# Determinant of Liquidity in Large Micro finance Institution: (in case of Ethiopian Micro finance Institution)

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# Abstract

*Liquidity is one of the major concerns for financial institution and thus achieving the optimum level of liquidity is crucial. The main objective of this study was to identify the determinants of liquidity of micro finance institutions in Ethiopia. In order to achieve the research objectives, data was collected from a sample of 12 micro finance institutions in Ethiopia over the period from 2011 to 2018. MFIs specific and macroeconomic variables were analyzed by using the balanced panel random effect regression model. MFIs liquidity is measured in two ratios.The findings of the study revealed that, GDP has negative and statistically insignificant impact on liquidity; while capital adequacy, Leverage,Tangibility and inflation have positive and statistically insignificant impact on liquidity of Ethiopian micro finance institutions.*



**Keywords:** Determinants of Liquidity, Ethiopian Large micro finance institutions, Liquidity Ratio,

Balanced Panel Random Effect Regression Model

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Acronyms

AEMFI; Association of Ethiopian Micro finance Institution

MFI; Micro finance Institution

CLRM; Classical Linear Regression Model

CPI: Consumer Price Index

ESRB: European Systemic Risk Board

FEM: Fixed Effect Model

GDP: Gross Domestic Product

HP: Hypotheses

INF: General inflation rate

IRL: Interest rate on Loans & Advances

IRM: Interest Rate Margin

LCR: The Liquidity Coverage Ratio

LOLR: Lender of Last Resort

LATO: Liquid asset to total asset ratio

LATD: Liquid asset to deposit ratio

MoFED: Ministry of Finance and Economic Development

# chapter one

## 1.1 Background of the study

Large micro finance Institutions are among the institutions which provide different finance service for the poor who are out of the conventional banking system particularly in developing countries. It provides financial services to poor clients who in most cases have no access to formal financial institutions. During the last three decades, micro finance has captured the interest of both academics and policy makers. This is, micro finance sector, presently consisting of 20 micro finance institution Is large in absolute terms (600,000 clients for normal activities plus some 700,000 to which government loans are channeled) but small in relation to the potential clientele (9% of demand for financial services). The sector has a strong unbalance, two large MFIs with more than 200,000 clients are active in Tigrai (DECSI) and Amhara (ACI) whereas in the other parts of the country only medium and small MFIs are found (or none at all). All large and most medium size MFIs are closely linked to regional governments, whereas the smaller MFIs in Addis and 2 executive Summary a few other places are linked to national and international Non-government organization according to Ethiopia Economy. Many large microfinance institutions have set out on a development path towards becoming true financial intermediaries; offering not only loans, but a full range of banking services including savings, checking and other non-cash payment services. Dealing not only with the fluctuating demand for loans but also with erratic deposit variations makes the task of liquidity management quite complex and requires systematic planning**.** Liquidity, therefore a major concern of every large microfinance institution. Liquidity is of major importance to both the internal and external analysts because of its close relationship with day to day operations of a business as it expressed in Ethiopia economy

According to bank for International Settlements (2008), liquidity is defined as “the ability of financial institution to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses”.

Therefore, according to the study was centered on investigating whether the liquidity in microfinance institution is likely to be influenced by micro finance leverage,Capital adequacy inflation,tangibility and gross domestic product(see also: Mohammed,2015; Tseganesh,2012; Vodava,2011; Greuning and Bratonovic,2014; Malik and Rafique,2013; Chaplin,Emblow and Michael,2015;

## 1.2 Statement of the Problem

Liquidity risk among the factors affecting the reputation of financial institution as customers confidence is deteriorate due to financial institution unable to withdraw their deposits when they need it. The current financial situations especially MFIs in Ethiopia deemed the responsible organs should maintain their financial safety and soundness by keeping their liquidity level at option. Large micro finance institution is liquidity position is measurement for financial stability as it plays a major role in the Ethiopian financial institution. Depending on impacts that come from liquidity in the financial system in general and banks in particular the interest of scholars on studies of determinants of banks liquidity in Ethiopia is increased in the past few year (Wubayew, 2017).

In recent days, following the financial crisis of 2007, liquidity risk has become one of the major concerns of financial institutions throughout the world. The financial crisis revealed that; liquidity becomes one of the top priorities of a micro finance management to ensure the availability of sufficient funds to meet future demands at reasonable costs.

In order to meet the liquidity requirements in financial institution determinant factor that affect liquidity have to be carefully investigated. The first factor that determines liquidity is capital adequacy. Capital adequacy accounts for the impact of better financial soundness on MFIs risk bearing capacity and, on their ability, to perform liquidity transformation (Rauch et al 2008; and Then et al 2010). A sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system Athanasoglou et al, (2005). According to Bourke (1989), financial institution holding more liquid assets benefit from a superior perception in funding markets, reducing their financing costs and increasing profitability. On the other hand, Molyneux and Thornton (1992);

Goddard et al, (2004) argued that holding liquid asset imposes an opportunity cost on the MFIs and has an inverse relationship with profitability The other factor that determine liquidity in MFIs is non-performing loan, Bloem and Gorter (2001), stated that though non-performing loans may affect all sectors, the most serious impact is on financial institutions which tend to have large loan portfolios. Another factor that pointing out in the literature is size. Large banks are likely to perform higher levels of liquidity creation that exposes them to losses associating with having to sale illiquid assets to satisfy the liquidity demands of customers (Kiyotaki and Moore, 2008). Further more liquidity of MFIs can affect by GDP, inflation, and foreign direct investment as noted by Painceira (2010); Huybens and Smith (1999); Ferrouhi and Lehadiri (2013) and Derelioglu and Gurgen, (2011).

According to directives issued by national bank of Ethiopia pursuant to the authority vested in it by article 41 of the monetary and banking proclamation No 83/1994 and by article 25 of the licensing and supervision of the business of micro finance institutions proclamation No 40/1996 micro finance institutions shall maintain at all times liquid asset at least equal to 20% of their total deposit. However, there are micro-finance institutions that have even (0%) liquid assets to deposit ratio so this shows there is a liquidity problem in micro finance institution. This is one of the problems that rise to determine its basic problem. These initiate the researcher to conduct a research on the title of determinant of liquidity in large micro-finance institutions.

To the knowledge of the researcher, many researches are conducted on the determinant of liquidity one related study was conducted by Tseganesh (2012), which tries to identify the impact of bank specific and macroeconomic variables on liquidity Ethiopian commercial banks including public banks many other research are conducted on either public or private banks. While there are no prior studies made which considers Ethiopian large micro finance institution and hence, the lack of sufficient research on the determinants of liquidity in the context of Ethiopian micro finances institution initiating this study. Therefore, this study seeks to fill the gap by providing information about macroeconomic and other specific factors that affects the liquidity of Ethiopian micro finance institution.

## 1.3 Objective of the study

### 1.3.1 General objective

The general objective of this study was to identify the determinants 0f liquidity in micro finance institution

### 1.3.2 Specific objective

To achieve the stated general objectives of the study the following specific research objectives are developed.

- ✓ To operational performance of To assess the financial and micro finance institutions

  Determine capital adequacy has impact on the LMFIs
- ✓ To examine the effect of inflation on the liquidity of large micro-finance institution in Ethiopia
- ✓ To determine the impact of gross domestic product on the liquidity of large micro finance institution in Ethiopia.
- ✓ To assess the sustainability of large micro finance
- ✓ **To examine the relationship between micro finance and leverage**

## 1.4 Hypothesis of the study

The purpose of this study was to identify the determinants of liquidity in Ethiopian micro finance institution. In order to evaluate and identify the determinants and to break down the research problem, the following major hypotheses will be tested in the case of Ethiopian micro finance institution.

H1: There is a significant relationship between the MFI and leverage

H2: Capital adequacy has positive and significant impact on micro finance liquidity

H3: Real GDP has positive and significant impact on micro finance liquidity

H4: Inflation has negative and significant impact on micro finance liquidity

H5:There relationship between liquidity and Tangibility in micro finance

### 1.6 Significance of Study

The issue of liquidity management has now got great attention in the Ethiopian finance industry. Moreover, the supervisory authority has required micro finance to have their own liquidity policy which enforces them to monitor their funding structure and their ability to handle short term liquidity problems and provide them with a better means of assessing the present and future liquidity risk associated. Specifically, this study is significant in the sense that. The policy makers and the government can use the study finding in building and widening the awareness of liquidity. Study will have great contribution to the Ethiopian micro finance institution to assess their liquidity requirement and to produce their liquidity policy and to give due attention on those factors which have significant impact on their liquidity. It has also a great contribution to the existing knowledge in the area of factors determining microfinance institution liquidity.

## 1.7 Scope and Limitation of the study

This paper is confined in identifying determinants of liquidity on Ethiopian micro finance institution. Both MFIs specific and macroeconomic variables by using balanced panel fixed effect regression model. There are more than 30 micro finance institutions in Ethiopia. The study selected 12 micro finance institution who have more than or equal to 10 years data as well as full data or accessible data. As the MFIs is young in Ethiopia, there is no long period data for all MFIs operating in Ethiopia in order to randomly determine the sample size. Therefore, the selected 12 are based on their time and availability of data.

### 1.7.1 Organizations of the Study

This study is to organized under five chapters. The first chapter provides the general overview of the study. The second chapter reviewed the related literature on the determinants of LMFIs liquidity. The third chapter focuses on the methodology of the study attached. The fourth chapter focuses on about data presentation and analysis. Finally chapter about conclusion and recommendation

# Chapter two

## Review of Related Literature

### 2.1 Theoretical review of liquidity

Different authors defined the concept liquidity in different ways. To begin with, (Erik Banks 2005, pp3), described the term liquidity broadly as ‘‘the availability of cash or equivalent resources, is the lifeblood of every commercial and sovereign entity’’. This shows that, liquidity includes resources such as cash for a healthy functioning of a commercial firm as well as country. Accordingly, the proper handling of these resource using different measures should be employed.

On the other hand, American Academy of Actuaries (USA) Liquidity is the ability to meet expected and unexpected demands for cash. Specifically, it is a company’s ability to meet the cash demands of its policy and contract holders without suffering any (or a very minimal) loss. The liquidity profile of a company is a function of both its assets and liabilities. (AAA, 2000, p. 4).Bank for International Settlements (Supranational) A liquid market is a market where participants can rapidly execute large volume transactions with a small impact on prices. (BIS, 2000, P.4).federal Deposit Insurance Corporation (USA) Liquidity represents the ability to efficiently and economically accommodate a decrease in deposits and other liabilities, as well as fund increases in assets. A bank has liquidity potential when it has the ability to obtain sufficient funds in a timely manner, at a reasonable cost (FDIC, 1998, p. 1).

HM Treasury (UK) Liquidity is the ease with which one financial claim can be exchanged for another as a result of the willingness of third parties to transact in the assets. (HM Treasury, 1999).Office of the Superintendent of Financial Institutions (Canada) Liquidity is the ability of an institution to generate or obtain sufficient cash or its equivalents in a timely manner at a reasonable price to meet its commitments as they fall due. (OSFI, 1995, p. 2). According to Tianwei and Paul (2006), deposit mobilization is one of the most important

functions of banks. This enables deposits to be mobilized which otherwise would have remained idle and unproductive in the surplus economic unit.

