№ of years in operation	+	-
GDP	GDP growth rate	+	-
INF	Inflation	-	+

Source: adapted from different empirical evidences

3.7. Model Specification

This section covers the operational multiple regression model that are used in the study. The multiple regression model used for this study to determine the factors affecting the financial distress of MFIs in Ethiopia is explained as follows. The model is adopted from different studies conducted on the same area.

$$FD = C + \beta_1 CAR_{it} + \beta_2 PAR_{it} + \beta_3 OPEFF_{it} + \beta_4 EAR_{it} + \beta_5 LIQ_{it} + \beta_6 AGE_{it} + \beta_7 GDP_{it} + \beta_8 INF_{it} + \varepsilon$$

Where:

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ and β_8 are coefficients of independent variables

FD is a dependent variable which is the output of the Z score

C: stands for the intercept term which varies across MFIs but constant over time

CAR_{it}: stands for Capital adequacy ratio for MFI i at time t

PAR_{it}: stands for portfolio quality for MFI i at time t

OPEFFit: stands for operational efficiency for MFI i at time t

EAR: stands for earning ability for MFI I at time t

LIQit: stands for liquidity of MFIi at time t

AGEit: stands for age of micro finance for MFI i at time t

GDPit: stands for growth domestic product of the country

INFit: stands for inflation

ε is an error term.

CHAPTER FOUR

4. DATA ANALYSIS AND DISCUSSION

This chapter deals with the results of study which include descriptive statistics of variables, correlation results for dependent and explanatory variables, model specification tests (tests for the Classical Linear Regression Model assumptions), and finally presentation of panel data regression analysis and discussion of results.

4.1. Descriptive Statistics of variables

In this section the study present the results based on the descriptive statistics for both dependent variable Z-score and independent variables. Table 4.1 provides a summary of the descriptive statistics of the dependent and independent variables.

Table 4.1. Descriptive statistics of dependent and explanatory variables

	Mean	Maximum	Minimum	Std. Dev.
Z-SCORE	1.9227	3.9278	0.4078	0.8146
CAR	0.3550	0.7200	0.0900	0.1376
PAR>30DAYS	0.0271	0.1516	0.0000	0.0262
OPEFF	0.1026	0.8000	0.0100	0.0970
EAR	0.0411	0.2400	-0.0930	0.0522
LIQ	1.1616	2.5342	0.4779	0.4493
LOG(AGE)	2.4664	2.8904	1.7918	0.2721
GDP	0.1054	0.1179	0.0884	0.0088
INF	0.1723	0.3640	0.0280	0.1084
Observations	100	100	100	100

Source: E-views 8 output from MFIs financial statement

For each variable, Table 4.1 shows mean, maximum, minimum and standard deviation value. The financial distress of Ethiopian micro finance institutions which is measured by Altman Z-score for 100 observations indicates that on average 1.9227 during the study period of (2006-2015). In addition the maximum and minimum values of Z-score were 3.9278 and 0.4078 respectively. The mean value of Z-score shows that MFIs in Ethiopia on average for the ten year period under study is under the grey zone which is $1.1 < Z < 2.6$ “Grey Zone”. On the contrary minimum value of 0.4078 indicating that there is MFIs in financial distress in the period of the

study. Standard deviation is 0.8146, which implies large difference in Z-score as it measures the financial distress of MFIs in Ethiopia.

The variable capital to asset ratio mean, minimum and maximum values shows that 35.5 %, 9% and 72 % respectively. The mean value 35.5 % indicated that 35.5 % of MFIs in Ethiopia were financed by shareholders funds while the remaining 64.5 % was financed by deposits and liabilities. The minimum value indicates that there is MFIs recorded capital to asset ratio below the requirements of CGAP. Micro finance institutions should be subject to even higher capital adequacy ratio than banks in light of the risk and vulnerability of MFIs loan portfolio and advises to maintain ratios approaching 20% (CGPA 2009, cited in AEMFI, (2013)

Regarding the PAR >30, the higher its value, the riskier the credit portfolio, which can have a negative influence on Z- score as taken as a proxy of financial distress of the MFI. These study mean, maximum and minimum values are 2.71 %, 15.16 % and 0 % respectively. According to AEMFI, (2015) any portfolio at risk (PAR > 30 days) exceeding 10 % should be a serious cause for concern; because unlike loans of commercial banks, most loans disbursed by MFIs are not backed by bankable collateral. Therefore, the result of this study shows that during the study period on average the MFIs the portion of the portfolio in arrears or unpaid is 2.71 %. The maximum 15.16 % result implies that the credit portfolio of some MFIs in the sample is risky.

Operational efficiency was measured by all expenses related to the operation to gross loan portfolio of the institutions. The average operating efficiency of MFIs in Ethiopia was 10.26 % indicating that on average they are incurring 0.1026 cents in operating expense for each birr in the gross loan portfolio. Some highly efficient institutions incur operating expense of 0.01 cent for each birr in the gross loan portfolio. On the other hand, inefficient institutions in the industry incur an operating expense of 0.80 cents for each birr on their gross loan portfolio. The result of the study indicated that the most efficient MFIs have a low operating expense ratio.

Earning ability of Micro Finance institutions which is measured by Return on Asset how well the institutions use all its assets. The result of the study indicated that the mean value of 4.1%, maximum value of ROA 24% and minimum value of -9.3%. This shows that the MFIs under the study period was get the return on average 0.0411 cents in every one birr investment they made on total asset and the profitable MFIs earned 0.24 cent of profit for a single birr investment they

made on total asset. On the contrary, not profitable MFIs lost 0.093 cents for one birr investment made on total assets of the firm.

Liquidity of the institutions was measured by current ratios. The results of the study indicated that the mean value of 1.1616, maximum 2.5342, minimum 0.4779 and standard deviation of 0.4493. This shows that on average MFIs current asset cover their current liabilities 116.16 %. On the contrary, some MFIs in the sample their current asset only cover their current liabilities 47.79%. The standard deviation showed 44.47 % implying the variation in terms of liquidity.

