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Relationship between Credit risk management and financial performance: empirical evidence from microfinance banks in Kenya

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Abstract

Effective Credit risk management enhances financial performance of Microfinance banks. A sound Microfinance banking subsector is vital for economic development as the sector supports low end entrepreneurs operating SMEs that form the bulk of Kenyan economy. In Kenya the microfinance banking subsector has been faced with risk management challenges. This necessitated the adoption of the Risk Based Supervision approach of supervising Microfinance banks in 2010. Additionally CIS feature was extended to MFBs to check on credit default. Despite these efforts, most MFBs are recording negative growth even with increased number of Microfinance bank licences being granted. The level of profitability and sustainability of the sector dropped significantly with ROE and ROA reported at 8% and 1% respectively. Non-performing loans increased by 6.9 percent and Risk coverage ratio shows a worrying negative trend. Hence the major objective for this study was to establish the relationship between Credit risk management and financial performance of Microfinance banks in Kenya. Specific objectives were: to establish the relationship between Portfolio at risk (PAR) and performance of MFBs and to determine the relationship between loan loss Provision coverage ratio (LLPCR) and performance of MFBs. Longitudinal research design utilizing panel data covering the period from 2011 to 2015 was used. Target population comprised 12 licensed MFBs. Purposive sampling was used to obtain a sample of 6 MFBs. Document analysis guide was used to gather secondary quantitative data from the MFBs financial reports. Descriptive statistics were used to show the trend of MFB risk exposure and performance. Pearson correlation was used to determine strength and association among variables. Panel data analysis based on system GMM technique was used to estimate a multiple regression model and test for significance of relationship between Risk management and financial performance. The findings were that Credit risk management with PAR and LLPCR parameters had a strong negative correlation (r=-0.68), giving a significant negative relationship with both ROAA and ROAE performance measures as depicted by regression coefficient of -0.2 estimated by GMM. Thus, the study concluded the existence of a significant relationship Credit risk management and performance and that credit risk management impacts performance of MFBs. The study recommended that Credit managers should operate under a sound credit granting process with well-defined credit-granting criteria detailing the MFB's target market, a thorough understanding of the borrower, purpose & structure of the credit, and its source of repayment.

Keywords: Credit risk, Microfinance banks and Performance

1.0 Introduction

The financial health of the microfinance banking industry is an important prerequisite for economic stability and growth (Halling & Hayden, 2006). Microfinance banks are part of the financial sector in an economy performing valuable activities on both sides of the balance sheet and providing the financial support to other segments. On the assets side, they enhance the flow of funds by lending cash starved users of funds and supply liquidity to savers on the liability side. They also facilitate the transactions of payments and help to ascertain the smooth transfer of goods and services. They avail the capital to be invested productively in order stimulate the economic growth. Banks make it possible to create new industries thereby increasing the employment and facilitating the growth (Diamond & Rajan, 2001).With the growing interests to search for the alternative to the conventional banking system in the post-2007/2008 global crisis, coupled with large potential customers' base of over one billion Small Scale Enterprise population worldwide, the demand for the Microfinance Banks and finance industry is expected to strengthen and

grow even more rapidly. Therefore, financial performance of Microfinance banks and other MFIs is key to the growth of this industry (Rifki, 2010).

The microfinance banking industry is growing rapidly and gaining importance in the global financial sector. As of December 31, 2010, there were 1,395 Microfinance Institutions globally with an estimated borrower base of 200 million with a total outstanding portfolio of over $44 billion as reported by the MFIs to the Microfinance Information Exchange. From 2003 to 2008, the global microfinance banking industry experienced a growth in borrowers at a Compound Annual Growth Rate (CAGR) of 12% and a portfolio outstanding CAGR of 34%. Inter-regionally, South Asia, East Asia and the Pacific region had the highest growth rates in terms of borrowers. Sub-Saharan Africa, Middle East and North Africa have experienced the slowest growth. Latin America continues to lead in terms of portfolio outstanding with $16 billion or 36% of the total global portfolio; however, South Asia has the lead in terms of borrowers with over 50% of the global borrower base (Rifki, 2010).

However, Credit risk has been cited to be and continue to be an impediment in the performance and growth of this very important sector (Akkizidis & Khandelwal, 2007). Risk management in banking and microfinance banking sub sector in particular came to limelight especially after the 2007/2008 turbulence that impacted the very existence of this sector as a viable industry. Not only the bank's, even the various government bodies have recognized the repercussions or impact of not managing the risks effectively in banks and accordingly enacted several regulations to control risks that arise in the banking business and operations. This development led to introduction of BASEL Norms by Bank of International Settlement (BIS) Committee. The committee has guided all the central banks of the participating countries and the banks governed by them to adapt and align their risk management practices to the norms over a period in time. (Vaidyula &Kavala, 2013).

In Kenya, the Microfinance industry over the years experienced growth and risk management challenges that brought increasing calls for regulation and hence the enactment of microfinance act 2006 and Deposit Taking Microfinance Regulations of 2008(CBK,2008). With the support of the Financial Sector Deepening (FSD) Kenya, Faulu and Kenya Women Finance Trust (KWFT) engaged in the process that led to their licensing as the pioneer deposit-taking microfinance institutions (DTMs) in Kenya. Both transformations were generally successful and helped the two institutions to maintain their strategic positioning in the market. However, in both cases, the process required more resources and took much longer than expected. In addition, the transformations rose greater than anticipated organizational challenges. By start of 2009 when KWFT embarked on the transformation into a deposit-taking institution in earnest, it was the largest non-bank microfinance institution in Kenya, serving 250,000 women only clients. Other DTMIs were later licensed. These include SMEP DTM, REMU DTM, Rafiki DTM, Century DTM and SUMAC DTM, Uwezo DTM and U&I DTM, bringing total nine DTMIs as of 2013(CBK, 2013). These DTMs were transformed into Faulu microfinance bank, Kenya women Microfinance, SMEP microfinance bank, REMU microfinance bank, Rafiki microfinance bank, Century microfinance bank, SUMAC microfinance bank, Uwezo microfinance bank and U&I Microfinance bank. The licensing of Daraja, Choice and Caritas Microfinance banks in 2015 brings Microfinance banks operating in Kenya to a total of twelve, with 98 branches and 69 marketing offices. Collectively, they have 1.47 million deposit accounts valued at Sh32.04 billion with an outstanding loan portfolio of Sh34.77 billion (CBK, 2015).

A growing literature suggests that risk management is even more challenging for the Microfinance banks compared to the conventional counterpart. This is largely attributed to the fact that the Microfinance banks are faced with additional risks due to the specific features of the financing contracts, liquidity infrastructure, legal requirements, nature of clientele and governance underlying the Microfinance bank operations (Cihak & Hesse, 2008). Moreover, in view of the increasing pressure of globalization, effective and efficient risk management in the Microfinance institutions is particularly important as they endeavor to cope with the challenges of cross border financial flows. Some argued that the microfinance banks performance and profitability are significantly affected due to need to allocate more resources to mitigate these risks. In particular, the greater risk mitigation requirements call for adequate capital and reserves, appropriate pricing and control of risks, strong rules and practices for governance, disclosure, accounting, and auditing rules, and suitable infrastructure that could facilitate liquidity management (Sundararajan & Errico, 2002).

To mitigate risk, the CBK carried out a risk management survey on the Kenyan banking sector in September 2004. The survey's objective was to determine the needs of the local banking sector with regard to risk management. The survey was necessitated by the drive to fully adopt Risk Based Supervision and to incorporate the international risk management best practices envisioned in the 25 Basel Core Principles for Effective Banking Supervision. The survey culminated in the issuance of the Risk Management Guidelines (RMGs) in 2005 and the adoption of the Risk Based Supervision approach of supervising financial institutions in 2005. In response to this, commercial banks embarked upon an upgrading of their risk management and control systems (CBK, 2005). This was later extended to Deposit taking Microfinance institutions that transformed into Microfinance Banks (CBK, 2010).

Similarly, the Credit Information Sharing (CIS) feature that was implemented by Kenyan financial institutions in 2010 reportedly was expanded to include Microfinance Banks and Savings and Cooperative Societies (SACCOS) in an effort to increase information sharing among financial institutions. CIS aimed at helping financial institutions keep a track record of borrower repayment habits and reinforce good repayment behavior and borrowing practices. The expansion was expected to help reduce interest rates in the micro financial market by decreasing credit defaults, thus providing an incentive for lenders to lower interest rates (Kratovac2013).

Following the launch of credit information sharing in July 2010, the number of credit reports requested by institutions stood at 4,325,200 in June 2014 up from 3,954,957 reports in March 2014, representing an increase of 9.4 percent or 370,243 reports. Over the same period, the number of reports requested by customers increased from 61,516 to 67,610 reports. The number of credit reports requested by banks increased from 357,669 registered in the quarter ending March 2014 to 370,243 reports registered in the quarter ending June 2014. However, credit reports requested by customers decreased from 6,422 to 6,094 over the same period. (CBK, 2014).

The extension of Risk Based Supervision and Credit Information Sharing to Microfinance banks is an indication of the Central Bank's commitment to the development of an all-inclusive financial system that serves different market segments as the Microfinance Banks targets the low end entrepreneurs operating Small and Micro Enterprises (SMEs) that form the bulk of Kenyan economy. This is in line with CBK's mandate to enhance financial inclusion and promote economic growth in Kenya, which are key tenets of Vision 2030 (CBK, 2013).

Despite the Risk Based Supervision and Credit Information Sharing effort, the Kenya microfinance sector report, 2012 which is a three year survey indicated the sectors asset growth as being less strong and relatively stagnant with Microfinance Banks recording negative growth even with increased number of Microfinance bank licences being granted. The loan loss reserve ratio coverage of portfolio stood at only 2.1% and risk coverage ratio showing a worrying negative trend. The value of gross non-performing loans (NPLs) increased by 6.9 percent from Ksh. 95.1 billion in March 2014 to Ksh. 101.7 billion in June 2014. The quality of assets, measured as a proportion of net non-performing loans to gross loans declined from 2.0 percent to 4.1 percent over the same period for the entire banking sector (CBK, 2014).