**Micro finance institution liquidity Creation and Financial Fragility Theory**

According to the theory of financial inter mediation, an important role of banks in the economy is to provide liquidity by funding long term illiquid assets with short term liquid liabilities. Through this function of liquidity providers, banks create liquidity as they hold illiquid assets and provide cash and demand deposits to the rest of the economy. Banks perform valuable activities on either side of their balance sheets; on the asset side, they make loans to illiquid borrowers and on the liability side, they provide liquidity on demand to depositors. As of Diamond and Rajan (1998) depositors get better access to their funds than they would if they invested directly and earned the same expected return: this is liquidity creation. Borrowing firms too can find the bank to be a more reliable source of funding than another firm or individuals: banks insure borrowers against the liquidity risk that funding will be cut off prematurely. Diamond and Dybvig (1983) emphasize the

"Preference for liquidity" under uncertainty of economic agents to justify the existence of banks: banks exist because they provide better liquidity insurance than financial markets; however, as banks are liquidity insurers, they face transformation risk and are exposed to the risk of run on deposits. In general, the higher is liquidity creation to the external public; the higher is the risk for banks to face losses from having to dispose of illiquid assets to meet the liquidity demands of customers

**Quantitative Framework for Measuring Microfinance institution Liquidity**

Liquidity is a financial institution's capacity to meet it cash and collateral obligations without incurring unacceptable losses (Ruozi & Ferrari, 2012). Adequate liquidity is dependent upon the institution's ability to efficiently meet both expected and unexpected cash flows and collateral needs without adversely affecting either daily operations or the financial condition of the institution. Therefore, liquidity management involves the supply/withdrawal from the market the amount of liquidity consistent with the desired level of short-term interest rates or reserve money. It is the ability of an institution to meet

demands for funds thereby ensuring that the institution maintain sufficient cash and liquid assets to satisfy client demand for loans and savings withdrawals and then meet its expected expenses (Samina & Ayub, 2013)

According to Sehrish, Faiza and Khalid (2011), liquidity management role is to prospectively assess the needs for funds to meet obligation and ensure the availability of cash or collateral to fulfill those need at the appropriate time by coordinating the various sources of funds available to the institution under normal and stressed conditions. It relies on the daily assessment of the liquidity conditions in the banking system, so as to determine its liquidity needs and thus the volume of liquidity to allot or withdraw from the market. Management of liquidity involves a daily analysis and detailed estimation of the size and timing of cash inflows and outflows over the coming days and weeks to minimize the risk that savers will be unable to access their deposits in the moment they demand them. Thus, liquidity is lifeblood of a banking system.

Sufian (2010), assert that the objective of liquidity management is to gear banks towards a financial position that enables them meet their financial obligations as they arise. Lack of adequate liquidity in a bank is often characterized by the inability to meet daily financial obligations. At time it may have the risk of losing deposits which erodes its supply of cash and thus forces the institution into disposal of its more liquid assets. As opined by (Stiroh & Rumbie, 2006), managing monies of a firm in order to maximized cash availability and interest income on any idle cash is a function of liquidity management. However, the problems of weak corporate governance, poor capital base, illiquidity and insolvency, poor asset quality and low earnings are some of the constraints faced by the banking system.

**Determinants of banks Liquidity**

The determinants of microfinance institution liquidity level can be classified into four broad categories. These include: the opportunity cost of liquidity holding, microfinance institution specific characteristics, moral hazard motives and macroeconomic fundamentals, as discussed here below.

**Opportunity Cost of Liquidity Holdings**

The early literature on bank liquidity buffers views liquidity management at banks as akin to a standard inventory problem (Baltensperger, 1980 and Santomero, 1984). The costs of keeping a stock of liquid assets of a particular size are weighed against the benefit of reducing the chance of being „out of stock". The key prediction of these theories is that the size of the liquidity buffer should reflect the opportunity cost of return foregone from holding liquid assets rather than loans. It should also relate to the distribution of liquidity shocks the bank may face, and in particular to the volatility of the funding basis as well as the cost of raising funds (eg in the interbank market) at short notice. In an extension of this literature, Agenor et al (2004) test whether the credit crunch in Thailand, 1998 was related to supply or demand factors, and to this end estimate a bank "demand function for reserves. They derive a demand function for excess reserves that depends both on the distribution of the deposits withdrawals, the external cost of finance (penalty rates applied by the central bank) and the impact of regulation. The determination of a microfinance institution optimal liquidity buffer involves a trade-off between self-insurance against liquidity risk and the returns from illiquid, higher-yielding assets.

Baltensperger (1980) as well as Santomero (1984) for instance argue that the size of banks" liquidity buffers is determined by the opportunity costs to hold liquid assets. Similar arguments can be found in Agénor et al. (2004) who shows, using aggregate data for Thailand, that bank liquidity holdings are positively related to the volatility of the money market rate, which proxies the need for self-insurance.

Unfortunately, we cannot observe liquidity risk exposure and banks investment opportunities directly. We can, however, observe banks" structure and operating environment as well as their realized liquid buffers. Based on the trade-off described above, we can therefore hypothesize as to the manner in which different firm-specific and environmental aspects of a bank business should affect its liquid buffer. In particular, any observed factor that would be expected to lower (raise) liquidity risk should reduce (increase) observed liquidity buffers.

**Moral Hazard Motives**

If liquidity is the availability of cash or equivalents, then we can define liquidity risk as the risk of loss arising from lack of cash or equivalents or, more specifically, risk of loss arising from an inability to obtain funding at economically reasonable levels, or sell or pledge an asset at carrying prices, in order to cover an expected or unexpected obligation. Liquidity risk is, in essence, the risk of economic loss suffered in attempting to secure the cash that is so vital to continuing business operations (Eric Bank, 2005)

Liquidity risk arises from maturity mismatches where liabilities have a shorter tenor than assets. A sudden rise in the borrowers‟ demands above the expected level can lead to shortages of cash or liquid marketable assets (Oldfield and Santamero, 1997).We can also develop more detailed definitions of liquidity risk. It is helpful, for instance, to distinguish between funding (or liability) liquidity, asset liquidity, and joint liquidity. Funding liquidity focuses on the availability of unsecured liabilities that can be drawn on to create cash, including short-term and long-term debt facilities. Funding liquidity risk is, therefore, the risk of loss stemming from an inability to access unsecured funding sources at an economically reasonable cost in order to meet obligations. Asset liquidity focuses on the availability of assets, such as marketable securities, inventories, receivables, and plant and equipment, which can be sold or pledged to generate cash. Asset liquidity risk is thus the risk of loss arising from an inability to convert assets into cash at carrying value in order to meet obligations. In certain instances asset and funding liquidity join together to produce an incremental degree of risk, which we term joint asset/funding liquidity risk – the risk of loss that occurs when funding cannot be accessed and assets cannot be converted into cash in order to meet obligations. It is important to stress those cash-sensitive off-balance sheet commitments and contingencies often supplement cash flow risks generated through balance sheet operations. Indeed, we shall note at various points in the text the crucial role off-balance sheet contracts play in liquidity risk management.

Canadian Institute of Actuaries (Canada) Liquidity risk is the inability to meet financial commitments as they fall due through ongoing cash flow or asset sales at fair market value. Liquidation risk is the potential loss when the sale of an asset is urgently required, which

may result in the proceeds being below fair market value. The loss is the difference between the fire sale price and the fair market value. (CIA, 1996).Financial Services Authority (UK) Liquidity risk is the risk that a firm, though solvent, either does not have sufficient financial resources available to it to meet its obligations when they fall due, or can secure them only at excessive cost. It is a basic business risk faced to some degree by most firms, though clearly it is more significant for some than others. (FSA, 2003, p. 3)

International Association of Insurance Supervisors (Supranational) The risk emerging when the insurer fails to make investments (assets) liquid in a proper manner as its financial obligations fall due. (IAIS, 2000).International Organization of Securities Commissioners (Supranational) The risk to [an institution's] ability to meet commitments in a timely and cost-effective manner while maintaining assets, and in the inability to pursue profitable business opportunities and continue as a viable business due to a lack of access to sufficient cost-effective resources. (IOSCO, 2002, p. 3).Office of the Controller of the Currency (USA) Liquidity risk is the risk to a bank's earnings and capital arising from its inability to timely meet obligations when they come due without incurring unacceptable losses. (OCC, 2001, p)

According to AEMFI the WWB report denotes leverage as one of the key indicators for measuring financial integration, since it reflects how successful a microfinance institution has been in accessing debt relative to its equity base. Leverage is also an indicator of how well an institution is maximizing its earnings, since for traditional company's debt is a cheaper source of capital than equity. Ethiopian microfinance institutions have not made the shift away from donor subsidies (donated equity and subsidized loans) to fully leverage commercial capital (commercial debt, deposits and equity investments). Consequently, commercial debt is a marginal portion of institutional funding structure; and although institutions have increased their deposits intermediation they have not fully maximized its potential. Moreover, the current regulatory environment constraints institutions from exploring the full range of available equity investment options. However, investors have recognized the potential of the microfinance sector, which is evident from Aggar's ability to fund its capital base solely through public shareholder investment.

According to a financing strategies report issued by the USAID, some microfinance institutions have successfully used development funding to leverage commercial finance. The report indicates that some institutions use grant from development agencies to guarantee commercial bank loans.

**Micro finance institution Specific Characteristics**

The internal (micro finance institution-specific) factors are factors that are related to internal efficiency and managerial decisions. Such factors include determinants such as micro finance institution, capital adequacy, interest rate margin and the like.

**Capital adequacy and micro finance institution Liquidity:**

Capital adequacy accounts for the impact of better financial soundness on bank risk bearing capacity and, on their ability, to perform liquidity transformation (Rauch et al. 2008 and Shen et al. 2010). A sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system (Athanasoglou et al. 2005). One of the highest yielding assets of a bank is loans & advances that provide the largest portion of operating revenue. In this respect, banks are faced with liquidity risk since loans and advances are funds from deposit of customers.

(Berrios, 2013). A liquidity management crisis was evident in Global financial crisis of 2007–08 (Bhattacharyya, 2011). This was the worst financial crisis raising fundamental questions about liquidity management (Banks, 2005). During the crisis, banks were hit hardest by liquidity management pressures cutting back sharply (CBK, 2016). In many areas, the economy faced a huge financial blow, resulting in house evictions, foreclosures and prolonged unemployment (Basel Committee on Banking Supervision, 2013). The crisis underscored the role of liquidity management to commercial banks (Basel Committee on Banking Supervision, 2013).

Liquidity is a precondition to ensure that financial institutions are able to meet its short-term obligations. The liquidity position in a company is measured based on the 'current ratio' and the 'quick ratio'. The current ratio establishes the relationship between current assets and current liabilities. Normally, a high current ratio is considered to be an indicator of the firm's ability to promptly meet its short-term liabilities (Beck &Hesse, 2006). The quick ratio establishes a relationship between quick or liquid assets and current liabilities. An asset is liquid if it can be converted into cash immediately or reasonably soon without a loss of value. Low liquidity leads to the inability of a company to pay its creditors on time or honors its maturing obligations to suppliers of credit, services and goods. This could result in losses on account of non-availability of supplies and lead to possible insolvency. Also, the inability to meet the short-term liabilities could affect the company's operations and in many cases, it may affect its reputation as well (Egesaand Abuka, 2006).