Macroeconomic indicators that can affect the MFIs financial distress over time are GDP and Inflation. The mean value of real GDP growth rate was 10.54% indicating the average real growth rate of the country's economy over the past 10 years. The maximum growth of the economy was recorded in the year 2007 (i.e. 11.8%) and the minimum was in the year 2012 (i.e. 8.84%) with little dispersion towards the average over the period under study with the standard deviation of 8%. The mean, minimum and maximum values of inflation are 17.23%, 6.4% and 2.8% in the period under consideration. If inflation is high it is possible that the MFI is actually losing money even though they show profits. In countries with high inflation, the cost of financing is generally the sum of the commercial financing rate plus the rate of inflation (Micro Rate, 2014).

4.2. Correlation Analysis

According to Brooks (2008), correlation between two variables measures the degree of linear association between them. Pearson product moment of correlation coefficient was used to find the association of the independent variables with the dependent variable. Values of the correlation coefficient are always ranged between positive one and negative one. A correlation coefficient of positive one indicates that a perfect positive association between the two variables; while a correlation coefficient of negative one indicates that a perfect negative association between the two variables. A correlation coefficient of zero, on the other hand, indicates that there is no linear relationship between the two variables.

Table 4.2 Correlation matrix among dependent and independent variables.

	Z-SCORE
Z-SCORE	1
CAR	0.513406
PAR>30DAYS	-0.452476
OPEFF	0.186346
EAR	0.464436
LIQ	0.234958
LOG(AGE)	0.181942
GDP	-0.254872
INF	-0.032672

Source: E-views 8 output from MFIs financial statement

By taking a correlation result which is presented above from 2006 up to 2015 the study period the independent variables to dependent variable which is Z-score. The result indicated in the table above PAR>30days, GDP and INF had negative correlation to Z-score with coefficient of correlation -0.452476, -0.254872 and -0.032672 respectively. CAR, OPEFF, EAR, LIQ and Age of MFIs had positive correlation to Z-score with correlation coefficient of 0.513406, 0.186346, 0.464436, 0.234958 and 0.181942 respectively. Hence, the results have to be interpreted in reverse: positive sign of the coefficient means negative linear relationship with financial distress and conversely.

4.3. Result of model test

H0: Random effect model is better than fixed effect model

H1: Fixed effect model is better than Random effect model

Table 4.3 Hausman test of Model

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	19.629692	8	0.0002

Source: E-views 8 output from MFIs financial statement

Reject H0 since the p-value is less than the significance level of 0.01 (1%). Therefore, fixed effect model is preferable than random effect model.

4.4. Tests for the Classical Linear Regression Model (CLRM) Assumptions

Test for average value of the error term is zero ($E(u_t) = 0$) assumption

The constant term (i.e. α) was included in the regression equation. Therefore, the average value of the error term in this study is expected to be zero.

Test for homoscedasticity assumption ($Var(u_t) = \sigma^2$)

According to Brooks, (2008) it has been assumed thus far that the variance of the errors is constant, σ^2 - this is known as the assumption of homoscedasticity. If the errors do not have a constant variance, they are said to be heteroscedastic. To test for the presence of heteroscedasticity, the popular white test was employed.

Table 4.4 Test of Heteroskedasticity

Heteroskedasticity Test: White			
F-statistic	1.347501	Prob. F(8,91)	0.2306
Obs*R-squared	10.59148	Prob. Chi-Square(8)	0.2259
Scaled explained SS	7.909704	Prob. Chi-Square(8)	0.4423

Source: E-views 8 output from MFIs financial statement

According to Brook, (2008) indicated that if the P-values of these test statistics are considerably in excess of 0.05, then the test give conclusion that there is no evidence for the presence of heteroscedasticity. It is clear evident that the errors are homoscedastic.

Test for Autocorrelation

The other assumption of regression model assumes that there is no pattern in the errors or disturbance terms i.e. the covariance between the error terms over time or cross-sectional is zero (Brook, 2008, p 139) this is called autocorrelation. One ways that autocorrelation is detected is using Durbin Watson (DW) test, the first order auto correlation test, that is the relationship

between error term and its immediate previous value. Accordingly to say that there is no autocorrelation, the DW test statistic should be closer to 2.

Figure 4.1. Durbin Watson test rejection and non-rejection region

Reject Ho: Positive Autocorrelation	Inconclusive	Do not reject Ho: No Autocorrelation	Inconclusive	Reject Ho: Negative Autocorrelation
0	<i>DL</i> 1.378	<i>Du</i> 2 1.717	4-du 2.283	4-dL 2.622

The study used the dL and dU values for 100 observations as approximation of 100 observations. As per the DW table for 100 observations with 8 variables at 1% level of significance, the dL and dU values are 1.378 and 1.717 respectively. Based on Eviews 8 result the DW values for Z-score for 100 observations was 1.775. The DW value of Z-score lies between 1.717 and 2.283. Hence, there was no evidence of autocorrelation.

Test for absence of series multicollinearity assumption

Multicollinearity is an assumption of a linear relationship between explanatory variables that creates biased regression model. This problem occurs when the explanatory variables are highly correlated with each other (Brook, 2008). Kennedy (2008) noted that the problem of correlation between explanatory variables exists when coefficient of correlation among the variables are greater than 0.70. As illustrated below in table 4.5, frequency of financial distress in microfinance institutions has a correlation coefficient of 0.628 which is relatively higher than the other variables coefficients; still it is less than 0.70. It can be said that the problem of serious multicollinearity had not existent.

Table 4.5 correlation matrix between explanatory variable

	Z-SCORE	CAR	PAR>30 DAYS	OPEFF	EAR	LIQ	LOG(AGE)	GDP	INF
Z-SCORE	1								
CAR	0.513	1							
PAR>30DAYS	-0.452	-0.239	1						
OPEFF	0.186	0.259	-0.131	1					
EAR	0.464	0.013	-0.230	-0.004	1				
LIQ	0.235	0.451	-0.245	0.234	0.098	1			
LOG(AGE)	0.182	-0.415	0.113	-0.008	0.435	-0.505	1		
GDP	-0.255	0.088	-0.112	-0.062	-0.377	0.225	-0.628	1	
INF	-0.033	0.021	0.125	-0.052	0.019	0.116	-0.146	-0.345	1

Source: E-views 8 output from MFIs financial statement

Normality test

Table 4.6 Jarque-Bera statistics result for the regression models to test Normality

	Z-score
Probability Jarque-Bera statistic	0.531

Source: E-views 8 output from MFIs financial statement

Based on the result, the probability of Jarque- Bera of Z-score in the above table is 0.531. Hence, the null hypothesis that is the error term is normally distributed should not be rejected and it seems that the error term in all of the cases follows the normal distribution.