In aggregate terms, the micro finance sub sector disbursed Ksh.296 billion between 2009 and 2012. However, growth rates in terms of borrowers are lower with an average of only 2.8%. In absolute terms, the average disbursed loan dropped from US$1649 to US$464, explaining the low credit access and expansion among the Kenyan entrepreneurs. The Kenya microfinance sector report, 2013 indicates that the level of profitability and sustainability of the sector dropped significantly with ROE and ROA reported at merely 8% and 1% respectively. Being involved in the intermediation process, risk management is as important to the Microfinance Banks as it is to the conventional commercial banks. Banking is a risky business and Credit risk has been identified as critical to ensure that the banks position remain intact amid the intense competition in the industry. The survival and success of a financial organization depends critically on the efficiency of managing Credit risk (Khan & Ahmed, 2001). Therefore the purpose of this study was to establish the relationship between credit risk management and financial performance of Microfinance Banks in Kenya.

1.1 Objectives of the Study

The Study sought to empirically establish the relationship between Credit risk management and financial performance of Microfinance Banks in Kenya. More specifically the study sought to:
The specific objectives of the study were to;

i. Establish the relationship between Portfolio at risk (PAR) and financial performance of MFBs in Kenya.
ii. Determine the relationship between Loan Loss Provision Coverage ratio (LLPCR) and financial performance of MFBs in Kenya.

1.2 Hypotheses of the Study

$H_{01.1}$: There is no significant relationship between PAR and financial performance of MFBs in Kenya.
$H_{01.2}$: There is no significant relationship between LLPCR and financial performance of MFBs in Kenya.

2.0 Literature Review

2.1 Credit Risk Management

Every business face credit risk as it exists whenever payment or performance to a contractual agreement by another entity is expected. According to Basel Committee on Banking Supervision, credit risk is defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms (Safakli, 2007). It is also perceived to be the current and prospective risk to earnings or capital arising from an obligor's failure to meet the terms of any contract with the Bank or otherwise to perform as agreed. It is found in all activities in which success depends on counterparty, issuer, or borrower performance. It arises any time bank funds are extended, committed, invested, or otherwise exposed through actual or implied contractual agreements, whether reflected on or off the balance sheet (BIS 2009).

In particular, banking sector generally have considerable credit exposure due to their prominence on lending and trading. Traditionally, credit risk is associated with lending, investing, and credit granting activities and concerns the return of borrowed money. However, a great source of credit risk in banks arises from the performance of counterparties in contractual agreements e.g. given a financial obligation, which is not fully discharged, either due to the counterparty disability to fulfill his or her obligations which may result in a loss (Horcher 2005).

Ranjan and Dhal (2003) opined that horizon of development of credit, better credit culture, positive macroeconomic and business conditions lead to lowering of Non-performing Loans (NPLs). In its annual report (2010) CBK noted that management of NPLs by banks remains an area of concern, particularly, due to the likelihood of worsening of the quality of restructured loans. The nonperforming loans of banks are an important criterion to assess the financial health of banking sector. It reflects the asset worth, credit risk and competence in the allocation of resources to the productive sectors.

The key purpose of credit risk management is for a microfinance bank (MFB) or commercial bank (CB) to maximize its risk-adjusted rate of return while maintaining exposure within its acceptable risk tolerance. Credit risk is diversifiable but impossible to fully eliminate and poses significant challenges. It involves the establishment of the distribution of probabilities of default (PD), loss given default (LGD), and credit exposures; measured in a portfolio context. It is the responsibility of the board of directors and senior management to ensure that MFBs have the appropriate credit risk assessment processes and an effective internal control environment to properly manage credit risk (BIS 2009). Raghavan (2005) and Funso (2012) summarize approaches of credit risk Management as follows: Internal risk rating; risk foreseeing and warning means; pricing on a scientific basis; Credit derivatives ;Credit securitization ; assets and loans securitization; adoption of a sound Internal lending policy; Credit Reference Bureaus and Information sharing; Hedging Credit Risk and compliance to Basel accord.

Best practices require that an internal control framework for credit risk assessment include a clear loan review process that is independent of the lending unit. The loan review process should contain a credit grading system that will identify and rank loan quality and credit risk characteristics. The established system must be applied consistently across the loan portfolio. The credit grading system is an important

tool for classifying the various credit exposures of a bank. An effective credit grading system will determine the overall risk of the loan portfolio, Potential of Default (PD), and the sufficiency of the provisions for loan losses. Loans should be classified on the basis of potential credit risk. The factors that the credit grading system should consider include the borrower's financial condition, capacity to pay, value of the collateral and other characteristics that may influence the likelihood of the collection of principal and interest. The credit risk can be based on history of defaults (for specific borrowers, industries) courtesy of information sharing.

Hamadi and Abdelmoula, (2010) maintained that CBK in compliance to Basel Committee on Banking Supervision (2006) provides banks and supervisors with guidance on sound credit risk assessment and valuation policies and practices for loans and state that a bank's policies should appropriately address validation of any internal credit risk assessment models. Models may be used in various aspects of the credit risk assessment process including credit scoring, estimating or measuring credit risk at both the individual transaction and overall portfolio levels, portfolio administration, stress testing loans or portfolios and capital allocation . Additionally, a key aspect of credit risk management is the ability of a bank to diversify across defaults. The rule of diversification supports that a portfolio of multiple loans is less risky than a single loan. One way to diversify the portfolio is to set concentration limits. MFB can limit the exposure of its loan portfolio to a specific geographical area or to an industry. The logic behind this is that the correlation of defaults is higher within sectors than acros*s* sectors.

When assessing the quality of credit risk management it is helpful to review a combination of various indicators. For example, a strong credit risk management framework will include the following indicators: the board of directors and senior management's tolerance for risk is well-communicated and fully understood, The financial institution has a strong culture of risk awareness, Credit analysis is comprehensive and timely, Credit risk grading systems effectively stratify credit risk and are used as early warning tools or key risk indicators (KRIs), Management information systems *(*MIS*)* provide an accurate, timely and comprehensive view of the portfolio, Concentration limits are set at reasonable levels to help diversify the portfolio and protect against the risk of correlated defaults, Strategic plans are consistent with the established risk appetite and promote an appropriate balance between risk and earnings growth.

2.2. Measures of Credit risk

Credit risk in a bank's loan portfolio can be measured through various ratios. These include Portfolio at risk and Loan loss provision.

2.2.1 Portfolio at Risk

The loan Portfolio at Risk (PAR) is defined as the value of the outstanding principal of all loans in arrears, expressed as a percentage of the total loan portfolio currently outstanding. PAR is a standard international measure of portfolio quality that measures the portion of a portfolio which is deemed at risk because payments are overdue. For example; PAR 30 means the portion of the portfolio whose payments are more than 30 days past due. PAR above 5 or 10% is a sign of trouble in microfinance banks because unlike commercial loans, most microloans are not backed by bankable collateral (Stauffenberg, 2003).

High delinquency makes financial sustainability impossible for a MFB. Portfolio at risk rates measure the outstanding balance of loans that are not being paid on time against the outstanding balance of total loans (Brown, 2006). McIntosh and Wydick (2004), concluded that credit information systems first create a screening effect that improves risk assessment of loan applicants, thereby raising portfolio quality, which in turn reduces rate of arrears.

$$\textit{Portfolio at Risk (PAR)} = \frac{\textit{loans due not paid on time}}{\textit{total loans due}}$$

Both the numerator and the denominator of the ratio are outstanding balances. The numerator is the unpaid balance of loans with late payments, while the denominator is the unpaid balance on all loans. The PAR uses the same kind of denominator as an arrears rate, but its numerator captures all the amounts that are placed at increased risk by the delinquency. A PAR can be pegged to any degree of lateness. PAR, a common measure among banks, captures the outstanding balance of all loans with a payment more than 30

days late.

2.2.2 Loan loss Provision Coverage Ratio

The performance of the loan portfolio may be measured using proxies for the credit risk and measures of the loan quality such as provisions set aside for loan losses, net losses or non-performing assets. The loan loss provision is a balance sheet account that represents a bank's best estimate of future loan losses. Sometime after creating a loan loss provision for a worrisome microloan, a bank will discover how much the borrower is actually able to repay. At that moment the bank will record a net charge-off - the amount of the loan that will never be repaid. The loan loss provision coverage ratio is an indicator of how protected a bank is against future losses. A higher ratio means the bank can withstand future losses better, including unexpected losses beyond the loan loss provision. The ratio is calculated as follows:

$$\textit{Loan Loss Provision Coverage Ratio} = \frac{(pretax\ income + loan\ loss\ provision)}{net\ charge-offs}$$

Giulio (2014).

A high proportion of loans relative to total assets and rapid growth of the loan portfolio are potential warning signs for loan quality problems which indicate potential failures of a financial institution (Sinkey, 2005; BOU, 2008). These warning signs stress that given the unconventional collateral used in Microfinance operations and prevalence of short-term loans with frequent repayment periods, requirement for provisioning and write-offs may need to be stricter for Microfinance banks than for commercial banks. Provisions and write-offs should be based on the amount of overdue loans (portfolio at risk) and the number of days any payments (principle or interest) are overdue. Provisions for loan losses can be made using the objective approach which classifies loans by the time that has elapsed since the expiry of the facility. Table 2.1 shows the loan classifications and provisions for MFBs and those recommended by Central Bank of Kenya.

Table 2.1: Classification of Loan advances in MFBs

Time	***Classification***	***Provision***
1 – 30 days	Normal and watch	1-5%
31-60 days	Sub-standard	25%
61 – 90 days	Doubtful	75%
91 days and above	Loss	100%

Source: CBK (2008)

2.3 Financial performance.

Birlay and Westheed (2001) view financial performance as an approximation for financial success, which is the rate at which the enterprise is satisfied with the profits and growth levels attained. Financial performance looks at the results of a firm's policies and operations in monetary terms, being a general measure of a firm's overall financial health over a given period of time, and can be used to compare similar firms across the same industry or to compare industries or sectors in aggregation (Hillman & Keim 2001).

There are a number of financial performance measures, however there is little consensus about which instrument to apply. Richard (2009), views organizational performance as encompassing three specific areas of firm outcomes financial performance (profits, return on assets, return on investment); product market performance (sales, market share); and shareholder return (total shareholder return, economic value added).

Many researchers use market measures like Alexander and Buchholz (1978) and Vance (1975) while others put forth financial measures like Cochran and Wood (1984) and Waddock and Graves (1997). Some adopt both of these (McGuire, Sundgren, Schneeweis, 1988) while others use perceptual measures given

inaccessibility of accounting measures of performance (Lyles, 1996; Peng, & Luo, 2000). However each has different theoretical implications (Hillman and Keim 2001) and each is subject to particular biases (McGuire, Schneeweis & Hill, 1990).