Kasekende and Ating-Ego (2003) in a study in Ghana found no positive relationship between liquidity trend and profitability and concluded that there is a negative relationship between liquidity and profitability in the Ghana banking sector. Havrylchyk and Emilia (2006) findings suggested that the adaptation of liquidity strategies do not have a significant impact on ROA. Only increased use of liquidity forecasting and short-term financing during financial crisis had a positive impact on ROA.

Lee and Lee (2006) found a weak positive relationship between the liquidity and the profitability of the listed banks in Ghana in their 2013 study. Matama (2008) in their study in Nigeria concluded that for the success of operations and survival, commercial banks should not compromise efficient and effective liquidity management and that both illiquidity and excess liquidity are "financial diseases" that can easily erode the profit base of a bank as they affect bank's attempt to attain high profitability-level. A study in Canada by Rahaman (2010) suggest that a nonlinear relationship exists, whereby profitability is improved for banks that hold some liquid assets, however, there is a point beyond which holding further liquid assets diminishes banks‟ profitability, all else equal. At the same time, estimation results provided some evidence that the relationship between liquid assets and profitability depends on the bank’s business model and the risk of funding market

difficulties. Adopting a more traditional (i.e., deposit and loan based) business model allows bank to optimize profits with a lower level of liquid asset.

**Macroeconomic Fundamentals**

The external or macro determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and liquidity positions of institutions. The macroeconomic factors that can affect bank's liquidity include factors such as GDP growth rate; inflation rate and short-term interest rate among others.

**GDP Growth and micro finance institution Liquidity:**

Where the country's macro economy is in periods of economic expansion, which are characterized by high degree of confidence of the economic units about their profitability, there is a rise in the level of investment. During this expansion, economic units decrease their liquidity preference, preferring more risky capital assets with higher return. In this environment, economic units are more likely to hold less liquid capital assets and to incur short-term debt with higher interest rates (Painceira 2010). Aspachs et al. (2005) indicated that banks hoard liquidity during periods of economic downturn, when lending opportunities may not be as good and they run down liquidity buffers during economic expansions when lending opportunities may have picked up. Thus, it can be expected that higher economic growth make banks run down their liquidity buffer and induce banks to lend more.

The regression results show that growth has a mixed result. The first model result indicates growth has a negative effect on leverage of MFI with coefficient values of (-.134) and the second model result indicates that growth of MFI has a negative impact but failed to show its statistical significance on the leverage of MFI with coefficients values of (-.120). Therefore, in the first model the alternate hypothesis that states growth has significant impact on the capital structure of MFI has been accepted with 10% level of significance. This indicates that faster growing MFI are less relying on external debt as the firms face greater uncertainty they tend to reduce their willingness to use debt.

Though it isn't statistically significant in the second model the regression result indicates a negative impact on the capital structure of MFI. This implies that growth is to measure

growth rate of MFI is the annual percentage in total asset of firms that is not consistent with the firms which may be fundamentally different from nature of MFI. Therefore, growing MFI might place a greater demand on the internally generated funds. Consequently, MFIs with a relatively high growth rate will tend to look first at internally generated funds then to debt financing for their growth. This result is inconsistent with the findings of banking sectors. However, pecking order theory suggests that a firm's growth is negatively related to its capital structure. Myers and Majluf indicate that information asymmetry demands an extra premium for firms to raise external funds, irrespective of the true quality of their investment project. In the case of issuing debt, the extra premium is reflected in the higher required yield. High-growth firms may find it too costly to rely on debt to finance growth. Empirical studies that support a negative relationship between firm growth and leverage hypothesis are few (Gill A. et al, 2009

## Liquidity on leverage:

The results indicate positive relationship between size and leverage with coefficient value of .442. Therefore, the alternate hypothesis that states size of MFI has a significant impact on their capital structure has been accepted at 1% level of significance as it is indicated in the second model. The implication of this finding is the larger (bigger) the MFI, the more external funds it will use. One reason is that, larger MFIs are more diversified and hence have lower variance of earning, enable them to manage high leverage. The providers of the debt capital are more willing to lend to larger MFIs as they are perceived to have lower risk levels. Besides, the size of MFI is highly correlated with the ownership of the MFI. Which is the main reason to separately regress in to Model 2 and 3 otherwise the separate effect of the two variables would have been difficult to identify. In general, the correlation of ownership and size of MFI in Ethiopia can be explained in such a way that the larger is the size of MFI, the higher tendency that it indicates they are governmentally backed Micro finance Institutions. Therefore, it isn’t surprising that the larger the MFI is highly levered as they are governmentally backed institutions they enjoy the benefits of being guaranteed in accessing the commercial debt in relation to others. This result supports the financial theory and is consistent with empirical evidence. Larger size firms enjoy economies of

scale and creditworthiness in issuing debt and have bargaining power over creditors. These arguments suggest that larger firms have tendency to use higher leverage (Amidu M. 2007, Gill M. et al, 2009, Octavia and Brown 2008).

## The Rate of Inflation and microfinance institution Liquidity.

A growing theoretical literature describes mechanisms whereby even predictable increases in the rate of inflation interfere with the ability of the financial sector to allocate resources effectively. More specifically, recent theories emphasize the importance of informational asymmetries in credit markets and demonstrate how increases in the rate of inflation adversely affect credit market frictions with negative repercussions for financial sector (both banks and equity market) performance and therefore long-run real activity (Huybens and Smith 1998, 1999). The common feature of these theories is that there is an informational friction whose severity is endogenous. Given this feature, an increase in the rate of inflation drives down the real rate of return not just on money, but on assets in general. The implied reduction in real returns exacerbates credit market frictions. Since these market frictions lead to the rationing of credit, credit rationing becomes more severe as inflation rises. As a result, the financial sector makes fewer loans, resource allocation is less efficient, and intermediary activity diminishes with adverse implications for capital/long term investment. In turn, the amount of liquid or short term assets held by economic agents including banks will rise with the rise in inflation. Hence, there is positive relationship between increase in inflation rate and banks liquidity.

### 2.2Review of Related Empirical Studies

This section gives a brief review of the previous studies made on the determinants of bank's liquidity from both developed and developing nations. Moreover, most of the studies undertaken on bank liquidity consider both bank specific and macroeconomic factors to examine the determinants of liquidity of banks. So, the studies conducted in related to bank's liquidity are reviewed as follows.

### 2.2.1 Related Empirical Studies in other continent Countries

Vodova (2011) aimed to identify important factors affecting commercial banks liquidity of Czech Republic. In order to meet its objective the researcher considered bank specific and macroeconomic data over the period from 2001 to 2009 and analyzed them with panel data regression analysis by using Views 6 software package. The study considered four firm specific and eight macroeconomic independent variables which affect banks liquidity. The expected impact of the independent variables on bank liquidity were: capital adequacy, inflation rate and interest rate on interbank transaction/money market interest rate were positive and for the share of non-performing loans on total volume of loans, bank profitability, GDP growth, interest rate on loans, interest rate margin, monetary policy interest rate/repo rate, unemployment rate and dummy variable of financial crisis for the year 2009 were negative whereas, the expected sign for bank size was ambiguous (+/-). The dependent variable (i.e. liquidity of commercial banks) was measured by using four liquidity ratios such as liquid asset to total assets, liquid assets to total deposits and borrowings, loan to total assets and loan to deposits and short term financing.

The study by Vodova (2011) revealed that bank liquidity was positively related to capital adequacy, interest rates on loans, share of non-performing loans and interest rate on interbank transaction. In contrast, financial crisis, higher inflation rate and growth rate of gross domestic product have negative impact on bank liquidity. The relation between the size of the bank and its liquidity was ambiguous as it was expected.

The control variable for the general macroeconomic influence shows that there is a positive relationship between the general health of the economy and the bank liquidity creation. The healthier the economy is the more liquidity is created. It was also found that banks with a higher ratio of interest to provision income create more liquidity. Other bank-related variables, such as size or performance revealed no statistically significant influence on the creation of liquidity by the banks. Determinants of liquidity risk of banks from emerging economies for a sample of commercial banks in 36 emerging countries between 1995 and 2000 with panel data regression analysis were analyzed by (Bunda and Desquilbet 2008).

The study was aimed to explore how the liquidity of commercial bank assets is affected by the exchange rate regime of the country in which they operate.

Liquidity ratio as a measure of bank's liquidity assumed to be dependent on individual behavior of banks, their market and macroeconomic environment and the exchange rate regime, i.e. on following factors: total assets as a measure of the size of the bank, the lending interest rate as a measure of lending profitability, and the realization of a financial crisis, which could be caused by poor bank liquidity expected to have negative impact on banks liquidity whereas, the ratio of equity to assets as a measure of capital adequacy, the presence of prudential regulation, which means the obligation for banks to be liquid enough, the share of public expenditures on gross domestic product as a measure of supply of relatively liquid assets, the rate of inflation, which increases the vulnerability of banks to nominal values of loans provided to customers, and the exchange rate regime, where banks in countries with extreme regimes (the independently floating exchange rate regime and hard pegs) were more liquid than in countries with intermediate regimes are expected to have positive impact on banks liquidity.

The result of the study by Bunda and Desquilbet (2008) showed there is positive and statistically significant effect of capital adequacy, lending interest rate, public expenditure to GDP, and growth on liquidity of banks under five liquidity measures. On the other hand, the presence of prudential regulation and financial crises showed negative and significant impact on bank liquidity position. It also reviled that in hard pegs and in pure floats, commercial banks are more liquid than in intermediary regimes (bank liquidity smile).

The study made by Bordeleau and Graham (2010), presented empirical evidence regarding the relationship between liquid asset holdings and profitability for a panel of Canadian and U.S. banks over the period of 1997 to 2009. In short, results suggested that a nonlinear relationship exists, whereby profitability was improved for banks that hold some liquid assets, however, there was a point beyond which holding further liquid assets diminishes a banks' profitability, all else equal.

### 2.2.2 Related Empirical Studies in Emerging Economies

Moore (2010) investigated the effects of the financial crisis on the liquidity of commercial banks in Latin America and Caribbean countries and specifically addresses the behavior of commercial bank liquidity during crises in Latin America and the Caribbean. They identify the key determinants of liquidity, and to provide an assessment of whether commercial bank liquidity during crises is higher or lower than what is consistent with economic fundamentals. The regression model was estimated by using ordinary least squares. The result of the study showed that the volatility of cash-to-deposit ratio and money market interest rate have negative and significant effect on liquidity. Whereas, liquidity tends to be inversely related to the business cycle in half of the countries studied, suggesting that commercial banks tend to error on the side of caution by holding relatively more excess reserves during downturns.