4.5. Result of regression analysis

4.5.1 Regression analysis between dependent and explanatory variables

Table 4.7 Regression results of Z-score

Variable	Coefficient	Prob.
CAR	3.846248	0.0000***
PAR>30DAYS	-6.705181	0.0017***
OPEFF	-0.192777	0.7434
EAR	5.262405	0.0000***
LIQ	0.431554	0.0201**
LOG(AGE)	1.205847	0.0006***
GDP	-0.950508	0.9115
INF	0.006514	0.9901
R ²	0.780122	
Adjusted R ²	0.734538	
Prob(F-statistic)	0.000000	
Durbin-Watson stat	1.775458	
*** Significant at 1%, ** Significant at 5% and * Significant at 10%		

Source: E-views 8 output from MFIs financial statement

Empirical model

$$\text{FD} = -2.834 + 3.846\text{CAR} - 6.705\text{PAR} - 0.193\text{OPEFF} + 5.262\text{EAR} + 0.432\text{LIQ} + 1.206\text{AGE} - 0.951\text{GDP} + 0.007\text{INF}$$

The R² values indicate that the explanatory power of the model and adjusted R² value which takes into account the loss of degrees of freedom associated with adding extra variables were inferred to see the explanatory powers of the models. As the regression result described in table 4.7, the R-squared statistics and the adjusted-R squared statistics of the model are 78.01% and 73.45% respectively. This indicates that the changes in the independent variables (capital adequacy, portfolio quality, operational efficiency, earning ability, liquidity, age of microfinance,

GDP and inflation) collectively explain 78.01% of the changes in the dependent variable Z-score as a proxy of FD and the remaining 21.99% of changes was explained by other variables which are not included in the model. Thus these variables collectively, are good explanatory variables of the financial distress of microfinance institutions in Ethiopia. Prob(F-Statistic) 0.000000 indicates strong statistical significance, which enhanced the reliability and validity of the model.

The value of beta in regression model indicates that the level of each coefficient of explanatory variable influence on the dependent variable positively or negatively. Moreover the P-value of each explanatory variable indicates the percentage level of each variable is significant or not. In view of the results presented in table 4.7, PAR > 30 days has negative and statistically significant impact on Z-score as a proxy of financial distress at 1% level of significance. On the other side capital adequacy, earning ability and age of MFIs have positive and statistically significant impact on Z-score as a proxy of financial distress at 1%. Liquidity has positive and statistically significant impact on Z-score as a proxy of financial distress at 5% level of significance. In contrary operational efficiency, GDP and inflation have no significant impact on Z-score as a proxy of financial distress of MFIs in Ethiopia.

4.5.2 Discussion of Empirical result

Capital Adequacy: The coefficient of the capital to asset ratio (CAR) is positive 3.8462 and statistically significant even at 1%. This confirms that for the study period 2006 up to 2015 capital strength of Ethiopian MFIs do have a positive relationship with Z-score as a proxy of financial distress. This indicates that all other variables holding constant, increasing CAR by one unit to increase Z-score by 3.8462 units which means it increases the financial health of the institutions. When Z-score increases the financial distress of the institutions was decreases. Therefore hypothesis No.1 which is capital adequacy ratio has positive significant relationship with Z-score as a proxy of financial distress of MFIs in Ethiopia was accepted because the data support the hypothesis. The theory also says that well capitalized MFIs is more flexible in dealing with problems arising from unexpected losses and against credit risks and results in a better chance for financial performance. This result is also in line with the previous studies carried out by Pranowo et al., (2010), Shaut and Mill (2011), Dorfleitner et al., (2014) and Ephrem G.,(2015).

Portfolio Quality: Portfolio quality is a measure of how well the institution is able to protect total funds available for use as loans to its clients against all forms of risks. The coefficient of the portfolio-at-risk > 30 days has significant negative influence on the financial health of the MFIs with coefficient of -6.7052 and the p-value of 0.0017. The beta coefficient of PAR > 30 days ratio indicate that all other variables holding constant the one unit increase in PAR>30 days will result in 6.7052 decrease in the Z score of the MFIs. This in turn will lead to deterioration of financial health of the MFIs since low Z score means high financial distress which even can lead to bankruptcy.

The result confirms the hypothesis, namely that a significant increase in the PAR > 30 days in the portfolio should have a negative impact on Z-score which increases the financial distress of MFIs in Ethiopia. In other words, a high portfolio at risk would limit the revenue derived from microcredit operations and therefore decrease the amount of lendable funds. As a result this would lead to the addressing of credit outreach problem and ultimately the inability to sustainably supply quality services to the clientele, and have a negative impact on MFIs' financial performance results. The negative value of the coefficient of -6.7052 of the portfolio-at-risk clearly illustrates this problem.

The portfolio at risk (PAR) measure indicates how efficient MFIs in making collections. The higher the PAR implies low repayment rates, an indication of inefficient MFI. The higher the PAR, the more inefficient the MFI will be and, therefore, the less financial performance and it also increases the financial distress of the MFIs. In general it shows that the portfolio-at-risk (PAR>30) is the most determining indicator of the financial distress of Ethiopian MFIs. This result is consistent with the results identified by Shaut and Mill (2011), Dorfleitner et al., (2014) and Ephrem G., (2015).