With a long term stable good performance, earning, efficiency, risk taking and leverage together should be concerned by Microfinance bank's manager. These factors can be presented with stakeholders' overall interest. However, different stakeholders could be interested with different measurements from traditional, economic and market based point of view applied by academics or practitioners. For example, commonly used traditional ROE measure is one of the internal performance measures for shareholders value (return of shareholder investment); on the other hand P/E ratio is the market based measure for analysis financial results of the bank over its share price. Different stakeholders of a bank see its performance from different angles, which depositors are more likely concerned with bank's long term ability to insure their savings, equity holders are more likely looking for bank's profit generation and debt holders will pay more attention to how this bank can repay its obligation (ECB, 2010).The following measures are applicable for financial performance,

2.3.1 Return on Assets and Return on Average Assets

Return on Assets (ROA) is a basic and efficient measure of bank's profitability, which concerns with its size relative to others. It also indicates the management ability to perform their job efficiently since it shows the ability to generate profit from bank's assets. From its formula point of view, it measures net income after tax for each shilling invested in the assets of a bank. Basically, the higher ROA means better performance and vice-versa.

$$ROA = \frac{Net\ Income\ after\ Tax}{Total\ Assets}$$

The use of average yearly values of assets expresses the performance more accurate than the end year values;

$$ROAA = \frac{Net\ Income\ after\ Tax}{Average\ Total\ Assets}$$

A Return on Average Assets (ROAA) is an indication of how well Microfinance Bank is managing its asset base to maximize profits. The ratio evaluates the return of the portfolio and other revenue generated from investments and operations. Microfinance bank benchmark for this ratio ranges from >3% (Excellent) to -2 % (very poor).

2.3.2 Return on Equity and Return on Average Equity

Shareholders of bank more concerned with how much bank earns for their investment to equity measured by ROE, which shows the net income after tax per shilling from equity capital.

$$ROE = \frac{Net\ Income\ after\ Tax}{Total\ Shareholders'\ Equity}$$

The use of average yearly values of equity expresses the performance more accurately than the end year values hence;

$$ROAE = \frac{Net\ Income\ after\ Tax}{Average\ of\ Total\ Shareholders'\ Equity}$$

Comparing to ROE, the use of ROA takes into account the risks derived from the leverage and is the key bank profitability ratio (Athanasoglou, Brissimis and Delis, 2005). A possible drawback of ROA is the existence of the off-balance-sheet assets, which represent an important source of profit for banks, but are not considered in computing this measure. Thus, Goddard et al (2004) argue that the use of ROE is more appropriate. Given that use of average yearly values of equity and assets expresses the performance more accurate than the end year values.

2.4.1 Microfinance bank Size

Size is introduced to account for existing economies or diseconomies of scale in the market. Short (1979) argues that size is closely associated with capital adequacy of a bank since relatively large banks tend to

raise less expensive capital and consequently appear more profitable. Alexiou and Sofoklis (2009) find that the coefficient of the size variable as measured by the logarithm of assets is positive and highly significant, reflecting the advantages of being a large company in the financial services sector. The estimated coefficient shows that the effect of bank size on profitability is positive, a fact that is in line with the economies of scale theory. Similarly, Flamini, McDonald, and Schumacher (2009) studied the determinants of bank profitability for the sub-Saharan African countries. Their findings show that higher returns on assets are associated with larger bank size

In contrast, Ben Naceur (2003) notices that bank size have a negative impact on profitability. Hence, the bigger the banks, the more they face diseconomies of scale beyond a certain level, and the smaller the banks, the more they achieve economies of scale up to a specific level (Pasiouras & Kosmidou, 2007). In addition, Ben Naceur and Goaied (2008) reveal that size is negatively related to bank profitability. Sufian and Habibullah (2009) obtained similar results.

2.4.2 Gross Domestic Product Growth rate

The macroeconomic conditions influence the bank profitability. The economic growth, expressed by the Gross Domestic Product (GDP) growth, has multiple consequences among which is the increase of bank activity. Both the increase of customer deposits and loans granted and of the interest margins has a positive impact on bank profitability. When the economic activity decreases, the demand for loans and deposits decreases and negatively affects the profit margins (Sufian and Chong, 2008).

By employing a direct measure of the business cycle, Athanasoglou, et al., (2005) found a positive, albeit asymmetric, effect on bank profitability in the Greek banking industry, with the cyclical output being significant only in the upper phase of the cycle. In addition, the rate of GDP growth reflects the state of the economic cycle and is expected to have an impact on the demand for banks loans. The positive impact of GDP supports the argument of the positive association between growth and financial sector performance (Kosmidou, Tanna & Pasiouras, 2006).

2.4.3 Annual Inflation Rate

Annual inflation rate measures the overall percentage increase in Consumer Price Index (CPI) for all goods and services. Inflation affects the real value of costs and revenues. Perry (1992), states that the extent to which inflation affects bank performance depends on whether inflation expectations are fully anticipated or not. An inflation rate fully anticipated by banks management implies that banks can appropriately adjust interest rates in order to increase their revenues faster than their costs, thus, acquiring higher economic profits.

Bourke (1989) has shown a positive relationship between inflation rate and profitability. Similarly, by replicating Bourke's methodology and examining the determinants of bank performances across eighteen European countries between 1986 and 1989, Molyneux and Thornton (1992) have also shown a positive relationship between inflation rate and profitability. However, Kunt and Huizinga (1999) conclude that banks in developing countries tend to be less profitable in inflationary environments, particularly when they have a high capital ratio. In these countries, bank costs actually increase faster than bank revenues. Additionally, the study of Abreu and Mendes (2000) reports a negative coefficient for the inflation variable in European countries.

2.4.4 Credit Information Sharing

Credit Information Sharing (CIS) regulation by CRBs is a moderating measure aimed at helping financial institutions keep a track record of borrower repayment habits and reinforce good repayment behavior and borrowing practices. CIS will help in stemming out malpractices in the banking sector since customers whose credit reports indicate as having been involved in malpractices are subjected to stringent terms and conditions. This is also expected to help suppress the levels of NPLs while increasing their loan books. To the clients of MFBs, credit information sharing is expected to minimize the problem of information asymmetry in the financial sector. Information asymmetry between financial institutions and borrowers is one of the main contributors to high cost of credit (Kratovac2013).

Financial institutions tend to load a risk premium to borrowers because of lack of customer information. This in turn, increases cost of borrowing, meaning repayment of loans go up which translates to a high level of default. The CIS mechanism is therefore expected to facilitate the development of information capital to increase information symmetry and allow cost of credit to decline substantially. One of the key indicators of the success of credit market is the proper and effective credit reference bureaus which includes the availability of quality information, affordable credit facilities, and quality of assets; measured as a proportion of net non-performing loans to gross loans, in this case, stock of gross non-performing loans declining, leading to decline on provision for bad debts and hence profitability (CBK, 2010).

Following the launch of credit information sharing in July 2010, the number of credit reports requested by banks increased from 357,669 registered in the quarter ending March 2014 to 370,243 reports registered in the quarter ending June 2014. However, credit reports requested by customers decreased from 6,422 to 6,094 over the same period (CBK 2014).

2.4.5 Financial Regulation

Consideration of an array of regulation and supervision reveals that regulatory environment is likely to impact on banks' risk-taking behaviour and bank performance. As in most cases, conflicting predictions about these regulations and supervision may raise concerns on how policymakers can effectively prevent banking crisis in the future. Capital requirement, Deposit insurance and restrictions on bank activities are such areas of regulation (CBK, 2008).

The Financial regulations state that MFBs licensed to conduct deposit-taking business should dedicate more than 70% of their portfolio to microfinance loans. At the same time, large exposures (loans between 2% and 5% of core capital) should represent less than 30% of the portfolio. In terms of reporting requirements MFBs must submit the following periodic reports and other disclosures to the CBK: biweekly liquidity information, monthly reports on capital to risk weighted assets, quarterly unaudited financial statements and annual audited financial statements.

2.5 Theoretical Literature Review

This study was guided by theory of Asymmetric information. The theory of asymmetric information proposes that an imbalance of information between buyers and sellers can lead to inefficient outcomes in certain markets. George Akerlof, Michael Spence and Joseph Stiglitz were influential in developing this theory in the 1970s. The meaning of this theory is that it may be complex to distinguish between good and bad borrowers, which may result into adverse selection and moral hazards problems. in the market, the person that possesses more information on a particular item to be transacted (in this case the borrower) is in a position to negotiate optimal terms for the transaction than the other party; in this case, the lender (Auronen, 2003). The party that knows less about the same specific item to be transacted is therefore in a position of making either right or wrong decision concerning the transaction. Loan defaults resulting in accumulation of nonperforming loans in banks thrive in the information asymmetry environment that prevails due to lack of a credit information sharing mechanism (Richard, 2011).

This theory is relevant to this study with regard to credit risk management. Loans forms huge proportion of credit as they normally account for 10 – 15 times the equity of a Microfinance banks. In this way, the business of banking is potentially faced with difficulties where there is small deterioration in the quality of loans. Poor loan quality starts from the information processing mechanism and then increase further at the loan approval, monitoring and controlling stages (Kitwa, 1996). This problem is magnified especially, when credit risk management guidelines in terms of policy and strategies and procedure regarding credit processing do not exist or are weak or incomplete. Akerlof (1970), opined that adverse selection implies existence of qualitatively different types of credit seekers. In contrast with high quality borrowers, low quality borrowers are not capable to use the borrowed money for valuable investment and they will have a relatively large chance to fail on payment of the loan. Banks consequently prefer to select high quality credit seekers and the major way of examining a potential borrower is by analyzing all available information. The selection challenge results from the behavior of low quality applicant that presumes to submit high quality project but do not forward all relevant negative information. Moral hazard models on the other hand imply that information sharing should reduce default rates and interest rates and increase lending of money, either because credit reference bureaus nurture competition by reducing informational

rents, (Padilla & Pagano, 1996) or because they punish borrowers (Padilla & Pagano, 1997).

However, the impact of information sharing on aggregate lending in this model is vague. When banks exchange credit information about borrowers, the increase in lending to good credit borrowers may fail to compensate for an eventual reduction in lending to risky types. The Adverse selection problem signals that when lenders cannot distinguish good from wicked borrowers, all borrowers are charged a normal interest rate that reflects their pooled experience. If this rate is higher than worthy borrowers deserve, it will push some good borrowers out of the borrowing market, forcing in turn to banks charging even higher rates to the remaining borrowers.