The other study made by Vodová (2012) aimed to identify the determinants of liquidity of commercial banks in Slovakia. In order to meet its objective, the researcher considered the data for bank specific factors over the period from 2001 to 2009. The data was analyzed with panel data regression analysis by using an econometric package Eviews7and the findings of the study revealed that bank liquidity decreases mainly as a result of higher bank profitability, higher capital adequacy and with the size of bank. The level of non-performing loans has no statistically significant effect on the liquidity of Slovakia commercial banks.

In another study from Pakistan, Malik and Rafique (2013) examines bank specific and macroeconomic determinants of commercial bank liquidity in Pakistan. Their study period covers from 2007 to 2011. They have used two models of liquidity. The first model L1 is based on cash and cash equivalents to total assets. The second model L2 is based on advances net of provisions to total assets. Their results suggest that, Non-Performing Loan (NPL) and Return on Equity (ROE) have a negative and significant effect with L1. Capital adequacy (CAP) and inflation (INF) are negatively and significantly correlated with L2, additionally there is a significant and positive impact of financial crisis on the liquidity of commercial banks. The central bank regulations greatly affect the liquidity of commercial banks which means tight monetary policy can regulate the undesirable effect of inflation

### 2.2.3 Related Empirical Studies in African Countries

Chagwiza (2011) made a study on Zimbabwe, regarding the commercial bank's liquidity and its determinants. The main objective of his study was to identify the determinants of liquidity in Zimbabwean commercial banks. The result of his study revealed that, there is a positive link between bank liquidity and capital adequacy, total assets, gross domestic product and bank rate. While the adoption of multi-currency, inflation rate and business cycle have a negative impact on liquidity. The other studies made by Laurine (2013) in Zimbabwe regarding Zimbabwean Commercial Banks Liquidity Risk Determinants after dollarizationAgbada and Osuji (2013) studied the efficacy of liquidity management and banking performance in Nigeria using survey research methodology. Data obtained were first presented in tables of percentages and pie charts. The data were empirically analyzed by Pearson product-moment correlation coefficient. Findings from the empirical analysis were quite robust and clearly indicate that there is significant relationship between efficient liquidity management and banking performance and that efficient liquidity management enhances the soundness of a bank.

A study made by Fadare (2011), on the banking sector liquidity and financial crisis in Nigeria with the aim of identifying the key determinants of banking liquidity and assessing the relationship between determinants of banking liquidity and financial frictions within the economy. It was employed a linear least square model and time series data from 1980 to 2009. The study found that monetary policy rate and lagged loan-to-deposit ratio were significant for predicting banking sector liquidity The other study made by Mohamed(2015) on Tunisia banks shows that , financial performance, capital / total assets, operating costs/ total assets, growth rate of GDP, inflation rate, delayed liquidity have significant impact on bank liquidity while size, total loans / total assets, financial costs/ total credits, total deposits / total assets does not have a significant impact on bank liquidity.

### 2.2. 4 Related Empirical Studies in Ethiopia

Some related studies were conducted by different researchers in Ethiopia. The study conducted by Semu (2010) intended to assess the impact of reducing or restricting loan disbursement on the performance of commercial banks in Ethiopia. It also attempts to examine the possible factors that compel the banks to reduce or restrict lending. Quantitative method particularly survey design approach was adopted for the study. The findings of the study showed that deposit and capital have statistically significant relationship with banks' performance measured in terms of return on equity (ROE). New loan and liquidity have relationship with banks' performance measured in terms of both return on asset (ROA) and ROE.

Worku (2006) argued that liquidity has an impact on the performance of commercial banks in Ethiopia and there was an inverse relation between deposit/net loan and ROE. And the coefficient of liquid asset to total asset was positive and directly related with ROE. Worku (2006) also studied capital adequacy and found that the capital adequacy of all commercial banks in Ethiopia were above threshold, means there was sufficient capital that can cover the risk-weighted assets. Depositors who deposit their money in all banks were safe because all the studied banks fulfilled NBE requirement (Worku, 2006). Worku used different ratios when analyzing liquidity effect on banks performance and these ratios were liquid asset/net profit, liquid asset/total assets, net loans/net deposits, interest income/net deposit and interest income/interest expense (Worku, 2006).

Ayalew (2005) used ratio analysis with the help of DEA model and the ratios were capital ratio, liquidity ratio and loan loss provision to total assets when studied the financial performance of private banks in Ethiopia. The study revealed that banks were becoming leveraged, the growth of deposits from depositors increased, efficiency was also increased from year to year. Generally, Ayalew (2005) concluded that the growth rate was positively related to efficiency scores.

Seyoum (2005) revealed that private banks performance in terms of managerial earning and operating efficiency was an average and less than that of the biggest government bank i.e. Commercial Bank of Ethiopia (CBE). Seyoum (2005) also noted that in Ethiopia the

banking sector was still dominated by state owned banks especially CBE, no stiff competition and compared performance of banks using managerial earning and operating efficiency.

Berhanu (2004) studied financial performance of Ethiopian commercial banks and found the following results. The banking system in general increased their assets position, private banks increased their market share, and liquidity condition of commercial banks was reliable. Finally commercial banks were operating at profit. Berhanu (2004) used profitability ratios and liquidity ratios to evaluate financial performance of commercial banks in Ethiopia

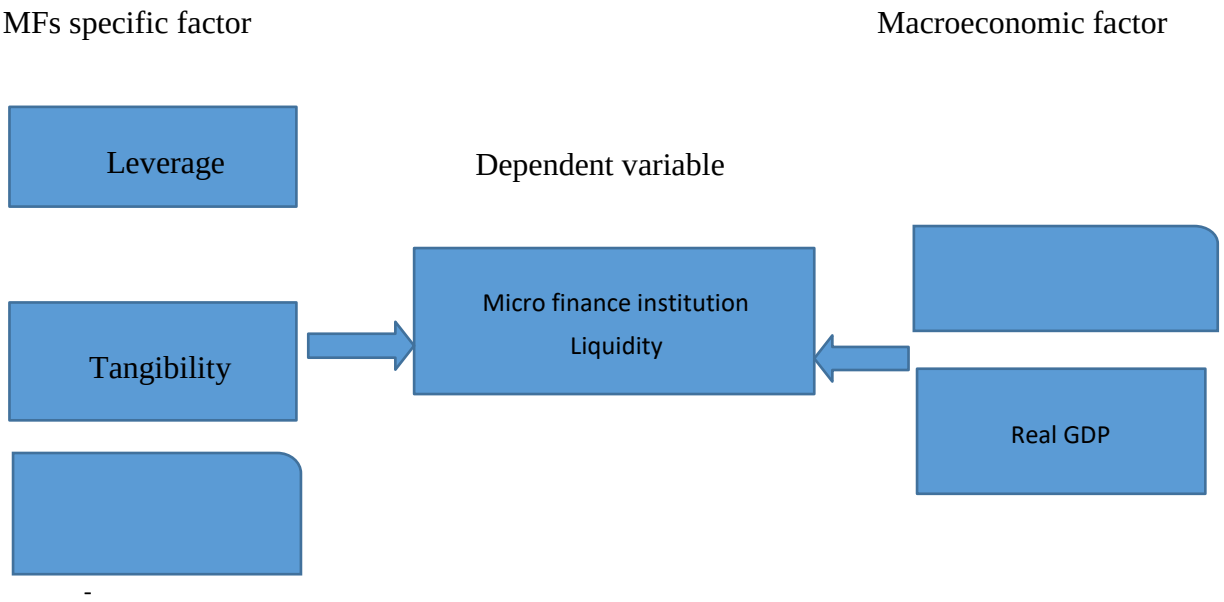
### 2.3 Summary and knowledge Gap

The above theoretical as well as empirical review showed that liquidity is important to all businesses specially for banking industry since their purpose is to avail loanable fund through mobilization of idle fund from the public and other funding organizations. It also revealed that banks liquidity can be affected by different factors such as bank specific, macroeconomic and regulatory factors, while this study focused on some of the bank specific and macroeconomic factors affecting liquidity.

Studies cited above suggest that commercial banks' liquidity is determined both by bank specific factors (such a, capital adequacy and factors describing risk position of the bank), macroeconomic factors (such asand indicators of economic environment) as well as the central bank decisions. There are also very limited number of studies appears to include liquidity as an explanatory variable for bank profitability, this relationship is not the focus of those papers and the empirical results were mixed. To the knowledge of the researcher there is no empirical studies done regarding to determinants of development bank liquidity and their impact on financial performance in Ethiopia.

## 2.3 Conceptual Framework

On the basis of the hypotheses that developed from the literature part and the regression model of the study, the following conceptual frame work can be developedThis paper is confined in identifying determinants of liquidity on Ethiopian microfinance institution. Both MFIs specific and macroeconomic variables by using balanced panel fixed effect regression model. There are more than 30 microfinance institutions in Ethiopia. The study selected 12 microfinance institution who have more than or equal to 10 years data as well as full data or accessible data. As the MFIs is young in Ethiopia, there is no long period data for all MFIs operating in Ethiopia in order to randomly determine the sample size. Therefore, the selected 12 are based on their time and availability of data.



# chapter three

## Research Methodology

This chapter specifically gives a brief description of the research method that has been employing to capture determinant factors of liquidity. This include research design, source and method of data collection, study population and sampling frame, the research instruments use in collecting data for the study and the data collection and data analysis methods. It also discusses about the model and the components of the model both the dependent and the independent variables

### 3.1. Research Design

The research methodology begins by presenting the overall research design, as the research design provides an important framework & guidelines on how to collect and analyze data. The choice of appropriate research design will help the researcher to answer the research questions and to satisfy the research objectives. Therefore, it is a paramount to properly define and evaluate the research design before conducting the research.

According to Leedy and Ormrod (2005) research methodology is a means to extract the meaning of data. Data and methodology are highly interdependent. Therefore, the methodology to be used for a particular research problem must always take into consideration about the nature of data that will be collected to resolve the research problem. There are three types of research approaches namely; quantitative, qualitative and mixed methods approach (Leedy & Ormrod, 2005). Considering the research problem and objective and the philosophy of the different research approaches, quantitative research approach will found to be appropriate for this study.

### 3.2. Study Population & Sampling Frame

The study population includes all related to large micro finance institution in Ethiopia. There are around 35 micro finance institutions in our country and there are three largest micro finance institution account for 65% of the market share in terms of borrowing client, and 74% by loan provision. These are Amhara (ACSI), Dedebit (DESCI) and Oromia (OCSSCO) credit and saving institution. The sampling frame for drawing the sample includes those micro finance institutions having at least 10 years of experience and accessible data. The rationale for using 10 years of data is to increase the number of observations.

According to Bhattacherjee (2012), non-probability sampling is sampling technique in which some units of the population have zero chance of selection or where the probability of selection cannot be accurately determined rather samples are selected based on certain non-random criteria, such as quota or convenience. The sampling technique used in this research is a non-probabilistic sampling and among the non probability sampling methods, this research used purposive sampling. As stated by Saunders et al (2009), purposive sampling is often used when working with small samples and when we wish to select cases that are particularly informative. Thus, the researcher used purposive sampling by considering the availability of full data for the selected time period. In Ethiopia there are around 35 micro finance institutions and Three which is very largest exist, Among the MFIs, 12 of them have more than 10 years of data and available of full data for the selected time period.