Operational Efficiency: Operational Efficiency is performance measure that shows how well MFIs is streamlining or reforms its operations and takes in to account the cost of the input and/or the price of output. Efficiency of the MFIs management measured in terms of adjusted operating expense to adjusted average gross loan portfolio, by taking the above formula as the tool to calculate, the current study indicates that coefficient of -0.1928 but it was statistically insignificant. This result shows that holding constant all other variables, increasing operational

expense in one unit on gross loan portfolio cause to decrease Z-score nearly by 0.19 this in turn will lead to deterioration of financial health of the MFIs since low Z- score mean high financial distress. It is an indication that MFIs should give great attention in cost minimization technique. The result indicated that there was a negative relationship between efficiency and Z-score of Ethiopian MFIs during the study period but statistically insignificant. Based on the finding of the study hypothesis no.3 namely there is a negative relationship between Operational efficiency and Z-score as a proxy of financial distress was rejected. This result is consistent with the results identified by Pranowo, et al., (2010) and Dissanayake, (2012).

Earning Ability: Earning ability of the MFIs measured by the Return on Asset (ROA), which indicates or measures how well the institution uses all it's asset. It is also an overall measure of profitability which reflects both the profit margin and the efficiency of the institutions. The coefficient of the ROA has significant positive influence on the financial health of the MFIs with coefficient of 5.2624 and the p-value of 0.0000. This confirms the hypothesis, namely that a Earning ability measured by ROA has significant positive impact on Z-score this in turn will lead to increase financial health of the MFIs since high Z- score mean low financial distress. The findings presented that taking all other variables constant, one unit increase in ROA would lead to increase 5.2624 in the Z- score of the MFIs which means increase the financial health of the MFIs. This result is consistent with the results identified by Andualem U., (2011), Shaut and Mill (2011), Dorfleitner et al., (2014) and Yohannes T., (2014).

Liquidity: Liquidity position determines how well the financial institutions are liquid in order to cover an immediate disturbance to the financial health of the financial institutions. Current Ratio indicates how well the financial institutions current assets have the ability to cover immediate disturbance made to the deposit. The result of the study coefficient of liquidity has significant positive influence on the financial health of the MFIs with coefficient of 0.4316 and the p-value of 0.0201. This confirms the hypothesis, namely that a liquidity of the MFIs measured by current ratio has significant positive impact on Z-score this in turn will lead to increase financial health of the MFIs since high Z-score mean low financial distress. It implies, holding other factors constant a unit increase in liquidity would lead to 0.4316 unit increases in Z-score of the MFIs which means increase the financial health of the MFIs and statically significant at 5% level of

confidence. This result is consistent with the results identified by Pranowo. et al., (2010) and Kinyarior, et al.,(2016) and contradict with Sainz-Fernandez, et al., (2015)

Age of MFIs: The Age of microfinance institutions refers to the period that MFI has been in operation since its initial inception. Previously, in hypothesis no.6 indicated that Age of the MFIs has a positive relationship with Z-score which means decrease the financial distress of MFIs in Ethiopia. The findings of this study accepts hypothesis No 6 namely age of the MFIs has a significant positive relationship with Z score as a proxy of financial distress of MFIs. The coefficient is 1.2058 and statistically significant at 1% significance level or in the other interpretation holding constant all other variables, increasing Age by one year would lead to increase Z-score by 1.2058 which means it increases the financial health of the MFIs since high Z- score means low financial distress. The positive relationship between age and financial health of MFI in Ethiopia implies that as MFIs mature, and thus gets considerable experience in the microfinance industry have diligently or carefully applied credit risk management and also implement efficient management techniques to attain the goal of the institutions.

Economic Growth (GDP): is the most commonly used macroeconomic indicators, as it is a measure of total economic activity within an economy and the study used real GDP growth as a proxy of the macroeconomic environment. The coefficient value of GDP was -0.9505 with a p-value 0.9115 this indicated that a growth rate of GDP had negative relationship and statistically insignificant impact on Z-score of MFIs in Ethiopia. Therefore, this study found that real GDP growth is negatively affect the MFIs financial health in Ethiopia. Therefore, the study rejects hypothesis no.7 namely real GDP has positive impact on Z-score as a proxy of financial distress of Ethiopian MFIs. This result is consistent with the results identified by Shaut and Mill (2011) and inconsistent with Sainz-Fernandez et al. (2015)

Inflation: Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals. The coefficient value of Inflation was 0.0065 with a p-value 0.9901 this indicated that inflation has positive but statistically insignificant impact on Z-score of MFIs in Ethiopia. Therefore, the study rejects hypothesis no.8 namely inflation has

negative impact on Z-score as a proxy of financial distress of Ethiopian MFIs. This result is consistent with the results identified by Shaut and Mill (2011)

4.6. Summary of Findings

The objective of this study is to examine the determinants of financial distress of MFIs in Ethiopia as measured by Altman's Z-score. Capital adequacy, portfolio quality, operational efficiency, earning ability, liquidity, age of MFIs, GDP and inflation are selected as explanatory variables. Descriptive statistics and regression analysis were performed to describe the determinants of financial distress of MFIs. Based on the descriptive statistics result on average the MFIs in the country for the study period had been under the "grey zone". The results of regression analysis reveal that capital adequacy, earning ability; liquidity and age of MFIs have significant positive impact on the financial healthiness of MFIs in Ethiopia. Portfolio quality which was measured by PAR > 30 days has negative relationship with Z score as a proxy of financial distress. Operational efficiency which was measured in terms of adjusted operating expense to adjusted average gross loan portfolio shows that negative relationship as expected but statistically insignificant. Regarding to macroeconomic factors economic growth (GDP) result shows a negative coefficient and statistically insignificant. Inflation appeared positively and statistically insignificant. Therefore, the study identified that capital adequacy, portfolio quality; earning ability, liquidity and age of MFIs are the major determinants of financial distress of MFIs in Ethiopia

CHAPTER FIVE

5. CONCLUSIONS AND RECOMMENDATION

This chapter presents conclusions and recommendations based on the analysis of the study.

5.1. Conclusion

The main objective of the study was to examine the determinants of financial distress of microfinance institutions in Ethiopia. The panel data were used for the sample of ten microfinance institutions for the period of ten years (2006 to 2015). Based on the descriptive statistics and regression analysis the study reached on the following conclusion. The descriptive statistics results show that Ethiopian MFIs during the study period on average records 1.9227 Z-score which means under “Grey zone”. Z-score measures the financial distress of the institutions, if Z-score increases the financial distress of the firm decreases.