2.6 Empirical literature review

Li Yuqi (2007) examined the determinants of bank's profitability and its implications on risk management practices in the United Kingdom. The study employed regression analysis on a time series data between 1999 and 2006. Six measures of determinants of bank's profitability were employed. Liquidity, credit and capital were proxied as internal determinants of bank's performance. GDP growth rate, interest rate and inflation rate were used as external determinants of banks profitability. The six variables were combined into one overall composite index of bank's profitability. Return on Asset (ROA) was used as an indicator of bank's performance. It was found that liquidity and credit risk have negative impact on bank's profitability. The current study uses the credit, liquidity and in addition operational risk management proxies as separate indices from moderator variables of GDP, Inflation and bank size as opposed to one overall composite index as used in this study. Further, Return on average assets (ROAA) and return on average equity (ROAE) which accounts for variation in bank assets and equity throughout the year as opposed to Return of assets (ROA) are used as performance measures in the current study.

Using data for banks from Egypt and Lebanon banks, Hakim and Neamie (2001) examined the relationship between credit risk and bank's performance over the period 1993-1999. The study estimated a fixed effects model of bank return with varying intercepts and coefficients. The findings showed that credit variable is positively related to profitability. The study also found a strong link between capital adequacy and commercial banks returns, with high capitalization being the hindrance to returns. The study concluded that the capital is a sunk cost with large banks realizing high profits in absolute but not in percentage terms. As a policy implication, the study provided important input for the policymakers in the region to set better performance targets, and enable bank managers to allocate capital more efficiently across their business units. The study also contributed in terms of how commercial banks can better employ their current capital and evaluate their future performance. The current study uses random effects model as opposed to fixed effects used in this study.

Agyei and Dasah (2012) carried out a study on the relationship between credit risk and profitability of some selected banks in Ghana. A panel data from six purposively selected commercial banks covering a five-year period (2005-2009) was analyzed within the fixed effects framework. From the results, credit risk (measured by non-performing loan rate, net charge-off rate, and the pre-provision profit as a percentage of net total loans and advances) had a positive and significant relationship with bank profitability. The findings indicated that banks in Ghana enjoyed high profitability in spite of high credit risk; contrary to the normal view held in previous studies that credit risk indicators are negatively related to profitability. These results were attributed to the prohibitive lending/interest rates (which stood at about 35%), fees and commission (non- interest income) charged. Also, the study found support for previous empirical works which depicted that bank size, bank growth and bank debt capital influence bank profitability positively and significantly. The current study measures credit risk using Portfolio at risk (PAR) and loan loss provision coverage ratio (LLPCR) using a random effects framework.

Kolapo, Kolade and Ojo (2012), did an empirical investigation into the quantitative effect of credit risk on the performance of commercial banks in Nigeria over the period of 11 years (2000-2010). Five commercial banking firms were selected on a cross sectional basis for eleven years. The traditional profit theory was employed to formulate profit, measured by Return on Asset (ROA), as a function of the ratio of Non-performing loan to loan & Advances (NPL/LA), ratio of Total loan & Advances to Total deposit (LA/TD) and the ratio of loan loss provision to classified loans (LLP/CL) as measures of credit risk. Panel model analysis was used to estimate the determinants of the profit function. The results showed that the effect of

credit risk on bank performance measured by the Return on Assets of banks is cross-sectional invariant. That is the effect is similar across banks in Nigeria. A 100 percent increase in non-performing loan reduces profitability (ROA) by about 6.2 percent, a 100 percent increase in loan loss provision also reduces profitability by about 0.65percent while a100 percent increase in total loan and advances increase profitability by about 9.6 percent. Based on the findings, it was recommended that banks in Nigeria should enhance their capacity in credit analysis and loan administration while the regulatory authority should pay more attention to banks' compliance to relevant provisions of the Bank and other Financial Institutions Act (1999) and prudential guidelines. The current study utilizes Pearson correlation analysis to establish the strength and direction of association between the credit risk management parameters and bank performance. Additionally, Return on average assets (ROAA) and return on average equity (ROAE) which accounts for variation in bank assets and equity throughout the year as opposed to Return of assets (ROA) are used as performance measures in the current study.

Using a time series and cross sectional data from 2004-2009 obtained from selected banks annual reports and accounts in Nigeria, Ogboi and Unuafe (2013) examined the impact of credit risk management and capital adequacy on banks financial performance in Nigeria. Panel data model based on pooled lest squares regression was used to estimate the relationship that exists among loan loss provisions (LLP), loans and advances (LA), non-performing loans (NPL), as measures of credit risk and return on asset (ROA) as a measure of financial performance. Results showed that sound credit risk management impacted positively on bank's financial performance with the exception of loans and advances which was found to have a negative impact on banks' profitability in the period under study. Based on the findings, the study recommended that Nigerian banks institute appropriate credit risk management strategies by conducting rigorous credit appraisal before loan disbursement and drawdown. The limitation of this study is in the measurement of credit risk. The mounts of non-performing loans, loans & advances and loan loss provisions used as proxies for credit risk management may not give a correct picture of risk management since there is lack of base of reference of the risk items. Thus the current study sought to fill this knowledge gap by using Portfolio at risk (PAR) determined as a ratio of non-performing loans over total loans and advances; and loan loss provision coverage ratio (LLPCR) determined by sum of net interest income and loan loss provisions over net charge –offs as proxies for credit risk management. Moreover, one step System of General methods of Moments(GMM) which proves to be a robust estimator for cross-sectional and time series data is utilized in the current study as opposed to pooled least squares regression model.

In investigating the quantitative effect of credit risk on the performance of commercial banks in Nigeria, Funso (2012) used panel data for the period 2000-2010. Profit was measured by Return on Asset, while ratio of non-performing loan to loan & advances, ratio of total loan & advances to total deposit and the ratio of loan loss provision to classified loans was used as a measures of credit risk. Panel model analysis was used to estimate the determinants of the profit function. The results showed that the effect of credit risk on bank performance is cross sectional invariant. Limitations of these studies are that the size of the banks used in the analysis is larger than most Microfinance banks and due to the nature of the database used. The current study examined the extent to which credit risk management affect financial performance of Microfinance banks in Kenya which have unique features of the financing contracts characterized by unbankable collateral, liquidity infrastructure, nature of clientele and governance underlying the Microfinance bank operations.

Kithinji (2010) analyzed the effect of credit risk management (measured by the ratio of loans and advances on total assets and the ratio of non-performing loans to total loans and advances) on financial performance (measured by return on total asset) of Kenyan Commercial banks between 2004 to 2008. The study found that the bulk of the profits of commercial banks were not influenced by the amount of credit and non-performing loans. The implication being, that other variables apart from credit and non-performing loans impact on banks' profit. The current study explored other factors such as liquidity and operational risk factors that influence the bank's profits.

In analyzing the effect of financial risk management on the financial performance of commercial banks in Kenya, Wanjohi (2013), assessed the current risk management practices of the commercial banks and linked them with the banks' financial performance. Return on Assets (ROA) was averaged for five years (2008-2012) to proxy the banks' financial performance. To assess the financial risk management practices,

a self-administered survey questionnaire was used across the banks. The study found out that majority of the Kenyan banks were practicing good financial risk management and as a result the financial risk management practices mentioned herein have a positive correlation to the financial performance of commercial banks in Kenya. Although there was a general understanding about risk and its management among the banks, the study recommended that banks should devise modern risk measurement techniques such as value at risk, simulation techniques and Risk-Adjusted Return on Capital. The study also recommended use of derivatives to mitigate financial risk as well as develop training courses tailored to the needs of banking personnel in risk management. This study used perceptual measures for credit risk management and panel data for performance of banks. In order to get a better insight to the effect and relationship, the current study opts for use of panel data for objective measures for both credit risk management and financial performance.

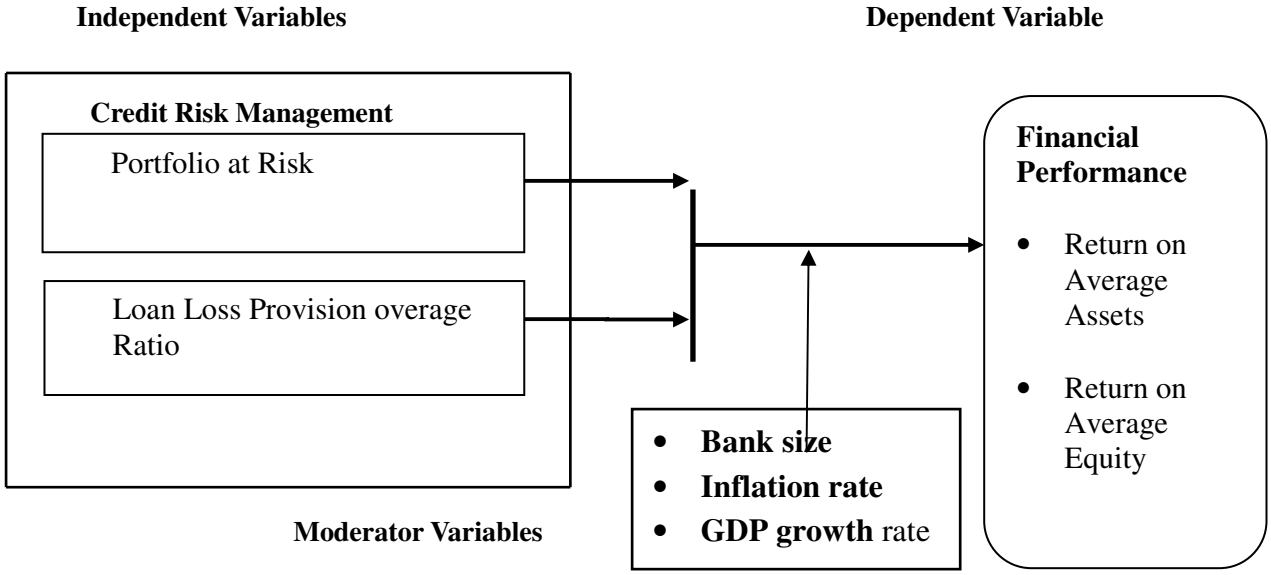
Anguka (2012), studied the influence of financial risk management on the financial performance of commercial banks in Kenya. The specific objectives were to determine the influence that the financial risk management practices have had on the financial performance of commercial banks in Kenya and to establish the relationship between Financial Risk Management and Bank performance. The study found that most commercial banks had highly adopted financial risk management practices to manage financial and credit risk and as a result the financial risk management practices had a positive correlation to the financial performance of commercial banks of Kenya. This study used perceptual measures in assessing risk management practices and financial performance. Therefore, the current study utilized panel data as objective measures of credit risk management and financial performance as empirical evidence.