### 3.3 Source and Method of Data Collection

This research relied mainly on the secondary data like already published financial reports, journals and publications etc. Secondary data sources are documented works of others (authors) that are related to the subject matter of study.

In view of the nature of this study, the extensive use of relevant data from previous works of other authors in the field such as materials like financial journals, national Bank of Ethiopia publications, economic and financial reviews, economic and financial indicator

briefs and DBE statistical bulletin. Also, Annual Reports of DBE for various years will be of great importance.

In the meantime questionnaires will be distributed for selected senior management and executive managers for assessing how decisions are carried out for the last decades and what challenge they face. The sources of data for this research were secondary sources. MFIS specific data will be collected from audited financial statements (i.e. Balance Sheet and Profit & Loss Statement) of each selected LMFIS included in the sample.

### 3.4. Methods of Data Analysis

After the data were collected, it was organized and financial ratios were computed for each LMFIS of each MFIS specific variables. And then, the next step was analyzing and interpreting them accordingly to achieve the stated objectives. In this study two type of statistical analysis have been used to test the hypotheses. These are descriptive statistics and inferential statistics/multiple regression analysis to see the effect (relationship) of explanatory or independent variables on the dependent variable. The descriptive statistics of both dependent and independent variables were calculated over the sampled periods. This helps to convert the raw data in to a more meaning full form which enables the researcher to understand the ideas clearly. And then interpret with statistical description including standard deviation, mean, and minimum & maximum. Then, correlation analyses between dependent and independent variables was made and finally a multiple linear regression used to determine the relative importance of each independent variable in influencing liquidity of LMFIs.

### 3.5. Variable Definition & Hypotheses of the Study

This study is focused on to identify the determinants of LMFIs liquidity. It is apparent that the most significant task is to select the appropriate explanatory variables. As it was discussed in the literature review part, some determinant factors which have positive relation with liquidity in one country may have negative relation with other country and some determinant factors which have significant impact on liquidity in one country may not have significant impact on liquidity in another country. Though various bank specific and macrocosmic variables were conducted in the previous studies made worldwide, in this study some variables (MFIs specific and macroeconomic) was included. Therefore, the

following variables selected based on Ethiopian context and previous relevant studies. The description and operational definition of selected variables is discussed here under.

### 3.5.1. Dependent Variables

Liquidity of LMFIs**:** Bank for International Settlements (2008) defines liquidity as "the ability of bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses". Liquidity can also be defined as a measure of the relative amount of asset in cash or which can be quickly converted into cash without any loss in value available to meet short term liabilities. As it was discussed in the literature, there are two methods of measuring liquidity of LMFIs which are liquidity ratios (stock approach) and liquidity gap (flow approach). The liquidity gap is the difference between assets and liabilities whereas liquidity ratios are various balance sheet items ratios which identify liquidity trends. The liquidity measure provides suggestions about the level of liquidity on which the MFIs are operating. The first approach, liquidity ratio, uses different balance sheet ratios and it is easy to compute whereas, the second approach, funding gap, is the difference between inflows and outflows which is difficult to measure because it is more data intensive and there is no standard technique to forecast inflows and outflows.

Liquid Asset to Deposit Ratio (LATD):

Liquid assets to total assets ratio should give us information about the general liquidity shock absorption capacity of a bank. As a general rule, the higher the share of liquid assets in total assets, the higher the capacity to absorb liquidity shock, given that market liquidity is the same. Nevertheless, high value of this ratio may be also interpreted as inefficiency. Since liquid assets yield lower income liquidity bears high opportunity costs for the bank. Therefore it is necessary to optimize the relation between liquidity and profitability. According to the NBE establishment proclamation (No. 591, pp. 4168) liquid assets of banks include cash on hand, deposit in other banks, and short term government securities that are acceptable by the NBE as collateral (for instance, Treasury bills). This measure of liquidity was taken as benchmark measure.

According to NBE directive No SBB/57/2014, liquid asset includes cash (local & foreign currency), deposits with the National bank and other local and foreign MFIs having acceptance by the National bank, other assets readily convertible into cash expressed and

payable in Birr or foreign currency having acceptance by the National bank and other assets as the National Bank may from time to time declare to be liquid assets. Accordingly, deposit refers to demand (current) deposits, savings deposits and fixed time deposits of MFIs while short term borrowing refers any borrowing secured from the National Bank of Ethiopia or any other interbank loans with maturity period of less than one year.

### Liquid Asset to Total Asset Ratio (LTA):

The liquid asset to total asset ratio gives information about the general liquidity shock absorption capacity of a MFIs. In general, when the ratio is high, it tells us that the MFIs have a capacity to absorb liquidity shock and that the MFIs is in a better position to meet its withdrawals. While, the higher this ratio may indicate inefficiency since liquid assets, most of the time non-earning assets, yield lower income. As a result, maintaining optimum level of liquidity is required to optimize the trade-off between liquidity and profitability by investing excess liquid asset to generate higher return.

## Leverage

Most MFIs employ high leverage, and finance their operations with long-term (as opposed to short-term) debt. Highly leveraged microfinance institutions perform better by reaching out to a wider clientele, enjoying economies of scale, and thus being better able to deal with moral hazard and adverse selection, enhancing their ability to deal with risk (Kyereboah-Coleman, 2007).Various factors, other than stage in the life cycle, seem to be associated with the performance of MFIs. Bogan (2008) for example indicates that the size of assets and capital structure of MFIs are associated with performance. In terms of sustainability and outreach, asset size is important: a measure of grants received by MFIs (from donors such as charities, governments and international organizations) as a percentage of assets is significantly and negatively related to sustainability and is positively related to MFI cost per borrower. Bogan (2008) also finds evidence to support the assertion that the use of grants drives down MFI's operational self-sufficiency. She suggests that long term use of grants may be related to inefficient operations due to lack of the competitive pressures that would be associated with attracting market funding. Notably, the results do not indicate that

grants are related to greater or more costly outreach. Thus, grants could hinder the development of MFIs into competitive, efficient, sustainable operations (Bogan, 2008

H1: There is positive relationship between leverage and liquidity of micro finance

### Capital adequacy

Capital of banks consists of common stocks plus surplus funds plus undivided profit plus reserve for contingencies and other capital reserves. As it is discussed in the literature review part, there are two opposing theoretical views regarding to the relationship between banks liquidity and capital adequacy. These are financial fragility-crowding of deposit hypothesis and risk absorption hypothesis. The first argument suggests that there is negative relationship between capital adequacy and bank liquidity whereas, the second argument is opposing to this. This study considered the second hypothesis since it has been used by various empirical studies reviewed under this study. The proxy for capital adequacy used in this study was the ratio of equity to total assets.

The other study made by Vodova (2013), suggest a negative influence on bank profitability (measured by return on equity) and bank liquidity.

*H2: Capital has positive and significant impact on LMFIs liquidity*

### Gross Domestic Product (GDP):

GDP is an indicator of the economic health of a country as well as the gauge of a country's standard of living. It is the measurement of level of economic activity of a country. According to previous studies, when the economy is at boom or goes out of recession, economic units including MFIs are optimistic and increase their loans & advances and as a result decrease their holding of liquid assets. On the other hand, during recession, business operations reduce borrower's capability to service their obligations which increases MFIs NPLs and eventually decreases MFIs liquidity. For the purpose of this study, GDP is measured by the annual real growth rate of gross domestic product and it is hypothesized to affect MFIs liquidity negatively.

*H3: Real GDP growth rate has negative and significant impact on LMFIs liquidity*

### Inflation (INF):

According to the recent theory of information asymmetry in the credit market an increase in the rate of inflation drives down the real rate of return not just on money, but on assets in general. The implied reduction in real returns exacerbates credit market frictions. Since these market frictions lead to the rationing of credit, credit rationing becomes more severe as inflation rises. As a result, the financial sector makes fewer loans, resource allocation is less efficient, and intermediary activity diminishes with adverse implications for capital/long term investment. In turn, the amount of liquid or short term assets held by economic agents including bank rise with the rise in inflation. To proxy inflation the annual gross inflation rate was used. Another. During inflation, it is expected that, LMFIs will make fewer loans and the amount of liquid or short-term assets held by economic agents including LMFIs will rise. On the other hand, during inflation the cost of living will rise and deposits are expected to be reduced and as a result liquidity will be affected negatively. For the purpose of this study, inflation is measured by the annual general consumer price index and a negative relationship between inflation rate and MFIs liquidity is expected.

*H4: Inflation rate has negative and significant impact on LMFIs liquidity*

Impact of tangibility on leverage:

That tangibility has a negative and significant impact on liquidity of MFI. The coefficient magnitude is (-6.44) and (-6.11) respectively in both models respectively with different level of significance. This indicates that a negative relationship exists between tangible assets and leverage. This result is statistically significant at 1% and 5% level of significance respectively. As a result, the alternate hypothesis has been accepted that tangibility has a significant negative impact on leverage of MFI.

Theoretical research predicts positive relationship between tangibility and liquidity. Prior empirical studies use net fixed assets scaled by total studies as its proxy and the findings are consistent with theoretical predictions. The findings of this study show different scenario. This is the main result for fact that most financial institutions do not lend to MFI because they assume loss of collateralization for debt increases the lenders risk. This result do not support the capital structure theory in principle that debt forms are used to finance tangible assets. This result is not consistent with other empirical studies due to the fact that tangibility has less to do with the objective of MFI. Therefore, this indicates the unique feature of these institutions in determining their capital structure. Generally, MFI industry

is usually characterized by a relatively low level of fixed assets. Current assets can more easily be converted to cash and thus have more liquid capacity than fixed asset. In MFI industry the importance of current rather than fixed assets plays an important role in their decision to offer loans to their clients with high ratio of current to total assets, or a low ratio of fixed to total assets. This supply-side argument might explain why firms who own relatively low ratios of fixed to total assets. The findings of this study are similar to those reported by (Gill A. et al, 2009, Octavia and Brown 2008).

H5: Tangibility and liquidity of micro finance has negative relationship

## 3.6. Definition of variables and Model Specification

### *Independent variables*

**LMFIs Size:** is measured as the logarithms total assets that refer to the sum of current and noncurrent assets at the end of firm's reporting year.

**Capital adequacy:** The share of own capital on total assets of the banks

**Inflation:** Inflation reflects a situation where the demand for goods and services exceeds their supply in the economy. It is measured by the annual general consumer price index.

**Gross Domestic Product (GDP):** GDP is an indicator of the economic health of a country as well as the gauge of a country's standard of living. GDP is measured by the annual real growth rate of gross domestic product

$\boldsymbol{Lit = \alpha + \beta Xit + \delta i + \varepsilon it}$ where $L_{it}$ is one of the three liquidity ratios for LMFIs $i$ in time $t$, $Xit$ is a vector of explanatory variables for LMFIs $i$ in time $t$, $\alpha$ is constant, $\beta$ are coefficient which represents the slope of variables, $\delta i$ denotes fixed effects in LMFIs $i$ and $\varepsilon it$ is the error term. The subscript $i$ denote the cross-section and $t$ representing the time-series dimension.