Capital adequacy ratio revealed positive and statistically significant impact on Z-score as a proxy of the financial distress of MFIs in Ethiopia, which implies the higher the Z-score the lower the financial distress. High ratio of equity to total asset implies most of the total assets of MFIs were financed by shareholders funds and also shows well capitalized MFIs are more flexible in dealing with problems arising from unexpected losses against credit risks and results in a better chance for financial performance.

PAR > 30 days coefficient shows that negative and statistically significant effect on Z-score as a proxy of financial distress of MFIs. This indicates loan portfolio is the primary income generating asset for MFI and it is most commonly subject to material misstatements. Most MFI failures stem from the deterioration in the quality of the loan portfolio (Graham A, P.6, 2006). Portfolio at risk would limit the revenue derived from microcredit operations and decrease the amount of lendable funds. This would lead the inability to sustainably supply quality services to the clientele, and have a negative impact on MFIs’ financial health.

The earning ability of MFIs shows positive and statistically significant impact on financial healthiness of MFIs in Ethiopia. Earning ability indicate the ability of the institution in generating revenue by using the asset to the proportion of gross income. High ratio implies MFIs generating profit besides their role on poverty eradication. The Liquidity coefficient shows that

positive and statistically significant effect on Z-score as a proxy of financial distress of MFIs. The lower this ratio indicates that the firm has lower amount of current funds to cover the current obligation. This leads the firm unable to meet its current obligation and may have high probability of financial distress. The positive relationship between age and financial health of MFI in Ethiopia implies that as MFIs mature, and thus gets experience in their industry: they increase their likelihood of attaining financial sustainability and poverty reduction.

Economic growth (GDP) result shows that a negative coefficient and statistically insignificant indicating that GDP growth did not affect financial distress of Ethiopian MFIs. Most likely the reason behind this result is when there was an economic growth the financial institutions give more credit to their clients, if they give more credit and have not good credit management the default rate also increases. Inflation also shows that a positive coefficient and statistically insignificant, possibly the reason behind this is rising inflation which may often works in financial institutions favor; their asset are re-priced faster than their liabilities and inflation reduced the real values of nonperforming loans. Therefore, the study indicated that capital adequacy, portfolio quality, earning ability, liquidity and age of MFIs are the major determinants of financial distress of MFIs in Ethiopia.

5.2.Recommendations

The major objective of microfinance institutions is the provision of financial service to the poor people who have no financial service access from banks and cannot provide qualified collateral to get loans. With this fact in mind, the researcher forwards the following recommendations based on the findings.

Portfolio at risk > 30 days, of the MFIs which is found to negatively influencing the financial health of the microfinance institutions need to be closely watched and taken care of. Which means a high PAR would limit the revenue derived from microcredit operations and decrease the amount of lendable funds. As a result this would lead to the addressing of credit outreach problem and ultimately the inability to sustainably supply quality services to the clientele and have a negative impact on the financial health of MFIs. Thus MFIs must ensure strict adherence to regular loan monitoring, because it is a crucial part of the whole credit administration process. With proper and regular loan monitoring, default rates could be minimal. Without it, even some

customers with repayment potential would deliberately default. Credit policies of MFIs must therefore be regularly updated to cater for the ever changing needs of their clients

Capital adequacy has significant positive association with MFI financial healthiness. This indicates that well capitalized MFIs are more flexible in dealing with problems arising from unexpected losses. Weak capitalization has hampered MFI financial health, where a loan portfolio has been increasing while provision of enough funding to the institutions remains a major challenge. In this regard the managements of MFIs should give great emphasis in properly managing capital to asset ratio. Regulators or policy makers also need to set the minimum capital adequacy requirements for MFIs and follow the proper implementation of the regulation.

Liquidity position determines how well the institutions are liquid in order to cover an immediate disturbance to the financial health of the MFIs. One of the causes of financial distress is problems of liquidity, which is the inability of current assets to cover current liabilities. Therefore, the management of MFIs should be expected to be monitored regularly to assess the MFI's liquidity and develop contingency funding plans to meet contingent liquidity needs. Because when liquidity problems happen frequently trust in financial institution was lost and the tendency to lend money to them often diminished.

In order to ensure their financial healthiness the management of MFIs and policy makers give attention to the key determinants of financial distress of MFIs.

5.3.Further Research

This study was undertaken to examine the determinants of financial distress of MFIs in Ethiopia. There are also other determinant variables suggested in the literature but not included in the models of the study. Future research should be conducted by using those variables that have not been considered under this study like the impact of women borrowers, subsidy and corporate governance on financial distress. In addition the descriptive statistics result of this study shows that the largest MFIs in Ethiopia in the study period under “grey zone”. Due to the fact that smaller and less mature MFIs might tend to fail more often in comparison to their peers. Thus future studies could be conducted by including peer two and peer three categories of MFIs.

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APPENDICES

Appendix 1- Model Test

Correlated Random Effects - **Hausman Test**

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	19.629692	8	0.0002

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CAR	3.84601	3.546316	0.139022	0.4215
PAR_30DAYS	-6.704466	-7.5401	0.482335	0.2289
OPEFF	-0.19253	-0.308368	0.059406	0.6346
EAR	5.263064	4.219461	0.207646	0.0220
LIQ	0.431552	0.273841	0.009804	0.1112
LOG(AGE)	1.205535	1.229708	0.006729	0.7682
GDP	-0.955592	-0.365753	3.613801	0.7563
INF	0.006394	0.145382	0.01185	0.2017

Cross-section random effects test equation:

Dependent Variable: Z_SCORE

Method: Panel Least Squares

Date: 02/11/17 Time: 16:05

Sample: 2006 2015

Periods included: 10

Cross-sections included: 10

Total panel (balanced) observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.832647	1.719272	-1.647585	0.1033
CAR	3.846010	0.619604	6.207202	0.0000
PAR_30DAYS	-6.704466	2.068117	-3.241822	0.0017
OPEFF	-0.192530	0.586946	-0.328019	0.7437
EAR	5.263064	1.225642	4.294127	0.0000