Musyoki, and Kadubo (2012), assessed the impact of credit risk management on the financial performance of commercial Banks in Kenya for the period 2000 – 2006. The objective of study was to assess various parameters pertinent to credit risk management as it affects banks' financial performance. Such parameters covered in the study were; default rate, bad debts costs and cost per loan asset. Financial reports of ten commercial banks were used to analyze profit ability ratio for seven years (2000-2006). Descriptive, multiple least squares regression and correlation analyses were used in this study. The study revealed that all these parameters have an inverse impact on banks' financial performance, however the default rate is the most predictor of bank financial performance vis-à-vis the other indicators of credit risk management. Limitation of this study is that the size of the banks used in the analysis is larger than most Microfinance banks and due to the nature of the database used. Also, the multiple least squares regression used in the study does not adequately address the cross sectional component of panel data for the sample of ten banks used in the study .The current study examined the extent to which credit risk management affect financial performance of Microfinance banks in Kenya which have unique features of the financing contracts characterized by unbankable collateral, liquidity infrastructure, nature of clientele and governance underlying the Microfinance bank operations. System GMM estimation technique that combines both time series and cross-sectional data components are utilized in this study.

Similarly, Ogilo (2012) analysed the impact of credit risk management on the financial performance of commercial banks and also attempted to establish if there exists any relationship between the credit risk management determinants by use of CAMEL indicators (Capital Adequacy, Asset Quality, Management Quality, Earnings and Liquidity) and financial performance of commercial banks in Kenya. A causal research design was undertaken in this study and this was facilitated by the use of secondary data which was obtained from the Central Bank of Kenya publications on banking sector survey for the period 2006 to 2010. The study found out that there is a strong impact between the CAMEL components on the financial performance of commercial banks. The study also established that capital adequacy, asset quality, management efficiency and liquidity had weak relationship with financial performance (ROE) whereas earnings had a strong relationship with financial performance. The study concluded that CAMEL model can be used as a proxy for credit risk management. Similarly, Jackson (2011) towed the line of Ogilo (2010) by using CAMEL indicators as independent variables and return on Equity as a proxy for banks performance. His findings were in line with that of Ogilo and also concluded that CAMEL model can be used as proxy for credit risk management. Return on equity (ROE) as a measure of bank performance in this study does not take care of the variations in equity within a financial or accounting period. The current study therefore used Return on average equity (ROAE) in addition to returns on average assets (ROAA) to account for variations in equity and assets of MFBs within a financial or accounting period.

On the other hand, Wangai and Gathogo (2012) did a survey on Impact of Non-Performing Loans on Financial Performance of Microfinance Banks in Nakuru Town, Kenya. It was established that, credit risk significantly affected financial performance of MFBs in Nakuru town. The credit risk negated the MFBs' financial performance. It was deduced that, increase in credit risk would significantly reduce the MFBs' financial performance. The limitation of this study is that did not look into other risks that affect financial performance of Microfinance banks in Kenya. This study will fill this knowledge gap by also looking at the effect of Liquidity and Operational risks on financial performance of Microfinance banks in Kenya. Further, the same study by Wangai and Gathogo conducted a survey at a specific point in time, that is, September/October, 2014 on Microfinance banks operating in Nakuru town only and utilized primary data. The current study expanded the time frame utilizing time series secondary quantitative data from 2011 to 2015 with all the microfinance banks in Kenya as target population. Lastly the same study did not demonstrate sufficiently how financial performance of Microfinance banks is measured. Therefore, this study also intended to fill this gap by using ROAA and ROAE as measures of financial performance.

2.7 Conceptual Framework



Source: *Self conceptualization (2015)*

Fig 2.1: Conceptual Framework

The conceptual underpinning of this study is that financial performance can be due to controllable factors such as Credit risk management. Therefore, the conceptual framework of the study consisted of independent variables; credit risk management (measured by portfolio at risk and Loan loss provision coverage ratio), while financial performance (measured by Return on average assets and return on average equity) as the dependent variable. Bank size, Inflation rate and GDP growth rate constituted control variables. The interplay among these study variables is depicted in figure 2.1

3.0 Research methodology

This study was conducted in Kenya given that the units of study are Microfinance banks that are geographically spread all over the country. The study employed a longitudinal research design and utilized panel data covering the period from 2011 to 2015. The target population for this study comprised 12 licensed microfinance banks operating in Kenya. The units of study were sampled purposively to ensure the availability of financial data during the 2011-2015 study period. Therefore, six Microfinance banks that were in operation during this study period formed the sample size. Document analysis Guide was used to gather secondary quantitative data on risk management and financial performance from the Microfinance banks (MFBs) published financial reports (the balance sheets and income statements) obtained from the

MFBs and CBKs' website and publication from the MFBs head offices. The panel data analysis for this study was executed by using both descriptive and inferential statistical techniques. STATA version 12 software was used to generate descriptive and inferential statistics and the estimation of a multiple regression model using General Methods of Moments (GMM).

3.1 Model Estimation

This study utilized a model built on the one proposed by Athanasoglou et al., (2006), Flamini et al., (2009), Ommeren (2011), and Dietrich and Wanzenried (2011), as in equation 3.2.

$$y_{it} = \alpha_i + \beta_i \sum_{i=1}^{t} x_{it}^{i} + \beta_j \sum_{i=1}^{t} x_{it}^{j} + u_{it} \quad \text{..... 3..1}$$

Where: $u_{it} = \mu_i + v_{it}$

y_{it} **:** represents the dependent variable and measures bank financial performance, estimated by ROAE and ROAA, for Microfinance bank *i* at time *t*, with *i* = 1, …N=6 and *t* = 1,…T= *5*.

N: represents the number of cross-sectional observations and T the length of the sample period.

α_i : denotes the constant term.

β_i : refers to a vector of *k* parameters that estimate the sign and the slope of parameters for all explanatory variables.

$\sum_{i=1}^{t} x_{it}^{i}$: denotes a vector of Credit Risk management variables (PAR and LLPCR)

$\sum_{i=1}^{t} x_{it}^{j}$: denotes a vector of control variables (Bank Size, Inflation rate and GDP growth rate)

u_{it} : refers to the disturbance error.

μ_i : refers to the unobserved heterogeneity (the fixed effect).

v_{it} : refers to the idiosyncratic error.

This model is a one-way error component regression, where (μ_i) is IIN (0, $\sigma^2_{\mu i}$) and independent of (v_i) which is IIN (0, σ_{vi}). A banks' financial performance shows a tendency to persist over time, reflecting barriers to market competition (Berger, Bonime, Covitz, & Hancock, 2000). Therefore, the study adopted a dynamic characteristic of the model by including a one-period lagged dependent variable ($y_{i,t-1}$) of Microfinance bank (i) at time (t-1) among the regressors. Accordingly, equation (2) is expanded with the lagged financial performance to become:

$$y_{it} = \alpha_i + \delta y_{i,t-1} + \beta_i \sum_{i=1}^{t} x_{it}^{i} + \beta_j \sum_{i=1}^{t} x_{it}^{j} + \mu_i + v_{it} \quad \text{..... 3.2}$$

Where:

($y_{i,t-1}$): represents the one-period lagged dependent variable.

(δ): represents the coefficient of the one-period lagged dependent variable, which measures the speed of adjustment of Microfinance bank financial performance to equilibrium.

3.2 Empirical Model

Based on equation 3.1, the Microfinance banks' financial performance (FP) was modeled as a function of credit risk management as:

$ROAA=\alpha+\beta_1 PAR+\beta_2 LLPR+\beta_3 logS+\beta_4 GDP+\beta_5 IF+\varepsilon$ 3.3a

$ROAE=\alpha+\beta_1 PAR+\beta_2 LLPR+\beta_3 logS+\beta_4 GDP+\beta_5 IF+\varepsilon$ 3.3b

4.0 Results and Discussion

4.1 Descriptive Statistics Analysis

Descriptive statistical variables are summarized and presented in Table 4.1, which shows the mean value for each variable, as well as minimum, maximum and standard deviation. It indicates that the micro finance banks in Kenya, on average, had a positive financial performance throughout the period 2011-2015. For the total sample, the mean for ROAA and ROAE equals 16.86% and 97.30%. Their median is 18.29% and 95.70% with a minimum of -4.94% and -21.20%, and a maximum of 30.77%, and 273.30% respectively. This suggests low usage of assets to generate wealth in the sample Micro finance banks, even though there is moderate utilization of shareholders' funds to generate wealth. There is also substantial variation in financial performance reflected in a standard deviation of 9.24% and 84.30% for ROAA and ROAE respectively.

For the credit risk management component, the mean and median of PAR equals to 10.86% and 8.94% with a minimum of 3.44% and a maximum of 26.03%. There is less variation in Portfolio at risk reflected in the standard deviation of 6.54%. The mean of the loan loss provision coverage ratio (LLPCR) variable equals to 10.88% with a minimum of 0.00% and a maximum of 25.97%. Contrary to PAR, it is noticeable that there are more variations in Loan loss provision coverage ratio reflected in the standard deviation of 7.02%. LLPCR is an indicator of how protected a bank is against future losses. LLPCR and PAR measures asset quality. These ratios are however higher than acceptable ratio of 5.0%., indicating poor quality of loan portfolio asset of microfinance.
The mean and median of Log S equals to 9.223 and 9.368 respectively with a minimum of 7.771 and a maximum of 10.431. There is less variation in size of microfinance banks indicated by log of assets reflected in the standard deviation of 8.79%. On the other hand, the mean and median of the GDP equals to 5.45% and 5.60% respectively with a minimum of 4.4% and a maximum of 6.2%. Therefore, we can observe that there is minimal variation in real gross domestic product growth rate reflected in the standard deviation of 0.683%. Moreover, the mean and median of IF variable equals 8.708% and 7.496% respectively with a minimum of 5.563% and a maximum of 14.278%. There is also less variation in inflation reflected in the standard deviation of 3.401%.