Therefore, the general models which incorporate all of the variables to test the determinants of LMFIs liquidity is:

$$LATDit = \alpha + \beta 1\ (LVG) + \beta 2\ (CA) + \beta 3\ (GDPit) + \beta 4(INFt) + \beta 5\ (TNGt) + \delta i + \varepsilon it$$ **…….(Model 1)**

$$LTAit = \alpha + \beta 1\ (LVG + \beta 2\ (CA) + \beta 3\ (GDPit)) + \beta 4(INFt) + \beta 5\ (TNGt) + \delta i + \varepsilon it$$ **…….(Model 2) Where:**

***LATDit*:** represents the LMFIs liquidity measured by liquid asset to deposit & short-term borrowing ratio of $i^{th}$ MFIs on year "t"

***LVGit*:** represents the LMFIs liquidity measured by liquid asset to total asset ratio of $i^{th}$ MFIs on year

"t"

***CAPit**:* is the capital adequacy of ith bank on the year t.the proxy was the ratio of total bank capital to total assets

***GDPt*:** is the real gross domestic product growth of Ethiopia on the year "t".

***INFt*:** is the inflation rate in Ethiopia on the year "t".Tangibility of $i^{th}$ on the year "t". *δi*: denotes fixed effects in bank "i" ***εit*:** is a random error term

The specific variables are both cross-sectional and time variant whereas the macroeconomic variables are only time variant but are converted into panel data type by including macroeconomic variables for each cross-sectional unit.

# Chapter Four

## Data Presentation and Analysis

In the preceding chapters, the review of relevant literature helped this study to understand the problem and design an appropriate research approach to deal with. The previous chapter also discussed the research design employed to achieve the objectives of the study and to test the research hypotheses there on. In this chapter, the study analyses the collected data using various statistical tools and presents the results and discussion accordingly. This chapter is organized in two sections. The first sub section presents the result which includes descriptive statistics, CLRM Assumptions and Diagnostic tests, correlation analysis, the regression results and interview result. The second section is dedicated to the discussion of results.

### 4.1. Descriptive Analysis

This section essentially present descriptive statistics of dependent and explanatory variables included in this study. The dependent variable of this study is liquid asset to deposit to total asset and explanatory variable are Leverage, Tangibility, Capital Adequacy, GDP and Inflation. The total observation for each dependent and independent variable was 60 (data for 8 MFIs for the period from the year 2011 to 2018). The descriptive statistics include mean, median, maximum, minimum and standard deviation of all study variable (see table 4.1).

**Table 4.1: Summary of descriptive statistics**

| | LQDT | CA | GDP | INF | LVG | TNG |
|---|---|---|---|---|---|---|
| Mean | 1.434927 | 0.300011 | 475651.5 | 13.46250 | 0.793625 | 0.027671 |
| Median | 1.379438 | 0.279172 | 475651.5 | 11.15000 | 0.721934 | 0.023535 |
| Maximum | 1.964581 | 0.545189 | 475655.0 | 34.10000 | 1.758703 | 0.065245 |
| Minimum | 1.084140 | 0.077610 | 475648.0 | 7.400000 | 0.454811 | 0.000000 |
| Std. Dev. | 0.209320 | 0.115642 | 2.309401 | 8.287062 | 0.303158 | 0.017510 |
| Skewness | 0.535549 | 0.404674 | 1.35E-18 | 1.837077 | 1.900327 | 0.534658 |
| Kurtosis | 2.626320 | 2.536875 | 1.761905 | 5.056790 | 6.071454 | 2.334805 |
| | | | | | | |
| Jarque-Bera | 3.431696 | 2.318739 | 4.087680 | 47.27944 | 63.67682 | 4.229121 |
| Probability | 0.179811 | 0.313684 | 0.129530 | 0.000000 | 0.000000 | 0.120686 |
| | | | | | | |
| Sum | 91.83530 | 19.20072 | 30441696 | 861.6000 | 50.79202 | 1.770937 |
| Sum Sq. Dev. | 2.760342 | 0.842509 | 336.0000 | 4326.550 | 5.789999 | 0.019316 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Observations | 64 | 64 | 64 | 64 | 64 | 64 |

Source: Output of Eviews 8

As shown in table 4.1 above, the first dependent variable of this study, liquid asset to deposit have a mean value of 1.434927 this shows the sampled microfinance institutions on average they have 1.434927 cents for each of one birr of their liability and standard deviation of 0.209320 shows dispersion from its mean. On the other hand, the minimum and maximum value of 1.084140 and 1.964581 indicate that from the sampled MFIs with 1.964581 have maximum liquid asset to deposit ratio while MFIs with 1.084140 have a minimum liquid asset to deposit ratio. In general, the higher this ratio signifies that the MFIs have the capacity to absorb liquidity shock and the lower this ratio indicates the MFIs increased sensitivity related to deposit withdrawals.

As shown in table 4.1 above, the independent variable, CA have a mean value of 0.300011 and standard deviation of 0.841064. This implies that during the study period the sampled MFIs have total asset, on average, with log value of 0.300011. On the other hand, the minimum and maximum value of 0.077610 and 0.545189 indicate that form the sampled MFIs with 0.545189 have the highest total asset while MFIs with 0.077610 have a minimum total asset. The entire figure shows that the Ethiopian MFIs have averagely log 0.300011 total asset that implicate size of the MFIs.

LVG return on asset has a mean value of 0.793625 and standard deviation of 0.303158. Thus, the management of the MFIs have generated on average 0.793625. Besides, the minimum and maximum amount of return on asset of the sampled MFIs is 0.454811 and 1.758703 respectively. This indicates that there is a MFIs with a maximum return on asset ratio of 1.758703 and MFIs with a minimum return on asset ratio of 0.454811.

The other independent variable is TNG has a mean value of 0.027671 and standard deviation of 0.017510. So, MFIs have 0.017510 TNG on average. Furthermore, the minimum and maximum amount of NPL of sampled MFIs is 0 and 0.065245 respectively. This indicate that there is a MFIs with a maximum TNG of 0.065245 and MFIs with a minimum TNG 0.

The mean for real GDP growth rate for the sampled period in Ethiopia is mean of 475651.5 having the minimum and the maximum of 475648.0 and 475655.0, respectively. The standard deviation is 2.309401, which indicates that the minimum fluctuation in the growth rate of GDP in the sampled period. This could show that there is a rapid GDP growth rate in the country based on international best practice.

Another important macroeconomic variable which may affect liquidity of MFIs is the inflation rate. During inflation, the central bank can raise the cost of borrowing and reduce the credit creating capacity of financial institution. The above figure shows that, the mean value of the general inflation rate of Ethiopia was 13.46250 with having the minimum and the maximum of 7.400000 and 34.10000, respective.

### 4.1.2 CLRM Assumptions and Diagnostic tests

#### 4.1.2.1 Heteroscedasticity

It is a test made to check whether error terms variance is constant (homoscedasticity) or not (heteroscedasticity). To test for the presence of heteroscedasticity, the popular white test was employed (Brooks 2008). One of the important assumptions of the multiple regression reveals that the variance of the disturbance term is constant. This is called the assumption of homoscedasticity. If disturbance terms (errors) do not have constant variance, they are said to be heteroscedasticity (Gujarati, 2004).

In this case as presented in table 4.2, both the F-statistic and Chi-Square versions of the test statistic gave the same conclusion that there is evidence for the presence of heteroscedasticity in this particular study, since the p-values are considerably less than 0.05. Therefore, the null hypothesis that the variance of the errors is constant (homoscedasticity) should be rejected.

Heteroskedasticity Test: White

| | | | |
|---|---|---|---|
| F-statistic | 2.943197 | Prob. F(14,49) | 0.0026 |
| Obs*R-squared | 29.23465 | Prob. Chi-Square(14) | 0.0097 |
| Scaled explained SS | 48.21981 | Prob. Chi-Square(14) | 0.0000 |

### *4.1.2.2 Autocorrelation*

The other Assumption of classical linear regression model is Autocorrelation. The diagnostic test for CLRM assumption of no autocorrelation was tested by this study. According to Gujarati, (2004) the assumption of no autocorrelation between the disturbances assumes that given any two X values, Xi and Xj (i≠j), the correlation between any two ui and uj(i≠j), is zero. According to Chris Brooks (2008) it is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are „autocorrelated" or that they are „serially correlated". This assumption was tested by Dubin Watson (DW) test of autocorrelation. Durbin--Watson (DW) is a test for first order autocorrelation -- i.e. it tests for a relationship between an error and its immediate previous value. One way to motivate the test and to interpret the test statistic would be in the context of a regression of the time *t* error on its previous value

$u_t = \rho u_{t-1} + v_t$

Where $v_t \sim N(0, \sigma^2 v)$ and $\rho$ is the coefficient of autocorrelation. The DW test statistic has as its null and alternative hypotheses. Under the null hypothesis, the errors at time $t-1$ and $t$ are independent of one another (the errors at time $t-1$ and $t$ are uncorrelated), and the alternative hypothesis says the errors at time $t-1$ and $t$ are independent (the errors at time $t-1$ and $t$ are serially correlated). Therefore

H0: $\rho = 0$ (no autocorrelation)

H1: $\rho \neq 0$ (autocorrelation)

DW has 2 critical values: an upper critical value (dU) and a lower critical value (dL), and there is also an intermediate region where the null hypothesis of no autocorrelation can neither be rejected nor not rejected! The rejection, non-rejection, and inconclusive regions are shown on the number line in figure 4.1

***Figure 4.1 Rejection, non-rejection, and inconclusive regions for DW test***

| Reject H0: positive autocorrelation | inconclusive | Do not reject H0: no evidence of autocorrelation | inconclusive | Reject H0: negative autocorrelation |
|---|---|---|---|---|

0 dL dU 2 4-dU 4-dL

According to Brooks (2008) the following is the decision rule to reject and not to reject the null hypothesis

null hypothesis is rejected and the existence of positive autocorrelation presumed if DW is less than the lower critical value dL;

the null hypothesis is also rejected and the existence of negative autocorrelation presumed if DW is greater than 4 minus the lower critical value dL;

The null hypothesis is not rejected and no significant residual autocorrelation is presumed if DW is between the upper critical value dU and 4 minus the upper critical value dU.

The null hypothesis is neither rejected or fails to be rejected if DW is between lower critical value dL and the upper critical value dU or if DW is in between4 minus the upper critical value dUand4 minus the lower critical value DL.

***Figure 4.2 DW test result***

0 1.483 1.672 2 2.328 2.517 4

***Table 4.3: DW test result test of autocorrelation***

| Test | DW test statistics |
|---|---|
| | ***LTA*** |

| | |
|---|---|
| DW result | ***1.781185*** |

This study has six explanatory variables (k) with 60 observations and the dL and dU values are **1.483**. The DW value of LQDT lies in the no evidence of autocorrelation region where the null hypothesis of no autocorrelation should not be rejected.