LIQ	0.431552	0.182034	2.370722	0.0201
LOG(AGE)	1.205535	0.338093	3.565687	0.0006
GDP	-0.955592	8.527986	-0.112054	0.9111
INF	0.006394	0.522929	0.012227	0.9903

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.780108	Mean dependent var	1.922677
Adjusted R-squared	0.734521	S.D. dependent var	0.814601
S.E. of regression	0.419720	Akaike info criterion	1.263093
Sum squared resid	14.44554	Schwarz criterion	1.732023
Log likelihood	-45.15464	Hannan-Quinn criter.	1.452877
F-statistic	17.11242	Durbin-Watson stat	1.775336
Prob(F-statistic)	0		

Appendix 2- Regression Result

Dependent Variable: Z_SCORE

Method: Panel Least Squares

Date: 12/11/16 Time: 18:06

Sample: 2006 2015

Periods included: 10

Cross-sections included: 10

Total panel (balanced) observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.833972	1.719544	-1.648095	0.1032
CAR	3.846248	0.619598	6.207655	0.0000
PAR>30DAYS	-6.705181	2.068062	-3.242254	0.0017
OPEFF	-0.192777	0.586932	-0.328449	0.7434
EAR	5.262405	1.225614	4.293689	0.0000
LIQ	0.431554	0.18203	2.370782	0.0201
LOG(AGE)	1.205847	0.338132	3.566198	0.0006
GDP	-0.950508	8.529341	-0.11144	0.9115
INF	0.006514	0.522991	0.012455	0.9901

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.780122	Mean dependent var	1.922676
Adjusted R-squared	0.734538	S.D. dependent var	0.814598
S.E. of regression	0.419705	Akaike info criterion	1.263021
Sum squared resid	14.44451	Schwarz criterion	1.731952
Log likelihood	-45.15105	Hannan-Quinn criter.	1.452806
F-statistic	17.11379	Durbin-Watson stat	1.775458
Prob(F-statistic)	0.000000		

Appendix 3-Heteroskedasticity Test: White

Heteroskedasticity Test: White

F-statistic	1.347501	Prob. F(8,91)	0.2306
Obs*R-squared	10.59148	Prob. Chi-Square(8)	0.2259
Scaled explained SS	7.909704	Prob. Chi-Square(8)	0.4423

Test Equation:

Dependent Variable:

RESID^2

Method: Least Squares

Date: 12/13/16 Time:

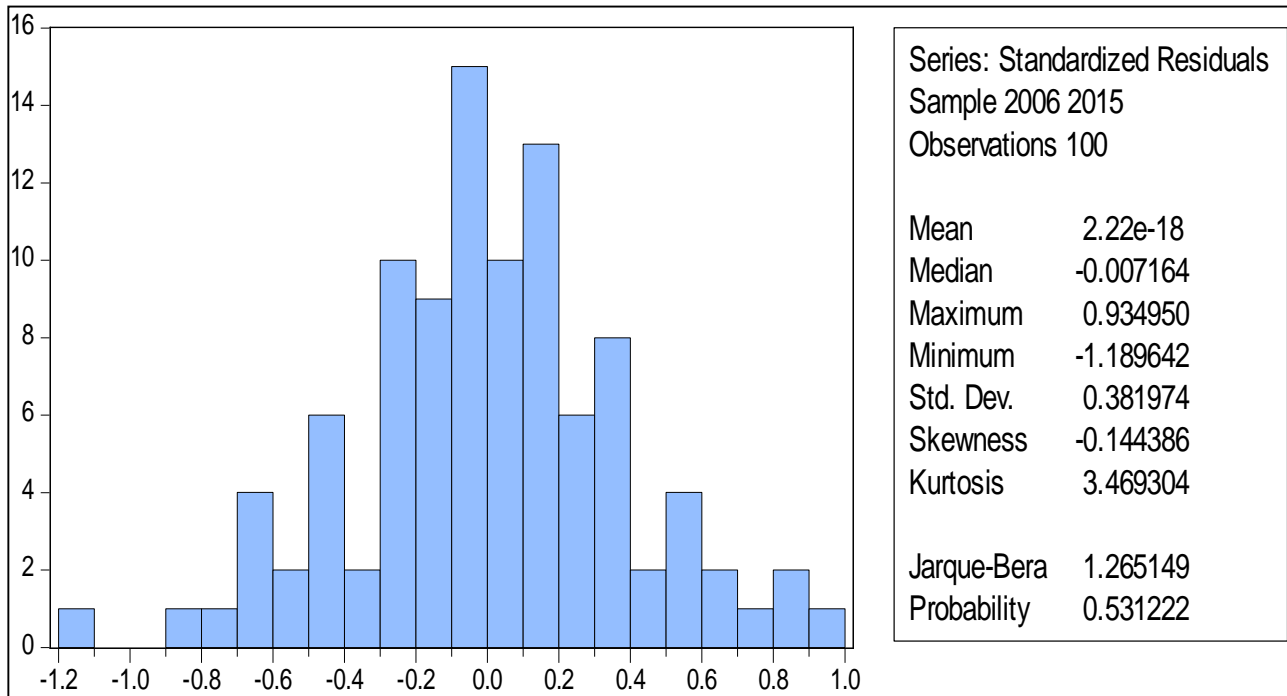
16:27

Sample: 1 100

Included observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.110009	0.706452	-0.155721	0.8766
CAR^2	0.861642	0.371453	2.319654	0.0226
PAR>30DAYS^2	-8.878910	12.57846	-0.705882	0.4821
OPEFF^2	-0.202475	0.521525	-0.388237	0.6987
EAR^2	-3.524001	4.006928	-0.879477	0.3815
LIQ^2	0.028513	0.035643	0.799962	0.4258
LOG(AGE)^2	0.058687	0.050146	1.170312	0.2449
GDP^2	-13.71987	34.09515	-0.402400	0.6883
INF^2	0.402821	1.04825	0.384279	0.7017
R-squared	0.105915	Mean dependent var		0.251297
Adjusted R-squared	0.027314	S.D. dependent var		0.339192
S.E. of regression	0.334528	Akaike info criterion		0.733496
Sum squared resid	10.18371	Schwarz criterion		0.967962
Log likelihood	-27.67482	Hannan-Quinn criter.		0.828389
F-statistic	1.347501	Durbin-Watson stat		1.036280
Prob(F-statistic)	0.230559			