Table 4.1: Descriptive Statistics for the Dependent and Independent Variables

Variable	Total Count	Mean	St. Dev	Minimum	Median	Maximum	Skewness	Kurtosis
ROAA	30	0.1686	0.0924	-0.0494	0.1829	0.3077	-0.26	0.18
ROAE	30	0.973	0.843	-0.212	0.957	2.733	0.11	-0.91
PAR	30	0.1086	0.0654	0.0344	0.0894	0.2603	0.36	-0.52
LLPCR	30	0.1088	0.07.02	0.000	0.1020	0.2597	0.31	-0.63
Log S	30	9.223	0.879	7.771	9.368	10.431	-0.23	-1.34
GDP	30	5.450	0.683	4.400	5.600	6.200	-0.42	-1.03
IF	30	8.708	3.401	5.563	7.496	14.278	0.29	-0.73

Source: Researcher (2015)

4.2 Collinearity

To check whether the independent variables are collinear, variance inflation factor (VIF) test for each variable entering the regression model was performed. Table 4.2 represents the VIF for ROAA and ROAE as measures of dependent variable. As shown in tables 4.2 all VIF are less than 10 and tolerance are greater than 0.05, suggesting that multi collinearity is not a problem in this study (Gujarati, 2004).

Table 4.2 Variance Inflation Factor (VIF)

Dependent Variable ROAA, ROAE		
Model	Collinearity Statistics	
	Tolerance	VIF
PAR	0.331	3.021
LLPCR	0.389	2.570
Log S	0.238	4.202
GDP	0.355	2.814
IF	0.451	2.002

Source: Research data 2015

4.3 Unit root test

In order to determine the stationarity of the panel data series for ROAA and ROAE, panel unit tests were performed. However, first, it was necessary to do a line plot to visualize the existence of constant (intercept), trend or drift in the plot so as to decide the items to include or exclude from the options in the unit root tests. Figure 4.1 shows the line plots for the six panel data in this study. It is evident that in all the six panels, both ROAA and ROAE line plots evolve around a non-zero value or constant, have means above zero and exhibit a trend pattern which is either upwards (increasing) or downwards (decreasing).

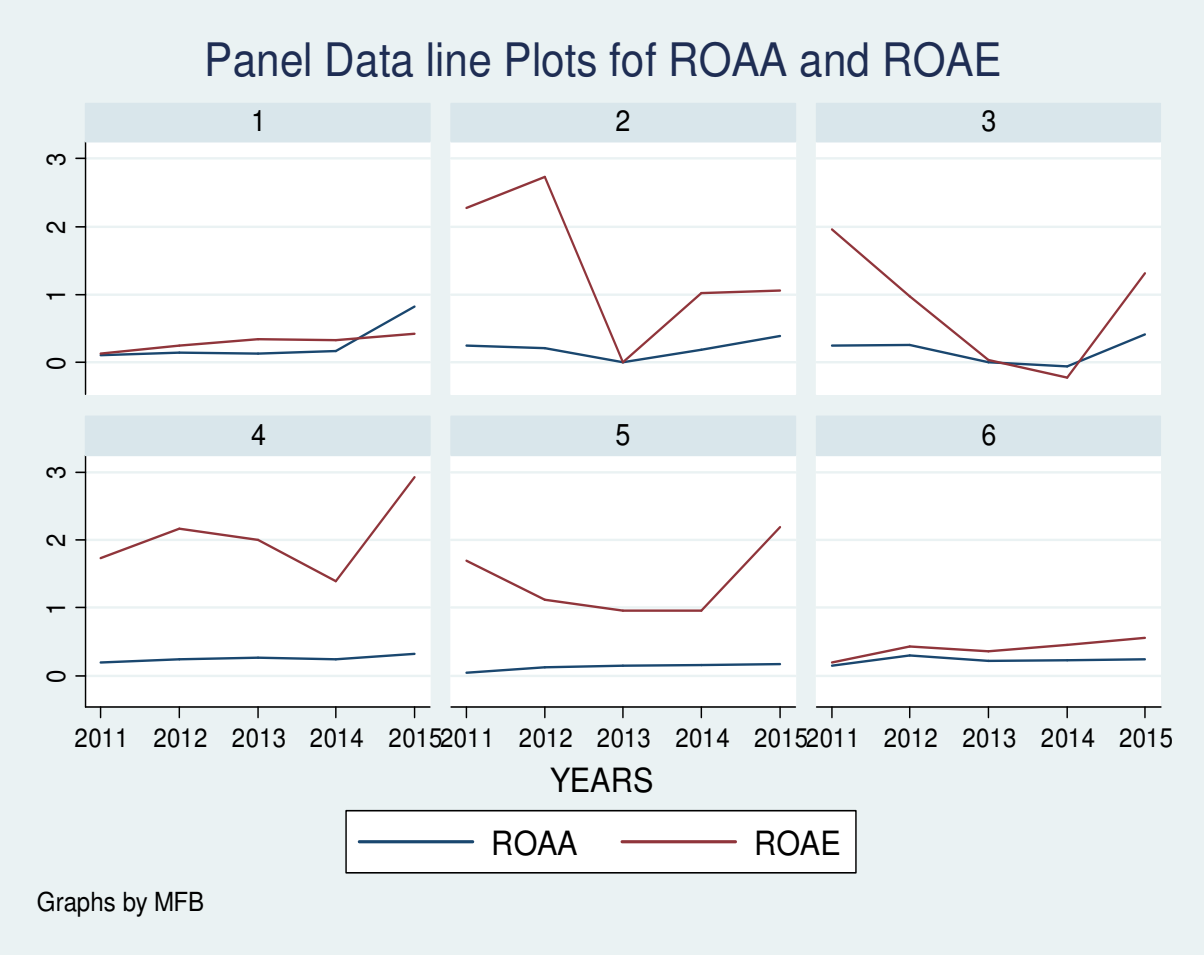


Figure 4.1 Panel data line plots for ROAA and ROAE series
Source: Research data 2015

Table 4.3 and 4.4 depicts the panel unit root test for ROAA series and ROAE series respectively using LLC test. Based on the panel line plots, the constant (which is common for all panels in LLC), panel mean and time trend are included in the test specifications. Given that Connell's (1998) results showed that the LLC

test exhibits severe size distortions in the presence of cross-sectional correlation, LLC (2002) suggested removing cross-sectional averages from the data to help control for this correlation. In this study, this was done by specifying the demean option to xtunitroot. The number of lags was also based on the Automatic Information Correction (AIC) criterion in an admission that it is not known the true number of lags to include in basic ADF autoregressive equation for the test.

The results for ROAA series show that The LLC adjusted test statistic t* = -1.6092 is significantly less than 0.0338 at 5% significant level, so we reject the null hypothesis of a unit-root (that is, that a = 0) in favor of the alternative that ROAA is stationary (that is, that a < 0). Similarly, for ROAE series, the adjusted test statistic t* is significant at 5% level of significance necessitating the rejection of the null hypothesis of a unit-root and concluding that ROAE is stationary.

The "Unadjusted t" in the output is a conventional t statistic for testing H_0: a = 0. When the model does not include panel-specific means or trends, this test statistic has a standard normal limiting distribution and its p-value is shown in the output (LLC 2002).

Table 4.3 Levin-Lin-Chu unit-root test for ROAA

xtunitroot llc ROAA, trend demean lags(AIC)

Ho: Panels contain unit roots	Number of panels = 6
Ha: Panels are stationary	Number of periods = 5
AR parameter: Common	Asymptotics: N/T -> 0
Panel means: Included	
Time trend: Included	Cross-sectional means removed

ADF regressions: 1.00 lags average (chosen by AIC)
LR variance: Bartlett kernel, 5.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-0.8715	
Adjusted t*	-1.6092	0.0338

Source: Research data 2015

Table 4.4 Levin-Lin-Chu unit-root test for ROAE

xtunitroot llc ROAE, trend demean lags(AIC)

Ho: Panels contain unit roots	Number of panels = 6
Ha: Panels are stationary	Number of periods = 5
AR parameter: Common	Asymptotics: N/T -> 0
Panel means: Included	
Time trend: Included	Cross-sectional means removed

ADF regressions: 1.00 lags average (chosen by AIC)
LR variance: Bartlett kernel, 5.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	0.0840	
Adjusted t*	-4.6322	0.0000

Source: Research data 2015

4.4 Correlation Matrix

Table 4.5 depicts the correlations between the explanatory variables and the dependent variable. It is observed that for credit risk management component, Portfolio at Risk (PAR) is negatively and

significantly correlated to Return on Average Equity (ROAE), with a correlation coefficient r = -0.6882.This suggests a fairly strong correlation. However, it has a fairly moderate, negative and significant correlation with Return on average assets (ROAA) at r = -0.3735. This implies that credit risk management aimed at low levels of PAR are related to enhanced financial performance, reflected fairly high in ROAE and moderately in ROAA. Similarly, Loan Loss Provision Coverage Ratio (LLPCR) is negatively and significantly correlated to both measures of performance. It is however, weakly related to ROAA (r=-0.1342) and moderately correlated to ROAE (r= -0.3907). Therefore credit risk management practices focusing on high loan loss provisioning with less realized net charge- offs on non-performing loans, are associated with weak to moderate financial performance of the MFBs.

Table 4.5: Correlation Matrix of Dependent and Independent Variables

	ROAA	ROAE	PAR	LLPCR
ROAA	1.0000			
ROAE	0.5254*	1.0000		
PAR	-0.3735*	-0.6882*	1.0000	
LLPCR	-0.1342*	-0.3907*	-0.1475	1.0000

Notes: * indicate significance at 5% level for the Pearson correlation coefficients
Source: Research data (2015)

4.5 Model Estimation and Hypothesis Testing

Tables 4.6 and 4.7 reports the regression outcomes of ROAA and ROAE series respectively as measures of Microfinance banks financial performance using one-step GMM System dynamic panel-data estimation.

4.5.1 Model Fitness

The model test of fitness was performed using the Wald test. As depicted in table 4.6 and 4.7, the Wald chi^2 test statistic is significant at 5% level. This statistic has the null hypothesis; Ho: all coefficients are zero. Wald chi^2 p-value of 0.0000 which is < 0.05 leads to the rejection of Ho and conclude that all predictor regression coefficients are significantly different from zero at 5% level of significance. Also, The GMM-in-System specifications seem to fit the panel data reasonably well since the Sargan (or Sargan-Hansen test) shows no evidence of over-identifying restrictions and the second-order autocorrelation was absent as depicted in Arellano-Bond test in tables 4.6 and 4.7. Further, the null hypothesis for Breusch-Pagan/Cook-Weisberg test for heteroscedasticity is not rejected implying that heteroscedasticity is not a problem in this study.