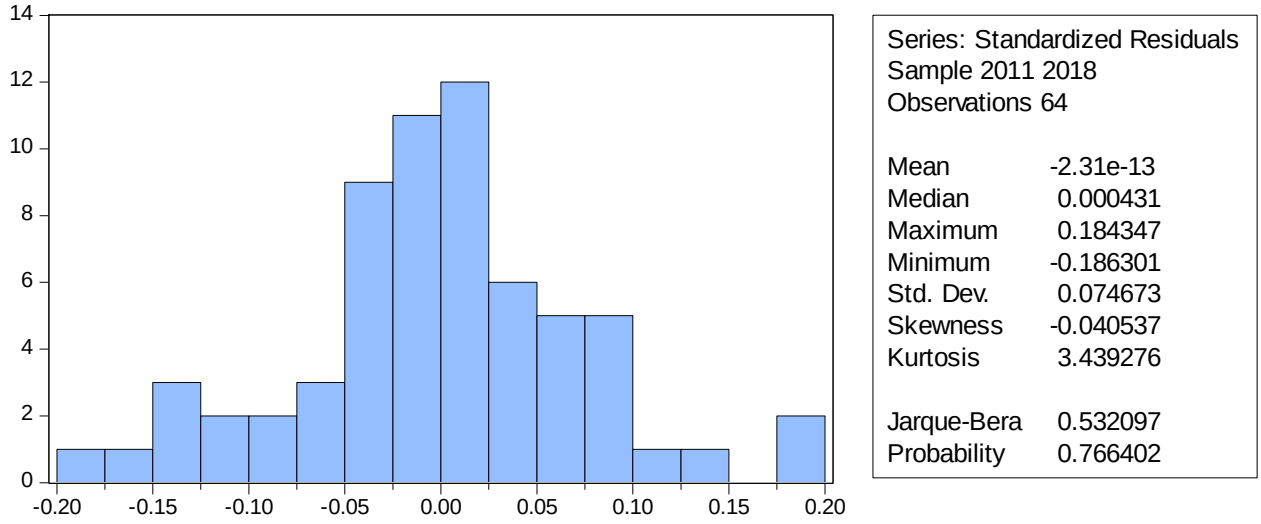
### *4.1.2.3 Normality*

One of the classical linear regression model assumption is normally distribution of the residual. The classical normal linear regression model assumes that each ui is distributed normally with mean and standard deviation values are near to 0 and 1 respectively Gujarati (2004). To test the normality assumption in this study the researcher applied the Jarque-Bera (JB) test. As noted by Brooks (2008) JB uses the property of a normally distributed random variable that the entire distribution is characterized by the first two moments -- the mean and the variance.

The standardized third and fourth moments of a distribution are known as its skewness and kurtosis. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how fat the tails of the distributed. If the residuals are normally distributed, the histogram should be bell-shaped and the Jarque-Bera statistic would not be significant. This means that the p-value given at the bottom of the normality test screen should be bigger than 0.05 to not reject the null of normality at the 5% level.

As clearly plotted in figure the normality test for this study shows a p-value of Jarque-Bera 0.532097 which is greater than 0.05 and the histogram is also bell-shaped implying that the residuals of this study is normally distributed.

### *Table 4.4:* **Jarque-Bera** *test result of Normality*




**Source output of Eview 8**

### *4.1.2.4 Multicollinearity*

The other very important assumption of the classical linear regression model is multicollinearity. According to Guajarati (2004) one of the assumptions of the classical linear regression model is that there is no multicollinearity among the explanatory variables, the X"s. Broadly interpreted, multicollinearity refers to the situation where there is either an exact or approximately exact linear relationship among the explanatory variable. To test the multicollinearity problem the current study used correlation matrix between the explanatory variables.

According to Kennedy (2008) multicollinearity problem exists when the correlation coefficient among the variables are greater than 0.70. Table 4.4 below shows the correlation coefficient among explanatory variables in this study. The highest correlation coefficient for this study explanatory variable is 0.138343 that is between INF and TNG, which is less than 0.7. Therefore, there is no evidence for presence of multicollinearity problem in this study model.

## Table 4.5 Correlation Matrix for independent variables

| | CA | GDP | INF | LVG | TNG |
|---|---|---|---|---|---|
| CA | 1.000000 | | | | |
| GDP | -0.141746 | 1.000000 | | | |
| INF | 0.124045 | -0.481379 | 1.000000 | | |
| LVG | -0.488777 | -0.005057 | -0.004786 | 1.000000 | |
| TNG | 0.007033 | -0.440251 | 0.055459 | 0.138343 | 1.000000 |

## 4.2 Correlation Analysis

In this section, the correlation between the dependent variables and the independent variables have been presented and analyzed. According to Brooks (2008), correlation between two variables measures the degree of linear association between them. Correlation coefficient between two variables ranges from +1 (i.e. perfect positive relationship) to -1 (i.e. perfect negative relationship) and a correlation coefficient of zero, indicates that there is no linear relationship between the two variables.

### Table 4.6 Correlation Matrix

| | LQDT | CA | GDP | INF | LVG | TNG |
|---|---|---|---|---|---|---|
| LQDT | 1.000000 | | | | | |
| CA | 0.929665 | 1.000000 | | | | |
| GDP | -0.217712 | -0.141746 | 1.000000 | | | |
| INF | 0.182665 | 0.124045 | -0.481379 | 1.000000 | | |
| LVG | -0.489196 | -0.488777 | -0.005057 | -0.004786 | 1.000000 | |
| TNG | 0.042468 | 0.007033 | -0.440251 | 0.055459 | 0.138343 | 1.000000 |

Table above, shows the correlation coefficient between the dependent variables and independent variables. Among the independent variables, Capital adequacy, Inflation, Leverage and Tangibility are positively correlated with LQDT with correlation coefficient of 0.007033, 0.055459, 0.138343 and 1.000000 respectively. While GDP are negatively correlated with LQDT with correlation coefficient of -0.440251. LVG has shown the highest positive coefficient of 0.138343 and GDP has shown the highest negative coefficient of 0.440251 with respect to LQDT.

## 4.3 Model Selection Test: Random Verses Fixed Effect Model

In order, achieve the objective of the study the researcher-employed panel Data model. As far as the Data is concerned, comprising both time series and cross-sectional elements panel model is appropriate. In order, achieve the objective of the study the researcher-employed panel Data model. As far as the Data, comprising both time series and cross-sectional elements panel model is appropriate. The choice of these method is comparing time series and cross-sectional units and by using Hausman specification test.

As noted by Gujarati (2004) if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model and random effect model. Hence, the choice here is based on computational convenience. On this score, random effect model may be preferable. The best alternative to make a choice between fixed effects and random effects model is conducting

Hausman specification test. In this study the Hausman specification tests is utilized to decide which model is appropriate to fit the sample data. Hausman specification test is the classical test of whether the fixed or random effects model should have used.

Running a Hausman specification test at five percent level enables the researcher to choose between fixed effects and random effects models (Hausman, 1978). The hypothesis for Hausman specification test is:

Null hypothesis: Random- effect model is more appropriate

Alternative hypothesis: Fixed-effect model is more appropriate

Decision rule: if the P-value from the Hausman test is statistically significant (less than five percent) the fixed-effect model is preferred in favor of random effect, otherwise the random effect model is selected.

The result from Hausman test in **table** allow as to not reject the null hypothesis that random model is better in this regression analysis. This implies that a random effect model is more appropriate than fixed effect model to undertake the panel regression estimation for this study.

### Table 4.7 Hausman 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 | 0.000000 | 7 | 1.0000 |

## 4.4. Results of Regression Analysis

This section discusses the regression results of random effect model that determines the liquidity of MFIs in Ethiopia. In this study, liquidity is measured by the ratio of liquid asset to deposit & liquid asset to total asset.

### Determinants of MFIs Liquidity Measured LATD

The empirical model used in this study to identify the statistically significant determinants of Ethiopian MFIs liquidity measured by liquid asset to deposit was:

$$Lqdt = \alpha + \beta 1\ (CAit) + \beta 2\ (INFit) + \beta 3(GDPit) + \beta 4\ (TNGit) + \beta 5\ (LVG) + \delta i + \varepsilon it$$

The following table presents the regression result of the determinants of MFIs liquidity measured by the ratio of liquid asset to deposit.

Table 4.8 Regression results Random Effect Model

Dependent Variable: LQDT
Method: Panel EGLS (Cross-section random effects)
Date: 01/01/21 Time: 12:25
Sample: 2011 2018
Periods included: 8
Cross-sections included: 8
Total panel (balanced) observations: 64
Swamy and Arora estimator of component variances

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 2027.602 | 2492.493 | 0.813484 | 0.4193 |
| CA | 1.544787 | 0.125217 | 12.33693 | 0.0000 |
| GDP | -0.004261 | 0.005240 | -0.813097 | 0.4195 |
| INF | 0.001276 | 0.001257 | 1.014730 | 0.3144 |
| LVG | -0.059661 | 0.049512 | -1.204989 | 0.0331 |
| TNG | 0.702147 | 0.686729 | 1.022452 | 0.0108 |

| Effects Specification | S.D. | Rho |
|---|---|---|
| Cross-section random | 0.029563 | 0.1507 |
| Idiosyncratic random | 0.070178 | 0.8493 |

| Weighted Statistics | | | |
|---|---|---|---|
| R-squared | 0.798115 | Mean dependent var | 0.922470 |
| Adjusted R-squared | 0.780711 | S.D. dependent var | 0.153930 |
| S.E. of regression | 0.072083 | Sum squared resid | 0.301366 |
| F-statistic | 45.85849 | Durbin-Watson stat | 0.815000 |
| Prob(F-statistic) | 0.000000 | | |

| Unweighted Statistics | | | |
|---|---|---|---|
| R-squared | 0.872735 | Mean dependent var | 1.434927 |
| Sum squared resid | 0.351294 | Durbin-Watson stat | 0.709697 |

The above table shows the results of the regression analysis on the determinant of the dependent variable (liquidity) which was measured by the ratio of liquid asset to deposit and the independent variables which includes both MFIs specific variables and macroeconomic variables for the sample of 8 Ethiopian micro finance institution. The coefficient of determination in this model is given by R-squared of 0.798115 and Adjusted R-squared of

0.780711, which means 79.81% of variation of Ethiopian MFIs liquidity (Lqdt) can be explained by the variation on Tangibility, Inflation, Leverage, Capital adequacy, GDP.

The remaining 20.1885% of changes was explained by other determinants which are not included in this model. Thus, the explanatory power of the model is high. The p-value of 0.000000 which is used to measure the overall significance of the model. Thus, the p-value of F-statistics is zero at six digits, the null hypothesis is rejected and the model is significant even at 1% significant level.

As it is shown on table above, capital adequacy, leverage and tangibility had statistically significant factors affecting liquidity of Ethiopian MFIs. Among the statistically significant variables, capital adequacy and tangibility had positively related with liquidity whereas leverage have negatively related with liquidity (Latd).

### 4.5. Discussion of the Regression Results

In this section, the relationship between the dependent variable and each explanatory variable were discussed on the basis of the findings on this study. The dependent variable, liquidity of Ethiopian MFIs, were measured by: - liquid asset to total asset ratio (LTA). And the independent variables were Capital adequacy, Inflation, GDP, Leverage and Tangibility. Thus, the regression result of each MFIs specific and macroeconomic variables was discussed in each the liquidity measures.