Appendix 4- Normality Test



Appendix -5 Data used for Regression Analysis

MFI ID	YEAR	Z-SCORE	CAR	PAR>30 days	OPEFF	EAR	LIQ	AGE	GDP	INF
1	2006	1.4131	0.3000	0.0080	0.0500	0.0450	0.7517	9	0.1154	0.1058
1	2007	1.3502	0.2700	0.0050	0.0400	0.0410	0.7189	10	0.1179	0.1582
1	2008	1.6471	0.3100	0.0200	0.0400	0.0800	0.7469	11	0.1119	0.2530
1	2009	1.8844	0.2600	0.0400	0.0400	0.0600	0.6707	12	0.1004	0.3640
1	2010	1.9265	0.2800	0.0400	0.0100	0.0400	0.6712	13	0.1057	0.0280
1	2011	1.8018	0.2789	0.0146	0.0400	0.0646	0.5584	14	0.1128	0.1810
1	2012	1.8883	0.2794	0.0100	0.0400	0.0710	0.6643	15	0.0884	0.3410
1	2013	1.7709	0.2667	0.0073	0.0400	0.0621	0.7011	16	0.0966	0.1350
1	2014	1.7731	0.2400	0.0087	0.0400	0.0551	0.4779	17	0.1030	0.0810
1	2015	1.5865	0.2302	0.0123	0.0400	0.0531	0.4865	18	0.1020	0.0760
2	2006	1.1038	0.2120	0.0000	0.0200	0.0190	1.4912	9	0.1154	0.1058
2	2007	1.3144	0.2030	0.0050	0.0200	-0.0030	1.4638	10	0.1179	0.1582
2	2008	1.1855	0.1900	0.0200	0.0200	0.0200	1.4592	11	0.1119	0.2530
2	2009	1.1146	0.3800	0.0500	0.0300	0.0300	1.0288	12	0.1004	0.3640
2	2010	1.2030	0.2400	0.0670	0.0200	0.0000	0.9639	13	0.1057	0.0280
2	2011	1.9648	0.2403	0.0216	0.0200	0.0190	0.7415	14	0.1128	0.1810
2	2012	1.6960	0.2460	0.0450	0.0300	0.0250	0.6312	15	0.0884	0.3410
2	2013	1.1445	0.2218	0.0588	0.0300	0.0155	0.5471	16	0.0966	0.1350
2	2014	1.2954	0.2150	0.0519	0.0600	0.0300	0.5015	17	0.1030	0.0810
2	2015	1.2524	0.2246	0.0554	0.0300	0.0300	0.5279	18	0.1020	0.0760
3	2006	2.0598	0.4380	0.0020	0.0600	0.0040	1.1546	9	0.1154	0.1058
3	2007	1.6627	0.2860	0.0000	0.0600	0.0070	1.2369	10	0.1179	0.1582
3	2008	1.8056	0.2200	0.0300	0.0300	0.0400	1.1455	11	0.1119	0.2530
3	2009	1.1603	0.2500	0.0700	0.0500	0.0300	0.8185	12	0.1004	0.3640
3	2010	1.3699	0.2416	0.0500	0.0600	0.0300	0.8865	13	0.1057	0.0280
3	2011	1.4498	0.2634	0.0502	0.0600	0.0540	0.7847	14	0.1128	0.1810
3	2012	1.6061	0.2712	0.0320	0.0600	0.0650	0.6763	15	0.0884	0.3410
3	2013	1.8291	0.2508	0.0277	0.8000	0.0400	0.6624	16	0.0966	0.1350
3	2014	1.4158	0.1956	0.0299	0.1100	0.0200	0.6075	17	0.1030	0.0810
3	2015	2.0497	0.2552	0.0288	0.0900	0.0800	0.6372	18	0.1020	0.0760
4	2006	0.9161	0.0990	0.0290	0.0800	-0.0050	0.9101	9	0.1154	0.1058
4	2007	0.8956	0.1230	0.0200	0.0900	-0.0130	1.5148	10	0.1179	0.1582
4	2008	1.4499	0.0900	0.0500	0.0400	0.0200	1.2597	11	0.1119	0.2530
4	2009	1.1751	0.1000	0.0700	0.0200	0.0200	1.1379	12	0.1004	0.3640
4	2010	1.1829	0.2734	0.0700	0.0300	0.0300	0.9725	13	0.1057	0.0280