The lagged dependent variables (ROAA L1 and ROAE L1) measure the degree of persistence in the financial performance of MFBs. In table 4.6, the lagged dependent variable ROAA L1 has a significant coefficient equals to 39.72% (significant at 5%). Similarly, table 4.7 shows that coefficient of the lagged ROAE L1 at 22.68% is significant at the 5% level. These significant coefficients representing (δ) in this study as per equation 3.4 indicates a small degree of persistence characterizing performance of MFBs and justifying the use of the dynamic model. Besides, this persistence performance means the forces of competition are not sufficiently strong to cause all abnormal profits to dissipate within a one-year time span (Al-Jafari and Alchami, 2014). In this study the estimates on lagged financial performance ratios ranging between 22.68% to 39.72% is slightly lower compared to the estimate reported by Naceur and Magda (2008) at 42.5% to 57.9% for Egyptian banks, Al-Jafari and Alchami (2014) at -13.3% to 50% for Syrian banks and more or less similar to Athanasoglou et al., (2008) at 26% to 35% but contrast with the finding by Goddard et al. (2004) indicating lack of profit persistence in European banks.

Table 4.6: GMM System dynamic panel-data estimation, one-step results: ROAA series

Independent variable: ROAA Number of obs = 30
Group variable: MFB Number of groups = 6
Time variable: YEAR: 2011-2015
Obs per group: min= 5
Avg= 5 Max= 5
Number of instruments = 16 Wald chi^2 (5) = 47.49
Prob > chi^2 = 0.0000

ROAA	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
ROAA						
L1.	.3971684	.1902969	2.09	0.037	.0241932	.7701435
PAR	-.1818499	.2820855	-0.64	0.019	-.3710274	.7347273
LLPCR	.1381292	.070859	-0.67	0.009	-.1045752	.2320104
_cons	.6286722	.3467343	1.81	0.010	-.0509146	1.308259

Sargan test of over id restrictions: H_0: over identifying restrictions are valid
Chi^2 (25) = 13.6592 Pr > Chi^2 = 0.9674

Arellano-Bond test for AR (1) in first differences: z = -1.80 Pr > z = 0.073
Arellano-Bond test for AR (2) in first differences: z = -0.87 Pr > z = 0.383
H_0: no autocorrelation
Breusch-Pagan/Cook-Weisberg test for heteroscedasticity:
H_0: constant variance
Chi^2 (6) = 5.65 Pr > Chi^2 = 0.2624

Source: Research data 2015

Table 4.7: GMM System dynamic panel-data estimation, one-step results: ROAE series

Independent variable: ROAE Number of obs. = 30
Group variable: MFB Number of groups = 6
Time variable: YEAR: 2011-2015
Obs. per group: min = 5
avg = 5
max = 5
Number of instruments = 16 Wald chi^2 (5) = 13.02
Prob. > chi^2 = 0.0232

ROAE	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
ROAE						
L1.	.2268584	.0707126	3.21	0.001	.0882643	.3654525
PAR	-.4796660	.4733210	-1.01	0.021	-1.039205	3.168137
LLPCR	-.1575246	.3158725	-0.50	0.000	.0264151	.0886342
_cons	.3909013	.4721605	0.83	0.008	-.5345162	1.316319

Sargan test of over id restrictions: H_0: over identifying restrictions are valid
Chi^2 (25) = 13.91734 Pr > chi^2 = 0.9632
Arellano-Bond test for AR (1) in first differences: z = -1.80 Pr > z = 0.073
Arellano-Bond test for AR (2) in first differences: z = -0.87 Pr > z = 0.383
H_0: no autocorrelation
Breusch-Pagan/Cook-Weisberg test for heteroscedasticity: H_0: constant variance
Chi^2 (6) = 4.21 Pr > chi^2 = 0.3112

Source: Research data 2015

4.5.2 Test of Hypotheses

Based on the study objectives, the hypotheses of the study were tested at 5% level of significance as follows:

$H_{01.1}$: There is no significant relationship between PAR and financial performance of MFBs in Kenya.

The finding of this study, based on the first objective is that Credit risk has a significant and negative effect on financial performance. In table 4.6, the regression coefficient of the Portfolio at risk (PAR) equals -0.1818 and is significant at the 5% level when the dependent variable is measured by ROAA. In table 4.7, the coefficient of PAR equals -0.4796 and is significant at the 5% level when the dependent variable is measured by ROAE. This result implies that for 1 unit increase in PAR, the financial performance of MFBs measured by ROAA and ROAE reduces by 0.1818 and 0.4797 respectively. Therefore, maintaining Portfolio at risk at low levels will enhance financial performance. Since both tables 4.6 and 4.7 indicate that the z-statistic of PAR is negatively significant; we reject the null hypothesis and conclude that PAR has a negative significant relationship with both ROAA and ROAE as financial performance measures.

$H_{01.2}$: There is no significant relationship between LLPCR and financial performance of MFBs in Kenya.

The Loan loss provision coverage ratio (LLPCR) component of credit risk is equally negatively significant at 5% level with a coefficient of -.1381292 and- 0.1575246 when the dependent variable is measured by ROAA and ROAE respectively. The coefficient of the estimate shows that every one unit increases in loan loss provision Coverage ratio decreases return on ROAA by 0.138 units and ROAE by 0.157 units. Both table 4.6 and 4.7, have z-statistic of LLPCR as negatively significant at 5% level. Hence we reject the null hypothesis and conclude that LLPCR has a significant negative relationship with both ROAA and ROAE performance measures.

In this study, Portfolio at risk (PAR) which is a measure of assets quality, obtained as a ratio of non-performing loan to total loan is found to have a significant negative impact on MFBs' performance. This can be explained from the fact that higher level of nonperforming loans means higher credit risk and poor asset quality management in the MFBs. It reduces interest income and increases provisioning costs, thus decreasing returns of a MFB. MFBs tend to experience enhanced financial performance when they are able to undertake more lending activities, yet due to the credit quality of lending portfolios and the general practice in Kenya a higher level of provision is needed. Such a high level of provision for non-performing loans against total loans in fact affects adversely MFBs' Returns on average assets and owners' equity significantly. Moreover, the Loan loss provision coverage ratio is an indicator of how a MFB is protected against future losses with regard to anticipated net charge offs on non-performing loans that are eventually written off. The higher this ratio, the more protected is the MFB against the future losses. But given the negative relationship between LLPCR and performance, in the Kenyan microfinance banking sector, managers should attempt adopting a risk-averse strategy, mainly through policies that improve screening and monitoring credit risk aimed at reducing net charge offs so as to keep LLPCR low.

This result is consistent with the empirical evidence of Athanasoglou et al. (2008) who observed that the loan-loss provisions to loans ratio (credit risk) is negatively and significantly related to banks' profitability. Other studies whose findings are consistent with this result are Li (2007), Ogboi and Unuafe (2013), Funzo (2012), Kolapo, Kolade and Ojo (2012), Al-Jafari and Alchami (2014), Bourke (1989), Vong and Chan (2006) and Sufian (2011). However, Agyei and Dasah (2012), Hakim and Neamie (2001) and Naceur & Omran (2008) found that credit risk has a positive and significant impact on banks financial performance. This difference could be attributed to the variation in methodology and sample size used.

4.6 Effect of Moderator Variables

The Moderator variables used in this study are growth rate in GDP, inflation rate (IF) and bank size measured as log of assets (log S). The first two are external macroeconomic factors while the latter is an internal factor. The system GMM model was estimated incorporating these variables and the results presented in table 4.8 and 4.9.

Table 4.8: GMM System dynamic panel-data estimation, one-step results: ROAA series with moderator variables included

Independent variable: ROAA Number of obs = 30
Group variable: MFB Number of groups = 6
Time variable: YEAR: 2011-2015
Obs per group: min = 5
avg = 5
max = 5
Number of instruments = 19 Wald chi^2 (5) = 49.55
Prob > chi^2 = 0.0000

ROAA	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
ROAA						
L1.	.4171684	.1912959	2.18	0.037	.0242932	.7701455
LogS	-.0359129	.0460656	-0.78	0.436	-.1261999	.0543741
GDP	.3857781	.3888507	0.99	0.021	-.3763552	1.147911
IF	.0773016	.0700583	1.10	0.270	-.0600102	.2146133
PAR	-.1018495	.2010856	-0.51	0.017	-.3710274	.7347273
LLPCR	- .1381292	.070859	0.67	0.009	-.1045752	.2320104
_cons	.6406730	.3557342	1.80	0.010	-.0509146	1.308259

Sargan test of overid. restrictions: H_0: over identifying restrictions are valid
chi^2 (25) = 13.6471 Pr > chi2 = 0.9688
Arellano-Bond test for AR (1) in first differences: z = -1.80 Pr > z = 0.072
Arellano-Bond test for AR (2) in first differences: z = -0.88 Pr > z = 0.391
H_0: no autocorrelation

Source: Research data 2015

Table 4.9: GMM System dynamic panel-data estimation, one-step results: ROAE series with moderator variables included

Independent variable: ROAE Number of obs. = 30
Group variable: MFB Number of groups = 6
Time variable: YEAR: 2011-2015
Obs per group: min = 5
avg = 5
max = 5
Number of instruments = 19 Wald chi^2 (5) = 16.04
Prob > chi^2 = 0.0211

ROAE	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
ROAE						
L1.	.2061184	.0607135	3.39	0.002	.0882645	.3654536
LogS	-.0273131	.1226287	-0.22	0.824	-.2676609	.2130347
GDP	0.653349	.6653754	0.98	0.003	.6492369	3.257461
IF	.4148027	.1326936	3.13	0.002	.1547280	.6748774
PAR	-.2756250	.2733210	-1.01	0.017	-1.039200	3.168130
LLPCR	-.1575246	.3158725	-0.50	0.000	.0264151	.0886342
_cons	.4109015	.4822603	0.85	0.009	-.5345245	1.316326

Sargan test of over id. restrictions: H_0: over identifying restrictions are valid
chi^2 (25) = 13.91734 Pr > chi2 = 0.9632
Arellano-Bond test for AR (1) in first differences: z = -1.80 Pr > z = 0.073
Arellano-Bond test for AR (2) in first differences: z = -0.87 Pr > z = 0.383
H_0: no autocorrelation

Source: Research data 2015

The Log S which represents size variable of the MFB presents a negative effect on ROAA and ROAE with a coefficient of -.0359129 and -.0273131 respectively. Interestingly both effects are insignificant as shown in table 4.8 and 4.9. Greater size may generate economies of scale, thus an increase of performance, but at the same time, the large organizations are often affected by rigidities, inertia, bureaucracy, that may decrease the performance (Kosmidou, 2008; Athanasoglou et al., 2006). Using ROAE as a measure of performance, the finding of this study concur with that of Naceur (2003), Sufian and Habibullah (2009) and Pasiouras & Kosmidou, 2007) who reported that bank size have a negative impact on profitability and observed that the bigger the banks, the more they face diseconomies of scale beyond a certain level, and the smaller the banks, the more they achieve economies of scale up to a specific level. However, using ROAA, the result is similar to that of Alexiou and Sofoklis (2009) and Flamini, McDonald, & Schumacher (2009) whose finding show that the coefficient of the size variable as measured by the logarithm of assets is positive but significant, reflecting the advantages of being a large company in the financial services sector.