#### MFIs Capital Adequacy and MFIs Liquidity

Capital adequacy was measured by the ratio of total capital of the bank to total asset of the bank and it was hypothesized that capital adequacy has positive and significant impact on MFIs liquidity. Based on the random panel regression result capital adequacy was statistically significant impact on the determination of liquidity of Ethiopian micro finance institution. The capital adequacy coefficient sign is around 1.5447 the estimations which reveals that, there is a positive relation between liquidity of MFI. This indicates that, when capital to total asset is increases by 1 unit, the liquidity of Ethiopian micro finance institution increased by 1.5447 units being other variables remains constant. This positive and significance relation of the share of capital to total asset is consistent with the assumption that a bank with sufficient capital

adequacy should be liquid too and in line with the risk absorption theory proposed by Diamond and Dybvig (1983) and it is also in line with our hypothesis, the findings of Vodova (2013) on Hungary commercial banks and inconsistence results with the findings of Mekubub (2016) Ethiopia commercial banks.

**Tangibility and MFIs Liquidity**

The regression result indicates that tangibility has a positive and significant impact on leverage of MFI. The coefficient magnitude is 0.7021 in with five percent level of significance. This indicates that a positive relationship exists between tangible assets and liquidity. This result is statistically significant at 5% level of significance. As a result, the alternate hypothesis has been accepted that tangibility has a significant positive impact on liquidity of MFI.

Theoretical research predicts positive relationship between tangibility and liquidity. Prior empirical studies use net fixed assets scaled by total studies as its proxy and the findings are consistent with theoretical predictions. The findings of this study show different scenario. This is the main result for fact that most financial institutions do not lend to MFI because they assume loss of collateralization for debt increases the lenders risk.

**Leverage and MFIs Liquidity**

Leverage had a coefficient of -0.05966 with a significance probability of 0.0331 as shown in table 4.1. Leverage had a negative effect on liquidity risk. The result suggested that highly levered commercial banks would experience lower liquidity risk. Because the p-value of 0.0331 is less than 0.05, the effect of leverage was statistically significant at 5% level.

## Gross Domestic Product (GDP) and MFIs liquidity.

GDP was one of the macroeconomic variables that affect liquidity of MFIs in Ethiopia and it was measured by the real growth rate. GDP has statistically insignificant and negative impact on liquidity of Ethiopian MFIs since its P-value is 0.4195 and coefficient is -0.0042. The negative sign of coefficient indicates that the increase in real GDP growth rate leads to decrease in the liquidity of MFIs consistent the studies conducted by Tseganesh (2012), Belete (2015), and

Nigist (2015). However, the finding of this study against with studies conducted by Angora and Roulet (2011) and Cucinelli (2013).

Furthermore, a unit change in real GDP growth rate changes the liquidity of MFIs by 0.0042 units in the opposite direction, i.e. one unit increase in real GDP growth rate decrease the MFIs liquidity by 0.0.0042. Therefore, the real GDP growth rate has insignificantly negative relationship with liquidity of MFIs in Ethiopia for the study period cover 2010 to 2018.

## Inflation Rate and MFIs Liquidity

The other macroeconomic variable included in this study was the inflation rate of Ethiopia and was measured by the annual general consumer price index. Inflation had positive and statistically insignificant impact on liquidity of Ethiopian MFIs at 5% significant level. This positive relation was based on the theory that during inflationary economy, MFIs are refraining from long term investment and prefer to hold risk free liquid asset. That is during, inflation it is expected that, MFIs will make fewer loans and the amount of liquid or short-term assets held by economic agents including MFIs will rise. The positive relation was consistent with the findings of Vodova (2013) on Poland commercial banks and Tseganesh(2012) on Ethiopian commercial banks. The positive coefficient of 0.001276 indicates that a one percent change on inflation rate of the country, other things being constant, liquidity of Ethiopian MFIs leads to a 0.001276 change in the same direction.

# Chapter five

## Conclusion and Recommendation

The preceding chapter presented the results and discussion, while this chapter deals with the conclusions and recommendations based on the findings of the study. Accordingly, this chapter is organized into two sub-sections. The first section presents the conclusions and the second presents the recommendations.

### 5.1 Conclusion

The main objective of this study was to identify the macroeconomic and MFIs specific determinants of liquidity of Ethiopian microfinance institution. To comply with the objectives of the study, three MFIs specific and two macroeconomic variables were used. The MFIs specific variables includes;

Tangibility, leverage, and capital adequacy while the macroeconomic variables were real GDP, and inflation rate. The study was used panel data for the 8MFIs over the period 2011 to2018. The MFIs specific data were mainly collected from annual financial reports of the respective MFIs and the macroeconomic data were collected from NBE and MoFED. Data was presented and analyzed by using descriptive statistics, correlation analysis and balanced random effect regression analysis to identify the determinants of liquidity of Ethiopian microfinance institution which were measured by liquid asset to deposit (LATD) and liquid asset to total asset ratio (LTA).

The result of this study confirmed that, among the MFIs specific variables; had statistically significant impact on the determination liquidity of Ethiopian MFIs . And among the macro-economic all variables had statistically significant impact on liquidity of Ethiopian microfinance institution.

The positive relationship between MFIs Capital Adequacy and liquidity was the same to our hypothesis but not consistent with the “too big to fail” hypothesis. It was also found that Leverage and liquidity had positively related and it was inconsistent with our hypothesis but it was consistent with Bourke (1989) result. The positive and statistically insignificant impact of inflation was in consistent with our hypothesis but it is consistent with the result of Huybens and Smith (1999). They argued that in the

inflationary economy, economic units including financial institution refraining from long term investments due to the decline in the real value of their investments that aggravate the credit market rationing and prefer to hold risk free liquid assets. GDP has statistically insignificant and negative impact on liquidity of Ethiopian MFIs negative sign of coefficient indicates that the decrease in real GDP growth rate leads to decrease in the liquidity of MFIs consistent the studies conducted by Tseganesh (2012), Belete (2015), and Nigist (2015).

## 5.2. Recommendations

This study was intended to identify the determinants of liquidity of Ethiopian Large micro finance institution; and hence on the basis of the findings of the study, the following recommendations were drown: Ethiopian micro finance institution should have liquidity management policy to ensure that they are operating to satisfy their profitability target as well as the ability of meeting the financial demands of their customers by maintaining optimum level of liquidity; Among the macroeconomic variables included in this study almost exists as significant key drivers of liquidity of Ethiopian micro finance institution. This is a clear signal to all LMFIs in Ethiopia that they cannot ignore the macroeconomic indicators when strategic to improve on their position of liquidity. Thus, LMFIs in Ethiopia should not only be concerned about internal structures and policies/procedures, but they must consider both the internal environment and the macroeconomic environment together in developing their strategies to efficiently manage their liquidity position. In general, the finding of the study reveals that, LMFIs specific variables have more statistically significant impact on the determination of liquidity of Ethiopian LMFIs, since they are internal variables that can be controlled by management, special emphasis shall be given to those significant variables.

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# APPENDEX:I

## Table 4.8 Regression results Random Effect Model

LATD

Dependent Variable: LQDT
Method: Panel EGLS (Cross-section random effects)
Date: 01/01/21 Time: 12:25
Sample: 2011 2018
Periods included: 8
Cross-sections included: 8
Total panel (balanced) observations: 64
Swamy and Arora estimator of component variances

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 2027.602 | 2492.493 | 0.813484 | 0.4193 |
| CA | 1.544787 | 0.125217 | 12.33693 | 0.0000 |
| GDP | -0.004261 | 0.005240 | -0.813097 | 0.4195 |
| INF | 0.001276 | 0.001257 | 1.014730 | 0.3144 |
| LVG | -0.059661 | 0.049512 | -1.204989 | 0.0331 |
| TNG | 0.702147 | 0.686729 | 1.022452 | 0.0108 |

| Effects Specification | S.D. | Rho |
|---|---|---|
| Cross-section random | 0.029563 | 0.1507 |
| Idiosyncratic random | 0.070178 | 0.8493 |

Weighted Statistics

| | | | |
|---|---|---|---|
| R-squared | 0.798115 | Mean dependent var | 0.922470 |
| Adjusted R-squared | 0.780711 | S.D. dependent var | 0.153930 |
| S.E. of regression | 0.072083 | Sum squared resid | 0.301366 |
| F-statistic | 45.85849 | Durbin-Watson stat | 0.815000 |
| Prob(F-statistic) | 0.000000 | | |

Unweighted Statistics

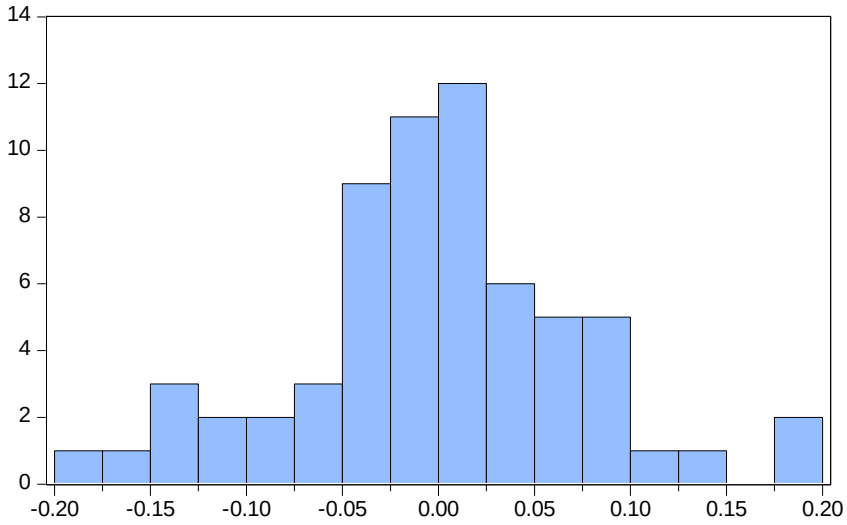
| | | | |
|---|---|---|---|
| R-squared | 0.872735 | Mean dependent var | 1.434927 |
| Sum squared resid | 0.351294 | Durbin-Watson stat | 0.709697 |

## APPENDIX II- Heteroskedasticity Test

Heteroskedasticity Test: White

| | | | |
|---|---|---|---|
| F-statistic | 2.943197 | Prob. F(14,49) | 0.0026 |
| Obs*R-squared | 29.23465 | Prob. Chi-Square(14) | 0.0097 |
| Scaled explained SS | 48.21981 | Prob. Chi-Square(14) | 0.0000 |

## APPENDIX III- Normality Test of LATD




| Series: Standardized Residuals | |
|---|---|
| Sample 2011 2018 | |
| Observations 64 | |
| Mean | -2.31e-13 |
| Median | 0.000431 |
| Maximum | 0.184347 |
| Minimum | -0.186301 |
| Std. Dev. | 0.074673 |
| Skewness | -0.040537 |
| Kurtosis | 3.439276 |
| Jarque-Bera | 0.532097 |
| Probability | 0.766402 |