4	2011	0.9029	0.2447	0.1516	0.0500	0.0140	0.7771	14	0.1128	0.1810
4	2012	1.0224	0.1781	0.0940	0.1000	0.0260	0.6979	15	0.0884	0.3410
4	2013	0.9345	0.1721	0.0017	0.0700	0.0300	0.6610	16	0.0966	0.1350
4	2014	0.4078	0.1463	0.0479	0.0700	0.0200	0.6803	17	0.1030	0.0810
4	2015	0.4775	0.1459	0.0709	0.0600	0.0300	0.7177	18	0.1020	0.0760
5	2006	2.2233	0.7070	0.0350	0.0400	-0.0650	1.3793	6	0.1154	0.1058
5	2007	2.1326	0.6690	0.0000	0.0500	-0.0810	1.6170	7	0.1179	0.1582
5	2008	2.7748	0.7000	0.0300	0.0400	0.0400	1.5547	8	0.1119	0.2530
5	2009	3.0653	0.7200	0.0400	0.0300	0.0300	1.4924	9	0.1004	0.3640
5	2010	1.7110	0.6483	0.0460	0.0400	0.0400	1.3111	10	0.1057	0.0280
5	2011	2.2234	0.4910	0.0378	0.0500	0.0310	1.0772	11	0.1128	0.1810
5	2012	1.1636	0.3822	0.0250	0.0500	0.0340	0.6987	12	0.0884	0.3410
5	2013	1.4948	0.4061	0.0298	0.0500	0.0300	0.5140	13	0.0966	0.1350
5	2014	1.8609	0.3820	0.0274	0.0400	0.0800	0.5646	14	0.1030	0.0810
5	2015	2.2261	0.3845	0.0286	0.0400	0.0900	0.7050	15	0.1020	0.0760
6	2006	1.7912	0.5240	0.0310	0.1300	-0.0270	1.0910	8	0.1154	0.1058
6	2007	1.2160	0.3070	0.0018	0.1300	-0.0930	0.9192	9	0.1179	0.1582
6	2008	2.0061	0.4600	0.0400	0.1200	0.0300	0.9172	10	0.1119	0.2530
6	2009	0.9545	0.4300	0.0300	0.1600	0.0100	0.8449	11	0.1004	0.3640
6	2010	3.7065	0.4482	0.0000	0.0800	0.0700	0.8995	12	0.1057	0.0280
6	2011	3.9278	0.4615	0.0000	0.1300	0.0680	0.9073	13	0.1128	0.1810
6	2012	3.5203	0.4267	0.0000	0.1100	0.0760	1.2859	14	0.0884	0.3410
6	2013	2.9141	0.3601	0.0000	0.1000	0.0800	1.4092	15	0.0966	0.1350
6	2014	3.1751	0.3847	0.0000	0.1000	0.0700	1.3842	16	0.1030	0.0810
6	2015	2.7591	0.3362	0.0000	0.1000	0.0800	1.5888	17	0.1020	0.0760
7	2006	1.6483	0.4730	0.0470	0.1800	0.0110	1.6100	7	0.1154	0.1058
7	2007	1.2700	0.3640	0.0270	0.2000	-0.0780	1.5506	8	0.1179	0.1582
7	2008	1.7777	0.4400	0.0300	0.2000	0.0000	1.6161	9	0.1119	0.2530
7	2009	1.4580	0.4400	0.0500	0.2000	-0.0200	1.7728	10	0.1004	0.3640
7	2010	1.9265	0.4722	0.0900	0.2600	-0.0100	1.5152	11	0.1057	0.0280
7	2011	1.5607	0.4809	0.0211	0.3400	-0.0260	1.4063	12	0.1128	0.1810
7	2012	3.3901	0.4765	0.0140	0.2500	0.0130	1.2764	13	0.0884	0.3410
7	2013	2.7816	0.4848	0.0178	0.2100	0.0600	1.1683	14	0.0966	0.1350
7	2014	2.8048	0.5201	0.0159	0.2500	0.0830	0.8014	15	0.1030	0.0810
7	2015	3.7604	0.5452	0.0169	0.1800	0.1400	0.8402	16	0.1020	0.0760
8	2006	1.3144	0.6660	0.0120	0.2300	-0.0130	1.7088	7	0.1154	0.1058
8	2007	0.9913	0.4350	0.0130	0.2500	-0.0080	1.9658	8	0.1179	0.1582
8	2008	1.5488	0.4400	0.0200	0.1800	0.0700	1.6959	9	0.1119	0.2530
8	2009	2.0729	0.4900	0.0200	0.1500	0.0700	2.2632	10	0.1004	0.3640
8	2010	2.1011	0.4945	0.0160	0.1900	0.0700	2.2334	11	0.1057	0.0280
8	2011	2.4302	0.5262	0.0068	0.1500	0.1410	2.5342	12	0.1128	0.1810

8	2012	2.7310	0.4650	0.0060	0.1700	0.2300	2.1830	13	0.0884	0.3410
8	2013	2.6108	0.3922	0.0044	0.1500	0.0700	1.9658	14	0.0966	0.1350
8	2014	2.7535	0.3711	0.0064	0.1000	0.2300	1.6129	15	0.1030	0.0810
8	2015	2.7461	0.3560	0.0054	0.1300	0.2400	1.2467	16	0.1020	0.0760
9	2006	1.8649	0.2690	0.0070	0.0800	0.0590	1.8048	7	0.1154	0.1058
9	2007	1.8411	0.3150	0.0050	0.0800	0.0520	1.6462	8	0.1179	0.1582
9	2008	2.0038	0.3300	0.0000	0.0800	0.0700	1.5629	9	0.1119	0.2530
9	2009	1.4800	0.3225	0.0600	0.0500	0.0200	1.5397	10	0.1004	0.3640
9	2010	2.9693	0.3706	0.0040	0.1500	0.0700	1.3350	11	0.1057	0.0280
9	2011	3.6143	0.4379	0.0034	0.1400	0.0930	1.4126	12	0.1128	0.1810
9	2012	3.7550	0.4517	0.0010	0.1400	0.0650	1.3994	13	0.0884	0.3410
9	2013	3.5343	0.4239	0.0014	0.1300	0.0400	1.2651	14	0.0966	0.1350
9	2014	3.6582	0.4364	0.0012	0.1400	0.0420	1.1752	15	0.1030	0.0810
9	2015	3.6732	0.4359	0.0013	0.1600	0.0423	1.1144	16	0.1020	0.0760
10	2006	0.9417	0.4660	0.0090	0.1500	-0.0160	1.3119	6	0.1154	0.1058
10	2007	1.3331	0.4580	0.0170	0.1100	0.0030	1.2461	7	0.1179	0.1582
10	2008	1.6568	0.3300	0.0200	0.0800	0.0600	1.2996	8	0.1119	0.2530
10	2009	1.5745	0.3200	0.0100	0.0600	0.0800	1.2199	9	0.1004	0.3640
10	2010	1.7029	0.3137	0.0410	0.0600	0.0300	1.3429	10	0.1057	0.0280
10	2011	1.8779	0.3467	0.0713	0.0800	0.0640	1.3944	11	0.1128	0.1810
10	2012	2.4917	0.3253	0.0770	0.0800	0.0750	1.4342	12	0.0884	0.3410
10	2013	2.4884	0.3178	0.0052	0.0900	0.0600	1.2913	13	0.0966	0.1350
10	2014	1.7743	0.2966	0.0411	0.1000	0.0200	1.2474	14	0.1030	0.0810
10	2015	1.4177	0.2348	0.0232	0.0900	0.0170	1.2420	15	0.1020	0.0760

Source: AEMFI's annual report (2006-2015), NBE and MoFEC and own computation