As for GDP growth rate has a positive significant relationship with both ROAA and ROAE with regression coefficients 0.3857781and 0.653349 respectively. This suggests that the GDP growth rate has a strong positive effect on financial performance of the microfinance banking sector. The economic growth, expressed by the GDP (per capita) growth which averaged a moderate 5.45% during the study period is expected to have had multiple consequences among which is the increase of bank activity. Both the increase of customer deposits and loans granted and of the interest margins had a positive impact on MFB performance. When the economic activity increases, the demand for loans and deposits increases and positively affect the profit margins (Sufian and Chong, 2008). In addition, the rate of GDP growth reflects the state of the economic cycle and is expected to have an impact on the demand for banks loans. The positive impact of GDP supports the argument of the positive association between growth and financial sector performance (Kosmidou, Tanna & Pasiouras, 2006).

The effect of inflation (IF) rate based on consumer price index is positive and significant on ROAE (regression coefficient of 0.4148027, z=3.13 , p>0.002) but the effect is insignificant for ROAA. The positive relationship between inflation and profitability supports the theory that inflation provides banks opportunity to adjust interest rate change which may result in revenue generation and increases bank profitability. Moreover, projecting the effect of inflation expectations in operational costs of MFBs enhances returns on average equity. Therefore, correct forecast of inflation could impact positively on MFB's returns on shareholders wealth. This finding is consistent with that of Bourk (1989) and Thornton (1992). On the contrary, Kunt and Huizinga (1999) conclude that banks in developing countries tend to be less profitable in inflationary environments, particularly when they have a high capital ratio. In these countries, bank costs actually increase faster than bank revenues. Additionally, the study of Abreu and Mendes (2000) reports a negative coefficient for the inflation variable in European countries.

The moderator variables seem to have had significant impacts on PAR for Credit risk component only. This is depicted by variations in the regression coefficients. Table 4.6 and 4.7 reports PARs regression coefficient of -0.1818499 for ROAA and -0.479666 for ROAE respectively. With moderator variables included in the model, Table 4.8 and 4.9 reports PARs regression coefficient of -0.1018495 for ROAA and -0.2756250 for ROAE respectively. This indicates significant reduction of 0.08 unit and 0.2 units respectively. This implies that Portfolio at risk tends to reduce by 0.08 to 0.2 units with the moderator factors at play. The reduction in PAR results in increased ROAA and ROAE. This could be attributed to the fact that given the positive average GDP growth rate during the study period, the relatively stable economic activities favoured less non-performing loans and hence lower or reduced PAR that is healthy for MFBs performance given the negative relationship between PAR and performance measures.

4.7 Empirical Regression Model

The regression model was based on the two equations:

$ROAA=\alpha+\beta_1 PAR+\beta_2 LLPR+\beta_3 logS+\beta_4 GDP+\beta_5 IF+\varepsilon$

$ROAE=\alpha+\beta_1 PAR+\beta_2 LLPR+\beta_3 logS+\beta_4 GDP+\beta_5 IF+\varepsilon$

These were modeled empirically to:

$ROAA=0.6407-0.1018PAR-0.1381LLPR+0.0359logS+0.3858GDP+0.0773IF$ ……4.7a

$ROAE=0.4109-0.2756PAR-0.1575LLPR+0.0273logS+0.6533GDP+0.4148IF$ ……..4.7b

5.0 Summary of findings conclusions and recommendations

5.1 Summary of findings

Given the pivotal role played by micro finance banking sector in supporting the growth of Small enterprises and that risk management has been a challenge to this sector in achieving this role, the study set out to examine the relationship between risk management and financial performance of microfinance banks in Kenya. It used a sample of 6 microfinance banks during the year 2011 and 2015, and utilized System GMM technique in model estimation and hypothesis testing. To achieve this, three specific objectives were addressed.

Objective one: to establish the relationship between Portfolio at Risk (PAR) and financial performance of Microfinance Banks in Kenya.

To achieve this objective a Pearson correlation matrix was obtained to determine the association between Portfolio at risk (PAR) and financial performance measures; Return on Average assets (ROAA) and Return on average equity (ROAE). PAR is negatively and significantly correlated to ROAE with a correlation coefficient r = -0.6882 which is a fairly strong correlation. However, it has a fairly moderate, negative and significant correlation with ROAA at r = -0.3735. This implies that credit risk management aimed at low levels of PAR are related to enhanced financial performance, reflected fairly high in ROAE and moderately in ROAA. Further, the hypothesis was tested, based on System GMM estimation model:

$H_{01.1}$: There is no significant relationship between PAR and financial performance of MFBs in Kenya.

The regression coefficient of PAR gave a value of -0.1818 that was significant at 5% level with ROAA as a performance measure. But the value equaled -0.4796 and significant at 5% level with ROAE as a measure of performance, suggesting that for 1 unit increase in PAR, the financial performance of MFBs measured by ROAA and ROAE reduces by 0.1818 and 0.4797 respectively. The z-statistic of PAR was significant at 5% level (z = -0.64, p> 0.019 for ROAA and z= -0.01, p> 0.021 for ROAE). The null hypothesis was thus rejected and concluded that PAR has a negative significant relationship with both ROAA and ROAE as financial performance measures. Therefore, maintaining Portfolio at risk at low levels enhances financial performance.

Objective Two: to determine the relationship between Loan loss provision coverage ratio (LLPCR) and financial performance of Microfinance Banks in Kenya.

To achieve this objective a Pearson correlation matrix was obtained to determine the association between Loan loss Provision coverage ratio (LLPCR) and financial performance measures; Return on Average assets (ROAA) and Return on average equity (ROAE) Similarly LLPCR was found to be negatively and significantly correlated to both measures of performance. This relation was however weak for ROAA (r=-0.1342) and moderate for ROAE (r= -0.3907).

$H_{01.2}$: There is no significant relationship between LLPCR and financial performance of MFBs in Kenya.

The LLPCR is negative and significantly related to performance with a coefficient of -.1381292 and-0.1575246 for ROAA and ROAE measures respectively. This implies that for every one unit increases in LLPCR, ROAA decreases by 0.138 units and ROAE by 0.157 units. The z-statistic of LLPCR was found to be significant at5% level (z = -0.67, p> 0.009 for ROAA and z= -0.50, p> 0.000 for ROAE). The null hypothesis was thus rejected and concluded that LLPCR has a negative significant relationship with both ROAA and ROAE as financial performance measures. Thus microfinance banks with higher LLPCR earn low returns on assets and shareholders wealth compared to those with low levels of LLPCR.

5.2 Conclusions

A strong and efficient microfinance banking sector is important for sustainable economic growth as the sector supports small scale enterprises that contribute about 20% to the GDP. Microfinance banking industry in Kenya has experienced drastic and comprehensive reforms since 2006 and more microfinance banks are still being licensed to date. The reform has achieved phased success, while challenges remain. There are numerous internal and external factors which influence Microfinance bank's performance. This

study investigated the relationship between Credit risk management and financial performance of Microfinance banks in Kenya. Microfinance bank size and external macroeconomic factors (GDP and inflation) were incorporated as moderating factors. The results of the study showed that the effects of credit risk management measured by PAR and LLPCR are negative and significant which calls for efficient credit risk identification, monitoring and controlling needed for improving the profitability of microfinance banks in the country. Credit risk tend to be better managed in economic conditions of increased GDP and moderate inflation that has a great positive impact on MFB performance. Based on the objectives, this study concludes as follows:

From the findings, this study concludes that financial performance of MFBs increases with lower levels of Portfolio at risk (PAR) and Loan loss provision coverage ratio (LLPCR). PAR and LLPCR measure asset quality. The mean values of 10.86% and 10.88% for PAR and LLPCR reported among the sampled MFBs is relatively high compared to the recommended ratio of 5%, an indication of poor asset quality that is attributable to substantial portion of non-performing loans or loans due not paid on time, less provisioning for loan losses and high net charge- offs that is occasioned by inadequate credit risk identification, monitoring and controlling.

5.3 Recommendations

More stringent approaches of reducing credit default that result in accumulation of loans overdue not paid on time and hence non-performing loans and high net charge- offs should be adopted by individual MFBs to keep Loan loss provision coverage and Portfolio at risk at low levels. Thus this study recommends that:

1. MFB Credit Manager should put in place and operate under a sound credit granting process with well-defined credit-granting criteria detailing the MFB's target market, a thorough understanding of the borrower, the purpose and structure of the credit, and its source of repayment. Overall credit limits should be established at the level of borrowers and new credit approvals, amendment, renewal and re-financing of existing credits should be based on Clearly-established process.
2. In addition to dependence on CIS from CRBs, the credit manager should develop and utilize management information system and an internal risk rating system consistent with the nature, size and complexity of a MFB's activities. The system should also determine the adequacy of loan loss provisions and reserves. Moreover, in assessing credit risk exposures for individual credits and their portfolios under stressful conditions, there should be consideration of potential future changes in economic conditions such as GDP growth rate and inflation

5.4 Suggestions for further research

For future research, this study can be extended to cover longer time periods. Unbalanced panel data can be used to incorporate the microfinance banks which are recently established. Other econometric techniques can be applied to verify the relationship. More macroeconomic factors such as real interest rates, exchange rate stock market turnover can be considered as moderating or control factors.

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